



Designation: D4497 – 10 (Reapproved 2018)

Standard Test Method for Determining the Open Time of Hot Melt Adhesives (Manual Method)¹

This standard is issued under the fixed designation D4497; 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 the manual determination of the open-time range of hot-melt adhesives under the stated conditions.

1.2 The values stated in SI units are to be regarded as the standard. The inch-pound units in parentheses are provided 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D907 Terminology of Adhesives

E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

3. Terminology

3.1 *Definitions*—Many of the terms found in this test method are defined in Terminology D907.

3.2 *Definitions of Terms Specific to This Standard:*

¹ This test method is under the jurisdiction of ASTM Committee D10 on Packaging and is the direct responsibility of Subcommittee D10.14 on Tape and Labels.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

3.2.1 *open time, n*—the time available between application of the adhesive to the first substrate and the mating of the second substrate which still results in a minimum of 50 % fiber tear when tested at ambient conditions.

4. Summary of Test Method

4.1 In this test method, open time is determined by bonding together with the adhesive, pieces of standard paper at intervals of 5 s sequentially after the molten adhesive has been applied using a heated film applicator on one surface. The bonded specimens are examined later to determine the longest time period, between application of the adhesive to one surface and mating with a second surface, which allows substantial bonding.

5. Significance and Use

5.1 This test method allows comparing the open time of several hot melt adhesives.

5.2 This test method is not intended to provide the open-time observed for a specific adhesive in a specific manufacturing operation. This test method can be used to compare the performance of adhesives which are represented to be identical or to rank the open-time of a group of hot melt adhesives.

6. Apparatus

6.1 *Oven*, which meets the precision required by the procedure, should be used to heat the adhesive sample and the applicator.

6.2 *Film Applicator*—Multiple clearance 0.125 to 1.25 mm (5 to 50 mil) square P.G. and T. Number 2 Film Applicator³ capable of providing an applied film of adhesive having a nominal width of 50 mm (2 in.).

6.3 *Hand Thermometer*, preferably metal, capable of measuring the temperature of the hot-melt with an accuracy of $\pm 1^\circ\text{C}$ ($\pm 2^\circ\text{F}$).

³ Film Applicator No. 2 is available from Precision Gage and Tool Company, 375 Gargrave Rd., Dayton, OH 45449, www.precisiongage-toll.com.