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Standard Test Method for Color Stability of Vinyl-Coated Glass Textiles to Accelerated Weathering¹

This standard is issued under the fixed designation D 4909; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reappraisal. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reappraisal.

1. Scope

1.1 This test method covers a procedure for evaluating the color change of vinyl-coated glass yarn textiles, such as yarns, insect screening, solar screening, and louver cloth, after exposure in a test apparatus with controlled wetting of the specimen by water spray, controlled relative humidity, and employing an open-flame carbon arc light source.

1.2 This test method shows the values in both SI units and inch-pound units. "SI units" is the technically correct name for a system of metric units known as the International System of Units. "Inch-pound units" is the technically correct name for the customary units used in the United States. The values stated in inch-pound units are to be regarded as the standard. The values in SI units are provided for information only.

1.3 *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. Specific precautionary statements are given in Section 7.*

2. Referenced Documents

2.1 ASTM Standards:

D 123 Terminology Relating to Textiles²

D 2258 Practice for Sampling Yarn in Testing²

E 171 Specification for Standard Atmospheres for Conditioning and Testing Materials³

2.2 AATCC Standards:

111A Weather Resistance: Sunshine Arc Lamp Procedure With Wetting⁴

Evaluation Procedure 1: Gray Scale for Color Change⁴

3. Terminology

3.1 Definitions:

3.1.1 *atmosphere for testing textiles, n—for glass, air maintained at a relative humidity of at least 48 % and no greater than 67 %, and at a temperature of at least 20°C (68°F) and no greater than 25°C (77°F).*

3.1.1.1 *Discussion*—Glass textiles are used in various

products such as reinforced plastics, mat-like material, tire cords, electrical insulation, etc. Each of these materials requires different testing atmospheres. It is the intent of the wide spread in testing atmosphere to allow testing of glass textiles in respective laboratories where end product test atmosphere requirements differ. The test atmospheres for respective products should be controlled as specified in Specification E 171. It is the opinion of ASTM Subcommittee D13.18 that color stability of vinyl coated glass yarn textiles would not be affected by the range selected. In any event, the test atmosphere should be stated in the report.

3.1.2 *color stability, n—in coated glass textiles*, the ability of the applied coating to resist fading from exposure to sunlight and water.

3.1.3 For definitions of other textile terms used in this test method, refer to Terminology D 123.

4. Summary of Test Method

4.1 Samples of the vinyl-coated glass yarn textiles to be tested are exposed to specified conditions of water spray, relative humidity, and light. The color change after exposure is compared to its original color.

5. Significance and Use

5.1 This test method is considered satisfactory for acceptance testing of commercial shipments since the method has been used extensively in the trade for acceptance testing.

5.1.1 In cases of a dispute arising from differences in reported test results when using this test method for acceptance testing of commercial shipments, the purchaser and the supplier should conduct comparative tests to determine if there is a statistical bias between their laboratories. Competent statistical assistance is recommended for the investigation of bias. As a minimum, the two parties should take a group of test specimens which are as homogeneous as possible and which are from a lot of material of the type in question. The test specimens should then be randomly assigned in equal numbers to each laboratory for testing. The average results from the two laboratories should be compared using Student's *t*-test for unpaired data and an acceptable probability level chosen by the two parties before the testing begins. If a bias is found, either its cause must be found and corrected or the purchaser and the supplier must agree to interpret future test results in the light of the known bias.

5.2 Results obtained by this test method should not be considered equivalent to those results obtained by exposure in an outdoor environment unless a mathematical correlation for a given material has been established and agreed upon between the contractual parties. Outdoor environ-

¹ This test method is under the jurisdiction of ASTM Committee D-13 on Textiles and is the direct responsibility of Subcommittee D13.18 on Glass Fiber and Its Products.

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² Annual Book of ASTM Standards, Vol 07.01.

³ Annual Book of ASTM Standards, Vol 08.03.

⁴ AATCC Technical Manual, available from American Association of Textile Chemists and Colorists, P. O. Box 12215, Research Triangle Park, NC 27709.