Designation: D 6590/D 6590M – 00

Standard Specification for Pressure-Sensitive Tape for Sealing Fiber Containers and Cans[1,2]

This standard is issued under the fixed designation D 6590/D 6590M; 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 specification covers one type of pressure-sensitive tape for closing and sealing slip cover type containers such as fiber tubes and metal cans.

1.2 The values stated in either inch-pound or SI units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system must be used independently, without combining values in any way.

1.3 The following safety hazards caveat pertains only to the test methods portion of this specification: *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 its use.*

2. Referenced Documents

2.1 *ASTM Standards:*

D 996 Terminology of Packaging and Distribution Environments[3]

D 3330/D 3330M Test Methods for Peel Adhesion of Pressure-Sensitive Tape[3]

D 3611 Practice for Accelerated Aging of Pressure-Sensitive Tapes[3]

D 3652/D 3652M Test Method for Thickness of Pressure-Sensitive and Gummed Tapes[3]

D 3654/D 3654M Test Method for Shear Adhesion of Pressure-Sensitive Tapes[3]

D 3715/D 3715M Practice for Quality Assurance of Pressure-Sensitive Tapes[3]

D 3759/D 3759M Test Method for Tensile Strength and Elongation of Pressure-Sensitive Tapes[3]

D 3811/D 3811M Test Method for Unwind Force of Pressure-Sensitive Tapes[3]

D 3816/D 3816M Test Method for Water Penetration Rate of Pressure-Sensitive Tapes[3]

D 3833/D 3833M Test Method for Vapor Transmission Rate of Pressure-Sensitive Tapes[3]

D 3951 Practice for Commercial Packaging[3]

D 5570 Test Method for Water Resistance of tape and Adhesives Used as a Box Closure[3]

2.2 *Military Specification:*

MIL-C-2439 Container, Ammunition, Fiber Spirally Wound[4]

2.3 *ISO Standard:*

ISO 9002 Quality Systems Model for Quality Assurance in Production and Installation[5]

3. Terminology

3.1 *Definitions:*

3.1.1 General definitions for packaging and distribution environments are found in Terminology D 996.

4. Significance and Use

4.1 The polyester film backed pressure-sensitive tape described in this specification is intended for closure and sealing of containers with slip cover closure, such as fiber spirally wound tubes (MIL-C-2439) and metal cans where strength, water-resistance, water-vapor resistance and resistance to rain and other deteriorating elements are required.

5. Ordering Information

5.1 The inquiry or order shall include the following:

5.1.1 ASTM Designation and date of issue;

5.1.2 Roll width and length;

5.1.3 When backing certification is required;

5.1.4 When testing and inspection certification is required; and

5.1.5 Level of packaging and packing, if other than commercial.

[1] This specification is under the jurisdiction of ASTM Committee D10 on Packaging and is the direct responsibility of Subcommittee D10.14 on Tapes and Labels.

Current edition approved Oct. 10, 2000. Published December 2000.

[2] This specification is intended to replace Military Specification MIL-T-43036, Type II.

[3] *Annual Book of ASTM Standards*, Vol 1509.

[4] Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

[5] Available from American Standards Institute, 11 W. 42nd St., 13 floor, New York, NY 10036.

6. Materials and Manufacture

6.1 The materials used in the construction of the tape shall be such as to assure performance of the tape over the temperature range from −55 to 71°C [−65 to 160°F] and shall conform to the requirements of this specification.

6.2 *Backing*—The backing shall be a polyester film.

6.3 *Adhesive*—The adhesive shall be pressure-sensitive, water resistant, and shall require no moisture, heat or other preparation prior to or after application to clean, dry surfaces. The adhesive shall be coated in a smooth and evenly distributed layer on one side of the backing.

6.4 *Rolls*—The tape shall be evenly wound in rolls, adhesive side in, on cores made of paper-fiber or plastic. The core shall have sufficient rigidity to prevent distortion of the roll under normal conditions of transportation and use. The inside diameter of the core shall be 76 −0 +1.6 mm [3 −0, +1⁄16 in.]. When the roll is unwound, the backing shall not tear, the adhesive shall not transfer, nor split from the face of the tape backing to the adjacent layer before or after aging (see Table 1).

6.5 *Color*—The color of the tape shall be transparent or other commercially available color.

7. Physical Properties

7.1 The tape shall comply with the physical property requirements listed in Table 2 and the water resistance requirements of Test Method D 5570.

8. Dimensions and Permissible Variations

8.1 The width of the rolls shall be 24, 36 or 48 mm [1, 1-½ or 2 in.], as specified [see 5.1.2].

8.1.1 A width tolerance of ± 1.5 mm [±1⁄16 in.] shall be allowed on all widths.

NOTE 1—The width of pressure-sensitive tapes in the common inch-pound system are not identical to the widths available in the SI system. For packaging applications this difference in width on packaging performance is not considered significant.

8.2 The length of the roll shall be 50 or 55 m [55 or 60 yd], or other commercially available lengths, (that is, 550 yd rolls) as specified (see 5.1.2).

8.3 *Splices*—The roll shall consist of a single length of tape except any single roll may contain a maximum of one splice.

8.3.1 Splices shall be such that they will not separate when the roll is unwound by hand or machine (see Table 1).

8.4 *Stability on a Fiber Container*—The tape, when tested as described in 12.4.2 shall show no evidence of buckling, curling or lifting extending toward the center of the tape plies more than ¼of the width of the tape from either side, and shall remove from the container without breaking. Adhesive transfer to the container shall not be cause for rejection.

8.5 *Low Temperature Removal*—The tape shall be removable from the container without breaking the tape backing, when tested as described in 12.4.3.

8.6 *Waterproof on Metal Cans*—The tape shall prevent the penetration of liquid water into the test cans for a period of 15 minutes when tested as described in 12.4.4.

TABLE 1 Rolls

Test Method	Designation
Adhesion, as received and aged	D 3330/D 3330M Test Method A
Shear adhesion	D 3654/D 3654M Procedure A
Tensile	D 3759/D 3759M
Thickness	D 3652/D 3652M
Unwind as received and aged	D 3811/D 3811M
Water penetration rate	D 3816/D 3816M
Water vapor transmission rate	D 3833/D 3833M
Accelerated aging	D 3611

TABLE 2 Physical Property Requirements

Test		Value	Referenced Test
Thickness, max	mm	0.10	Table 1
	mils	4	Table 1
Tensile strength, min			
Longitudinal,	(N/100 mm)	615	Table 1
	(lb/in.)	35	Table 1
Transvers,	(N/100 mm)	700	Table 1
	(lb/in.)	40	Table 1
Elongation, % min.		120	Table 1
Adhesion, min.			
Initial	(N/100 mm)	55	Table 1
	(oz/in.)	50	Table 1
Aged	(N/100 mm)	49	Table 1
	(oz/in.)	45	Table 1
Shear adhesion, minutes, min[A]			
Initial and Aged			
at 23°C [73.5°F]		3000	Table 1
at 65.5°C [150° F]		3000	Table 1
Unwind, max			
Initial	(N/100 mm)	70	Table 1
	(lb/in.)	4	Table 1
Aged	(N/100 mm)	70	Table 1
	(lb/in.)	4	Table 1
WPR, max	(g/m^2/24 h)	15.5	Table 1
	($g/100 in.^2$/24 h)	1.0	Table 1
WVPR, max	(g/m^2/24 h)	15.5	Table 1
	($g/100 in.^2$/24 h)	1.0	Table 1

[A] The shear adhesion test at 23°C [73°F] and at 65.5°C [150°F], both initial and aged, shall show no creepage or slippage in excess of 3 mm [⅛ in.].

9. Workmanship, Finish and Appearance

9.1 The tape shall be uniformly constructed and free from defects that impair the usefulness of the tape for the purposes intended. The tape adhesive coating shall be uniform, covering entirely one side of the tape. The edges shall be clean, straight, and unbroken. The roll shall be evenly wound. The finished product shall conform to the levels of quality established herein.

10. Sampling

10.1 *End Item Examination*—The lot size for visual inspection shall be in accordance with Practice D 3715/D 3715M. The sample size shall be one roll.

10.2 *End Item Testing*—The lot size for end-item testing shall be in accordance with Practice D 3715/D 3715M. The acceptance quality level (AQL) shall be 4.0 %.

11. Specimen Preparation and Number of Tests

11.1 Specimen preparation shall be as specified in the appropriate test method.