



Designation: D 952 – 95

## Standard Test Method for Bond or Cohesive Strength of Sheet Plastics and Electrical Insulating Materials<sup>1</sup>

This standard is issued under the fixed designation D 952; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reappraisal.

### 1. Scope

1.1 This test method covers the determination of the bond strength or ply adhesion strength of sheet plastic and electrical insulating materials. It is applicable to both laminated and nonlaminated thermoplastic and thermosetting materials and vulcanized rubber.

1.2 Test data obtained by this test method is relevant and appropriate for use in engineering design.

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

1.4 *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 618 Practice for Conditioning Plastics and Electrical Insulating Materials for Testing<sup>2</sup>

D 4000 Classification System for Specifying Plastic Materials<sup>3</sup>

D 4066 Specification for Nylon Injection and Extrusion Materials<sup>3</sup>

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method<sup>4</sup>

#### 2.2 ANSI Standard:

B1.1 Standard for Unified Screw Threads<sup>5</sup>

### 3. Significance and Use

3.1 This test, when applied to laminated plastics, is a measure of the interlaminar or intralaminar strength, whichever is smaller. When applied to nonlaminated plastics, the test is a

measure of the cohesive strength of the material. The property determined is of fundamental aspect and has not yet been correlated with the results of any other method for bond strength.

3.2 The test may be found to be useful as (1) a research test when studying the effects of changes in independent variables, (2) a specification test, or (3) a referee test.

3.3 For many materials, there may be a specification that requires the use of this test method, but with some procedural modifications that take precedence when adhering to the specification. Therefore, it is advisable to refer to that material specification before using this test method. Table 1 of Classi-

TABLE 1 Precision Data

Materials	Average Strength, MPa (psi)	Coefficient of Variation	
		$v_r$ Within <sup>A</sup> Laboratories	$v_R$ Between <sup>B</sup> Laboratories
BMC	12.7 (1840)	7.1	7.1
SMC	14.0 (2030)	5.4	8.8

<sup>A</sup>  $v_r$  is the within-laboratories standard deviation of the mean, expressed as a percentage of the listed average.

<sup>B</sup>  $v_R$  is the between-laboratories standard deviation of the mean, expressed as a percentage of the listed average.

fication System D 4000 lists the ASTM materials standards that currently exist.

### 4. Apparatus and Materials

4.1 *Testing Machine*—Any suitable tensile testing machine capable of crosshead movement at a constant rate of 1.3 mm/min.

4.2 *Loading Fixtures*—The loading fixtures shall be self-aligning and shall not apply eccentric loads.

4.3 *Metal Blocks*—A pair of 51-mm (2-in.) square metal blocks each having a maximum height of 51 mm (2 in.). Each block shall contain a hole to permit attachment to the loading fixture (see Fig. 1).

NOTE 1—Blocks constructed from heat-treated aluminum alloy, each having a hole in one end tapped  $\frac{7}{8}$  in. in accordance with ANSI B1.1, to accommodate threaded  $\frac{7}{8}$ -in. studs of convenient length, have been used successfully.

4.4 *Adhesive*—Any adhesive that is found to perform satisfactorily under this test may be used provided that it will not influence the specimen behavior by physical or chemical effects.

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D-20 on Plastics and is the direct responsibility of Subcommittee D20.10 on Mechanical Properties. Current edition approved Oct. 10, 1995. Published December 1995. Originally published as D 952 – 48 T. Last previous edition D 952 – 93.

<sup>2</sup> *Annual Book of ASTM Standards*, Vol 08.01.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 08.02.

<sup>4</sup> *Annual Book of ASTM Standards*, Vol 14.02.

<sup>5</sup> Available from American National Standards Institute, 11 West 42nd St., 13th Floor, New York, NY 10036.