Designation: D6961 – 03

Standard Test Method for Color Measurement of Flax Fiber[1]

This standard is issued under the fixed designation D6961; 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 reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method covers the instrumental color measurement of flax fiber.

1.2 *Units*—The values stated in either SI units or inch-pound units (which are provided in parentheses) shall be regarded sepaately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

1.3 *This standard does not purport to address all of the safety concerns, if any, 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.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D123 Terminology Relating to Textiles

D1776 Practice for Conditioning and Testing Textiles

D6798 Terminology Relating to Flax and Linen

E284 Terminology of Appearance

E308 Practice for Computing the Colors of Objects by Using the CIE System

E1164 Practice for Obtaining Spectrometric Data for Object-Color Evaluation

2.2 *Other Standard:*

AATCC Evaluation Procedure 6 Instrumental Color Measurement[3]

3. Terminology

3.1 *Definitions:*

3.1.1 *water retting*, *v—in flax*, the process of immersing flax straw for a period of time in water to effect retting.

3.1.2 *dew retting*, *v—in flax*, the process of pulling or cutting flax straw and leaving on the soil for a period of time to allow partial degradation of straw to effect retting.

3.1.3 *enzyme retting*, *v—in flax*, the process of mechanically adding enzyme formulations under precise conditions to pulled or cut flax straw for a period of time to effect retting.

3.2 For definitions of other textile terms used in this test method, refer to Terminologies D6798 and D123.

4. Summary of Test Method

4.1 Samples of flax fiber are presented to a color spectrophotometer. Color measurements are taken through a large aperture port 25.4 millimeter (1-inch) diameter, in order to average over the natural color variation that occurs in flax fiber. The instrument aperture is fitted with a quartz window. The window serves two functions, namely, to provide a base for compacting the sample during measurement, and to protect the instrument from accumulation of stray fiber particles. CIELAB L*, a*, and b* measurements are taken and are instrumentally calculated from tristimulus X, Y and Z data, observer function, and illuminant data.

5. Significance and Use

5.1 Few standards exist to objectively judge flax quality. Color is an important factor in the quality of flax fiber. Natural variations in raw flax fiber, various processing steps, fiber blending, and a wide range of end uses contribute to the need for a standard method of objectively measuring the color of flax fiber. Spectrophotometic data provide an accurate, precise determination of the color of flax fiber. Colorimetric data are obtained through specimen measurement by combining specimen spectral data with data representing a CIE standard observer and a CIE standard illuminant, as described in Method E308.

5.2 If there are differences of practical significance between reported test results for two (or more) laboratories, comparative tests should be performed to determine if there is a statistical bias between them, using competent statistical assistance. As a minimum, use the samples for such a comparative test that are as homogeneous as possible, drawn from the same lot of material as the samples that resulted in disparate results

[1] This test method is under the jurisdiction of ASTM Committee D13 on Textiles and is the direct responsibility of Subcommittee D13.17 on Flax and Linen.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from American Association of Textile Chemists and Colorists (AATCC), One Davis Dr., P.O. Box 12215, Research Triangle Park, NC 27709-2215.