Designation: D5570/D5570M – 10 (Reapproved 2015)

Standard Test Method for Water Resistance of Tape and Adhesives Used as Box Closure[1]

This standard is issued under the fixed designation D5570/D5570M; 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 a procedure to determine the water resistance of an adhesive or tape as measured by the amount of tape or adhesive dissolved or dispersed in water.

1.2 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with 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:*[2]

D644 Test Method for Moisture Content of Paper and Paperboard by Oven Drying (Withdrawn 2010)[3]

D996 Terminology of Packaging and Distribution Environments

D1974 Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes

3. Terminology

3.1 *Definitions:*

3.1.1 General definitions for packaging and distribution environments are found in Terminology D996.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *box closure*—the means of securing the flaps or covers of a box so that the box will not accidentally open during normal shipment, handling, and storage.

4. Summary of Test Method

4.1 *Procedure A*—The water resistance of a tape (gummed or pressure sensitive) is measured by immersing the tape in water at least 24 h at 73.4 ± 4°F [23 ± 2°C] and determining the percent of tape that is dissolved or dispersed.

4.2 *Procedure B*—The water resistance of an adhesive is measured by coating the adhesive on a paper surface, immersing in water at least 24 h at 73.4 ± 4°F [23 ± 2°C], and determining the percent of adhesive that is dissolved or dispersed.

5. Significance and Use

5.1 When a box becomes wet, the performance of the box and its closure are reduced. It is desirable to have box closure methods that retain an ability to keep the box closed when wet. Sealing or reinforcing methods sometimes are useful to improve performance of wet boxes and closures. Water resistance is sometimes a regulatory or contractual requirement.

5.2 A test result indicating that a box closure tape or adhesive is soluble or dispersible in water is an indication that its function will be significantly impaired when wet. A test result that does not indicate solubility or dispersibility does not necessarily ensure that the bonding ability will be satisfactory when wet or that the performance of the box closure will be satisfactory when wet. Package performance testing described in the water resistance section of Practice D1974 is useful to further investigate the effects of water on package and closure functions.

6. Apparatus and Materials

6.1 *Drying Oven,* capable of maintaining 221 ± 9°F [105 ± 5°C] and providing adequate air circulation.

6.2 *Testing Chamber,* capable of keeping samples at 73.4 ± 4°F [23 ± 2°C].

6.3 *Balance,* capable of reading the mass of specimens at least to the nearest 0.00035 oz. [1 mg].

6.4 *Container,* capable of holding at least 1 qt [1 L] of water.

[1] This test method is under the jurisdiction of ASTM Committee D10 on Packaging and is the direct responsibility of Subcommittee D10.27 on Paper and Paperboard Products.

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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] The last approved version of this historical standard is referenced on www.astm.org.