Designation: D 3153 – 87 (Reapproved 2002)

Standard Test Method for Recoatability of Water-Emulsion Floor Polishes[1]

This standard is issued under the fixed designation D 3153; 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 the determination of the effects of the application of a water-emulsion floor polish over a dried coating of the same polish. The method is designed for laboratory bench panel testing. A method is also provided for large area testing. A rating system is provided to indicate the acceptability of the polish based on recoatability performance.

NOTE 1—Recoatability of a water-emulsion floor polish is a general-performance property, and the determination of it is dependent upon the observation of several other properties of the polish under the specific conditions expressed in this test method. This test method for recoatability is not designed for the evaluation of other properties, except as these properties relate to the recoatability of the specific polish being evaluated under the conditions of this test.

1.2 Gloss as observed herein extends only to freedom from loss of apparent visual gloss upon recoating, in the execution of this test method, and should this loss occur, it indicates a distortion of the property of gloss, by recoating.

1.3 A degree of recoatability failure may be reflected from a degree of leveling failure. The failure to level should be observed only if it is to be a part of the observation of recoatability.

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 2825 Terminology Relating to Polishes and Related Materials[2,3]

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *beading*—the apparent failure of the liquid polish to wet out the surface as evidenced by the gathering of the polish into puddle-like beads.

3.1.2 *drag*—the resistance observed when the wet applicator is moved over the wet coating, when the polish is being spread.

3.1.3 *foaming*—the development and persistence of bubbles in the wet polish during application.

3.1.4 *ghosting*—the dissimilar appearance, in transparency or gloss, of a portion of the coating.

3.1.5 *streaking*—the apparent mark (or marks) that remains in the dried film showing the path followed by the applicator during the spreading of the liquid polish.

3.1.6 *whitening*—the development of a white color on or within a coating during the drying process, which reduces the functioning of a polish to beautify and (possibly) protect floors.

4. Summary of Test Method

4.1 The test method involves the application of floor polish using, but not restricted to, cheesecloth or lamb's wool applicator for spreading a measured amount of polish, over previously applied coatings of the polish. The test method includes a fast recoat cycle at 30 min which can also be used following manufacturer's directions and an extended recoat cycle of seven days. All tests are run on commercial floor tile.

5. Significance and Use

5.1 The essential practical usage of water-emulsion floor polishes as renewable coatings to protect and beautify floors, depends upon satisfactory recoatability. This test method is useful both in product development and final product testing, as a means of evaluating recoatability.

6. Interferences

6.1 The presence of the factory finish, mold-release agents, or other foreign materials on the test surface, prior to the first application of the polish that is to be tested in accordance with this method, will cause irregular results. Abrading the surface of the test panel or area (for example, by cleaning with an abrasive pad) prior to the first application of the polish, will yield abnormal results. The cleaning formula listed in Footnote

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[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 Jan. 30, 1987. Published March 1987. Originally published as D 3153 – 72. Last previous edition D 3153 – 78 (1986).

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

[3] Composition of cleaning solution: MEA 1 %, trisodium phosphate dodecahydrate 10 %, propylene glycol monomethyl ether 6 %, octylphenoxy polyethoxyethanol (nonionic surfactant, 9 to 10 moles of ethylene oxide) 2 %, and distilled water 81 %. Compounding—Dissolve the TSP in the water. Add remaining ingredients and mix thoroughly till clear.

3 should be used to remove the above mentioned coatings.

7. Apparatus

7.1 *Floor Tile Panels,*[4] black vinyl (homogeneous), 304.8 by 304.8 mm (12 by 12 in.).

7.2 *Floor Tile Area,*[4] black vinyl (homogeneous), 1.2 by 0.9 m (4 by 3 ft).

7.3 *Cheesecloth*, clean, completely free of sizing.[5]

7.4 *Pipet*, 5-mL, graduated in 0.2 mL.

7.5 *Graduate*, 50 mL.

7.6 *Applicator*, lamb's wool.[6]

7.6.1 Optional applicators include chenille pads and cotton and synthetic mops.

NOTE 2—Black vinyl composition floor tile panels or black vinyl composition floor tile area of the same dimensions as stated for the black vinyl (homogeneous) tile may be used. See Sections 9 and 11 of this method for information regarding the selection of test surfaces and reporting of results.

8. Conditioning

8.1 Average ambient conditions shall be equal for all polishes and surfaces used, and shall be free of drafts, and shall be between 15 and 30°C (59 and 86°F) with the relative humidity not in excess of 70 % or below 40 %.

9. Procedure

9.1 *Bench Panel Test*:

9.1.1 *Selection of Panels*—Select either five black vinyl (homogeneous) floor tile panels or five black vinyl composition floor tile panels, for each polish under test, basing selection on like-new condition. Do not intermix these two types of test surfaces in any one test sequence.

9.1.2 *Preparation of Test Panels*—Prepare five panels for each polish under test by cleaning with undiluted comparison cleaning solution described in Footnote 3. Soak the panels face to face for 20 min. Using a soft brush or clean cheesecloth, scrub thoroughly to remove all coatings, soil, etc. Rinse thoroughly with clear water and let dry completely.

9.1.3 *Application of Polish*—Prepare a swab 50.8 mm (2 in.) square and twelve plies thick, using clean cheesecloth, free of sizing. Immerse the swab in the test polish and squeeze out the excess. Pipet 2.6 ml (Note 3) of the test polish on to the surface of a test panel, which should be lying level on a horizontal surface, and spread the polish uniformly, using the swab previously prepared. Repeat for the other four panels. Observe the coatings on all five panels after they have dried for 30 min. or following manufacturers directions, under average ambient conditions. Note the similarity. If the appearance of the coating on all panels is not uniformly equal, discard these panels, and prepare a new group of coated panels using the above procedure.

NOTE 3—2.5 mL of polish are used for 12 by 12-in. (304.8 by 304.8-mm) panels. 1.4 mL of polish are used for 9 by 9-in. (228.6 by 228.6-mm) panels. Test can be performed using polish manufacturer's recommended rate of application.

9.1.4 *Application of Second Coat*—Thirty minutes after application of the first coat of polish, or following manufacturer's dry time recommendations, take two of the five panels and apply on each a second coat using the procedure detailed in 9.1.3 for applying and spreading the polish. Record the temperature and relative humidity. Observe and record any foaming of the polish and drag of the applicator during application and spreading. Observe and record any beading of the polish or required additional stroking with applicator to wet out the surface. Allow to dry 2 h, and observe and record any removal of the first coat, any whitening, streaking, or ghosting. Observe and record leveling. Visually observe the apparent gloss of the recoated polish, and record the comparison with the single coat of polish.

9.1.5 After allowing them to remain undisturbed for seven days under average ambient conditions, take two of the three remaining panels which have a single coat of polish, recoat, using the procedure given in 9.1.4, making and recording observations as directed in that paragraph. Include those observations made after allowing the recoat to dry for 2 h.

9.2 *Large Area Test*:

9.2.1 *Selection of Test Areas*—Select two test areas, each having a minimum size of 1.2 by 0.9 m (4 by 3 ft) of either black vinyl (homogeneous) floor tile or black vinyl composition floor tile, for each polish under test, basing selection on like-new condition. Do not intermix these two types of test surfaces in any one test sequence.

9.2.2 *Preparation of Test Areas*—Prepare each selected test area by cleaning carefully using undiluted comparison cleaning solution described in Footnote 3 and scrubbing with a soft brush or soft synthetic floor machine pad to remove all coatings, soil, etc. Rinse thoroughly and let dry completely.

9.2.3 *Application of Polish*—For each polish under test, apply one coat of polish to each of two test areas with a portion of each area to be recoated, one in 30 min, or following manufacturer's directions the other in seven days. Prepare a lamb's wool applicator, chenille applicator or suitable mop by wetting it with the test polish, then squeeze it, allowing no excess to remain. Pour 30.0 mL (Note 4) of polish, on the test area, and spread it uniformly over the test area using the applicator prepared above. After drying 30 min under average ambient conditions, observe the coatings for uniformity of gloss and general appearance. If not uniform, clean the test area following the procedure in 9.2.2, and repeat the application. If nonuniformity persists, select a fresh test area of new or like-new surface.

NOTE 4—The spreading rate is 1500 ft^2/gal (36.7 m^2/L).

9.2.4 *Application of Second Coat*—Apply a second coat on a 0.6 by 0.9-m (2 by 3-ft) portion of one of the test areas 30 min, or as recommended by the manufacturer, after the application of the first coat by pouring out on the test area 15.0 mL of the test polish, and spreading it uniformly, using a freshly wet out lamb's wool applicator prepared as above.

[4] The floor tiles must be new or of like-new quality. New tile can be purchased through the Chemical Specialties Manufacturer's Association, 1001 Connecticut Ave., N.W., Washington, DC 20036.

[5] Gauze pads, available from most pharmacies, are suitable.

[6] Lamb's wool applicators sold commercially, having an area about 508 by 254 mm (2 by 10 in.) of lamb's wool mounted on a support of the same size and attached to a handle of suitable length, are recommended.

Record observations on this test of the qualities and performance characteristic directed to be observed in the panel recoat procedure in 9.1.4.

9.2.5 Allow the other test area to remain undisturbed for seven days under average ambient conditions. On the seventh day recoat a 0.6 by 0.9-m (2 by 3-ft) portion of the once-coated area, following the procedure in 9.2.4, making and recording the specified observations. Duplicate tests may be conducted if the results are in doubt.

10. Calculation and Interpretation of Results

10.1 Since a number of floor polish properties collectively determine the property of recoatability, the evaluation of recoatability must be confined to the general appearance of the multicoat finish in relation to the single coat finish. Rate the multicoat finishes as follows:

10.1.1 *Good*—appearance of the multicoat finish significantly superior to the single-coat finish.

10.1.2 *Fair*—appearance of the multicoat finish only marginally superior or inferior to the single-coat finish.

10.1.3 *Poor*—appearance of the multicoat finish significantly inferior to the single-coat finish.

11. Report

11.1 The report shall include the following:

11.1.1 Test surface size as bench panel test or large area test,

11.1.2 Floor tile type used, as vinyl (homogeneous) or vinyl composition,

11.1.3 Recoatability of polish as defined in Section 9 of this method, and

11.1.4 Further note may be made in the report of any specific problem areas as defined in Section 4 of this test method.

12. Precision and Bias

12.1 This is a subjective method and the precision and bias have not been fully established.

13. Keywords

13.1 beading; drag; emulsion; floor polish; foaming; ghosting; glass; OVCT; recoatability; streaking; strip; water emulsion; wax; whitening