Designation: D 3207 – 92 (Reapproved 2002)

Standard Test Method for Detergent Resistance of Floor Polish Films[1]

This standard is issued under the fixed designation D 3207; 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 (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method covers a bench procedure for measuring the detergent resistance properties of floor polishes.

1.2 *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 1436 Test Methods for Application of Emulsion Floor Polishes to Substrates for Testing Purposes[2]

3. Significance and Use

3.1 This test method is used to determine the relative resistance of floor polishes to detergent scrubbing using the Gardner Straight Line Washability Meter and to separate polishes with poor detergent resistance from those with good detergent resistance. Results are duplicative between laboratories.

4. Apparatus

4.1 *Washability Apparatus*—The Gardner straight line washability machine.[3]

4.2 *Applicator*—Doctor blade, 50 mm (2-in.) wide and having a 0.203-mm (0.008-in.) clearance along the bottom edge (see Test Methods D 1436).

4.3 *Test Flooring Substrates*—Official Vinyl Composition Tile (OVCT),[4] Black, 304.8 by 304.8 mm (12 by 12 in.).

4.4 *Volumetric Pipet*—A 1-mL pipet graduated in 0.2-mL units.

4.5 *Hog Bristle Brush*—Aluminum block, 89 by 38-mm (3½ by 1½-in.) hog bristle brush with 19-mm (¾-in.) bristles. Soak in detergent solution (see 5.1) for a minimum of 1 h prior to test.

4.6 *Cellulose Sponge*—Cut to fit the Gardner brush holder. The sponge is to be used for household floor polishes only.

5. Reagent

5.1 *Detergent Solution at Use Concentration*:

Tetrasodium pyrophosphate (TSPP)	0.25 %
Tetrapotassium pyrophosphate (TKPP)	0.25 %
Octyl phenol + 10 moles ethylene oxide (OPE_{10})	0.38 %
Sodium hydroxide	0.03 %
Surfactant QS44 (80 %)[5] or equivalent	0.15 %
Distilled or deionized water	98.94 %

6. Sample

6.1 The sample used for test purposes shall be completely representative of the material in question.

7. Procedure

7.1 *Preparation of Test Surface*—Clean the test tiles with a good polish stripper and steel wool. Rinse thoroughly with water and dry at room temperature.

7.2 *Floor Finish Application*—Apply in duplicate as shown in the template in 6.3, 0.8 mL of test polish *A* to a 2 by 8-in. section of OVCT (tile must be level to obtain uniform film thickness). Apply in a similar fashion duplicate samples of preferably a control floor polish *B* (a second test polish can be used if desired). Let dry for 24 h at 22.8 ± 2°C (73.4 ± 3.6°F) and 50 ± 5 % relative humidity.

7.3 *Template for Polish Application*—See Fig. 1.

7.4 *Detergent Resistance*—Place the conditioned coated test panel on the plate of the washability apparatus in such a manner that the oscillating brush (sponge) will travel at right angles to the longer side of the dried polish film near the top of polish film. Place a clean dummy panel on either side of the test panel to hold the latter panel in place and to provide a

[1] This test method is under the jurisdiction of ASTM Committee D21 on Polishes and is the direct responsibility of Subcommittee D21.04 on Performance Tests.

Current edition approved Aug. 15, 1992. Published October 1992. Originally published as D 3207 – 73. Last previous edition D 3207 – 87.

[2] *Annual Book of ASTM Standards*, Vol 15.04.

[3] The sole source of supply of the apparatus known to the committee at this time is Gardner Laboratory, Inc., P. O. Box 5758, Bethesda, MD. If you are aware of alternative suppliers, please provide this information to ASTM Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend.

[4] The sole source of supply of the apparatus known to the committee at this time is Chemical Specialties Manufacturers Assn., 1913 Eye St., NW, Washington, DC 20006. If you are aware of alternative suppliers, please provide this information to ASTM Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend.

[5] The sole source of supply of the apparatus known to the committee at this time is Union Carbide, 39 Old Ridgebury Rd., Danbury, CT 06817-0001. If you are aware of alternative suppliers, please provide this information to ASTM Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend.

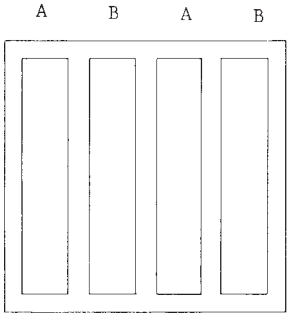

FIG. 1 Polish Application

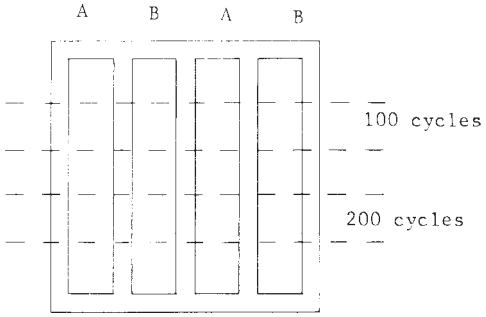

FIG. 2 Detergent Resistance Test

uniform surface for the oscillating brush (sponge) to travel upon.

7.4.1 *Industrial Floor Polishes*—Insert the brush into the receptacle, and while in an inverted position pour 10 mL of detergent solution onto the brush. Immediately turn the brush so that the bristles make contact with the coated panel and start the motor. If for any reason the 10 mL has insufficient volume of detergent solution for good wetting, add more solution dropwise during the test period. After 100 oscillations, stop the machine, remove the panel and rinse with water being careful not to wet the polish film below where it was scrubbed. Blot dry. Below the first track, repeat the scrubbing operation using a fresh 10 mL of detergent solution for 200 cycles, rinse, and blot dry.

7.4.2 *Template for Detergent Resistance Test*—See Fig. 2.

7.4.3 *Household Floor Polishes*—Use exactly the same procedure as for industrial floor polishes except replace the hog bristle brush with a cellulose sponge cut to fit the washability receptacle. More detergent solution will be required to saturate the sponge; 25 mL is suggested to start.

7.4.4 Prior to rating the panels, attempt to repair the scrubbed section of polish films by wiping briskly with cheesecloth.

8. Report

8.1 The report shall include a qualitative rating in accordance with the following terminology.

8.2 Deterioration in film appearance shall comprise film removal, permanent film whitening, haze development in treated polish film, or any combination of these factors.

8.3 *Rating System*:

Degree of detergent resistance	deterioration in film appearance
Excellent	none
Very good	<10 % after 200 cycles
Good	>10 % after 200 cycles but <10 % after 100 cycles
Fair	>25 % after 200 cycles with< 25 % after 100 cycles
Poor	>50 % after 100 cycles

9. Precision and Bias

9.1 Duplicate determinations should not differ by more than one rating group.

9.2 Since there is no accepted reference material suitable for determining the bias for measuring the detergent resistance of floor polish films, bias has not been determined.

10. Keywords

10.1 detergent; detergent resistance; doctor blade; emulsion; hog bristle brush; OVCT; polishes; sponge; washability; washability apparatus