Colorfastness to Water: Sea

Developed in 1962 by AATCC Committee RA23; revised 1967, 1968, 1972, 1981; reaffirmed 1975, 1978, 1989, 2007; editorially revised 1985, 1994, 2001, 2005; editorially revised and reaffirmed 1986, 1991, 1997, 2002. Partly equivalent to ISO 105-E02.

1. Purpose and Scope

1.1 This test method is designed to measure the resistance to sea water of dyed, printed, or otherwise colored textile yarns and fabrics of all kinds.

1.2 Artificial sea water is used in this test because natural sea water is variable in composition, and is often difficult to obtain.

2. Principle

2.1 The specimen, backed by multifiber test fabric, is immersed in artificial sea water under specified conditions of temperature and time, and then placed between glass or plastic plates under specified conditions of pressure, temperature and time. The change in color of the specimen and the staining of the attached multifiber test fabric are observed.

3. Terminology

3.1 **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.

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

4.4 Observe padder safety. Ensure adequate guard at the nip point. Normal safeguards on pad should not be removed.

5. Apparatus and Materials

5.1 AATCC Perspiration Tester, Perspirometer or equivalent device (plastic or glass plates are available with the equipment) (see 12.1 and 12.2).

5.2 Drying oven—convection.

5.3 Multifiber test fabric No. 1 or No. 10 (see 12.1).

5.4 AATCC Chromatic Transference Scale (see 12.1).

5.5 AATCC Gray Scale for Color Change and Gray Scale for Staining (see 12.1).

5.6 Wringer (see 12.3).

6. Test Solution (Artificial Sea Water)

6.1 Per liter:

Sodium chloride (NaCl), tech. 30 g

Magnesium chloride ($MgCl_2$), anhyd. 5 g

Distilled water to make 1000 mL solution

7. Test Specimens

7.1 Colored specimens 60 × 60 mm ± 2 mm (2.25 × 2.25 in.) with multifiber test fabric attached to the technical face (see 12.1).

8. Procedure

8.1 Immerse the test specimen in the test solution at room temperature with occasional agitation to ensure thorough wetting out (approximately 15 min generally required for average fabrics) (see 12.4).

8.2 Remove the test specimen from the test solution and only pass between squeeze rolls (wringer) to remove excess liquor when the wet weight of the test specimen is more than 3 times its dry weight. Whenever possible, the wet weight should be 2.5-3.0 times the dry weight.

8.3 Place the test specimen between glass or plastic plates and insert in the specimen unit of the perspiration tester. Adjust the perspiration tester to produce a pressure of 4.5 kg (10.0 lb) on the test specimen (see 12.2).

8.4 Heat the loaded specimen unit in an oven at 38 ± 1°C (100 ± 2°F) for 18 h. Remove specimen from unit and complete drying by hanging in air at room temperature. Do not press dry.

9. Evaluation Method for Color Change

9.1 Rate the effect on the color of the test specimens by the Gray Scale for Color Change (see 12.1).

Grade 5—negligible or no change as shown in Gray Scale Step 5.

Grade 4.5—change in color equivalent to Gray Scale Step 4-5.

Grade 4—change in color equivalent to Gray Scale Step 4.

Grade 3.5—change in color equivalent to Gray Scale Step 3-4.

Grade 3—change in color equivalent to Gray Scale Step 3.

Grade 2.5—change in color equivalent to Gray Scale Step 2-3.

Grade 2—change in color equivalent to Gray Scale Step 2.

Grade 1.5—change in color equivalent to Gray Scale Step 1-2.

Grade 1—change in color equivalent to Gray Scale Step 1.

10. Evaluation Method for Staining

10.1 Rate the staining of the multifiber test fabric (see 12.5) by the AATCC Chromatic Transference Scale or the Gray Scale for Staining. Report which classification scale is used (see 12.6).

Grade 5—negligible or no color transfer.

Grade 4.5—color transfer equivalent to Step 4-5 on the Gray Scale for Staining or Row 4.5 on the 9-step AATCC Chromatic Transference Scale.

Grade 4—color transfer equivalent to Step 4 on the Gray Scale for Staining or Row 4 on the 9-step AATCC Chromatic Transference Scale.

Grade 3.5—color transfer equivalent to Step 3-4 on the Gray Scale for Staining or Row 3.5 on the 9-step AATCC Chromatic Transference Scale.

Grade 3—color transfer equivalent to Step 3 on the Gray Scale for Staining or Row 3 on the 9-step AATCC Chromatic Transference Scale.

Grade 2.5—color transfer equivalent to Step 2-3 on the Gray Scale for Staining or Row 2.5 on the 9-step AATCC Chromatic Transference Scale.

Grade 2—color transfer equivalent to Step 2 on the Gray Scale for Staining or Row 2 on the 9-step AATCC Chromatic Transference Scale.

Grade 1.5—color transfer equivalent to Step 1-2 on the Gray Scale for Staining or Row 1.5 on the 9-step AATCC Chromatic Transference Scale.

Documents Document Sharing Hub

Copyright © 2007 American Association of Textile Chemists and Colorists

Full document details: AATCC 106 2007

Grade 1—color transfer equivalent to Step 1 on the Gray Scale for Staining or Row 1 on the 9-step AATCC Chromatic Transference Scale.

11. Precision and Bias

11.1 *Precision.* Precision for this test method has not been established. Until a precision statement is generated for this test method, use standard statistical techniques in making any comparisons of test results for either *within-laboratory* or *between-laboratory* averages.

11.2 *Bias.* Colorfastness to sea water can be defined only in terms of a test method. There is no independent method for determining the true value. As a means of estimating this property, the method has no known bias.

12. Notes

12.1 For procurement see listing under Special Equipment and Materials Used in AATCC Test Methods in the AATCC TECHNICAL MANUAL.

12.2 AATCC Perspiration Tester: Put all 21 glass or plastic plates into the unit regardless of the number of specimens. After the final glass or plastic plate is put in position on top, set the dual plates with compensating springs in position. Place a 3.6 kg (8.0 lb) weight on top making a total of 4.5 kg (10.0 lb) under the pressure plate. Lock the pressure plate in position by turning the thumb-screws. Remove the weight. Place the unit in the oven on its side, so that the plates and the specimens are vertical.

Perspirometer: The plates are held in a vertical position between an indicating scale with a fixed metal plate at one end and an adjustable metal plate at the other end. By means of adjusting screws, the movable plate may be made to exert increasing pressure against the test specimens. When the desired pressure of 4.5 kg (10.0 lb) is indicated on the scale, lock the specimen unit by a set screw. The specimen unit can now be removed from the section applying the pressure. Another specimen unit may be added to the pressure section and the loading procedure repeated.

12.3 The Atlas Motorized Laboratory Wringer (see 12.1) and the Kenmore Hand Wringer #7326 (Sears, Roebuck & Co.) are suitable.

12.4 Or immerse the test specimen in the test solution at room temperature, pass through squeeze rolls (wringer) and reimmerse. Repeat, if necessary, to attain thorough wetting out.

12.5 Classify according to the fiber showing the greatest stain.

12.6 For very critical evaluations and in cases of arbitration, ratings must be based on the Gray Scale for Staining.

Documents
Document Sharing Hub

Copyright © 2007 American Association of Textile Chemists and Colorists

Full document details: AATCC 106 2007