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Absorbency of Textiles

Developed in 1954 by AATCC Committee RA34; Jurisdiction transferred in 2003 to AATCC Committee RA63; reaffirmed 1968, 1972, 1975, 1979, 1992, 2000, 2014; editorially revised and reaffirmed (with title change) 1986; revised 1995, 2007 (with title change), 2010; editorially revised 2012.

Foreword

The original test method for the measurement of absorbency of bleached textiles was developed to help textile dyeing and finishing mills determine the effect and efficiency of textile preparation and processing applications. Later, the test method was used as one of several measurements for judging water resistance and repellency (i.e., non-absorbency) of textile finish applications. After some time, the test method was also used to judge the durability of textile applications to home laundering.

Option B has been added to AATCC Test Method (TM) 79 to recognize variations from the original procedure that have come into use by retailers and independent laboratories. Option B was first published as an unofficial method in the 2004 AATCC/ASTM International's *Concept 2 Consumer Technical Supplement: A Compilation of Procedures and Guidelines for Textile Products*, TS-018, and as MM-TS-01 Quick Water Absorbency procedure in the 2008 AATCC/ASTM International's *Moisture Management Technical Supplement: Applicable to Apparel, Linens and Soft Goods* (see 12.1).

Because the rate of water flow (drops per milliliter) and height above the specimen (mm) can be accurately and precisely determined for Option A, this option is more rigorously controlled. Therefore, in case of dispute, Option A is to be considered the reference procedure.

1. Purpose and Scope

1.1 The test method is for the determination of the water absorbency of yarns, fabrics and garments. It can be used on textiles of any fiber content or construction, including woven, knit and nonwoven.

2. Principle

2.1 A drop of water is allowed to fall from a fixed height onto the taut surface of a test specimen. The wetting time required for a drop of water to lose any light reflection and change to a dull, wet spot is recorded.

3. Terminology

3.1 **absorbency,** n.—the propensity of a material to take in and retain a liquid, usually water, in the pores and interstices of the material.

NOTE: Absorbency is sometimes referred to as wettability.

3.2 **wetting,** n.—the time required for a drop of water to lose its light reflection characteristic, i.e., when it changes to a dull, wet spot due to the absorbent propensity of a textile material.

3.3 **textile product,** n.—an article of fabric, or other flexible material, made to protect or decorate the body (garments), for use in the home (bedding, drapery, towels, table linens), or other uses (i.e., handkerchiefs, etc.).

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.

5. Uses and Limitations

5.1 Absorbency is one of several factors that influence textile processing such as fabric preparation, dyeing, and the application of finishes. Often interchanged with the term wettability, the absorbency characteristics of a fabric can influence the uniformity and completeness of bleaching and dyeing by the ability to take in water into the fiber, yarn, or fabric construction. The suitability of a fabric for a particular use, for example gauze or toweling, may also be dependent upon a fabric's ability and propensity to take in water.

5.2 Water absorbency may help judge or interpret "comfort." However, users of TM79 should be cautioned that its test results should not be the only criterion for the assessment of comfort (see the 2008 AATCC/ASTM International's *Moisture Management Technical Supplement: Applicable to Apparel, Linens and Soft Goods*, p19) (see 12.1).

5.3 Users of the TM79 should be cautioned about the interpretation of results that may be impacted by whether the face or the back of a textile fabric is tested. If the objective is to measure the absorbency of finishing, processing or durability to laundering, the face side of a sample would be exposed to water during the test. However, if the objective of performing the test is to evaluate the absorbency of a textile for further processing, then the side of the textile that would be worn next to the skin would be exposed to the water drops during testing. Further, if textiles are used in a product as a composite, the absorbency of the individual fabrics will be different than that of the end product.

5.4 If liquids other than distilled water are used to perform this test method, test results might not be comparable.

5.5 It is not known how test results from this test method would compare to other absorbency test methods.

5.6 No statement can be made about the comparison or correlation of the results between Options A and B in this method.

6. Apparatus (see 12.2)

6.1 Beaker, with opening of a size that allows for the support of the outer edge of the specified embroidery hoop.

6.2 Option A: Burette, 10 ± 0.05 mL with 0.5 mL graduations that allows a delivery rate of 15-25 drops per milliliter.

6.3 Option A: Burette stand.

6.4 Distilled or deionized water, 21 ± 1°C (70 ± 2°F).

6.5 Embroidery hoop, 152 ± 5 mm (6.0 ± 0.2 in.) in diameter (see 12.1).

6.6 Stopwatch or timer.

6.7 Option B: Medicine dropper, 76 mm glass, 2mL capacity, capable of dispensing 20 drops per milliliter.

7. Test Specimens

7.1 Take two 200 ± 5 × 200 ± 5 mm specimens from each sample on which a total of five water drop sites can be tested. If sufficient fabric is available, five specimens from different locations of a sample (i.e., different length × width locations; side-middle-side locations on a sample cut; or front-back-sleeve garment panels) can be prepared for each water drop test site. Otherwise, five water drop

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