

**INCH-POUND**

MIL-W-44049A  
20 April 1989  
SUPERSEDING  
MIL-W-44049  
10 September 1981

**MILITARY SPECIFICATION****WEBBING, TEXTILE AND TAPE, TEXTILE, POLYPROPYLENE,****GENERAL PURPOSE, NATURAL OR IN COLORS**

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

**1. SCOPE**

1.1 Scope. This specification covers materials and construction of various types of polypropylene webbing and tape woven on shuttleless looms or shuttle looms.

1.2 Classification. The webbing and tape shall be of the following types and classes as specified (see 6.2).

- Type I - Light weight tape
- Type Ia - Extra light weight tape
- Type II - Medium weight webbing (hard texture)
- Type IIa - Medium weight webbing (soft texture)
- Type IIb - Medium - heavy weight webbing
- Type III - Heavy weight webbing

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: U.S. Army Natick Research, Development and Engineering Center, Natick, MA 01760-5014 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 8305

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

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- Class 1 - Natural
- Class 2 - Dyed
- \* Class 3 - Natural, water repellent
- \* Class 4 - Dyed, water repellent

2. APPLICABLE DOCUMENTS

2.1 Government documents.

- \* 2.1.1 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 listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATION

MILITARY

MIL-P-43334 - Packaging of Textile Webbing and Tape

STANDARDS

FEDERAL

FED-STD-191 - Textile Test Methods

MILITARY

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes

- \* (Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Naval Publications and Forms Center, (ATTN: NPODS), 5801 Tabor Avenue, Philadelphia, PA 19120-5099.)
- \* 2.1.2 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.

FEDERAL TRADE COMMISSION

Rules and Regulations Under the Textile Fiber Products Identification Act

(Copies are available from the Federal Trade Commission, Washington, DC 20580.)

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- \* 2.2 Non-Government publications. The following document forms a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

\* AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS (AATCC)

Chromatic Transference Scale

(Copies may be obtained from the American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709.)

- \* (Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)
- \* 2.3 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 6.3), in accordance with 4.3.
- \* 3.2 Standard sample. The dyed webbing and tape shall match the standard sample for shade and appearance and shall be equal to or better than the standard sample with respect to all characteristics for which the standard sample is referenced (see 6.5).
- \* 3.3 Material. It is encouraged that recycled material be used when practical as long as it meets the requirements of this specification.

3.3.1 Yarns. The yarn shall be continuous multi-filament polypropylene. The yarn shall be untwisted and single ply.

3.4 Color. Webbing and tape shall be natural or in colors as specified (see 6.2).

3.4.1 Dyeing classes 2 and 4. Dyed webbing and tape shall be obtained by the use of melt spun solution dyed yarn.

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3.4.2 Colorfastness.

- \* 3.4.2.1 Classes 1 and 3. The natural and the natural, water repellent treated webbing and tape shall show fastness to light and accelerated weathering equal to or better than the standard sample or equal to or better than a rating of "good" when tested as specified in 4.4.3.
- \* 3.4.2.2 Classes 2 and 4. The dyed and finished webbing and tape shall show fastness to light, laundering, and accelerated weathering equal to or better than the standard sample or equal to or better than a rating of "good". The dyed and finished webbing and tape shall show fastness to crocking equal to or better than the standard sample or shall have an AATCC Chromatic Transference Scale rating of not lower than 3.5. Testing shall be as specified in 4.4.3.
- \* 3.4.3 Matching. The color of the dyed and finished webbing and tape for classes 2 and 4 shall match the standard sample when viewed under filtered tungsten lamps which approximate artificial daylight having a correlated color temperature of  $7500 \pm 200$  K, with illumination of  $100 \pm 20$  foot candles, and shall be a good match to the standard sample under incandescent lamplight at  $2300 \pm 200$  K.

3.5 Physical requirements. The physical requirements of the natural and dyed webbing and tape shall be as shown in tables I through VI when tested as specified in 4.4.3. The tolerance in width for the webbing and tape up to 2-3/4 inches wide shall be  $\pm 1/16$  inch and for webbing over 2-3/4 inches shall be  $\pm 3/32$  inch.

TABLE I. Physical requirements for type I light weight tapes

<u>Width</u> inches	<u>Weight</u> Ounces per lin. yd min.	<u>Yarns (minimum)</u>		<u>Breaking</u> <u>strength</u> Pounds minimum	<u>Yarn denier</u>	
		Total warp	Per inch filling 1/ 3/		Warp	Filling 2/3/
3/8	0.10	24	44	150	840	420
1/2	0.13	32	44	200	840	420
5/8	0.16	40	44	250	840	420
3/4	0.20	48	44	300	840	420
7/8	0.23	56	44	350	840	420
1	0.26	64	44	400	840	420
1-1/8	0.29	72	44	450	840	420
1-1/4	0.32	80	44	500	840	420
1-1/2	0.40	96	44	600	840	420
2	0.53	128	44	800	840	420
2-1/2	0.66	160	44	1000	840	420
3	0.79	192	44	1200	840	420

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- 1/ Two picks per shed.
- 2/ Catch cord shall be no finer than 150 denier and shall be the color of the webbing.
- 3/ When shuttle construction is used, the filling denier shall be doubled and the picks per inch halved.

TABLE II. Physical requirements for type Ia extra light weight tape

<u>Width</u> inches	<u>Weight</u> Ounces per lin. yd min.	<u>Yarns (minimum)</u>		<u>Breaking</u> <u>strength</u> Pounds minimum	<u>Yarn denier</u>	
		<u>Total</u> warp	<u>Per inch</u> filling 1/ 3/		<u>Warp</u>	<u>Filling 2/ 3/</u>
2	0.45	103	40	640	840	420

- 1/ Two picks per shed.
- 2/ Catch cord shall be no finer than 150 denier and shall be the color of the webbing.
- 3/ When shuttle construction is used, the filling denier shall be doubled and the pick per inch halved.

\* TABLE III. Physical requirements-for type II medium weight webbing (hard texture)

<u>Width</u> inches	<u>Weight</u> Ounces per lin. yd min.	<u>Yarns (minimum)</u>		<u>Breaking</u> <u>strength</u> Pounds minimum	<u>Yarn denier</u>	
		<u>Total</u> warp	<u>Per inch</u> filling 1/ 3/		<u>Warp</u>	<u>Filling 2/ 3/</u>
3/8	0.18	54	28	250	840	840
1/2	0.24	72	28	350	840	840
5/8	0.30	90	28	450	840	840
3/4	0.36	108	28	500	840	840

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\* TABLE III. Physical requirements for type II medium weight webbing (hard texture) (cont'd)

<u>Width</u> inches	<u>Weight</u> Ounces per lin. yd min.	<u>Yarns (minimum)</u>		<u>Breaking</u> <u>strength</u> Pounds minimum	<u>Yarn denier</u>	
		Total warp	Per inch filling 1/ 3/		Warp	Filling 2/ 3/
1	0.50	144	28	700	840	840
1-1/4	0.62	180	28	900	840	840
1-1/2	0.76	216	28	1000	840	840
2	1.00	288	28	1500	840	840
2-3/4	1.35	396	28	1800	840	840
3	1.50	432	28	2000	840	840
3-3/4	1.85	540	28	2500	840	840
5	2.50	720	28	3600	840	840
5-5/8	2.80	810	28	4000	840	840

1/ Two picks per shed.

2/ Catch cord shall be no finer than 150 denier and shall be the color of the webbing.

3/ When shuttle construction is used, the filling denier shall be doubled and the picks per inch halved.

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TABLE IV. Physical requirements for type 11A medium weight webbing (soft texture)

Width inches	Weight Ounces per lin. yd min.	Yarns (minimum)			Per inch filling 1/3/ stuffer	Breaking strength pounds and minimum binder	Warp and binder	Yarn denier	
		Total warp	Total binder	Total stuffer					
3/8	0.20	41	5	10	60	300	840	420	1680
1/2	0.25	47	6	12	60	340	840	420	1680
5/8	0.30	53	7	14	60	380	840	420	1680
3/4	0.40	65	9	18	60	500	840	420	1680
1	0.50	83	12	24	60	630	840	420	1680
1-1/4	0.60	101	15	30	60	775	840	420	1680
1-1/2	0.80	119	18	36	60	900	840	420	1680
2	1.00	155	24	48	60	1200	840	420	1680
2-1/4	1.20	173	27	54	60	1350	840	420	1680

1/ Two picks per shed.

2/ Catch cord shall be no finer than 150 denier and shall be the color of the webbing.

3/ When shuttle construction is used. The filling denier shall be doubled and the picks per inch halved.

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TABLE V. Physical requirements for type IIb medium - heavy weight webbing

<u>Width</u> inches	<u>Weight</u> Ounces per lin. yd min.	<u>Yarns (minimum)</u>			<u>Breaking</u> <u>strength</u> Pounds minimum	<u>Yarn denier</u>	
		<u>Total</u> warp	<u>Total</u> binder	<u>Per inch</u> filling 1/ 3/		<u>Warp</u> and binder	<u>Filling</u> 2/3/
5/8	0.50	70	4	44	500	1680	840
3/4	0.65	86	5	44	620	1680	840
1	0.90	118	7	44	850	1680	840
1-1/4	1.15	150	9	44	1100	1680	840
1-1/2	1.30	162	10	44	1170	1680	840
2	1.75	226	14	44	1625	1680	840
2-1/4	2.00	258	16	44	1850	1680	840
3	2.50	338	21	44	2425	1680	840

1/ Two picks per shed.

2/ Catch cord shall be no finer than 150 denier and shall be the color of the webbing.

3/ When shuttle construction is used, the filling denier shall be doubled and the picks per inch halved.



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TABLE VI. Physical requirements for type III heavy weight webbing

Width inches	Weight Ounces per lin. yd min.	Yarns (minimum)		Per inch filling 1/ 3/	Breaking strength pounds minimum	Warp and binder	Yarn denier		
		Total warp	Total stuffer						
5/8	0.70	57	10	36	44	670	1680	840	1680
3/4	0.80	65	12	42	44	770	1680	840	1680
1	0.90	81	16	54	44	970	1680	840	1680
1-1/4	1.00	89	20	66	44	1115	1680	840	1680
1-1/4	1.80	97	20	132	44	1650	1680	840	1680
1-1/2	1.50	113	24	78	44	1375	1680	840	1680
2	2.00	145	32	102	44	1775	1680	840	1680
2-1/2	2.50	177	40	126	44	2175	1680	840	1680
3	3.00	209	48	150	44	2575	1680	840	1680

1/ Two picks per shed.

2/ Catch cord shall be no finer than 420 denier and shall be the color of the webbing.

3/ When shuttle construction is used, the filling denier shall be double and the picks per inch halved.

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3.5.1 Weave.

3.5.1.1 Types I and Ia. The weave for type I and type Ia tapes shall be plain weave. When latch type shuttleless looms are utilized, the filling yarn shall traverse the full width of the tape and shall be held at the edge by an extra catch-cord end interlocking with the filling yarn. When bobbin type shuttleless looms are utilized, interlacing of the catch-cord and filling shall occur within the selvage area before the first binder end. Testing shall be as specified in 4.4.3.

3.5.1.2 Type II. Webbing shall be a single fabric consisting of one warp and one filling and weaving plain weave. Three warp ends shall weave as one and the body of the webbing shall have 2 groups of threes weaving as one. Both selvage shall have 4 groups of 3 all weaving singly. When latch type shuttleless looms are utilized, the filling yarn shall traverse the full width of the webbing, and shall be held at the edge by an extra catch-cord end, interlacing with the filling yarn. When bobbin type shuttleless looms are utilized, interlacing of the catch-cord and filling occur within the first four ends of warp yarn at the edge. Testing shall be as specified in 4.4.3.

3.5.1.3 Type IIa. Webbing shall be a double fabric consisting of two warps bound together by a single filling and a binder warp. The face warp shall weave plain weave with the picks showing on the face. The back warp shall weave plain weave with the picks showing on the back. The binder warp ends shall weave plain weave. There shall be two stuffer warp ends between each binder warp and in addition one stuffer on each edge. One selvage shall consist of nine ground warp ends and the other selvage shall consist of eight ground warp ends. The filling yarn shall weave alternatively on the face and on the back. When latch type shuttleless looms are utilized, the filling yarn shall traverse the full width of the webbing, and shall be held at the edge by an extra catch-cord end, interlacing with the filling yarn. When bobbin type shuttleless looms are utilized, interlacing of the catch-cord and filling shall occur within the first four ends of warp yarn at the edge. Testing shall be as specified in 4.4.3.

3.5.1.4 Type IIb. Webbing shall be a double fabric consisting of two warps bound together by a single filling and binder warp. The face warp shall weave plain weave with the picks showing on the face. The back warp shall weave plain weave with the picks showing on the back. The binder-warp ends shall weave plain weave. One selvage shall consist of nine ground-warp ends and the other selvage shall consist of eight ground-warp ends. The filling yarn shall weave alternately on the face and on the back. For latch-needle type shuttleless looms, one selvage shall have 11 ground-warp ends and the other selvage shall have 7 ground-warp ends. When latch-needle type shuttleless looms are utilized, the filling yarn shall traverse the full width of the webbing, and shall be held at the edge by an extra catch-cord end, interlacing

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with the filling yarn. When bobbin type shuttleless looms are utilized, interlacing of the catch-cord and the filling shall occur within the selvage area before the first binder end. Testing shall be as specified in 4.4.3.

3.5.1.5 Type III. Webbing shall be the same as type IIB, except that there shall be 2 ends of ground-warp weaving as one: there shall be 3 stuffer-warp ends between each binder warp and on each edge, 13 ground-warp ends weaving singly on one edge and 12 ground-warp ends weaving singly on the other edge. For latch-needle type shuttleless looms, one selvage shall have 10 ground-warp ends and the other selvage shall have 15 ground-warp ends. Also, all binder ends shall weave 2 ends as 1. The 1-1/4 inch, 1.8 ounce webbing shall be woven with 12 stuffer-warp ends between each binder warp and on each edge and 6 ground-warp ends on 1 edge weaving singly and 11 on the other edge weaving singly. The filling yarn shall weave alternately on the face and on the back. When latch-needle type shuttleless looms are utilized, the filling yarn shall traverse the full width of the webbing, and shall be held at the edge by an extra catch-cord end, interlacing with the filling yarn. When bobbin type shuttleless looms are utilized, interlacing of the catch-cord and the filling shall occur within the selvage area before the first binder end. Testing shall be as specified in 4.4.3.

3.5.2 Curvature. The webbing and tape shall show no more lateral curvature than 1/4 inch within a yard when tested as specified in 4.4.3

3.6 Length and put-up. The webbing or tape shall be put-up in rolls. Unless otherwise specified (see 6.2), each roll shall contain not more than three pieces and the minimum length of any piece shall be 3 yards. One end of each piece in the roll shall be marked with paper or other means to reveal the number of pieces in the roll. The length of the rolls shall be as follows:

Type I - Not more than 100 yards nor less than 80 yards per roll, except that for widths narrower than 5/8 inch the minimum roll length may be 50 yards with not more than two pieces per roll.

Type Ia - The length of the roll shall be 500 ± 6 feet with not more than four pieces per roll and the minimum length of any piece shall be 10 yards.

Type II - Not more than 100 yards nor less than 80 yards per roll, except that for widths narrower than 5/8 inch the minimum roll length may be 50 yards, with not more than two pieces per roll.

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Type IIa - Not more than 80 yards nor less than 60 yards per roll, except that for widths narrower than 5/8 inch the minimum roll length may be 40 yards, with not more than two pieces per roll.

Type IIb - Not more than 80 yards nor less than 60 yards per roll, except that the 5/8 inch width shall be furnished in rolls not less than 35 yards nor more than 40 yards in length with not more than two pieces per roll; or not less than 41 yards to a maximum length roll of 50 yards with not more than three pieces per roll.

Type III - Not more than 60 yards nor less than 50 yards per roll, except that the 5/8 inch width shall be furnished in rolls not less than 35 yards nor more than 40 yards in length with not more than two pieces per roll; or not less than 41 yards to a maximum length roll of 50 yards with not more than three pieces per roll.

3.7 Identification tickets. Each roll of webbing shall have an identification ticket attached to the roll in accordance with MIL-W-43334.

3.8 Fiber identification. Each roll of webbing shall be labeled or ticketed for fiber content in accordance with the Textile Fiber Products Identification Act.

\* 3.9 Water repellent finish. Classes 3 and 4 webbing and tape shall be given an approved water repellent finish (see 6.4). The dynamic absorption of the treated webbing and tape shall be no more than 40 percent after laundering when tested as specified in 4.4.3.

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

#### 4. QUALITY ASSURANCE PROVISIONS

\* 4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in this specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

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\* 4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.1.2 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.

\* 4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. First article inspection (see 4.3)
- b. Quality conformance inspection (see 4.4)

\* 4.3 First article inspection. When a first article is required (see 3.1 and 6.2), it shall be examined for the defects specified in 4.4.2 and tested as specified in 4.4.3.

4.4 Quality conformance inspection. Unless otherwise specified, sampling for inspection shall be performed in accordance with MIL-STD-105.

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

4.4.1.1 Component and material certification. A certificate of compliance may be acceptable as evidence that the webbing and tape conforms to the requirements specified in 3.3.1 and tables I through VI.

\* 4.4.1.2 Component testing. In addition to the quality assurance provisions of the subsidiary specifications, component materials listed in table VII shall be tested for the characteristics specified and in accordance with the referenced test methods of FED-STD-191. The lot size shall be expressed in pounds and the sample unit shall be 500 yards of the polypropylene yarn. The lot shall be unacceptable if one or more units fail to meet any requirement specified. All test reports shall contain the individual values utilized in expressing the final results. The sample size shall be as follows:

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

TABLE VII. Test methods for components

<u>Characteristic</u>	<u>Requirement paragraph</u>	<u>Test method</u>
<b>Material:</b>		
Polypropylene identification	3.3.1	<u>1/</u>
<b>Yarn denier:</b>		
Warp	Tables I, II and III	4021 <u>1/</u>
Filling	Tables I thru VI	4021 <u>1/</u>
Warp and binder	Tables IV, V and VI	4021 <u>1/</u>
Stuffer	Tables IV and VI	4021 <u>1/</u>
Catch-cord	Tables I thru VI	4021 <u>1/</u>

1/ A certificate of compliance shall be submitted and will be acceptable for the stated requirements.

#### 4.4.2 End item visual examination.

4.4.2.1 Yard-by-yard examination. The required yardage of each roll shall be inspected on both sides and visual defects classified as listed in table VIII. 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 or tape, 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 sample unit for this examination shall be 1 linear yard. The sample size shall be in accordance with inspection level II of MIL-STD-105. The acceptable quality levels expressed in defects per hundred units shall be as follows:

For widths up to and including 1-1/2 inches	- 0.40 major
	- 1.50 total (major and minor)
For widths over 1-1/2 inches and up to and including 3 inches	- 0.65 major
	- 2.50 total (major and minor)

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For widths over 3 inches

- 1.00 major  
 - 4.00 total (major and minor)

The lot size shall be expressed in units of 1 linear yard each. An approximate equal number of yards shall be examined from each roll selected. The number of rolls from which the sample is to be selected shall be in accordance with table IX of this specification.

TABLE VIII. End item visual defects

Defects	Classification	
	Major	Minor
Abrasion mark - resulting in a weak place	101	
Broken or missing end or pick:		
Two or more contiguous	102	
Single		201
Cut, hole, or tear, any	103	
Fine or light filling bar	104	
Fine yarn or drop ply, less than 1/2 the thickness of the normal yarn		202
Float:		
Multiple, more than 1/2 inch in combined warp and filling directions	105	
Multiple, 1/2 inch or less in combined warp and filling directions		203
Single, more than 1/2 inch in length		204
Heavy filling bar or heavy place: <u>1/</u>		205
Knot on surfaces or edges <u>1/</u>		206
Slack or tight end or ends <u>1/</u>		207
Slub, slug, jerked-in filling, or slough-off, more than three times the thickness of the normal yarn		208
Smash	106	
Weak or soft spot	107	
Wrong draw, more than 9 inches in length		209
Spot, stain, or streak <u>1/</u>		210
Edges:		
Cut, frayed, or torn	108	
Slack, not firmly or tightly woven	109	
Shade (when colors are specified):		
Shade bar <u>1/</u>		211
Dye streak <u>1/</u>		212
Undyed stuffer warp yarn showing through <u>1/</u>		213
Untrimmed filling yarn ends <u>1/</u>		214
Width beyond specified tolerances		215

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TABLE VIII. End item visual defects (cont'd)

Defects	Classification	
	Major	Minor
Dropped knitted stitch on edge (applicable to shuttleless looms)	110	
Catch-cord missing	111	
Twisted or wavy, will not lay flat upon application of manual pressure <u>2/</u>	112	
Catch-cord not interlacing with filling	113	

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

2/ A three-yard length of webbing or tape shall be laid on a flat and smooth surface without tension. If the webbing or tape does not lie flat or if the webbing is wavy or ridgy, it shall be counted as a defect.

\* 4.4.2.2 Overall examination. Each defect listed below shall be counted no more than once in each roll examined. The sample unit for this examination shall be one roll. The sample size and acceptance number shall be as shown in table IX. The lot size shall be expressed in units of 1 linear yard each.

Defects

Appearance not equal to standard sample.  
 Off shade, not within established tolerances (classes 2 and 4).  
 Color not uniform throughout.  
 Poorly constructed, not firmly and tightly woven.  
 Objectionable odor.  
 Overall uncleanness.  
 Not labeled in accordance with Textile Fiber Products Identification Act.

TABLE IX. Sample size

Lot size in yards	Sample size in rolls	Maximum number of
		defects acceptable in sample <u>2/</u>
1200 or less <u>1/</u>	3	0
1201 through 3200	5	0
3201 through 10,000	8	0



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TABLE IX. Sample size (cont'd)

<u>Lot size in yards</u>	<u>Sample size in rolls</u>	<u>Maximum number of defects acceptable in sample 2/</u>
10,001 through 35,000	13	0
35,001 through 150,000	20	1
150,001 and up	32	2

- 1/ If a lot contains fewer than three rolls, each roll in the lot shall be examined.
- 2/ Except that the acceptance number shall be zero for color and uniformity of shade defect found in overall examination.

4.4.2.3 Length examination.

4.4.2.3.1 Individual rolls. Each roll in the sample shall be examined for the defects listed below. The sample unit for this examination shall be one roll. The sample size and acceptance number shall be as shown in table IX. The lot size shall be expressed in units of 1 linear yard each.

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 piece ticket.

Any piece less than the allowable minimum length of piece.

Any roll containing more than the allowable number of pieces permitted for the applicable type of webbing or tape.

4.4.2.3.2 Total yardage in sample. The lot shall be unacceptable if the total of the actual gross lengths of rolls in the sample is less than the total of the gross lengths marked on roll tickets.

4.4.3 End item testing. The methods of testing specified in FED-STD-191, wherever applicable, and as listed in table X shall be followed. When the data in the "number of determinations" and "results reported as" columns are not specified in the table, they shall be as required by the referenced test method. The physical and chemical values specified in section 3 apply to the results of the determinations made on a sample unit for test purposes as specified in the applicable test methods. All test reports shall contain the individual values utilized in expressing the final results. The sample size shall be as follows:

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<u>Lot size (yards)</u>	<u>Sample size</u>
800 or less	2
801 through 22,000	3
22,001 and up	5

The lot shall be unacceptable if one or more sample units fail to meet any requirements specified. The lot size shall be expressed in units of 1 linear yard. The sample unit for testing shall be 6 linear yards.

\* TABLE X. End item tests

<u>Characteristic</u>	<u>Requirement reference</u>	<u>Test method</u>	<u>Number of determinations per sample unit</u>	<u>Results reported as</u>
Colorfastness to:				
Light	3.4.2	5660	-	-
Laundering (classes 2 and 4)	3.4.2	5614 <u>1/</u>	-	-
Weathering	3.4.2	5671 <u>2/</u>	-	-
Crocking (classes 2 and 4)	3.4.2	5651	-	-
Weight	Tables I thru VI	5041	-	To nearest 0.01 oz.
Breaking strength	Tables I thru VI	4108 <u>3/</u>	-	-
Texture warp:				
Total	Tables I thru VI	5050	1	Actual count
Binder	Tables IV, V, and VI	5050	1	Actual count
Stuffer	Tables IV, and VI	5050	1	Actual count
Filling:				
Yarns per inch	Tables I thru IV	5050	1	Actual count
Weave	3.5.1	Visual	1	Pass or fail
Curvature	3.5.2	4.5.1	-	To nearest 1/32 inch
Dynamic absorption after one laundering (classes 3 and 4)	3.9	5556, 4500	-	-

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- 1/ On the color transfer cloth evaluation, only the stain on the nylon fibers of the color transfer cloth shall be evaluated.
- 2/ Time of exposure shall be 40 standard hours.
- 3/ During the breaking strength test it shall be observed whether the non-conventional edge of the shuttleless loom webbing or tape ruptures prior to the body of the webbing or tape. When the edge ruptures at a breaking strength value less than the minimum requirement specified, the webbing or tape shall be rejected.

4.4.4 Packaging inspection. The inspection shall be in accordance with the quality assurance provisions of MIL-P-43334.

4.4.5 Palletization examination. The examination shall be made in accordance with the quality assurance provisions of MIL-P-43334.

#### 4.5 Methods of inspection.

##### 4.5.1 Measurement of lateral curvature.

4.5.1.1 Test specimen. The test specimen shall be a length of webbing or tape full width, measuring a minimum of 40 inches. The specimen shall not be stretched, smoothed, or otherwise changed from its original condition prior to testing.

4.5.1.2 Number of determinations. One specimen shall be tested from each sample unit. Each specimen shall not exceed 1/4 inch maximum.

4.5.1.3 Apparatus. Plexiglass or equal - plexiglass weighing approximately 35 ounces with dimensions of 45 inches by 5 inches by 1/4 inch.

Straight edge - a rigid straight edge measuring 36 inches in length.

Roller - a roller one inch in diameter and weighing 1-1/2 pounds.

4.5.1.4 Procedure. The specimens shall be placed flat, on a smooth, horizontal flat surface without tension and allowed to reach moisture equilibrium as defined in Section 4 of FED-STD-191. After equilibrium is reached, a weight shall be placed at one end of the webbing. The roller shall be placed on the specimen at the end of the webbing where the weight is located. The specimen should be approximately in the center of the roller. The roller shall be rolled along the length of the specimen, care being taken to keep the specimen in the center of the roller and not to exert any pressure on the roller. When the roller has passed the length of the webbing, the plexiglass shall then be placed on the specimen for a period of 1 hour. Without moving the plexiglass on the specimen, the straight edge shall be

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placed on the plexiglass so that both ends of the straight edge are aligned perpendicularly with the outermost edge of the specimen. Determine the highest degree of curvature of the specimen from the straight edge by measuring to the nearest 1/32 of an inch perpendicularly from the straight edge. Record the highest measure. See figure 1.

4.5.1.5 Report. The results of each determination from each sample unit shall be taken.

## 5. PACKAGING

\* 5.1 Preservation. Preservation shall be level A or Commercial as specified (see 6.2).

5.1.1 Levels A and Commercial. Webbing and tape shall be preserved in accordance with the applicable requirements of MIL-P-43334.

5.2 Packing. Packing shall be level A, B or Commercial as specified (see 6.2).

5.2.1 Levels A, B and Commercial. Webbing and tape shall be packed in accordance with the applicable requirements of MIL-P-43334.

5.3 Palletization. When required (see 6.2), palletization shall be in accordance with the applicable requirements of MIL-P-43334.

5.4 Marking. In addition to any special marking required by the contract or purchase order, shipments shall be marked in accordance with MIL-P-43334.

## 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 webbing and tape is intended for use as an alternate for the cotton webbing and tape specified in MIL-W-530 in the manufacturing of tentage, clothing and equipage items.

\* 6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number and date of this specification.
- b. Type and class required (see 1.2).
- c. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).

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- d. When a first article is required (see 3.1, 4.3, and 6.3).
- e. Color required (see 3.4).
- f. Width required (see tables I thru VI).
- g. Length, if other than specified (see 3.6).
- h. Levels of preservation and packing (see 5.1 and 5.2).
- i. When palletization is required (see 5.3).

\* **6.3 First article.** When a first article is required, it shall be inspected and approved under the appropriate provisions of FAR 52.209. The first article should be a preproduction sample. The contracting officer should specify the appropriate type of first article and the number of units to be furnished. The contracting officer should include specific instructions in acquisition documents regarding arrangements for selection, inspection, and approval of the first article.

\* **6.4 Water repellent finish approval and testing.** Approval of water repellent finishes is the responsibility of the US Army Natick Research, Development and Engineering Center, Natick, MA 01760, and is based on more extensive tests, including those for toxicity, which are not set forth in this document. Because of the time necessary to conduct full evaluation (approximately 6 months), only those water repellent finishes already approved and so listed in the invitation for bids or request for proposal shall be considered acceptable for the related acquisition. Information pertaining to approval of new water repellent finishes should be obtained from the US Army Natick Research, Development and Engineering Center.

\* **6.5 Sample.** For access to samples, address the contracting activity issuing the invitation for bids.

\* **6.6 Subject term (key word) listing.**

- Clothing
- Equipage
- Manufacture
- Tentage
- Textile fabrics

\* **6.7 Changes from previous issue.** The margins of this specification are marked with asterisks to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content, irrespective of the marginal notations and relationship to the previous issue.

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Custodians:

Army - GL  
Navy - NU  
Air Force - 11

Preparing activity:

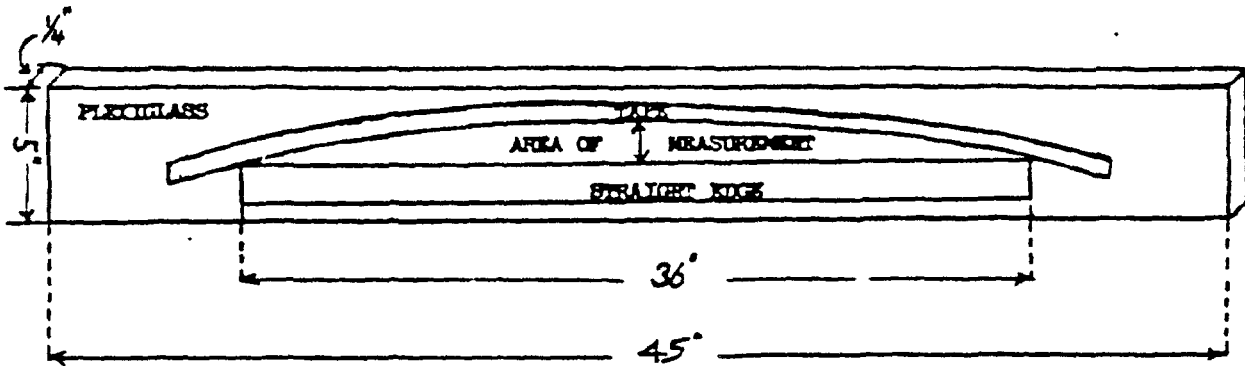
Army - GL  
(Project 8305-0281)

Review activities:

Army - MD, ME  
Navy - MC  
Air Force - 82, 99  
DLA - CT

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Figure 1  
Diagram Curvature Measurement







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