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Test Method for Colorfastness to Heat: Hot Pressing

1. Purpose and Scope

1.1 This test method is intended for determining the resistance of the color of textiles of all kinds and in all forms to color change, and color transfer when subjected to hot pressing. Tests are given for hot pressing when the fabric is dry, damp and wet. The textile end use usually determines which tests should be made.

2. Principle

2.1 Dry Pressing. The dry specimen is pressed with a heating device at a specified temperature and pressure for a specified time.

2.2 Damp Pressing. The dry specimen is covered with a wet, undyed cotton cloth and pressed with a heating device at a specified temperature and pressure for a specified time.

2.3 Wet Pressing. The wet specimen is covered with a wet, undyed cotton cloth and pressed with a heating device at a specified temperature and pressure for a specified time.

2.4 Color change of specimen and staining of cotton cloth are each reported as a grade from 5 to 1, with 5 representing no color change or staining and 1 representing the most color change or staining.

3. Referenced Documents

3.1 AATCC EP1, Evaluation Procedure for Gray Scale for Color Change (see 14.1).

3.2 AATCC EP2, Evaluation Procedure for Gray Scale for Staining (see 14.1).

3.3 AATCC EP7, Evaluation Procedure for Instrumental Assessment of the Change in Color of a Test Specimen (see 14.1).

3.4 AATCC EP8, Evaluation Procedure for AATCC 9-Step Chromatic Transference Scale (see 14.1).

3.5 AATCC EP12, Evaluation Procedure for Instrumental Assessment of Degree of Staining (see 14.1).

3.6 ASTM E1402, Standard Guide for Sampling Design.

4. Terminology

4.1 **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.

4.2 **hot pressing**, *n.*—a process for smoothing and possibly shaping textile products by applying mechanical pressure with heat, either dry or in the presence of moisture.

5. Safety Precautions

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

5.2 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.

5.3 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).

6. Apparatus and Materials (see 14.2)

6.1 Heating device, providing even heat transfer to the specimen from the top by close contact at a controlled temperature (110–200°C, see 10.1) and giving a pressure on the specimen of 40 ± 10 g/cm² (see 14.3, 14.4).

6.2 Smooth, heat-resistant sheet (see 14.5).

6.3 Wool flannel, approximately 260 g/m² (see 14.3). Two layers of this material are used to make a pad approximately 3 mm thick. Other smooth wool fabrics or felt may also be used to achieve this thickness.

6.4 Cotton cloth, undyed, bleached, unmercerized, with a smooth surface, 100–130 g/m².

6.5 Equipment and environment for evaluating color change.

6.5.1 For visual evaluation, use Gray Scale for Color Change (see 14.1). Refer to AATCC EP1 for additional materials and use of gray scale.

6.5.2 For instrumental evaluation, use a spectrophotometer as specified in AATCC EP7.

6.6 Equipment and environment for evaluating staining.

6.6.1 For visual evaluation, use Gray Scale for Staining or AATCC 9-Step Chromatic Transference Scale (see 14.1). Refer to AATCC EP2 for additional materials and use of the gray scale. Refer to AATCC EP8 for additional materials and

use of the chromatic scale.

6.6.2 For instrumental evaluation, use a spectrophotometer as specified in AATCC EP12.

7. Sampling

7.1 Test results are valid only when the samples are statistically representative (see ASTM E1402).

7.2 Sampling must be random. Every unit of product must have a mathematically equal chance of becoming a sample; and every portion of each sample must be equally likely to become a test specimen.

7.3 All specimens must be alike within the variations due to pure chance. There must be no differences within samples assignable to known causes.

8. Specimens

8.1 If the textile to be tested is fabric, a 12×4 cm specimen is used.

8.2 If the textile to be tested is yarn or thread, knit it into a fabric specimen 13×4 cm or wind it around a piece of thin, inert material 12×4 cm.

9. Conditioning

9.1 Condition specimens, wool flannel, and undyed cotton cloth for at least 4 h in an atmosphere of $21 \pm 2^\circ\text{C}$ ($70 \pm 4^\circ\text{F}$) and $65\% \pm 5\%$ RH by laying each piece separately on a screen or perforated shelf of a conditioning rack.

10. Procedure

10.1 Use one of the following temperatures (see Table I, 14.6):

110 $\pm 2^\circ\text{C}$
150 $\pm 2^\circ\text{C}$
200 $\pm 2^\circ\text{C}$

When necessary, other temperatures may be used, provided they are specifically noted in the report. Preheat the top plate of heating device to test temperature for at least 15 min. During the preheating period and between test periods, both plates of the heating device should be in contact to ensure uniform heat distribution.

10.2 Cover the bottom plate of the heating device with the heat resistant sheet. Place wool flannel over the sheet. Place dry, undyed cotton cloth over wool flannel (see Fig. 1). Allow the sheet to cool and fabric to dry between tests.

10.3 Dry Pressing. Place dry test specimen on top of the cotton cloth (see Fig. 1).