

Absorbency of Bleached Textiles

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

1. Purpose and Scope

1.1 Absorbency is one of several factors that determines the suitability of a fabric for a particular use, as in the case of gauze or toweling. It is important in fabrics that are to be dyed, since the completeness and uniformity of the dyeing are dependent upon the absorbency. Where fabrics are to be given resin or other specialized finishes, absorbency is a factor to be considered. Wettability or absorbency of textile fabrics or yarns can be determined by this test method.

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 time required for the specular reflection of the water drop to disappear is measured and recorded as wetting time.

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.

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. Apparatus

5.1 Embroidery hoop with a 150 mm

(6 in.) or more diameter.

5.2 Burette, delivering 15-25 drops of water per milliliter.

5.3 Stopwatch.

5.4 Burette stand.

6. Test Specimen

6.1 A swatch or skein of bleached material can be used for this test, as long as the specimen can be spread tightly over an embroidery hoop.

6.2 Specimens sampled prior to drying should first be air dried. All specimens should be brought to moisture equilibrium in a standard atmosphere having a relative humidity of $65 \pm 2\%$ at $21 \pm 1^\circ\text{C}$ ($70 \pm 2^\circ\text{F}$) (see 10.1).

7. Procedure

7.1 Conduct the test in a standard atmosphere as defined above.

7.2 Mount the cloth (or smoothed-out, thick portion of yarn) in the embroidery hoop so that the surface is free of wrinkles, but without distorting the structure of the material.

7.3 Place the hoop about 10 ± 1 mm (0.375 in.) below the tip of the burette, and allow one drop of distilled or deionized water at $21 \pm 3^\circ\text{C}$ ($70 \pm 5^\circ\text{F}$) to fall on the cloth.

7.4 Using a stopwatch, measure the time required, up to 60 s maximum, for the surface of the liquid to lose its specular reflectance. This point is determined by having the hoop between the observer and a source of light—such as a window or laboratory spotlight—at such an angle that the specular reflectance of light from the surface of the flattened drop can be plainly seen. As the drop is gradually absorbed, the area of this tiny mirror diminishes and finally vanishes entirely, leaving only a dull wet spot. At this instant the watch is stopped and the elapsed time is recorded. When the wetting time exceeds 60 s, 60+ s should be recorded.

7.5 Take 5 readings.

8. Calculation and Evaluation

8.1 Average the 5 time readings. The shorter the average time, the more absorbent is the textile. Five seconds or less is generally considered to represent adequate absorbency.

9. Precision and Bias

9.1 *Interlaboratory Study.* Tests for absorbency of bleached textiles were conducted in 1992, with 5 laboratories evaluating 7 fabrics. Participating laboratories were presumed to be performing the test method under statistical control, without verification.

9.1.1 The analysis of variance technique was applied to the data set. The analysis is being retained for reference in RA34 committee files.

9.2 Precision.

9.2.1 When two or more laboratories wish to compare test results, it is recommended that laboratory level be established between them prior to beginning test comparisons.

9.2.2 Critical differences for single fabric comparisons and for multiple fabric comparisons are given in Tables I and II, respectively.

Table I—Critical Difference for Single Fabric Comparisons (seconds) (95% probability)

Det/Avg	Single Operator	Within Laboratory	Between Laboratory
2	2.5	2.5	4.1
4	1.8	1.8	3.7
5	1.6	1.6	3.6
10	1.1	1.1	3.5

Table II—Critical Difference for Multiple Fabric Comparisons (seconds) (95% probability)

Det/Avg	Single Operator	Within Laboratory	Between Laboratory
2	4.0	4.0	7.1
4	3.6	3.6	6.8
5	3.5	3.5	6.8
10	3.3	3.3	6.7

9.2.3 If difference comparisons are made on a single fabric, critical differences in Table I are used, with units of seconds.

9.2.4 If difference comparisons are made on multiple fabrics, critical differences in Table II are used, with units in seconds.

9.2.5 The number of determinations in an average (Det/Avg) is a factor in determining the magnitude of critical differences.

9.2.6 If two laboratories are shown to be in statistical control and operating at comparable levels, the magnitude of applicable critical differences may be less

than those given in these tables, and may be determined by data from comparison trials between them.

9.3 *Bias*. The true value of absorbency of bleached fabrics can be defined only in terms of a test method. There is no independent method for determining the true value. In estimating this property, the test

method has no known bias.

10. Note

10.1 It has been observed that if specimens collected at drying cans are not brought to moisture equilibrium, the wetting times could falsely indicate poor absorbency for that material.