

INCH-POUND
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MIL-DTL-43685C

November 1, 2005

SUPERSEDING

MIL-W-43685B(GL)

20 September 1989

## DETAIL SPECIFICATION

## WEBBING AND TAPE, TEXTILE, ARAMID FIBER

This specification is approved for use by all Departments and Agencies of the Department of Defense.

## 1. SCOPE

1.1 Scope. This specification covers webbing and tape made from aramid fiber.

1.2 Classification. (see 6.2)

Type I - Double woven webbing

Type II - Single woven tape

## 2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 or 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 the list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3 or 4 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract (see 6.2).

Comments, suggestions, or questions on this document should be addressed to: Defense Supply Center Philadelphia, Clothing and Textiles Directorate, Attn: DSCP-COET (Bldg 6), 700 Robbins Avenue, Philadelphia, PA 19111-5092 or emailed to <a href="http://ct.dscp.dla.mil">http://ct.dscp.dla.mil</a> . Since contact information can change, you may want to verify the currency of this address information using Acquisition Streamlining and Standardization Information System (ASSIST) online database at <a href="http://assist.daps.dla.mil">http://assist.daps.dla.mil</a> .
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(Copies of these documents are available online at <http://assist.daps.dla.mil> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5092.)

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation or contract.

### FEDERAL TRADE COMMISSION

#### Rules and Regulations Under the Textile Fiber Products Identification Act

(Copies are available online at [www.ftc.gov](http://www.ftc.gov) or from the Federal Trade Commission, 600 Pennsylvania Avenue, N.W., Washington, DC 20580-0001.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract (see 6.2).

### AMERICAN SOCIETY FOR QUALITY

#### ANSI/ASQ Z1.4 - Sampling Procedures and Tables for Inspection of Attributes

(Copies are available online at [www.asq.org](http://www.asq.org) or from the American Society for Quality, 600 Plankinton Avenue, Milwaukee, WI 53203.)

### AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS (AATCC)

- AATCC – 16 - Colorfastness to Light
- AATCC – 61 - Colorfastness to laundering, Home and Commercial:  
Accelerated
- AATCC – 96 - Dimensional Changes in Commercial Laundering of Woven and  
Knitted Fabrics Except Wool
- AATCC Evaluation Procedure 1, Gray Scale for Color Change
- AATCC Evaluation Procedure 9, Visual Assessment of Color Difference of Textiles

(Copies of documents are available on line at [www.aatcc.org](http://www.aatcc.org) or from the American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709-2215.)

### ASTM INTERNATIONAL

- ASTM-D-1777 - Standard Method for Testing Thickness of Textile Materials
- ASTM-D-3775 - Standard Method for Fabric Count of Woven Fabric
- ASTM-D-3776 - Standard Method for Mass per Unit Area (Weight) of Fabric
- ASTM-D-5034 - Standard Method for Breaking Force and Elongation of Textile  
Fabrics

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(Copies of documents are available on line at [www.astm.org](http://www.astm.org) or from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19426-2959.)

PARACHUTE INDUSTRY ASSOCIATION

PIA TEST METHOD 4108 - Strength and Elongation, Breaking; Textile Webbing,  
Tape and Braided Items

(Copies may be purchased online from PIA at [www.pia.com/shopping/shop01.htm](http://www.pia.com/shopping/shop01.htm) or by contacting PIA Headquarters, Specification Department, 3833 West Oakton Street, Skokie, IL 60076.)

2.4 Order of precedence. 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 6.2), a sample shall be subjected to first article inspection (see 4.2).

3.2 Standard sample. The solution-dyed webbing and tape shall match the standard sample for shade and shall, unless otherwise indicated, be equal to or better than the standard sample with respect to all characteristics for which the standard sample is referenced (see 6.3).

3.3 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible, provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

#### 3.4 Materials.

3.4.1 Yarn. The yarn for the warp and filling shall be made from a bright continuous filament aramid fiber (see 6.6). The yarn shall be heat set to meet the shrinkage requirement specified in 3.9 and testing shall be as specified in 4.4.2.

3.5 Color. The color of the webbing and tape shall be as specified (see 6.2) to match the standard sample when tested as specified in 4.4.2. The color shall be obtained by the use of melt spun solution-dyed fibers.

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3.5.1 Visual shade matching (all classes). The color and appearance of the tape and webbing shall match the standard sample when viewed using the AATCC Evaluation Procedure 9, Option A, under filtered tungsten lamps that approximate artificial daylight D75 illuminant with a color temperature of  $7500 \pm 200$  K illumination of  $100 \pm 20$  foot candles, and shall be a good match to the standard sample under horizon lamplight at  $2300 \pm 200$  K.

3.5.2 Colorfastness. The finished webbing and tape shall show fastness to light and laundering equal to or better than the standard sample or equal to or better than a rating of "2-3" on the AATCC Gray Scale for color change for fastness to light and "3-4" for fastness to laundering. Testing shall be as specified in 4.4.2.

3.6 Physical requirements. The construction and physical requirements of the finished webbing and tape shall be as specified in Table I.

TABLE I. Physical requirements

Characteristic	Type I	Type II
Width (inch)	$5/8 - 1/32 + 1/16$	$1 \pm 1/32$
Thickness (inch)	0.040 min. - 0.055 max.	0.015 min. - 0.025 max.
Weight oz./lin. yd. (max)	0.45	0.30
Breaking strength, lb. (min)	650	525
Ends in warp (min)		
Face and back	158	276
Binder	9	-
Stuffer	40	-
Filling yarns per inch (min)	48	30
Filling yarns per inch (min), (shuttleless)	96 $\frac{1}{2}$	60 $\frac{1}{2}$

$\frac{1}{2}$  Two picks per shed.

3.7 Weave. The weave for the webbing and tape shall be as specified in 3.7.1 and 3.7.2. When shuttleless construction is used a catchcord shall be utilized.

3.7.1 Type I. The webbing shall be a double fabric consisting of face and back warps with two ends weaving as one and a stuffer warp, all bound together by a binder warp with the ends weaving singly. The stuffer ends shall weave between the face and back warps and shall not show on either the face or the back. The face warp shall weave plain weave with the picks that show on the face. The back warp shall weave plain weave with the picks that show on the back. The binder warp shall weave plain weave throughout.

3.7.2 Type II. The tape shall be plain weave, except that the warp ends shall weave two ends as one.

3.8 Finish. The webbing and tape shall be scoured and heat set in order to meet the shrinkage requirement specified in 3.9.

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3.9 Shrinkage. The shrinkage of the finished webbing and tape shall be no more than 5.0 percent when tested as specified in 4.4.2.

3.10 Length and put-up. For Government procurement only, unless otherwise specified (see 6.2), the webbing and tape shall be furnished in lengths of 90 to 110 yards. No roll shall contain more than three pieces and no piece shall be less than 3 yards in length.

3.11 Fiber identification. Each roll of webbing and tape shall be labeled, ticketed, or invoiced for fiber content in accordance with the Textile Fiber Products Identification Act.

3.12 Workmanship. The finished cloth shall conform to the quality of product established by this specification. The quality acceptance level shall not exceed the established maximum value.

#### 4. VERIFICATION

4.1 Classification of inspections. 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. A first article, submitted in accordance with 3.1, shall be inspected, examined for appearance, color and finished defects for the characteristics as specified in Tables II and III.

4.3 Conformance inspection. Conformance inspection shall include the examination of 4.4 and the tests of 4.4.2 as applicable. Sampling for inspection shall be performed in accordance with ANSI/ASQ Z1.4 and with quality acceptance levels as specified in the contract and/or order, except where otherwise indicated.

4.3.1 Material inspection. In accordance with 4.1 above, the material shall be inspected in accordance with all the requirements of referenced documents, unless otherwise excluded, amended, modified or qualified in this specification or applicable procurement documents.

4.4 Examination. The webbing and tape shall be examined on both sides for the defects listed in Table II. All defects found shall be counted regardless of their proximity to each other, except where two or more defects represent a single local condition, in which case only the more serious defect shall be counted. A continuous defect shall be counted as one defect for each warpwise yard or fraction thereof, in which it occurs. The lot size shall be expressed in linear yards. The sample unit shall be 1 linear yard of webbing or tape. The number of rolls from which the sample is to be selected shall be in accordance with 4.4.1. The sample yardage shall be apportioned equally among the selected rolls. Sampling for inspection shall be performed in accordance with ASQ Z1.4 inspection level I. Quality acceptance levels will be specified in the contract and/or order, except where otherwise indicated.

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TABLE II. End item visual defects.

Examine	Defect	Classification	
		Major	Minor
Twist or distortion	Webbing or tape will not lay flat upon application of manual pressure due to twist or distortion.		201
Cut, hole, or tear	Any cut, hole or tear.	101	
Drop-ply	Clearly visible on more than two ends within same length and extending over 9 linear inches or more. <u>1/</u>	102	
	Clearly visible on one or two ends within same length and extending over 9 linear inches or more. <u>1/</u>		202
Edges	Frayed, slack or otherwise poorly constructed and exceeding 1/4 inch in length.	103	
Knots	More than one knot in any 9 linear inches.	104	
	More than one knot every 2 yards with untrimmed ends extending from surface of webbing.		203
Mispick	Two or more across the full width.	105	
Width	Beyond specified tolerances.		204

1/ Clearly visible at normal inspection distance (approximately 3 feet).

4.4.1 Overall examination. The webbing and tape shall be examined for the defects listed below. Each defect listed shall be counted not more than once in each roll examined. The sample shall consist of the applicable number of rolls indicated below.

Defects

Off shade

Uneven weaving throughout

Not labeled in accordance with Textile Fiber Products Identification Act

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<u>Lot size (yards)</u>	<u>Sample size (rolls)</u>
1200 or less <sup>1/</sup>	3
1201 up to and including 3200	5
3201 up to and including 10,000	8
10,001 up to and including 35,000	13
35,001 up to and including 150,000	20
150,001 and over	32

<sup>1/</sup> If a lot contains fewer than 3 rolls, each roll in the lot shall be examined.

4.4.1.1 Length examination. Each roll of webbing and tape shall be examined for the defects listed below. The sample shall consist of the applicable number of rolls indicated above. If the total of the actual gross lengths of rolls in the sample is less than the total of the gross lengths marked on the roll tickets, the lot shall be rejected.

Defects

Gross length less than specified minimum length or more than specified maximum length

Gross length more than 2 yards less than gross length marked on roll tickets

Any piece less than 3 yards in length

Any roll containing more than three pieces

4.4.2 End item testing. The webbing and tape shall be tested for the characteristics listed in Table III. Except where otherwise specified, the methods of testing specified wherever applicable and as listed in Table III shall be followed. All test reports shall contain the individual values utilized in expressing the final result. The lot size shall be expressed in units of 1 linear yard. The sample unit for testing shall be 10 yards. The lot shall be rejected if one or more sample units fail to meet any requirement specified. The sample size shall be as follows:

<u>Lot size (yards)</u>	<u>Sample size (sample units)</u>
800 or less	2
801 up to and including 22,000	3
22,001 and over	5

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TABLE III. End item tests.

Characteristics	Requirement paragraph	Test method
Aramid yarn	3.4.1	<u>1</u> /
Visual color matching	3.5	AATCC Evaluation Procedure 9, Option A
Colorfastness to: Light (after 6 hrs.)	3.5.2	AATCC-16, Opt 1 or 5
Laundering	3.5.2	AATCC-61, Test 1A
Thickness	3.6	ASTM D-1777, Opt 2 <u>3</u> /
Weight	3.6	ASTM D-3776, Opt D
Breaking strength	3.6	PIA Test Method 4108
Warp ends (full width): Face and back	3.6	ASTM D-3775
Binder (Type I)	3.6	ASTM D-3775
Stuffer (Type I)	3.6	ASTM D-3775
Filling yarns per inch	3.6	ASTM D-3775
Weave	3.7	Visual <u>1</u> /
Finish: Scoured	3.8	<u>1</u> /
Heat set	3.8	<u>1</u> /
Shrinkage after 5 launderings	3.9	AATCC 96 <u>2</u> /

1/ Unless otherwise specified, a certificate of compliance shall be submitted and will be acceptable for the stated requirement(see 6.4).

2/ Except that the length of the test specimen shall be 24 inches and the cotton laundering procedure shall be used. The stack temperature of the tumble drier shall be 180°F and the webbing or tape shall not be pressed.

3/ The anvil shall be not less than 0.25 inches in diameter.

## 5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of material is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Department or Defense Agency, or within the military service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.



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## 6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The Type I webbing is utilized as a slide fastener thong for Shirt, Man's, Army Aviation, Crewmember and as a waist adjustment strap for the trousers of Uniform, Army Aviation Crewmember. The Type II tape is utilized as a retrieval strap in Coveralls, Armored Vehicle, Crewmember.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Type required (see 1.2).
- c. Color required (see 3.5)
- d. ASSIST to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1).
- e. When a first article is required (see 3.1 and 4.2).
- f. When length of rolls is other than specified (see 3.10).
- g. Quality acceptance level (see 4.4)
- h. Packaging (see 5.1).

6.3 Standard sample. For access to samples, address the contracting activity issuing the invitation for bids or request for proposal.

6.4 Certificate of compliance. When certificates of compliance are submitted, the Government reserves the right to inspect such items to determine the validity of the certification.

6.5 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issues, due to the extensiveness of the changes.

6.6 Fiber identification. The requirements of the webbing and tape are based on materials made from "NOMEX" aramid fiber manufactured by Dupont Advanced Fiber Systems, Richmond, VA 23234.

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6.7 Subject term (key word) listing.

Webbing  
Filament  
Nomex  
Synthetic  
Uniforms

Custodian:

Army – GL

Review activities:

Army – AV, MD

Preparing activity:

DLA – CT

Project No. 8305-0861

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using ASSIST Online database at <http://assist.daps.dla.mil>.