



Standard Test Method for Pressure-Sensitive Tack of Adhesives Using an Inverted Probe Machine¹

This standard is issued under the fixed designation D 2979; 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 measurement of the pressure-sensitive tack of adhesives. This test method is applicable to those adhesives which form a bond of measurable strength rapidly upon contact with another surface and which can be removed from that surface cleanly, that is, without leaving a residue visible to the eye. For such adhesives, tack may be measured as the force required to separate an adhesive and the adherend at the interface shortly after they have been brought into contact under a defined load of known duration at a specified temperature.

1.2 The values stated in SI units are to be regarded as 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:

D 907 Terminology of Adhesives²

E 171 Specification for Standard Atmospheres for Conditioning and Testing Flexible Barrier Materials³

3. Terminology

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

4. Summary of Test Method

4.1 This test method involves bringing the tip of a cleaned probe of defined surface roughness into contact with the adhesive at a controlled rate, under a fixed pressure, for a short time, at a given temperature; and subsequently breaking the bond formed between the probe and adhesive, also at a controlled rate. Tack is measured as the maximum force required in breaking the adhesive bond.

¹ This test method is under the jurisdiction of ASTM Committee D14 on Adhesives and is the direct responsibility of Subcommittee D14.50 on Hot-Melt and Pressure-Sensitive Adhesives.

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² *Annual Book of ASTM Standards*, Vol 15.06.

³ *Annual Book of ASTM Standards*, Vol 15.09.

5. Significance and Use

5.1 This test method provides a quantitative measure of the pressure-sensitive tack of the adhesive.

5.2 The method is designed for the adhesive mass itself and is suitable for measuring the tack of pressure-sensitive adhesives for use on both rigid and flexible backings.

5.3 This test method is suitable for quality control and research purposes.

6. Apparatus

6.1 *Probe*—A Type 304 stainless steel rod, 5.0 mm (0.197 in.) in diameter, machined at one end of 90° to the longitudinal axis. The tip is finished to a surface roughness of not more than 500 or less than 250 nm (20 to 10 μm .) rms as measured by a surface-measuring device.⁴

NOTE 1—When the adhesive is supported on flexible backings, or is greater than 0.25 mm (0.010 in.) thick, a probe with a spherical crown of 0.05 mm (0.002 in.) high, and with a 62.5-mm (2.5-in.) radius may be used.

6.2 *Pressure-Loading Weight*—An annular ring whose inside diameter is slightly larger than the probe diameter. The ring weight is such that the pressure applied to the sample is 9.79 ± 0.10 kPa (1.42 psi).

NOTE 2—Contact pressures of 0.98, 1.96, or 4.90 kPa (0.14, 0.28 or 0.71 psi) may be obtained by employing annuli of different weight. These lower pressures as well as ones of 98 kPa (14.2 psi) or higher can be used to show the effect of pressure directly when tack is pressure-dependent.

6.3 *Force Gage*—A spring device with an indicator that retains the maximum force reading until reset manually. The spring characteristics is such that between 8.9 and 22.2 N (2 and 5 lb) are required to extend it the permissible 2.5 mm (0.10 in.). Mount the probe directly on the force gage.

NOTE 3—Other force-measuring devices such as strain gage load cells, or devices with different force-deflection characteristics may be used in certain instances. Tack values obtained with these devices will differ in magnitude but will be related to standard values obtained with the specified gage.

6.4 *Testing Machine*⁵—A mechanical system for bringing

⁴ An example of a suitable surface-measuring device is a Surfindicator manufactured by Gould, Inc., Gage and Control Div., 4601 Arden Dr., El Monte, CA.

⁵ An example of a suitable machine is the Polyken Probe Tack Tester available from Chemsultants International, Mentor, OH.