



Standard Test Method for Heat Aging of Asbestos Textiles¹

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1. Scope

1.1 This test method covers the heat aging of asbestos textiles. It may be used to determine the resistance to the deterioration of tensile strength at temperatures up to 450°C (800°F).

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

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:

D 123 Terminology Relating to Textile Materials²

D 1571 Specification for Woven Asbestos Cloth³

D 1682 Test Methods for Breaking Load and Elongation of Textile Fabrics⁴

D 2946 Terminology Relating to Asbestos³

3. Terminology

3.1 For textile terms, refer to Terminology D 123. For asbestos terms, refer to Terminology D 2946.

4. Significance and Use

4.1 This test method covers the evaluation of asbestos textiles with regard to (1) quality and (2) elevated temperature serviceability characteristics. Since asbestos textiles are usually composed of blends of asbestos with cotton or other organic carrier fibers, the latter being present in amounts up to 25 %, temperatures above 150°C (300°F) will promote the degradation of the cotton content and will reduce the structural reinforcement derived therefrom. In the higher grade asbestos textiles, wherein little or no carrier fibers are used and in which the longer asbestos fibers are necessary if a satisfactory yarn is

to be produced, the degradation in strength resulting from heat-aging up to 540°C (1000°F) is low. In the case of the lower grade asbestos textiles, however, wherein amounts from 15 to 25 % carrier fibers are incorporated, asbestos fibers having shorter lengths may be utilized. Under the relatively low service temperatures to which such materials may be subjected, neither the cotton nor the cloth properties are greatly affected. However, the strength-imparting influence of the carrier fibers is reduced at elevated temperatures and the entwining properties of the shorter asbestos fibers primarily serve to establish the resultant tensile strength and other physical properties of the textile. In view of this, elevated temperature tests may serve to indicate the asbestos fiber grade or quality that may be used in a textile construction.

4.2 Another use and perhaps more practical application for the information to be derived from elevated temperature studies is the revelation of the ability of a subject textile to withstand known elevated temperature service conditions. It will be appreciated that temperature alone may not be the only degradatory influence in the destruction of such materials; however, under normal operating conditions, high temperatures are usually the dominating factors in such degradation. The results obtained through such investigations therefore may be interpreted in terms of elevated temperature serviceability.

5. Apparatus

5.1 Test Oven:

5.1.1 The oven shall be electrically heated and have the necessary controls to maintain temperatures to within $\pm 3^\circ\text{C}$ (5.4°F) at any designated testing temperature up to 430°C (800°F) and shall have determinable and controllable air circulation. The air circulation provisions shall be capable of delivering between 3 and 6 m³/min (100 and 200 ft³/min) continuously to the oven during the testing period.

5.1.2 The minimum inside dimensions of the oven shall be 500 by 500 by 500 mm (18 by 18 by 18 in.), and it shall be provided with two hardware cloth trays, 20 mm (0.75 in.) mesh, at least 500 by 500 mm (18 by 18 in.), upon which the test specimens may be deployed.

5.2 The temperature indicating device shall be a chromel-alumel thermocouple, or its equivalent, coupled with an accurate potentiometer capable of being calibrated and adjusted to compensate for room temperature and cold junction differentials. Other devices ensuring at least equal precision and accuracy may be used.

¹ This test method is under the jurisdiction of ASTM Committee C-17 on Fiber-Reinforced Cement Products and is the direct responsibility of C17.03 on Asbestos-Cement Sheet Products and Accessories.

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² Annual Book of ASTM Standards, Vol 07.01.

³ Annual Book of ASTM Standards, Vol 04.05.

⁴ Discontinued. See 1981 Annual Book of ASTM Standards, Vol 07.01.