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Standard Test Method for Detergent Cleaners for Evaluation of Corrosive Effects on Certain Porcelain Enamels¹

This standard is issued under the fixed designation D 1567; 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 corrosive effects of water-soluble detergent cleaners on certain porcelain enamels, particularly those used on working surfaces of washing machines and dishwashing machines (Note 1). The test is designed for the determination of corrosion characteristics of the cleaner and not for determination of the life of the cleaner.

NOTE 1—This test method is not intended as a test for the corrosion resistance of porcelain enamels, but for the evaluation of the cleaners. It is further recognized that various porcelain enamels of differing formulations are available with varying degrees of resistance to corrosion attack by detergent cleaners. The evaluation of the detergent under test is in terms of the particular porcelain enamel used in making the test.

1.2 *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems 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. For specific precautionary statement see Note 3. Material Safety Data Sheets are available for reagents and materials. Review them for hazards prior to usage.*

2. Significance and Use

2.1 This test method is intended as a laboratory screening test to determine corrosion characteristics of the cleaner under actual use conditions, but will not necessarily predict the aggression of the cleaner toward porcelain enamels under all end-use conditions.

3. Apparatus

3.1 *Heating Source*—A controlled-wattage laboratory hot plate or other source to provide the conditions specified.

3.2 *Stainless Steel Rack*, for supporting the enamel test specimen inside the flask. This may be made from a strip of stainless steel approximately 1/2 in. (12.7 mm) wide and 0.012 in. (0.305 mm) thick formed as shown in Fig. 1 on 1/4-in. (6.4-mm) spacings approximately 3/4 in. (19 mm) deep.

3.3 *Wire*, with hook on the end for inserting enamel test specimens in the flask.

3.4 *Short-Neck Florence Flask*, 1500-mL, flat-bottom, with a standard-taper 40/50 joint.

NOTE 2—The apparatus described in 3.6 and 3.7 can be used in place of the apparatus described in 3.4 and 3.5.

3.5 *Bulbed Reflux Condenser*, 30-cm, with a standard-taper 40/50 joint (Note 2).

3.6 *Stainless Steel Beaker*, 1-L capacity (Note 2).

3.7 *Volumetric Flask*, 1000-mL (Note 2).

4. Test Specimens

4.1 Porcelain enamel test specimens, 2 1/2 by 1 1/4 in., (63.5 by 31.7 mm) shall be used. A 3/16-in. (4.77-mm) hole shall be drilled in one corner before enameling. The edges and both sides of the plates should have a coating of enamel. For this reason, all burrs must be removed and the edges slightly rounded before enameling.

5. Preparation of Test Specimens

5.1 *Precleaning Materials*—Assemble the following cleaning materials for removal of soil present on the enamel surface prior to immersion corrosion testing:

5.1.1 A 250-mL beaker containing 200 mL of trichloroethylene at room temperature.

NOTE 3: Precaution—Adequate ventilation must be provided when working with trichloroethylene.

5.1.2 A 1-L beaker containing 150 to 200 mL of hot trichloroethylene, the degree of vaporization being controlled to permit vapor degreasing of the specimens when held in the beaker, or, alternatively, a wash bottle containing either of these solvents at 25 to 30°C.

5.1.3 A 250-mL beaker of either anhydrous methanol or isopropanol at 50°C.

5.1.4 A 250-mL beaker of distilled water at 50°C.

5.1.5 A 250-mL beaker of acetone at room temperature.

5.1.6 A small swab of fresh absorbent cotton placed in each of the beakers.

5.2 *Precleaning Technique*—Clean the test specimens as follows immediately prior to use in the test (Section 7):

5.2.1 Immerse the test specimens in the beaker of trichloroethylene (5.1.1) and immediately swab the surfaces of the individual specimens thoroughly, using clean forceps to hold both the cotton swab and the test specimen.

5.2.2 After the swabbing of each specimen is completed, shake off excess solvent and either transfer the specimen to the vapor degreasing bath long enough to observe the vapor completely covering and condensing on the specimen, or thoroughly wash the specimen with a stream of fresh solvent from the wash bottle.

5.2.3 Swab the specimens separately in the beaker of alcohol and shake free from excess alcohol.

5.2.4 Transfer the specimens to the beaker of distilled

¹ This test method is under the jurisdiction of ASTM Committee D-12 on Soaps and Other Detergents and is the direct responsibility of Subcommittee D12.16 on Hard Surface Cleaning.

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