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Colorfastness to Home Laundering with Activated Oxygen Bleach Detergent: Accelerated

Developed in 2001 by AATCC Committee RA60; reaffirmed 2002, 2003; reaffirmed and editorially revised 2008; revised 2010; editorially revised 2012, 2013. Partly equivalent to ISO 105-C09.

1. Purpose and Scope

1.1 This test method is a diagnostic test intended to screen dyed cotton textiles sensitive to oxygen bleach detergents. It provides an accelerated procedure to assess the shade changes of dyed textiles when exposed to activated oxygen bleach detergent (simulating multiple home launderings, typically 10 or more). This procedure is most appropriately used during the dye selection process, prior to the production of washable textiles.

1.2 This method does not reflect the contribution to shade change of optical brighteners, which are present in some commercial washing products, or finishes that may be applied to the textile during production.

2. Principle

2.1 A specimen of the dyed textile is laundered, rinsed, and dried. Specimens are tested under defined conditions of temperature, bleach concentration and time to assess whether fading will occur after multiple home launderings. The color difference between the test specimen and the original textile is assessed instrumentally or visually.

3. Terminology

3.1 **activated oxygen bleach,** n.—a bleaching system comprising an oxygen bleach and a bleach activator.

3.2 **bleach activator,** n.—a bleach agent precursor, which converts a less potent bleaching species into a more powerful one.

3.3 **colorfastness,** n.—the resistance of a material to change in any of its color characteristics, to transfer of its colorant(s) to adjacent materials, or both, as a result of the exposure of the material to any environment that might be encountered during the processing, testing, storage or use of the material.

3.4 **laundering,** n.—*of textile materials*, a process intended to remove soils and/or stains by treatment (washing) with an aqueous detergent solution and normally including subsequent rinsing, extracting and drying.

3.5 **oxygen bleach,** n.—a bleach agent which can liberate hydrogen peroxide by hydrolysis upon dissolving in water.

4. Safety Precautions

NOTE: These safety precautions are for information purposes only. The precautions are ancillary to the testing procedures and are not intended to be all inclusive. It is the user's responsibility to use safe and proper techniques in handling materials in the test method. Manufacturers MUST be consulted for specific details such as material safety data sheets and other manufacturer's recommendations. All OSHA standards and rules must also be consulted and followed.

4.1 Good laboratory practices should be followed. Wear safety glasses in all laboratory areas.

4.2 All chemicals should be handled with care.

4.3 The 1993 AATCC Standard Reference Detergent WOB and the 2003 AATCC Standard Reference Liquid Detergent WOB may cause irritation. Care should be taken to prevent exposure to skin and eyes.

4.4 Use suitable gloves when handling hot canisters.

4.5 An eyewash/safety shower should be located nearby for emergency use.

4.6 Manufacturer's safety recommendations should be followed when operating laboratory testing equipment.

5. Apparatus, Reagents and Materials (see 12.1)

5.1 Apparatus

5.1.1 An accelerated laundering machine used for rotating closed canisters in a thermostatically controlled (± 2°C [± 4°F] of prescribed temperature) water bath at 40 ± 2 rpm.

5.1.2 Stainless steel lever lock canisters 550 ± 50 mL, 75 × 125 mm. For heavy weight fabrics, stainless steel lever lock canisters 1200 mL, 90 × 200 mm may be used.

5.1.3 Teflon fluorocarbon gaskets, optional (see 7.5.2 and 12.2).

5.1.4 Preheater/storage module, optional (see 7.5).

5.1.5 NOTE: Steel balls are NOT used in this testing.

5.2 Suitable colorimeter, spectrophotometer or Gray Scale for Color Change (AATCC Evaluation Procedure 1) (see 12.4).

5.3 Reagents and Materials

5.3.1 1993 AATCC Standard Reference Detergent WOB (without optical brightener and without phosphate) or 2003 AATCC Standard Reference Liquid Detergent WOB (see 10.3 and 12.5).

5.3.2 Bleach activator (see 12.6).

5.3.3 Sodium perborate monohydrate (PB1) (see 12.4).

5.3.4 Water, distilled or deionized having <15 ppm hardness.

5.3.5 Balance, accurate to ± 0.01 g.

5.3.6 Electric or automatic stirrer.

5.3.7 Blotting paper (see 12.4).

5.3.8 Screen or drying rack.

5.3.9 White cards (specimen mounts) with *Y* tristimulus value at least 85%.

6. Test Specimens

6.1 Prepare a 50 × 100 mm specimen of the sample being tested. Woven fabrics may be stitched around edges with colorfast (preferably white) thread to prevent raveling.

6.2 Yarn may be knit on an appropriate sample knitting machine.

6.3 Keep one specimen of each sample as an unwashed original.

6.4 Weigh the specimen using the balance (see 5.3.5) to aid in accurate liquor ratio volumes.

6.5 Test only one specimen in each canister.

6.6 Three replicates are advised for improved precision. Replicates should be tested in separate accelerated test cycles.

7. Procedure

7.1 Adjust the accelerated tester to maintain 20 ± 2°C (68 ± 4°F).

7.2 A minimum of 1 L detergent solution should be prepared and freshly made immediately prior to each accelerated test.

7.3 Prepare the wash liquor by dissolving 10 ± 0.3 g of the 1993 AATCC Standard Reference Detergent WOB powder or 15.2 ± 0.5 g of 2003 AATCC Standard Reference Liquid Detergent WOB (see 5.3.1) plus 4 g bleach activator (*100% activity*) (see 12.6) and 3 g sodium perborate monohydrate (PB1) per liter of water (see 5.3.4). Preheat this solution to 20 ± 2°C (68 ± 4°F) and stir with electric/automatic stirrer for 10 ± 1 min to ensure thorough dispersion of

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