



Designation: D3440 – 01 (Reapproved 2007)

Standard Guide for Preparing Specifications for Water-Emulsion Floor Polishes¹

This standard is issued under the fixed designation D3440; 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 guide covers preparing specifications for water-emulsion floor polishes on all nonwood floors and for sealed wood floors.

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:

- D1288 Test Method for Test for Total Ash and Silica in Water-Emulsion Polishes (Withdrawn 1984)²
- D1290 Test Method for Sediment in Water-Emulsion Polishes by Centrifuge
- D1455 Test Method for 60° Specular Gloss of Emulsion Floor Polish
- D1791 Test Method for Accelerated Aging of Liquid Water-Emulsion Floor Polishes
- D1792 Test Method for Long-Term Removability Properties of Emulsion Floor Polishes
- D1793 Test Method for Water Spotting of Emulsion Floor Polishes
- D2047 Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine
- D2048 Test Method for Powdering of Floor Polish Films
- D2825 Terminology Relating to Polishes and Related Materials
- D2834 Test Method for Nonvolatile Matter (Total Solids) in Water-Emulsion Floor Polishes, Solvent-Based Floor Polishes, and Polymer-Emulsion Floor Polishes
- D3052 Practice for Rating Water-Emulsion Floor Polishes
- D3153 Test Method for Recoatability of Water-Emulsion Floor Polishes

- D3206 Test Method for Soil Resistance of Floor Polishes
- D3207 Test Method for Detergent Resistance of Floor Polish Films
- D3210 Test Method for Comparing Colors of Films from Water-Emulsion Floor Polishes
- E70 Test Method for pH of Aqueous Solutions With the Glass Electrode

2.2 Federal Standards:³

- Federal Specification, Wax, Floor, Water-Emulsion P-W155C, February 22, 1978
- Federal Specification, Finish, Floor, Water-Emulsion P-F00430C (GSA-FSS) October 26, 1978.

3. Terminology

3.1 *Definitions*—For definitions of other terms used in this guide refer to Terminology D2825.

3.1.1 *specification*—a precise statement of a set of requirements to be satisfied by a material, product, system, or service, indicating, whenever appropriate the procedure by means of which it may be determined whether the requirements given are satisfied. As far as practicable, it is desirable that the requirements be expressed numerically in terms of units together with their limits.

4. Classification

4.1 *Buffing-Type Floor Polish*—A floor polish that requires buffing to maintain or enhance appearance, or both.

4.2 *Self-Polishing-Type Floor Polish*—A self-polishing-type floor polish that dries to a shine.

5. Basis of Purchase

5.1 *Reference Material*—A floor polish which the purchaser has found to provide the desired characteristics in each of the tests described and which is mutually agreed upon between the purchaser and the seller, will be used as a reference material. Other polishes will be compared to this reference material for performance.

5.2 *Qualification Sample*—Seller shall submit a sample typical of the material he intends to supply for qualification testing.

¹ This guide is under the jurisdiction of ASTM Committee D21 on Polishes and is the direct responsibility of Subcommittee D21.05 on Specifications.

Current edition approved Feb. 1, 2007. Published March 2007. Originally approved in 1976. Last previous edition approved in 2001 as D3440-01. DOI: 10.1520/D3440-01R07.

² The last approved version of this historical standard is referenced on www.astm.org.

³ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

5.3 Acceptance Sample—Samples shall be taken from each shipment and examined for conformation to the qualification sample.

6. Requirements

6.1 Physical:

6.1.1 All values in the following tests are to be mutually agreed upon between the purchaser and the seller. Infrared spectroscopy and gas chromatography are optional.

6.1.2 *Infrared Spectroscopy*—The infrared spectra shall be measured in accordance with 8.1. The peak heights may vary within $\pm 10\%$.

6.1.3 *Color*—The color shall not be greater than (____) when analyzed in accordance with Method D3210.

6.1.4 *Gas Chromatography*—The sample shall be analyzed in accordance with 8.3.

6.1.5 *Total Solids*—The solids shall not be greater than (____) or less than (____) when analyzed in accordance with Test Method D2834.

6.1.6 *Sediment*—The maximum allowable sediment shall be (____) as determined by Test Method D1290.

6.1.7 *Alkalinity*—The pH of the polish shall be between (____) and (____) when determined by Test Method E70.

6.1.8 *Stability*—Stability of the product shall be determined by Test Method D1791.

6.1.9 *Odor*—The product shall leave no offensive odor.

6.1.10 *Total Ash and Silica*—The total ash shall be between (____) and (____) and silica shall be between (____) and (____) when analyzed by Test Method D1288.

7. Sampling

7.1 *For Inspection Lots*—Sample all production batches. Take a minimum of one sample. Protect samples from any possibility of freezing. The sample shall consist of at least 1 gal (3.8 L) of floor polish taken in accordance with 7.2.

7.2 *Method of Sampling*—Select samples at random. Take the number of samples agreed upon between the purchaser and the seller. Cans or containers should be coded or identified to correspond to production batch codes.

7.3 *Identification and Disposition*—All subdivisions of the sample taken in accordance with 7.1 and 7.2 shall be properly identified, including any code or batch numbers, and numbered consecutively. Samples shall be distributed as directed by the purchaser or his authorized representative. Any remaining shall be retained at the sampling site pending further or final instructions.

8. Test Methods

8.1 Infrared Spectroscopy:

8.1.1 *Test Specimen*—Cut a 2½-in. (64-mm) square of aluminum foil of 3-mil (0.08-mm) thickness (minimum) having one side mirror bright. Wash the square with absolute alcohol, and air dry. The mirror bright side should give a spectra that differs less than 2 % transmittance from the standard front surface test mirror used in the specular reflectance accessory (individual spectrophotometers have different accessories). Apply approximately 1 mL of floor polish with an eye dropper in a zig-zag pattern, and produce a uniform layer

by means of a 2-in. (51-mm) doctor blade with 0.008-in. (0.20-mm) gap. The sample thus prepared is allowed to dry overnight before use.

8.1.2 *Procedure*—Run the spectrum of the coated foil on an infrared spectrophotometer equipped with a specular reflectance accessory. The base line of the spectrum should show approximately 90 % transmittance, and the most intense band should show approximately 10 %. It may be necessary to move the coated aluminum foil slightly to approach these conditions as nearly as possible.

8.2 *Color*—Method D3210.

8.3 Gas Chromatography:

8.3.1 *Apparatus*—Pack a 6-ft by ⅛-in. (1.83-mm by 3.2-mm) stainless steel column with 5 weight % OV-17 phenylmethyl silicone on Chromosorb W80⁴ 100 mesh, acid washed and silanized. Condition the column overnight in helium at 340°C in the gas chromatograph.

8.3.2 *Procedure*—Program the oven temperature from 100 to 325°C at 6°C/min, with a 2-min post injection hold at 100°C and an upper temperature hold at 325°C for 30 min. Set the injection port and detectors (Note 1) at 325°C and gas flows as follows: helium 75 mL/min and 50 psi (345 kPa), hydrogen 35 mL/min and 30 psi (205 kPa) and air, 280 mL/min and 30 psi. The sample size should be 3 µL of floor polish. Condition the chromatograph with one prerun of the sample. Discard the results of this prerun. The evaluation of results may be performed manually or with any integrator.

NOTE 1—It is desirable to use a flame detector set at a suitable attenuation range since the organic content of floor polish is low and there is an upper limit to the amount of water that can be put on a column.

NOTE 2—This test method was derived from Federal Specifications P-W-155C and P-F-00430C (GSA-FSS).

8.4 *Total Solids*—Test Method D2834.

8.5 *Sediment*—Test Method D1290.

8.6 *Alkalinity*—Test Method E70.

8.7 *Stability*—Test Method D1791.

8.8 *Total Ash and Silica*—Test Method D1288.

9. Performance Testing

9.1 All performance tests shall be equal to reference sample unless a deviation is agreed upon between the purchaser and the seller.

9.1.1 *Performance*—Practice D3052.

9.1.2 *Removability*—Test Method D1792.

9.1.3 *Resistance to Soiling*—Test Method D3206.

9.1.4 *Water Spotting*—Test Method D1793.

9.1.5 *Recoatability*—Test Method D3153.

9.1.6 *Powdering*—Test Method D2048.

9.1.7 *Static Coefficient of Friction*—Test Method D2047.

9.1.8 *Detergent Resistance*—Test Method D3207.

9.1.9 *Gloss*—Test Method D1455.

⁴ Trademark of Celite Corporation, P.O. Box 519, Pomona, CA 91768.