



## Standard Test Method for Asbestos Strength Units<sup>1</sup>

This standard is issued under the fixed designation D 3880; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This test method gives a procedure for the evaluation of the strength-giving properties of asbestos fibers used to reinforce asbestos-cement products.

1.2 The purpose of this test method is to determine the number of strength units that may be assigned to the sample tested.

1.3 Asbestos fiber possesses the ability to impart strength to an asbestos-cement product. Every fiber grade may be regarded as possessing a certain quantity of strength-giving units. The quantity of fiber required in an asbestos-cement composition varies inversely with the number of strength units it possesses. For example, if an amount, designated by X, of a fiber possessing 100 strength units produces a product of a given strength, 2X would be required to produce a product of equivalent strength from fiber possessing only 50 strength units.

1.4 The following definition is the basis for the strength unit test: An asbestos fiber that gives the standard strength at the standard density when used as 10 % of the furnish is defined as having 100 strength units. Therefore, by knowing the percent fiber required in the mix to give standard strength at the standard density, it is possible to calculate the strength units of a sample of asbestos.

1.5 This procedure is intended primarily for chrysotile asbestos; it has not been verified whether or not it is applicable to other types.

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

1.7 *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.* For specific precautionary statements see 8.1.1, 9.2.2 and Note 6.

### 2. Referenced Documents

#### 2.1 ASTM Standards:

C 150 Specification for Portland Cement<sup>2</sup>

C 184 Test Method for Fineness of Hydraulic Cement by the 150- $\mu$ m (No. 100) and 75- $\mu$ m (No. 200) Sieves<sup>2</sup>

C 204 Test Method for Fineness of Portland Cement by Air Permeability Apparatus<sup>2</sup>

C 430 Test Method for Fineness of Hydraulic Cement by the 45- $\mu$ m (No. 325) Sieve<sup>2</sup>

C 1120 Test Method for Wash Test of Asbestos<sup>3</sup>

C 1121 Test Method for Turner and Newall (T and N) Wet-Length Classification of Asbestos<sup>3</sup>

C 1162 Test Method for Loose Density of Asbestos<sup>3</sup>

D 1193 Specification for Reagent Water<sup>4</sup>

D 1655 Specification for Aviation Turbine Fuels<sup>5</sup>

D 2590 Test Method for Sampling Chrysotile Asbestos<sup>3</sup>

D 2946 Terminology Relating to Asbestos and Asbestos-Cement Products<sup>3</sup>

D 2589 Test Method for McNett Wet Classification of Asbestos Fiber<sup>3</sup>

D 3639 Test Method for Classification of Asbestos Fibers by Quebec Standard Test<sup>3</sup>

D 3752 Test Method for Strength Imparted by Asbestos to a Cementitious Matrix<sup>3</sup>

E 11 Specification for Wire-Cloth Sieves for Testing Purposes<sup>6</sup>

#### 2.2 Other Standards:

Quebec Asbestos Mining Association (QAMA) Standard, Designation for Chrysotile Asbestos Grades<sup>7</sup>

### 3. Terminology

#### 3.1 Definitions:

3.1.1 *point value, n*— in asbestos, an index of commercial value of asbestos fiber used in asbestos-cement products. Point value = (SU-10)/1.39 where SU stands for strength units.

3.1.2 *strength unit, n*— in asbestos, unit of reinforcing potential of asbestos fiber in asbestos-cement products. An asbestos fiber that yields a flexural modulus of rupture of 27 MPa at a product density of 1.6 g/cm<sup>3</sup> when used as 10 % of the furnish (dry ingredients) is defined as having 100 strength units. Therefore, the number of strength units of a given

<sup>2</sup> Annual Book of ASTM Standards, Vol 04.01.

<sup>3</sup> Annual Book of ASTM Standards, Vol 04.05.

<sup>4</sup> Annual Book of ASTM Standards, Vol 11.01.

<sup>5</sup> Annual Book of ASTM Standards, Vol 05.01.

<sup>6</sup> Annual Book of ASTM Standards, Vol 14.02.

<sup>7</sup> Available from Asbestos Institute, 1130 Sherbrooke St. West, Montreal, Q.C., H3A2 M8.

<sup>1</sup> 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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