



Designation: D 903 – 98

## Standard Test Method for Peel or Stripping Strength of Adhesive Bonds<sup>1</sup>

This standard is issued under the fixed designation D 903; 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 approval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

*This standard has been approved for use by agencies of the Department of Defense.*

### 1. Scope

1.1 This test method covers the determination of the comparative peel or stripping characteristics of adhesive bonds when tested on standard-sized specimens and under defined conditions of pretreatment, temperature, and testing machine speed.

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 907 Terminology of Adhesives<sup>2</sup>

### 3. Terminology

3.1 *Definitions*—Many terms used in this test method are defined in Terminology D 907.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *flexible*—*in this test method*, indicates a material of the proper flexural strength and thickness to permit a turn back at an approximate 180° angle in the expected loading range of the test without failure. In order to fulfill all terms of the definition, at least one of the adhered materials must be flexible.

3.2.2 *peel or stripping strength*—the average load per unit width of bond line required to separate progressively one member from the other over the adhered surfaces at a separation angle of approximately 180° and at a separation rate of 152 mm (6 in.)/min. It is expressed in kilograms per millimetre (pounds per inch) of width.

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D-14 on Adhesives and is the direct responsibility of Subcommittee D14.80 on Metal Bonding Adhesives.

Current edition approved April 10, 1998. Published February 1999. Originally published as D 903 – 46T. Last previous edition D 903 – 93.

<sup>2</sup> *Annual Book of ASTM Standards*, Vol 15.06.

### 4. Apparatus

4.1 *Testing Machine*— A power-driven machine, with a constant rate-of-jaw separation or of the inclination balance or pendulum type, which fulfills the following requirements:

4.1.1 The applied tension as measured and recorded is accurate within  $\pm 1\%$ .

4.1.2 Hold specimens in the testing machine by grips which clamp firmly and prevent slipping at all times.

4.1.3 The rate of travel of the power-actuated grip is 305 mm (12 in.)/min. This rate which provides a separation of 152 mm (6 in.)/min is to be uniform throughout the tests.

4.1.4 Operate the machine without any device for maintaining maximum load indication. In pendulum-type machines, the weight lever swings as a free pendulum without engagement of pawls.

4.1.5 The machine is autographic giving a chart having the inches of separation as one axis and applied tension as the other axis of coordinates.

4.1.6 The capacity of the machine is such that the maximum applied tension during test does not exceed 85 % nor be less than 15 % of the rated capacity.

4.2 *Conditioning Room or Desiccators*—A conditioning room capable of maintaining a relative humidity of  $50 \pm 2\%$  at  $23 \pm 1^\circ\text{C}$  ( $73.4 \pm 2^\circ\text{F}$ ), or desiccators filled with a saturated salt solution (Note 1) to give a relative humidity of  $50 \pm 2\%$  at  $23 \pm 1^\circ\text{C}$  are required for the conditioning of some specimens.

NOTE 1—A saturated salt solution of calcium nitrate gives approximately 51 % relative humidity at the testing temperature.

### 5. Test Specimen

5.1 The test specimen, shown in Fig. 1(a), consists of one piece of flexible material, 25 by 304.8 mm (1 by 12 in.), bonded for 152.4 mm (6 in.) at one end to one piece of flexible or rigid material, 25 by 203.2 mm (1 by 8 in.), with the unbonded portions of each member being face to face.

5.2 In order to maintain a separation rate of 152.4 mm (6 in.)/min the specimen is to be relatively nonextensible in the expected loading range. Where a material is sufficiently extensible to lessen radically the separation rate, back it up with a