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# Test Method for Stain Resistance: Pile Floor Coverings

## 1. Purpose and Scope

1.1 This test method is used to determine the resistance to staining by acid food colors on pile floor coverings.

## 2. Principle

2.1 A specimen of pile floor covering is stained with a small volume of a diluted aqueous solution of Food Drug & Cosmetic (FD&C) Red 40 adjusted to an acid pH. After allowing the stained specimen to remain at controlled conditions for  $24 \pm 4$  h, it is rinsed in water to remove all unused FD&C Red 40 dye. Any residual stain is assessed after drying.

## 3. Terminology

3.1 **stain**, n.—for pile floor covering, a discoloration due to a color adding material, such as food or liquid, which exhibits resistance to removal by standard cleaning methods.

3.2 **stainblocker**, n.—a chemical substance which, when applied to a textile substrate, imparts partial or total resistance to staining.

## 4. Safety Precautions

4.1 The safety precautions specified in the method/procedure are ancillary to the testing procedures and are not intended to be all inclusive.

4.2 It is the user's responsibility to reference applicable safety data sheets, use safe and proper techniques, and wear appropriate personal protective equipment in handling materials in this standard.

4.3 Users MUST consult manufacturers for specific details such as equipment operating instructions and other recommendations. Consult and follow all applicable health and safety regulations (e.g., OSHA standards and rules).

4.4 Good laboratory practices should be followed.

All chemicals should be handled with care.

## 5. Apparatus and Materials

5.1 AATCC stain cup and 50 mm (2.0 in.) diam staining ring (see 12.1 and Fig. 1).

5.2 AATCC Red 40 Stain Scale (see 12.1).

5.3 FD&C Red 40 (C.I. Food Red 17) (see 12.1).

5.4 Citric acid (technical grade or better).

5.5 Deionized or distilled water.

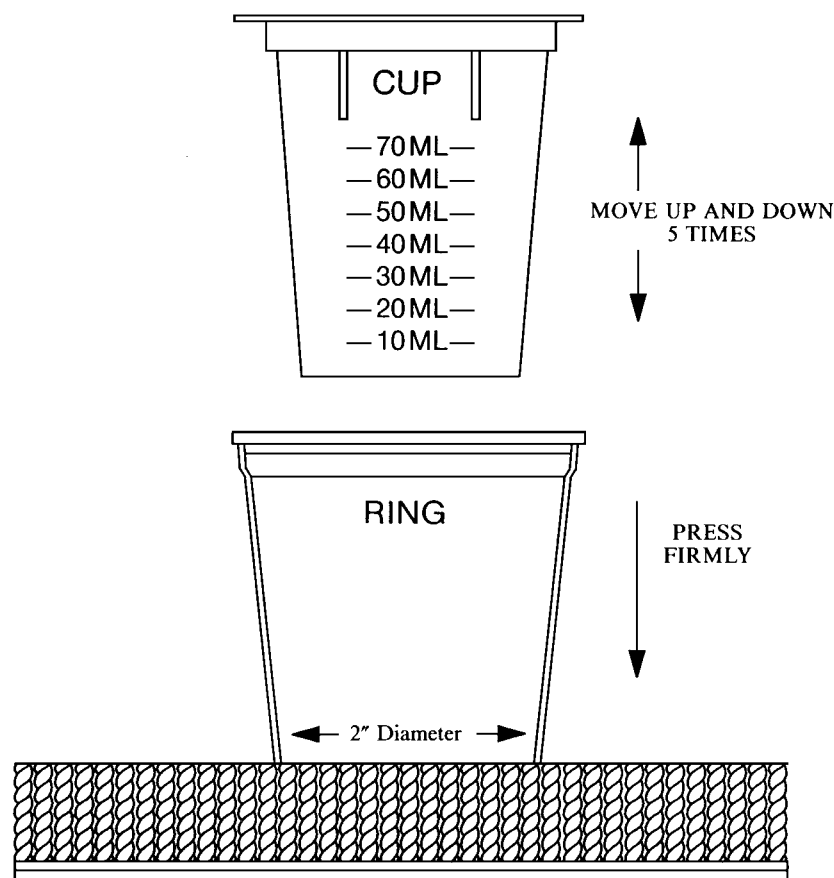


Fig. 1—AATCC stain cup and ring.

5.6 pH meter.

5.7 Buffer solutions, pH 2.0 and 4.0.

## 6. Specimens

6.1 Cut one specimen at least 150 mm (6 in.) square for each test to be run.

6.2 Remove any extraneous surface materials by brushing and or vacuuming.

## 7. Preparation of Staining Solution

7.1 Weigh  $100 \pm 1$  mg of FD&C Red 40 and dissolve in  $1 \text{ L} \pm 10 \text{ mL}$  of distilled or deionized water at  $24 \pm 3^\circ\text{C}$  ( $75 \pm 5^\circ\text{F}$ ).

7.2 Adjust the pH of this solution to  $2.8 \pm 0.1$  with citric acid (approximately 3.2 g). Check the pH of the solution with a meter that has been calibrated with pH 2.0 and 4.0 buffer solutions. Due to their lack of precision, the use of pH strips is not advised. If the pH of the prepared staining solution is below 2.7 discard this solution and prepare a new one.

## 8. Procedure

8.1 Condition all test specimens, pile side up, on a nonabsorbent surface for 24 h at standard conditions of  $21 \pm 2^\circ\text{C}$  ( $70 \pm 4^\circ\text{F}$ ) and  $65 \pm 5\%$  RH. Avoid contamination by contact with extraneous materials (see 12.2).

8.2 Place the 50 mm (2 in.) diameter staining ring in the center of the test specimen. While pressing down on the ring pour 20 mL of the staining solution into the center of the ring. Press the bottom of the stain cup through the ring into the pile, moving it up and down 5 times to facilitate wetting of the pile fiber from top to bottom. Do not rotate or twist the cup inside the ring since this may result in surface abrasion which may remove the stainblocker from the fiber surface. Carefully remove the staining ring and stain cup.

8.3 Recondition the stained specimen for  $24 \pm 4$  h in a flat position, pile side up, at standard conditions of  $21 \pm 2^\circ\text{C}$  ( $70 \pm$