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Colorfastness to Solvent Spotting: Perchloroethylene

Developed in 1978 by AATCC Committee RA92; editorially revised and reaffirmed 1981, 1985, 1995, 2010; editorially revised 1986, 2001, 2002; reaffirmed 1990, 2000, 2005, 2017; revised 2016.

1. Purpose and Scope

1.1 This test method is designed to measure the degree of color migration that occurs when a fabric is spotted with a drycleaning solvent.

1.2 Perchloroethylene is used because it is a common drycleaning solvent.

2. Principle

2.1 A specimen, attached to a piece of white blotting paper, is placed specimen side up on a glass plate. Perchloroethylene is placed on the center of the specimen. The test is carried out at room temperature. The staining of the blotting paper is evaluated.

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.

3.2 **migration**, *n.*—the nonuniform movement and distribution of dyes, pigments, finishes or other materials from one part of a material to another.

3.3 **spotting**, *n.*—*in cleaning*, application of solvent or solution to a material prior to or after commercial scouring, laundering, or drycleaning to remove or enhance removal of soil or stains in a local area.

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 Perchloroethylene is toxic by inhalation, by repeated contact with skin and by ingestion; it should be used only in a well vented atmosphere. Toxicology studies with laboratory animals have shown evidence of cancer in rats and mice exposed to perchloroethylene vapors at 100-400 ppm concentrations for prolonged times. Fabric saturated with this solvent should be dried in an adequately ventilated hood. Use chemical goggles or face shield, impervious gloves and an impervious apron when handling perchloroethylene.

4.4 An eyewash/safety shower should be located nearby and an organic vapor respirator should be readily available for emergency use.

4.5 Exposure to chemicals used in this procedure must be controlled at or below levels set by governmental authorities (e.g., Occupational Safety and Health Administration's [OSHA] permissible exposure limits [PEL] as found in 29 CFR 1910.1000; see web site: www.osha.gov for latest version). In addition, the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) comprised of time weighted averages (TLV-TWA), short term exposure limits (TLV-STEL) and ceiling limits (TLV-C) are recommended as a general guide for air contaminant exposure which should be met (see 10.1).

4.6 The laws regarding perchloroethylene vary from place to place; therefore, user must check local legislation regarding availability and handling requirements.

5. Apparatus, Materials and Reagents

5.1 Pipette, graduated to deliver 1.5 mL.
5.2 Plate, glass.

5.3 AATCC 9-Step Chromatic Transference Scale (AATCC Evaluation Procedure 8) (see 10.2).

5.4 White AATCC Textile Blotting Paper (see 10.2).

5.5 Perchloroethylene; technical or commercial grades are acceptable.

6. Test Specimen

6.1 Piece of dyed fabric, 25 × 25 mm (1 × 1 in.).

7. Procedure

7.1 Attach test specimen to the center of a 150 × 150 mm (6 × 6 in.) piece of white blotting paper. Make sure the sample is flat against the blotting paper. If necessary, staple the edges of the fabric down to keep the sample flat on the blotting paper.

7.2 Place blotting paper on the glass.

7.3 Deliver 1.5 mL of perchloroethylene (by pipette) on the center of the test specimen.

7.4 Let stand in air until dry; then evaluate the staining on the blotting paper.

8. Evaluation Method for Staining

8.1 Rate the degree of stain on the blotter using the AATCC 9-Step Chromatic Transference Scale [AATCC Evaluation Procedure (EP) 8] or Instrumental Assessment of Degree of Staining (EP12), and record the numerical rating that corresponds to the appropriate one on it.

9. Precision and Bias

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

9.2 *Bias.* Colorfastness to solvent spotting (perchloroethylene) 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.

10. Notes

10.1 Available from Publications Office, ACGIH, Kemper Woods Center, 1330 Kemper Meadow Dr., Cincinnati OH 45240; tel: +1.513.742.2020; web site: www.acgih.org.

10.2 Available from AATCC, P.O. Box 12215, Research Triangle Park NC 27709; tel: +1.919.549.8141; fax: +1.919.549.8933; e-mail: orders@aatcc.org; web site: www.aatcc.org.