



PIA-T-87130C
25 November 2013

Superseding
PIA-T-87130B
16 September 2010

The following commercial specification is adopted from the military document. Revision A included all known accepted revisions, amendments, notices, and Department of Defense (DoD) engineering changes previously developed for this item. Revisions B and forward include changes adopted to reflect technology and design evolution.

TAPE AND WEBBING TEXTILE PARA-ARAMID, INTERMEDIATE MODULUS

The Parachute Industry Association makes this document available for use by Industry and Government organizations that wish to apply this specification to their products.

1. SCOPE

1.1 Scope. This specification covers eleven types of tapes and webbings made from para-aramid, intermediate modulus yarn.

1.2 Type and Class designation. The tapes and webbings shall be of the Types and Classes as specified in TABLE I (see 6.1).

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in Sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in Sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government publications. The following publication forms a part of this document.

FEDERAL TRADE COMMISSION (FTC)

16 CFR 303

- Rules And Regulations Under the Textile Fiber
Products Identification Act

(Copies are available online at: www.ftc.gov or from the Federal Trade Commission, 600 Pennsylvania Avenue, N.W. Washington, DC 20580-001. Electronic copies may be obtained from: <http://www.access.gpo.gov/>.)

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2.3 Non-government publications. The following publications form a part of this document.

AMERICAN SOCIETY FOR QUALITY (ASQ)

ANSI/ASQ Z 1.4 - Sampling Procedures and Tables for Inspection by Attributes

(Copies are available online at: www.asq.org or from the American Society for Quality, 600 North Plankinton Avenue, Milwaukee, WI 53203. Electronic copies may also be obtained from www.access.gpo.gov/.)

ASTM INTERNATIONAL (ASTM)

ASTM D 1423	- Standard Test Method for Twist in Yarns by Direct-Counting
ASTM D 1776	- Standard Practice for Conditioning and Testing Textiles
ASTM D 1907	- Standard Test Method for Linear Density of Yarn (Yarn Number) by Skein Method
ASTM D 3774	- Standard Test Method for Width of Textile Fabric
ASTM D 3775	- Standard Test Method for Warp (End) and Filling (Pick) Count of Woven Fabrics
ASTM D 3776	- Standard Test Methods for Mass per Unit Area (Weight) of Fabrics

(Application for copies should be addressed to the ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959. Electronic copies may be obtained from www.astm.org.)

TECHNICAL MANUAL OF THE AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS (AATCC)

(Applications for copies should be addressed to the AATCC National Headquarters, P.O. Box 12215, Research Triangle Park, NC 27709-2215. Electronic copies may be obtained from www.aatcc.org.)

PARACHUTE INDUSTRY ASSOCIATION (PIA)

PIA-TEST METHOD-4108 - STRENGTH AND ELONGATION, BREAKING; TEXTILE WEBBING, TAPE AND BRAIDED ITEMS

(Electronic copies may be obtained from www.pia.com.)

2.4 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 First article. When specified (see 6.1), a sample representative of production quality shall be submitted for first article inspection in accordance with 4.2.



3.2 Material.

3.2.1 Yarn. The yarn used in the manufacture of all types of webbing shall be a para-aramid, intermediate modulus type (see 6.4).

3.2.1.1 Denier. The yarn used in manufacturing of the webbing shall be the denier specified in TABLE I.

3.2.1.2. Twist. The warp yarns shall be a minimum of 2 turns per inch. Plied yarns shall be made by twisting together the specified number of ends of zero twist singles (as supplied by the producer). Filling yarns shall have a minimum of producer's twist.

3.3 Physical Requirements. The construction and physical requirements of the finished webbing shall be as specified in TABLE I.

3.4 Weave. The weave for each Class of each Type of webbing shall be as shown in TABLE I.

3.5 Length and put-up. Unless otherwise specified (see 6.1), webbing 9/16 inch or less in width shall be furnished on double headed spools or tubes. Webbing 5/8 inch and wider shall be furnished in rolls. No roll shall contain more than 3 pieces, and no piece shall be less than 20 yards in length.

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TABLE I Construction and physical properties.

Type	Class	Width (inches ±1/16)	Maximum weight (oz./yd.)	Minimum breaking strength (lb.)	Warp			Fill			Weave
					Denier	Ply	Total ends (min.)	Denier	Ply	Picks (per inch)	
I	1	1/2	.06	250	200	1	42	200	1	39	Plain
	2	1/2	.09	550	400	1	39	400	1	22	Plain
	3	1/2	.12	800	200	1	12.2	200	1	35	1/3 Twill Center Reversal
	6	1/2	.56	3,500	1500	1	79	400	1	24	Double Plain 31/13
II	1	9/16	.08	500	400	1	39	400	1	22	Plain
	2	9/16	.13	700	400	1	58	400	1	32	Plain
IV	1	3/4	.11	500	200	1	90	200	1	38	Plain
	4	3/4	.50	3,000	1500	2	31	1500	1	12	Plain
	5	3/4	.60	4,500	1500	2	41	1500	1	11	Plain
VI	1	1	.08	370	200	1	50	200	1	45	Plain
	2	1	.12	525	200	1	90	200	1	50	Plain
	3	1	.12	750	200	1	108	200	1	35	Plain
	4	1	.23	1,000	400	1	102	400	1	31	Plain
	5	1	.23	1,500	400	1	108	400	1	26	Plain
	6	1	.36	2,500	1500	2	24	1500	1	14	Plain
	6a	1	.36	2,400	1000	2	40	1000	1	15	Plain
	7	1	.52	3,000	1000	2	48	1000	1	15	Plain
	8	1	.55	4,000	1500	2	39	1000	1	12	Plain
	9	1	1.00	6,000	1500	3	49	1500	1	12	2/2 HBT - Center Reversal
	9a	1	1.09	7,000	1500	2	76	1500	2	18	51/15 Center Reversal (Last End 2/2)
	9b	1	1.00	6,000	1500	3	44	1500	1	10	Plain
VI	10	1	1.50	9,500	1500	3	76	1500	1	8	212 HBT - Center Reversal
	11	1	1.65	12,500	1500	3	89	1500	1	9	Plain
VII	1	1-1/8	.23	1,100	400	1	96	400	1	34	Plain
	2	1-1/8	.45	2,750	1000	1	45	1000	1	13	Plain
	6	1-1/8	2.00	13,500	1500	2	140	1500	2	14	5/1 HBT- Center Reversal
VIII	1	1-1/4	.23	800	400	1	60	1000	1	26	Plain
IX	1	1-1/2	.12	500	200	1	82	200	1	48	Plain
	2	1-1/2	.17	1,100	200	1	172	200	1	36	Plain
	5	1-1/2	.47	3,000	1000	1	96	1000	1	18	Plain

TABLE I Construction and physical properties cont'd.

Type	Class	Width (inches ±1/16)	Maximum weight (oz./yd.)	Minimum breaking strength (lb.)	Warp			Fill			Weave
					Denier	Ply	Total ends (min.)	Denier	Ply	Picks (per inch)	
X	1	1-3/4	.17	1,000	200	1	156	200	1	34	Plain
	2	1-3/4	.35	1,200	400	1	103	1000	1	23	Plain
	3	1-3/4	.45	2,500	1000	1	84	1000	1	16	Plain
	4	1-3/4	.94	3,000	1000	1	96	1000	1	17	Plain
	5	1 -3/4	.60	4,000	1000	2	55	1000	1	15	Plain
	6	1-3/4	.80	4,500	1500	2	50	1500	1	17	Plain
	7	1-3/4	1.00	6,500	1500	1	140	1500	1	11	Plain
	8	1-3/4	1.20	8,000	1500	2	88	1000	1	10	Plain
	9	1-3/4	1.75	10,000	1500	2	127	1500	1	12	2/2 HBT- Center Reversal
	11	1-3/4	2.40	15,000	1500	3	121	1500	1	13	Double Plain (see FIGURE 1)
	13	1-3/4	2.50	20,000	1500	3	137	1500	1	9	Double Plain (see FIGURE 1)
XI	3	2	.121	400	200	1	60	200	1	50	Plain 1
	5	2	.15	600	200	1	92	200	1	46	Plain
	7		.16	800	200	1	124	200	1	42	Plain
	9a		.23	1,000	200	1	164	200	1	46	Plain 2
	9b	2	.18	1,000	200	1	150	200	1	40	Plain
	11	2	.26	1,500	400	1	108	400	1	31	Plain
	13	2	.32	2,000	400	1	142	400	1	30	Plain
	14	2	.37	2,500	1000	1	77	400	1	26	Plain
	15	2	.44	3,000	1000	1	96	400	1	24	Plain
	16	2	.60	4,000	1000	2	58	1000	1	20	Plain
	17	2	.80	5,000	1500	1	110	1500	1	13	Plain
	18	2	1.10	6,000	1500	1	140	1500	1	13	Plain
	19	2	1.05	8,000	1500	1	160	1500	1	12	Plain

3.6 Identification of product. Each spool or tube shall have a ticket attached with not finer than 5-ply cotton string doubled to not less than 6 inches long. The tickets shall be made of paperboard not less than 0.015 inch in thickness and the color shall be manila or light in intensity to permit easy reading of printed, stamped or typed markings. The use of handwritten entries is prohibited. The ticket shall have clipped corners at the end where a reinforcing patch (with or without a metal eyelet) is firmly affixed for attaching the tying string. The ticket shall be legibly printed with water insoluble ink with the following information:

- Webbing, Textile, Para-aramid, Intermediate Modulus
- Type, class, and specification number
- Width
- Gross yardage
- Number of pieces in roll, spool or tube
- Producer's name
- Date of manufacture (month and year).

3.7 Fiber identification. When directed in the procurement document or purchase order, each roll, spool or tube, of webbing shall be labeled or ticketed for fiber content in accordance with the Rules and Regulations under the Textile Fiber Products Identification Act.

3.8 Workmanship. The finished webbing shall conform to the quality and grade of product established by this specification. The occurrence of defects shall not exceed the applicable acceptable quality levels.

3.9 Date of manufacture. When required by the procurement document, the textile manufacturer shall properly identify the age of the textile materials by placing a tag on the finished goods or label on the containers identifying the specification to which the material is manufactured, the lot number and the date of manufacture. The date of manufacture is defined as the date (month and year) of the last manufacturing process that affects the physical characteristics of the material.

4. VERIFICATION

4.1 Classification of inspection. The inspection requirements specified herein are classified as follows:

- a. First article inspection (see 4.2)
- b. Conformance inspection (see 4.3).

4.2 First article inspection. The first article shall be submitted in accordance with 3.1 and shall be inspected as specified in 4.3 through 4.4 for compliance with design, construction, workmanship and dimensional requirements.

4.3 Conformance inspection. Conformance shall include examination of 4.3.1 and the tests in 4.4 through 4.5 as applicable. Sampling for inspection shall be performed as specified in this document, unless otherwise specified in the contract or order.

4.3.1 Component and material inspection. In accordance with 4.1 above, components and materials shall be inspected in accordance with all the requirements of referenced specifications, drawings, and standards unless otherwise excluded, amended, modified, or qualified in this specification or applicable procurement documents.

4.3.2 Certificates of Compliance. When Certificates of Compliance are submitted, the procuring activity reserves the right to inspect items to determine the validity of the certification.

4.3.2 End item examination. Defects found during the examination shall be classified in accordance with 4.4.1 through 4.4.3.

4.4 End item examination.

4.4.1 Yard-by-yard examination. The required yardage of each roll, spool or tube, shall be inspected on both sides for the defects listed in TABLE II. All defects found shall be counted regardless of their proximity one to another, except where two or more defects represent a single local condition of the webbing, in which case only the more serious defect shall be counted. A continuous defect shall be counted as one defect for each warp wise yard or fraction thereof in which it occurs. The lot size shall be expressed in yards. The sample unit shall be one linear yard. Inspection sampling and procedures shall be in accordance with ANSI/ASQ Z1.4. The inspection level shall be III and the Acceptable Quality Limit (AQL), expressed in terms of defects per hundred units, shall be 2.5 for minor defects. In addition, the finding of one or