



Designation: **D5749 – 01 (Reapproved 2012) D5749 – 17**

## Standard Specification for Reinforced and Plain Gummed Tape for Sealing and Securing<sup>1</sup>

This standard is issued under the fixed designation D5749; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope ~~Scope\*~~

1.1 This specification covers plain and reinforced paper gummed adhesive tapes suitable for securing and banding paper products and closing fiberboard boxes.

1.2 This specification is intended to replace Fed. Specs. CID A-A-1492, CID A-A-1671, and PPP-T-45 in part.

1.3 The values stated in SI units are to be regarded as standard. The values given in parentheses are for information only.

1.4 The following safety hazards caveat pertains only to the test methods portion, Section 11, 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 use.*

1.5 *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:<sup>2</sup>

D685 Practice for Conditioning Paper and Paper Products for Testing

D828 Test Method for Tensile Properties of Paper and Paperboard Using Constant-Rate-of-Elongation Apparatus

D996 Terminology of Packaging and Distribution Environments

~~D1974~~**D1974/D1974M** Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes

D3951 Practice for Commercial Packaging

#### 2.2 TAPPI Standards:

T 401 Fiber Analysis of Paper and Paperboard<sup>3</sup>

T 410 Weight per Unit Area (Basis Weight or Substance)<sup>3</sup>

T 414 Internal Tearing Resistance of Paper (Elmendorf-Type Method)<sup>3</sup>

UM 575 Water Resistance of Adhesive Bond in Laminated Paper and Paperboard<sup>3</sup>

#### 2.3 ANSI/ASQC Standards:

ANSI/ASQC Z 1.4 Sampling Procedures and Tables for Inspection by Attributes<sup>4</sup>

ANSI/ASQC Z 1.9 Sampling Procedures and Tables for Inspection by Variables for Percent Defective<sup>4</sup>

#### 2.4 Federal Specifications:

PPP-T-45 Tape, Gummed, Paper, Reinforced and Plain, for Sealing and Securing<sup>5</sup>

PPP-T-681 Tape, Gummed, Packaging and Packing of<sup>5</sup>

CID A-A-1492 Commercial Item Description Tape, Gummed, Paper, Plain<sup>5</sup>

CID A-A-1671 Commercial Item Description Tape, Gummed, (Paper, Reinforced, Laminated)<sup>5</sup>

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee D10 on Packaging and is the direct responsibility of Subcommittee D10.14 on Tape and Labels. Current edition approved April 1, 2012/April 1, 2017. Published May 2012/June 2017. Originally approved in 1995. Last previous edition approved in 2006/2012 as D5749 – 01(2006):(2012). DOI: 10.1520/D5749-01R12-10.1520/D5749-17.

<sup>2</sup> 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.

<sup>3</sup> Available from Technical Association of the Pulp and Paper Industry (TAPPI), 15 Technology Parkway South, Norcross, Suite 115, Peachtree Corners, GA 30092, http://www.tappi.org.

<sup>4</sup> Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

<sup>5</sup> Available from U.S. Government Printing Office Superintendent of Documents, Publishing Office, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, http://www.access.gpo.gov/20401-0001, http://www.gpo.gov.

\*A Summary of Changes section appears at the end of this standard

2.5 *ISO Standard:*

ISO 9002 Quality Systems Model for Quality Assurance in Production and Installations<sup>4</sup>

### 3. Terminology

3.1 *Definitions*—General definitions for packaging and distribution environments are found in Terminology **D996**.

### 4. Classification

4.1 *Type I Reinforced, Laminated:*

4.1.1 *Class 1*—Strippable.

4.1.2 *Class 2*—Nonstrippable.

4.2 *Type II Plain, Single Ply, Strippable:*

4.2.1 *Grade A*—Light duty, for lightweight packages.

4.2.2 *Grade B*—Medium duty, for medium-sized packages.

4.2.3 *Grade C*—Heavy duty, for heavy-duty packages.

### 5. Significance and Use

5.1 Type I is a reinforced gummed tape which may be strippable (Class 1) or nonstrippable (Class 2). It is intended for use in Methods 2C2, 2C3, and any other methods in Practice **D1974/D1974M**.

5.2 Type II is a plain paper-backed nonstrippable gummed tape. It is intended for use in Methods 2C4, 2C5, and other methods in Practice **D1974/D1974M**.

### 6. Ordering Information

6.1 The inquiry or order shall include the following:

6.1.1 ASTM designation and date of issue,

6.1.2 Type, class, and grade required (5.1),

6.1.3 When core plugs are required (7.7),

6.1.4 If tape is to be wound gummed side out (7.7),

6.1.5 Roll width and length (9.1 and 9.2),

6.1.6 Acceptance sampling plan and desired acceptance quality level (Section 12),

6.1.7 When backing certification is required (15.1),

6.1.8 When testing and inspection certification is required (15.1),

6.1.9 Level of packaging and packing if other than commercial (Section 17), and

6.1.10 When packaging for shipments to the U.S. Government (17.2).

### 7. Materials and Manufacture

7.1 The materials used in the construction of the tape shall be such as to ensure performance of the tape over the range of –55 to +71°C (–65 to +160°F) service conditions and shall conform to the requirements of this specification.

7.2 *Paper:*

7.2.1 *Stock*—The paper used in the fabrication of the tape shall be a kraft paper. The use of recycled pulp in the paper is encouraged.

7.2.2 *Weight*—The weight of the paper prior to gumming shall conform to the requirement of **Table 1**, when tested as described in TAPPI T 410.

7.3 *Adhesives*—The adhesives used shall not have an offensive odor (dry or wet) and shall meet the environmental considerations of **16.1**.

**TABLE 1 Weight of Ungummed Paper**

(24 × 36 — 5500500 sheets)	Minimum Weight	
	g/m <sup>2</sup> /m <sup>2</sup>	lbf/ream
Type I, Classes 1 and 2	49	55
Type I, Classes 1 and 2	30	43
Type II		
Grade A	57	35
Grade B	98	60
Grade B	90	55
Grade C	146	90
Grade C	138	85

7.3.1 Type I, Class 1 adhesive shall be capable of being quickly activated with water. The wetted adhesive shall show pronounced tackiness and shall cause the tape to remain so firmly affixed that it cannot be removed without leaving a thin film of paper from the tape on the test paper, when tested in accordance with 13.6.1.

7.3.2 Type I, Class 2, and Type II adhesive shall be capable of being quickly activated with water. The wetted adhesive shall show pronounced tackiness and shall cause the tape to remain so firmly affixed that it cannot be removed without failure of either the tape or paper when tested in accordance with 13.6.1.

7.4 Reinforcing Materials—The reinforcing fibers used in fabricating Type I tapes shall be composed of glass or polyester, or both, of such size as to permit the reinforced tape to meet the requirements set forth in Table 2 when tested as described in 13.5.

7.5 Laminating Materials—The laminating material for Type I tape shall be non-asphaltic, water resistant, flexible, and non-staining. Water resistance of the finished tape shall be tested in accordance with TAPPI UM 575.

7.6 Construction—Type I tape shall consist of two strips of paper in roll form, securely laminated together with reinforcing fibers embedded in the laminate. The reinforcing laminated tape shall be completely and uniformly coated on one side with an adhesive.

7.6.1 The tape shall be reinforced by crosswise reinforcing fibers spaced not less than 2 fibers/50fibers/25 mm (1 in.) on average and by lengthwise fibers spaced not more than an average of 25 mm (in both the machine and crosswise directions, ½ in.) apart. If a diamond pattern is employed for crosswise reinforcement, the spacing between the parallel sides of the diamond shall not be more than 32 mm (1.25¼ in.). ~~The In addition to the diamond-patterned reinforcement, a three-way tape shall be reinforced in both the machine direction and cross direction with reinforcing fibers spaced by not less than 2 fibers/50fibers/25 mm (1 in.) on average, in addition to the diamond-patterned reinforcement.~~

7.6.2 Type II tapes, all grades, shall consist of one strip of paper in roll form of the applicable grade, completely and uniformly coated on one side with an adhesive.

7.7 Rolls—Unless otherwise specified, the tape shall be evenly wound and tightly wound in rolls with the gummed side in (6.1.4). Type II shall be wound on a core having sufficient rigidity to prevent distortion of the roll under normal conditions of transportation and use. The inside diameter of the core shall be not less than 13 mm (½ in.). When specified, Type II tape shall have the core secure with a plug (6.1.3). Type I tape shall not be required to have a core. The end of the outer leaf of the tape shall be adhered to the next layer to prevent unwinding. The tape in each roll shall be furnished in one continuous length and have no more than three splices per roll. All splices shall be neatly and evenly made with glue or double sided pressure sensitive tape and shall not separate upon unwinding.

8. Physical Properties

8.1 The tape shall meet the physical property requirements in Table 2.

9. Dimensions, Mass, and Permissible Variations

9.1 The width of the roll for Type I shall be 38.5, 50, and 75 mm (1.5, 2, and 3 in.); For Type II 25, 38.5, 50, 70, and 75 mm (1, 1½, 2, 2.75, and 3 in.).

9.1.1 A width tolerance of ±1.5 mm (±1/16 in.) shall be allowed on all widths.

9.2 Length:

9.2.1 Type I—The length of the roll shall be 115 or a minimum of 140 m (375 or 450 (450 ft) or other commercially available lengths, as specified (6.1.5).

9.2.2 Type II—The length of the Class A roll shall be 245 m (800 ft) when wound gummed side out, 150 m (500 ft) when wound gummed side in, or other commercially available length (6.1.5). The length of the Class B roll shall be 185 or 300 m (600 or 800 ft), or other commercially available length (6.1.5). The length of the Class C roll shall be 115 m (375 ft), or other commercially available length (6.1.5).

TABLE 2 Physical Properties

Type	Tensile Strength, kN/m width (lb/in.) min		Tearing Resistance, grams force mN(mN) min <sup>A</sup>	
	Machine direction	Cross direction <sup>B</sup>	Machine direction	Cross direction
Type I	11 (63)	5.25 (30)		
Type I	11 (63)	5.25 (30)		
Type II				
Grade A	4.5 (26)		540(55)	647 (66)
Grade A	4.5 (26)		540(55)	647 (66)
Grade B	8 (45)		1109 (113)	1315 (134)
Grade C	12 (68)		1991 (203)	2197 (224)

<sup>A</sup> This requirement does not apply to tapes less than 63 mm (2 ½ in.) in width.

<sup>B</sup> This requirement does not apply to tapes less than 76 mm (3 in.) in width.