



Designation: D5749 – 24

Standard Specification for Reinforced and Plain Gummed Tape for Sealing and Securing¹

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 (ϵ) indicates an editorial change since the last revision or reapproval.

1. 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, health, and environmental 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:*²

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

¹ 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.

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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.

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 Paperboard³

T 410 Weight per Unit Area (Basis Weight or Substance)³

T 414 Internal Tearing Resistance of Paper (Elmendorf-Type Method)³

UM 575 Water Resistance of Adhesive Bond in Laminated Paper and Paperboard³

2.3 *ANSI/ASQC Standards:*

ANSI/ASQC Z 1.4 Sampling Procedures and Tables for Inspection by Attributes⁴

ANSI/ASQC Z 1.9 Sampling Procedures and Tables for Inspection by Variables for Percent Defective⁴

2.4 *Federal Specifications:*

PPP-T-45 Tape, Gummed, Paper, Reinforced and Plain, for Sealing and Securing⁵

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

2.5 *ISO Standard:*

ISO 9002 Quality Systems Model for Quality Assurance in Production and Installations⁴

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 (typically non-unitized loads):*

4.1.1 *Grade A*—Light duty.

4.1.2 *Grade B*—Medium duty.

4.1.3 *Grade C*—Heavy duty.

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

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

⁵ Federal specifications are available online at ASSIST Quick Search, <https://quicksearch.dla.mil/>.

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

- 4.2 *Type II Plain, Single Ply (typically unitized loads):*
- 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 intended for use in closing methods in Practice D1974/D1974M for domestic storage and shipments of fiberboard boxes, or closing wrappers of packages and banding of paper and paper products.

5.2 Type II is a plain paper gummed tape intended for use in closing methods in Practice D1974/D1974M for general closing of fiberboard boxes or wrappers of packages; or for protection against abrasion on fragile products.

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 and grade required (5.1),
- 6.1.3 If a core is 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 paper-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.

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 the following service conditions: -18°C to $+60^{\circ}\text{C}$ (0°F to $+140^{\circ}\text{F}$) for Type I and -34°C to $+204^{\circ}\text{C}$ (-30°F to $+400^{\circ}\text{F}$) for Type II 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.

TABLE 1 Weight of Ungummed Paper

Minimum Weight		
(24 × 36 — 500 sheets)	g/m ²	lb/ream
Type I		
Grade A	65	40
Grade B	73	45
Grade C	81	50
Type II		
Grade A	57	35
Grade B	90	55
Grade C	138	85

7.3 *Adhesives*—The adhesives used shall not have an offensive odor (dry or wet) and shall meet the environmental considerations of 16.1. 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 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, polyester, both, or other suitable fibers, 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 using a 2 h soak for commercial use and a 24 h soak for DoD use. Test specimen dimension can be as specified in UM 575, or 25.4 cm (10 in.) by tape width.

7.6 Construction:

7.6.1 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. The tape shall be reinforced by not less than 2 fibers/25 mm (1 in.) on average in both the machine and crosswise directions. 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 (1.25 in.). In addition to the diamond-patterned reinforcement, a three-way tape shall be reinforced in the machine direction by not less than 2 fibers/25 mm (1 in.) on average.

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 and tightly wound in rolls with the gummed side in (6.1.4). Type I and Type II tapes shall not be required to have a core. If a core is required, then the inside diameter of the core shall be not less than 13 mm (½ in.). 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.

TABLE 2 Physical Properties

Type	Tensile Strength, kN/m (lb/in.) min		Tearing Resistance, grams force (mN) min ^A	
	Machine direction	Cross direction ^B	Machine direction	Cross direction
Type I				
Grade A	9 (50)	3.5 (20)	N/A	N/A
Grade B	12 (70)	4.4 (25)	N/A	N/A
Grade C	14 (78)	4.9 (28)	N/A	N/A
Type II				
Grade A	4.0 (23)	1.8 (10)	540 (55)	647 (66)
Grade B	7.4 (42)	3.5 (20)	1109 (113)	1315 (134)
Grade C	11.0 (63)	4.4 (25)	1991 (203)	2197 (224)

^A Tested in accordance with TAPPI T 414.

^B This requirement does not apply to tapes less than 76 mm (3 in.) in width.