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Wetting Agents: Evaluation of Rewetting Agents

Developed in 1944 by AATCC Committee RA8; jurisdiction transferred in 2003 to AATCC Committee RA63; revised 1952; reaffirmed 1971, 1974, 1977, 1980, 1989, 1999, 2009, 2013; editorially revised and reaffirmed 1985, 1994, 2004; editorially revised 1988, 1991, 1992, 2008.

1. Purpose and Scope

1.1 This test method provides a means of measuring the effectiveness of commercial rewetting agents on cotton fabrics.

2. Principle

2.1 A test specimen is padded in a water solution of a rewetting agent and dried. A drop of water is then carefully deposited on the taut surface of the specimen and the time required for the specular reflection of the water is recorded as rewetting time.

3. Terminology

3.1 **rewetting agent,** n.—*in textile preparation, dyeing and finishing*, a surfactant which, after application and drying onto textiles, promotes rapid wetting on subsequent exposure to an aqueous solution.

3.2 **wetting agent,** n.—a chemical compound which when added to water lowers both the surface tension of the liquid and its interfacial tension against the solid 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 Observe padder safety. Normal safeguards on pad should not be moved. Ensure adequate guard at the nip point. A foot-operated kickoff is recommended.

5. Apparatus and Materials (see 9.1)

5.1 Rewetting agents.

5.2 Cloth, fairly heavy cotton, in the greige; cloth must not have been boiled, bleached or desized. Cotton sateen is suggested for use in this test.

5.3 Small padder. A household wringer with improvised pad box is satisfactory in lieu of a small padder.

5.4 Embroidery hoop, 15.2 cm (6 in.).

5.5 Burette delivering 15-25 drops per mL.

5.6 Stopwatch.

5.7 Conditioned room in which standard temperature 21 ± 1°C (70 ± 2°F) and humidity (65 ± 2% RH) are maintained. Although satisfactory comparisons can be made in the ordinary laboratory, the results should be more reproducible under standard conditions.

6. Procedure

6.1 Application of rewetting agent—a solution of the rewetting agent is prepared by pouring 100 mL of hot water over the required amount of the product in a small beaker or casserole. This solution is heated above 97°C (200°F) for a moment and then is diluted with hot water to a final volume of 1 L. The temperature of the solution in the padder box for application should be 70 ± 3°C (158 ± 5°F).

6.2 The padder is adjusted to a uniformly firm squeeze from side to side. On a household wringer it has been found that a dozen half turns of the wing nuts from the place where they just begin to take hold is satisfactory.

6.3 A strip of the selected cotton goods is padded *three times* through the solution of the rewetting agent. Three times through ensures thorough and uniform penetration of the cloth. The pickup should be from 60-90%.

6.4 The padded cloth is dried in air at approximately 82°C (180°F) for 30 min.

6.5 Four strips of padded cotton are prepared for each rewetting agent representing, respectively, four concentrations for each product to be tested. Concentrations generally suitable are 2.50, 5.0, 10.0 and 20.0 g of rewetting agent per liter.

6.6 Rewetting—a square of the padded, dried and conditioned cloth is mounted in the embroidery hoop. The burette containing either distilled water or tap water, whichever is desired for the test, is adjusted so that it delivers one drop of water at 21 ± 1°C (70 ± 2°F) approximately every 5 s. The surface of the taut cloth is held about 1 cm (0.394 in.) below the tip of the burette and the stopwatch is started just as the drop falls on the cloth. The watch is stopped when the liquid on the surface of the cloth loses its specular reflective power. This point is determined by placing the hoop between the observer and a source of light—such as a window—at such an angle that the specular reflection of light from the surface of the flattened drop can plainly be seen. As the drop is gradually absorbed the area of this tiny mirror diminishes and finally vanishes entirely leaving only a dull wet spot behind. It is at this moment that the watch is stopped.

7. Evaluation

7.1 Readings of rewetting time are made so easily and quickly that ten are taken for each concentration. The average times of disappearance of a drop for 2.50, 5.0, 10.0 and 20.0 g of rewetting agent per liter of pad liquor are then plotted on log-log coordinate paper with concentration as the abscissa (X-axis). A straight line is drawn to approximate the four points as nearly as possible.

7.2 From this line relating disappearance time to concentration, one can find the concentration which would give a disappearance time of 10 s. This is called the rewetting concentration for the product. A corresponding value is then determined for the second rewetting agent. By using a simple proportion with these figures it can be calculated how many parts of the second product are equivalent to 100 parts of the first product (or Standard) for rewetting.

8. Precision and Bias

8.1 *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.

8.2 *Bias*. Rewetting agents 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.

9. Notes

9.1 For potential equipment information pertaining to this test method, please visit the online *AATCC Buyer's Guide* at http://www.aatcc.org/bg. AATCC provides the possibility of listing equipment and materials sold by its Corporate members, but AATCC does not qualify, or in any way approve, endorse or certify that any of the listed equipment or materials meets the requirements in its test methods.

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