Designation: D3052 – 17

Standard Practice for Rating Water-Emulsion Floor Polishes[1]

This standard is issued under the fixed designation D3052; 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 practice covers the comparison of the performance of water-emulsion floor polishes on test floors against a reference material. It is applicable to the following types of polishes:

1.1.1 Wax emulsion polishes,

1.1.2 Nonbuffable emulsion polishes,

1.1.3 Detergent-resistant emulsion polishes, household type, and

1.1.4 Detergent-resistant emulsion polishes, industrial type.

1.2 Gloss, leveling, discoloration, traffic marking, slip resistance, and removal ease of these types of floor polishes is rated in comparison to a reference material. Where applicable, detergent resistance is also evaluated. This method is not to be considered as a recommended maintenance procedure.

1.3 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.4 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.5 *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.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D523 Test Method for Specular Gloss

2.2 *CSMA Bulletin:*

245-70 Comparative Determination of Slip Resistance of Floor Polishes[3]

3. Significance and Use

3.1 When comparing different floor polishes for an actual field performance, it is important that all surfaces used be prepared in the same way. When this procedure is followed, variations in the test surfaces are minimized.

4. Apparatus

4.1 *Test Tile,* OVCT.[4]

4.2 *Glossmeter*, 60°—The instrument and the reference standards shall conform to the requirements prescribed in Test Method D523, using an angle of reflection of 60°.

4.3 *Floor Machine.*

5. Procedure

5.1 The preferred substrate shall be Official Vinyl Composition Tile.

5.2 The test floor shall include both dark (black) and light (white) colored tiles laid out so that one half of the panel is all white and the other half is all black.

5.3 The minimum test panel size for each polish tested shall be 3 ft (0.9 m) in width and 3 ft in length.

5.4 Prepare all of the test panels with scrub-cleaned new tiles, or strip completely of dirt and old wax, rinse thoroughly and dry before application of the test polishes. Under no

[1] This practice 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 March 1, 2017. Published April 2017. Originally approved in 1972. Last previous edition approved in 2010 as D3052 – 87 (2010). DOI: 10.1520/D3052-17.

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from the Chemical Specialties Manufacturers Association, 1001 Connecticut Avenue, NW, Washington, DC 20036.

[4] OVCT tile may be obtained through Armstrong Flooring from various home improvement stores. The following Armstrong tile substrates have been found to perform adequately for this test method: Armstrong Excelon Feature Tile: Black (56790), http://www.armstrong.com/commflooringna/product_details_toolbox_magnify.jsp?item_id=47394.

circumstances should comparative tests be made on new versus old tiles. Similarly, where old tiles are employed, care should be taken to employ tiles or panels with approximately equivalent traffic history.

5.5 Mask a small portion of a black tile prior to polishing so as to provide an unpolished control area. The masking is to remain during the entire traffic period.

5.6 Take glossmeter readings on the clean and dry center four panels (two light tiles and two dark tiles) with a 60° glossmeter prior to application of the polish.

5.7 Apply the test polish and the reference (standard) polish equally to the same test panel in such a manner that each polish covers half of the black tiles and half of the white tiles. A typical panel is illustrated in Fig. 1. An alternative approach is to apply each polish to a separate panel.

5.8 Apply each of the test polishes to the test panels at a rate of 1500 to 2000 ft^2/gal (37 to 49 m^2/L), using any suitable and controlled procedure. This spreading rate is equivalent to:

0.06 to 0.08 fluid oz/ft^2

1.9 to 2.5 mL/ft^2

5.9 Apply a second coat of a like amount 2 h after the first coat.

5.10 In the instance of wax emulsion polishes, machine buff the test panels coated with the text wax and the reference material with a new 00 steel wool pad or clean bristle brush attachment 30 min after the second coat is apparently dry. Consider the small area and do not over buff. Do not buff any other polish types considered in this method at this time.

5.11 Allow each test panel to dry 1 h before being exposed to traffic. (Environmental conditions outside the norm or 70 to 90°F (21.1 to 32.2°C) and above 70 % relative humidity may necessitate longer periods of drying time.) Again take gloss readings on the four center tiles prior to exposure to traffic. Comparatively rate the films visually for leveling, for any discoloration tendencies, and for slip resistance following CSMA Bulletin 245-70. In the instance of the wax emulsion polishes, make the leveling and gloss ratings after buffing.

5.12 Daily maintenance should include dry brushing or sweeping.

6. Maintenance and Evaluation Schedule for Wax Emulsion Polishes

6.1 Damp mop the test panels weekly, or when necessary, with a commercial neutral cleaner used in accordance with label instructions as to dilution, water temperature, etc. Rinse the panel with clear water and allow to dry thoroughly.

6.2 Machine buff the test panels weekly, following the damp mopping and a suitable drying period, by the technique described in 5.10.

6.3 Evaluate the test panels for traffic marking (heel marking, soiling, scuffing, and scratching), visually and with a 60° glossmeter (four center tiles) for gloss and for slip resistance following CSMA Bulletin 245-70.

6.3.1 After 1 day's exposure to normal traffic.

6.3.2 Before and after the first damp mop cleaning and buffing operation. (This operation should be performed no later than the end of the first traffic week.)

6.3.3 Before and after the third damp mop cleaning and buffing operation. (No later than the end of the third traffic week.)

6.3.4 Evaluate for soil and heel mark resistance on the light tiles.

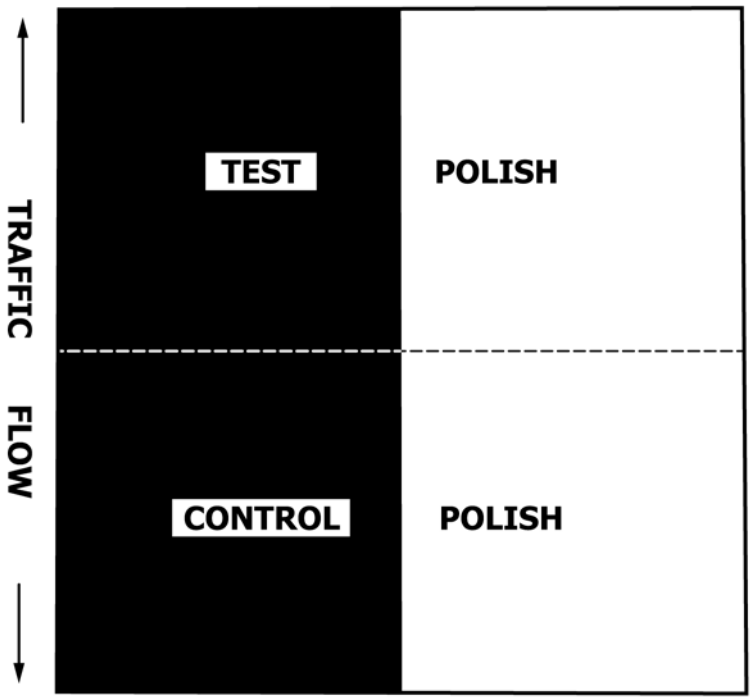

FIG. 1 Typical Floor Service Test Panel

TEST CONDITIONS

Date began_____ Date ended_____ Place_____

Type of Substrate used_____ Glossmeter Reading on Pre-stripped Surface _____

Remarks_____

Test Polish _____ Control Polish _____

TEST RESULTS

	Observer	Fresh	1 Day	1st Cleaning Before	1st Cleaning After	2nd Cleaning Before	2nd Cleaning After	3rd Cleaning Before	3rd Cleaning After
GLOSS	1								
	2								
	3								
	4								
	Average								
	Test Glossmeter								
	Control Glossmeter								
	Range								
Scratch Resistance	1								
	2								
	3								
	4								
	Average								
	Range								
Scuff Resistance	1								
	2								
	3								
	4								
	Average								
	Range								
Slip Resistance	1								
	2								
	3								
	4								
	Average								
	Range								
Detergent Resistance	1								
	2								
	3								
	4								
	Average								
	Range								

Leveling	Observer	Fresh
	1	
	2	
	3	
	4	
	Average	
	Range	

Removal Ease	Observer	*
	1	
	2	
	3	
	4	
	Average	
	Range	

Glossmeter reading on stripped tile_____

FIG. 2 Data Sheet for Evaluating Water-Emulsion Floor Polishes on Dark Substrate of Test Floors

6.3.5 Evaluate scuff and scratch resistance ratings on the dark tiles.

6.3.6 Determine slip resistance on both light and dark tiles that have been most trafficked because of direction of traffic flow.

6.3.7 Determine ease of removal on the black tiles after power-scrubbing the entire test panel with a commercial polish remover used in accordance with label recommendations as to dilution, temperature, wet contact time prior to scrubbing, etc. Rinse the panel with clear water and allow to dry thoroughly. Remove tape masking prior to making visual comparison of removal properties. A 60° glossmeter reading on the stripped tiles may prove helpful. Hand buffing a small area with a soft cloth is suggested as a supplemental aid in determining if stripping is complete. If no appreciable increase in gloss is achieved, it can be concluded that the film has been removed.

7. Maintenance and Evaluation Schedule for Nonbuffable Emulsion Polishes

7.1 Damp mop the test panels twice a week with a commercial neutral cleaner used in accordance with label instructions as to dilution, water temperature, etc. Rinse the panel with clear water and allow to dry thoroughly.

7.2 Evaluate the test panels for traffic marking (scuffing, scratching, soiling and heel marking), visually and with a 60° glossmeter for gloss (four center tiles), and for slip resistance by following CSMA Bulletin 245-70.

7.2.1 After 1 day's exposure to normal traffic.

7.2.2 At the end of the first week, both before and after damp mop cleaning.

7.2.3 At the end of the second week, both before and after damp mop cleaning.

7.2.4 At the end of the third week, both before and after damp mop cleaning.

7.3 Evaluate for soil and heel mark resistance on the light tiles.

7.4 Evaluate scuff and scratch resistance ratings on the dark tiles.

7.5 Determine slip resistance as in 6.3.6.

7.6 Determine ease of removal as in 6.3.7.

8. Maintenance and Evaluation Schedule for Detergent-Resistant Emulsion Polishes, Household Type

8.1 Sponge mop clean the test panels after 4 days of traffic minimum or when necessary, with a solution of ¼ cup (2 oz)

TEST CONDITIONS

Date began _____ Date ended _____ Place _____

Type of Substrate used _____ Glossmeter Reading on Pre-stripped Surface _____

Remarks _____

Test Polish _____ Control Polish _____

TEST RESULTS

	Observer	Fresh	1 Day	1st Cleaning Before	1st Cleaning After	2nd Cleaning Before	2nd Cleaning After	3rd Cleaning Before	3rd Cleaning After
GLOSS	1								
	2								
	3								
	4								
	Average								
	Test Glossmeter								
	Control Glossmeter								
	Range								
Heel Marking	1								
	2								
	3								
	4								
	Average								
	Range								
Soil Resis-tance	1								
	2								
	3								
	4								
	Average								
	Range								
Slip Resis-tance	1								
	2								
	3								
	4								
	Average								
	Range								
Detergent Resis-tance	1								
	2								
	3								
	4								
	Average								
	Range								

	Observer	Fresh
Discoloration	1	
	2	
	3	
	4	
	Average	
	Range	

FIG. 2 *(continued)*

alkaline cleaner per gallon of water (16 mL/L), (Note 1), rinse and allow to dry thoroughly. The total wet contact time of the alkaline cleaner solution with test panel should be controlled within a 3 to 5 min period.

NOTE 1—The composition of the alkaline cleaner shall be as follows:

	Mass, %
Sodium sesquicarbonate	52.0
Trisodium phosphate (anhydrous)	22.0
Disodium phosphate (anhydrous)	25.0
Alkyl aryl sulfonate (40 % active)	1.0
	100.0

8.2 Evaluate the test panels visually for traffic marking (scuffing, soiling, scratching and heel marking), and with a 60° glossmeter for gloss (center four tiles only) and for slip resistance following CSMA Bulletin 245-70.

8.2.1 One hour after application (gloss and slip resistance only).

8.2.2 *First Cleaning*—After 4 days of traffic (minimum), or when necessary, before and after sponge mop cleaning.

8.2.3 *Second Cleaning*—After 8 days of traffic (maximum), or when necessary, before and after sponge mop cleaning.

8.2.4 *Third Cleaning*—After 12 days of traffic (maximum), or when necessary, before and after sponge mop cleaning.

8.3 Evaluate for soil and heel mark resistance on the light tiles.

8.4 Evaluate scuff and scratch resistance ratings on the dark tiles.

8.5 Determine slip resistance as in 6.3.6.

8.6 Determine ratings for detergent resistance after each cleaning and rinsing. They are arrived at by reference to the visual gloss observations and consideration of gloss retention, or lack of it. An optional method based upon percent reduction in gloss arrived at by calculation with the 60° gloss values may be used.

NOTE 2—Percent loss of gloss can be calculated from gloss measurements before and after cleaning. The difference between the loss of gloss of the sample *versus* that of the control may be related to detergent resistance. Thus, if the test sample exhibits 5 to 10 % more loss of gloss than the control, it would receive a rating of −1. If the greater loss exceeded 10 %, it would receive a −2 rating, and if the greater loss were less than 5 %, the rating would be 0. Conversely, if the control sample exhibited 5 to 10 % more loss of gloss than the test sample, the test sample would receive a rating of +1, etc.

8.7 Mask a second small section of a black tile following the third cleaning and rinsing. The masked area will serve as a polished, detergent-washed and trafficked control.

8.8 Sponge mop-strip the test panels with ¼ cup (2 oz) of alkaline cleaner per gallon (16 mL/L) of solution (Note 1) to which has been added 2 cups (16 oz) (473 mL) of a 5 %

ammonium hydroxide (NH_4OH) solution, following the third cleaning. Spread the solution over the panel and allow to remain for 2 min after which use a moderate scrubbing action to strip the film.

8.9 Rinse the panel and wipe dry with a cloth.

8.10 Make visual observations on the black tiles as to film removal. Remove the masking from the two control areas for purposes of comparison, when making this final observation. Sixty-degree glossmeter readings on the stripped tiles may prove helpful. Hand buffing a small area with a soft cloth is suggested as a supplemental aid in determining if stripping is complete. If no appreciable increase in gloss is achieved, it can be concluded that the film has been removed.

9. Maintenance and Evaluation Schedule for Detergent-Resistant Emulsion Polishes, Industrial Type

9.1 Mop-clean the test panels with a commercial neutral detergent solution at the use dilution recommended for routine cleaning of floors. Rinse the cleaned floor thoroughly, allow to dry, and then machine buff lightly. The total wet contact-time of the cleaner solution with the test panel should be controlled within a 3 to 5-min period. This cleaning, rinsing, and buffing procedure is repeated after every 4 days of traffic, or when necessary. When more than 12 days of traffic are desired, employ additional evaluation sheets with changes to indicate 4th, 5th cleaning, etc.

9.2 Evaluate the test panels as follows:

9.2.1 One hour after application, visual and 60° gloss and slip resistance following CSMA Bulletin 245-70.

9.2.2 After each 4-day traffic period, following dry sweeping, for gloss, 60° and visual, scratch resistance, scuff resistance, soil resistance, heel mark resistance and slip resistance; following cleaning and rinsing, for gloss, 60° and visual and detergent resistance, visual (see 8.6); following machine buffing for gloss, 60° (optional, where a separate record of buffability is desired), soil resistance, heel mark resistance, and slip resistance.

9.2.3 Evaluate for soil and heel mark resistance on the light tiles.

9.2.4 Evaluate scuff and scratch resistance ratings on the dark tiles.

9.2.5 Determine slip resistance as in 6.3.6.

9.2.6 Determine ratings for detergent resistance after each cleaning and rinsing prior to buffing. They are arrived at by reference to the visual gloss observations and consideration of gloss retention, or lack of it. An optional method based upon percent reduction in gloss arrived at by calculation with the 60° gloss values may be used (Note 2).

9.2.7 Mask a small section of a black tile following the fourth cleaning and rinsing. The masked area will serve as a polished, detergent-washed and trafficked control.

9.2.8 Power strip the test panels after the fourth cleaning with a stripping pad or brush and with the recommended dilution of an ammoniated wax stripper or the neutral detergent solution employed for cleaning to which is added 2 cups (16 fl. oz. or 473 mL) of 5 % NH_3OH per g of diluted cleaner. Spread the stripping solution over the panel and allow to remain for 2 min after which start the scrubbing actions.

9.2.9 Rinse the panel and wipe dry with a cloth.

9.2.10 Make visual observations on black and white tiles for film removal. Remove the masking from the two control areas for purposes of comparison, when making this final observation. Sixty-degree glossmeter readings on the stripped tiles may prove helpful. Hand buffing a small area with a soft cloth is suggested as a supplemental aid in determining if stripping is complete. If no appreciable increase in gloss is achieved, it can be concluded that the film has been removed.

10. Report

10.1 The evaluation of the test panels shall be made by at least three qualified observers. Assigning a value of 0 to the reference material, rate each characteristic of the test polish according to the table listed below:

Rating System	
0	Equal to reference material
+1	Slightly better than reference material
+2	Much better than reference material
–1	Slightly poorer than reference material
–2	Much poorer than reference material

10.2 The results should be reported as the average of the three or more observers carried to two decimal places for example, 1.25. An additional figure, the range between the highest and lowest value, will help show the agreement between observers. The range between +2 and –2 is 4.

10.3 The results should be tabulated on the accompanying data sheets.

10.4 One sheet is for light substrate and one sheet is for dark substrate.

11. Keywords

11.1 CSMA Bulletin 245-70; floor machine; glossmeter; OVCT; polish; scratch resistance; scuff resistance; slip resistance wax; water emulsion