INCH-POUND
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SUPERSEDING
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17 JULY 1990

PERFORMANCE SPECIFICATION

TAPE, TEXTILE AND WEBBING, TEXTILE, REINFORCING, NYLON

This specification is proposed for use by all departments and agencies of the Department of Defense.

1. SCOPE.

1.1 Scope. This specification covers nylon reinforcing tape and webbing.

1.2 Classification. The tape and webbing shall be of the following types.

Type II	- Tape - Herringbone Twill Weave
Type III	- Tape - Plain Weave
Type IV	- Webbing - Double Plain Weave
Type V	- Tape - Herringbone Twill Weave
Type VI	- Tape - Herringbone Twill Weave

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.

Beneficial comments (recommendations, additions, deletions, clarifications) and any pertinent data which may be of use in improving this document should be addressed to: Defense Personnel Support Center, Clothing and Textiles Directorate, Attn: DPSC-FNS, 2800 South 20th Street, Philadelphia, PA 19145-5099 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter..

AMSC N/A FSC 8305

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 shall be those listed in the issue of the Department of Defense Index of Specifications and Standard (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

STANDARDS

FEDERAL

FED-STD-191 - Textile Test Methods

(Unless otherwise indicated, copies of Federal and military specification, standards and handbooks are available from the Standardization Documents Order Desk, Bldg. 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094

2.3 Non-Government publications. The following documents(s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues shall be those listed in 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 SOCIETY FOR TESTING AND MATERIAL (ASTM)

ASTM-D1907 - Test Method for Yarn Number by the Skein Method
ASTM-D1777 - Method for Measuring Thickness of Textile Materials
ASTM-D2376 - Determination of Weight of Textile materials, Small specimen Method
ASTM-D3775 - Test Method for Fabric Count of Woven Fabric
ASTM-D2165 - Test Method for pH of Aqueous Extracts of Wool and similar animal Fibers

(Copies should be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI/ASQC-Z1.4. - Sampling Procedures and Tables For Inspection By Attributes

(Copies should be obtained from the American Society for Quality Control, PO Box 3005, 611 East Wisconsin Avenue, Milwaukee, WI 53201-4606)

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS (AATCC)

61 - Colorfastness to Laundering of Cotton and Linen Textile Materials, Launderometer Method
16 - Colorfastness to Light of Textile Materials; Accelerated Method
111A - Weathering Resistance: yarn thread, Cordage: Accelerated Weathering method

(Copies should be obtained from the American Association pf Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, N.C. 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.)

2.4 Order of precedence. In the event of a conflict between the text of this document and 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 Samples. The dyed tape and webbing shall match the standard sample for shade and shall be equal to or better than the standard sample with respect to all characteristics for which the standard sample is referenced. A first article maybe requested. (Standard Samples are available at DPSC 2800 South 20th Street, Philadelpia, PA 19145).

3.2 Material. It is encouraged that recycled material be used when practical as long as it meets the requirements of this specification.

3.3 Yarn. The nylon yarn used in the manufacture of the tape and webbing shall be a bright, high tenacity, light and heat resistant nylon. The yarn shall not be bleached.

3.3.1 Denier. The nominal denier of the warp, filling and binder yarns, prior to dyeing shall be as specified in table I. The catch cord for the shuttleless loom tapes or webbings shall be 30 to 210 denier nylon or 70 to 250 denier polyester.

3.4 Color. The color shall be as specified by the procuring activity.

3.4.3 Matching. The color and appearance of the dyed tape or webbing shall match the standard sample (see 3.1) when viewed under filtered tungsten lamps that approximate artificial daylight and that have a correlated color temperature of 7500 $\pm$ 200K, with illumination of 100 $\pm$ 20 foot candles, and shall be a good match to the standard sample under incandescent lamplight at 2300 $\pm$ 200K.

3.4.4 Colorfastness. The dyed tape or webbing shall show fastness to laundering and light (20hrs) equal to or better than the standard sample or equal to or better than a rating of 4 when tested as specified in the end item testing table.

3.5 Physical requirements. The finished tape and webbing shall conform to the requirements specified in table I when tested as specified in End item Testing table.

3.5.1 Resistance to light and heat. The nylon tape and webbing shall not lose more than 25 percent of the original breaking strength upon exposure to light (AATCC-16 Option A) and heat (MIL-STD-191-4108).

3.5.2. Curvature. The tapes and webbings shall show no more lateral curvature than 1/4 inch within a yard when tested. A 36 inch sample is cut and laid down on a flat surface and the amount of curvature is noted as specified in figure 2.

TABLE I Physical requirement

Type	Width inches	Thickness inch	Weight oz. per lin. yard max	Breaking strength lbs min 1/	Elongation % min 2/	Yarns per inch (Min)			Yarn denier 4/		
						Warp	Binder	Filling 3/	Warp	Binder	Filling
II	1 (±1/32)	.025-.035	0.40	900	18	96		40	840		210
II	1-1/2 (±1/32)	.025-.035	0.60	1300	18	144		40	840		210
II	2 (±1/32)	.025-.035	0.80	1700	18	192		40	840		210
III	3/8 (±1/32)	.015-.025	0.12	200	18	74		33	210		420
III	1/2 (±1/32)	.015-.025	0.15	250	18	100		33	210		420
III	3/4 (±1/32)	.015-.025	0.20	400	18	150		33	210		420
III	1 (±1/32)	.015-.025	0.30	525	18	200		33	210		420
III	1-1/2 (±1/32)	.015-.025	0.40	850	18	300		33	210		420
IV	1/2 (±1/32)	.030-.040	0.35	550	18	99	8	48	420	420	420
IV	5/8 (±1/32)	.030-.040	0.40	625	18	123	10	48	420	420	420
IV	1 (±1/32)	.030-.040	0.50	1000	18	197	16	48	420	420	420
IV	1-1/8 (±1/32)	.030-.040	0.60	1100	18	221	18	48	420	420	420
IV	1-1/2 (±1/32)	.030-.040	0.75	1500	18	293	24	48	420	420	420
V	9/16 (±1/32)	.020-.030	0.20	500	18	42		32	840		420
VI	3/4 (±1/32)	.020-.030	0.20	425	18	150		38	210		420

1/ No individual determination shall fall below the minimum specified.

2/ Minimum elongation measured at 90 percent or more of the minimum rated breaking strength requirement.

3/ Shuttleless loom constructions require double the number of yarns per inch of filling shown and substitution of approximately one-half the denier of shuttle constructions.

4/ Equivalent denier maybe substituted (Example - 420X2 may be substituted for 840X1).

3.6 Weave. The weave of the tape and webbing shall be as specified in 3.6.1 through 3.6.5. The filling yarn for shuttle weaving shall traverse the full width of the tape or webbing with one filling yarn per shed. The filling yarn of all shuttleless weaving shall traverse the full width of tape or webbing and shall be held at the edge by a catch cord yarn interlacing with the filling yarn in a method depicted in figure 1.

3.6.1 Type II. The weave for type II tape shall be a 2-up and 2-down herringbone twill with three reversals of the twill across the width of the tape.

3.6.2 Type III. The weave for type III tape shall be a plain weave.

3.6.3 Type IV. The weave for type IV webbing shall be composed of two ground warps (face and back), one binder warp, and one filling. The face warp shall weave plain with the picks that show on the face, and the back warp shall weave plain with the picks that show on the back. The binder warp shall weave plain throughout.

3.6.4 Type V. The weave for type V tape shall be a 2-up and 2-down herringbone twill with one reversal of twill at the center.

3.6.5 Type VI. The weave for type VI tape shall be a 2-up and 2-down herringbone twill with one reversal of twill at the center and 2 ends woven as 1.

3.7 pH. The pH value of the water extract of the finished tape or webbing shall be not less than 5.0 nor more than 8.5 when tested as specified in the end item testing.

3.8 Length and put-up. Shall be as specified in the procurement document.

4. VERIFICATION

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

1. First article inspection (see 4.2)
2. Quality conformance inspection (see 4.3)

4.2 First article inspection. When a first article is required, it shall be examined for the defects and tested for characteristics specified in the end item testing. (see Para. 6.2).

4.3 Quality conformance inspection. Sampling for inspection shall be performed in accordance with ANSI/ASQC Z1.4, except where otherwise indicated.

4.3.1 Examination of the end item. Examination of the end item shall be in accordance with 4.3.1.1.

4.3.1.1 Visual examination. The tape or webbing shall be examined for the defects listed below:

Abrasion marks
Broken or missing ends
Filling yarn - 2 yarns per shed
Broken or missing picks
Coarse or light filling bar

Twist or distortion
Cut, hole, or tear
Frayed or tight edges
Scalloped edges
Floats or skips
knots (more than 2 in 9 linear inches)
Mispick, or double pick
Slubs
Spot, stain or streaks 1/
wrong draw
Width not within tolerance
Number of yarns not at specified on the spool, roll or tube.
Possible missing hitchback crack
Jerked-in filling
Slough off, Slug, Kinks, Slack end, Smash
Tight end
Shaft mark
Carch cord missing/twisted/or wavy

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

4.3.3 End item testing. The tape or webbing shall be tested for the characteristics listed in table II.

TABLE II End item tests

Characteristic	Requirement paragraph	Test method
yarn	3.3	1/
Denier	3.5	ASTM-D-1907 1/
Colorfastness to laundering light	 3.4.4 3.4.4	 AATCC-61 (4A) 2/ AATCC-16 Option A
Thickness	3.5	ASTM-D-1777 3/
Weight	3.5	ASTM-2376 Option C
Warp ends per inch: Face and back warp Binder warp (Type IV)	 3.5 3.5	 ASTM-D-3775 ASTM-D-3775
Filling Picks per inch	 3.5	 ASTM-D-3775
Elongation	3.5	4108 (191) 4/
Breaking strength Original After light test After heat test	 3.5 3.5.1 3.5.1	 4108 (191) 4108 (191) 5/ 4108 (191) 6/
Weave	3.6	Visual
pH	3.7	ASTM-D-2165
Curvature	3.5.2	Individual results for each specimen tested

1/ A certificate of compliance shall be submitted and will be acceptable for the stated requirements.
2/ Only the stain on the polyamide fibers of the color transfer cloth shall be evaluated.
3/ A thickness gauge of the dead-weight type equipped with a dial graduated to read directly to 0.0001 inches shall be used. The presser foot shall be circular, with a diameter of 0.375 ± 0.0001 inches and with the moving parts weighted to apply a total load of 3.4 ± 0.1 pounds per square inch to the specimen. The anvil shall be not less than 0.250 inches in diameter. The presser foot and anvil surface shall be planed to within 0.0001 inches. The micrometer shall be capable of repeating its reading to 0.00005 inches at zero setting or on a steel gauge block.
4/ The pretension load (pounds) shall be equivalent to 1 percent of the minimum rated specification breaking strength requirements.
5/ The test specimens shall be exposed in the accelerated weathering unit as specified in method AATCC 111A Option 4. The unbacked specimen shall be placed in a stainless steel holder or suspended from the rack. Corex D filters and sunshine carbons shall be used. The exposure time shall be 50 hours. The spray heads shall be shut off during the entire exposure period. The relative humidity conditions shall be 55 ± 5 percent throughout the test cycle. At the end of the exposure period, the specimens shall be brought to equilibrium under standard conditions as defined in AATCC 111A Option 4. The specimens shall then be tested for breaking strength as specified and the percent of breaking strength (B.S.) loss shall be calculated as follows:

$$\frac{\text{Original Average B.S. - Ave. B.S. after aging}}{\text{Original Average B.S.}} \times 100 = \%\ \text{B.S. loss}$$

6/ The test specimens shall be suspended in a circulation air oven a temperature of 180° C ± 3° C (356° F ± 5°F) for 1 hour. After removal from the oven, the specimen shall be brought to equilibrium under standard conditions (70° F ± 2° and 65% RH ± 2%). The specimens shall then be tested for breaking strength as specified in Table I and the percent of breaking strength loss shall be calculated as follows:

$$\frac{\text{Original Ave B.S. - Ave B.S. after aging}}{\text{Original AVE B.S.}} \times 100 = \%\ \text{of B.S. loss}$$

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 materiel is to be performed by DoD 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 activity within the Military Department or Defense Agency, or within the Military Department's System Command. 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.

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 tape and webbing is intended for binding and reinforcing applications in parachute packs and for equipage.

6.2 Acquisition Requirements. Acquisition documents should specify the following:

a. Title, number and date of this specification.
b. Issue of DODISS to be cited in the solicitation and, if required , the specific issue of individual documents referenced (see 2.2.1 and 2.3).
c. When first article inspection is required, (see 4.2) the item will be tested and should be a first article sample. The contracting officer should include specific instructions in acquisition documents regarding arrangement for examination, quantity, and testing and approval.

6.3 Subject term (key word) listing.

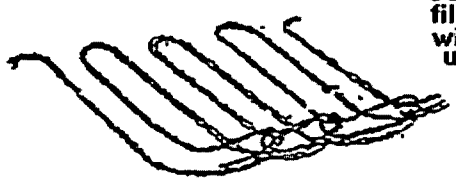
Binding and reinforcing
Equipage
High tenacity
Light and heat resistant polyamide
Parachute packs

Custodians:
Army - GL
Navy - AS
Air Force - 99

Preparing Activity
DLA - CT

(Project 8305-0618)

Review Activities:
Army - MD
Air Force - 82
DLA - CS
Navy - OS, SH
Air Force - 45



CATCH CORD DIAGRAM

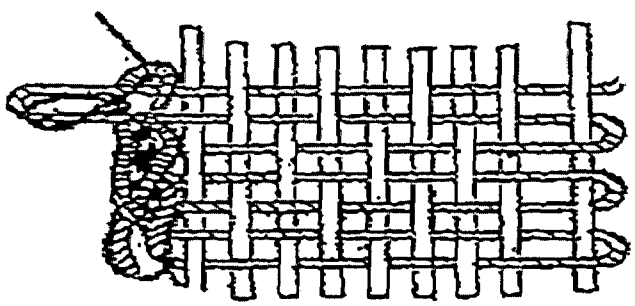


FIGURE 1

CATCH CORD DIAGRAM

Diagram curvature measurement

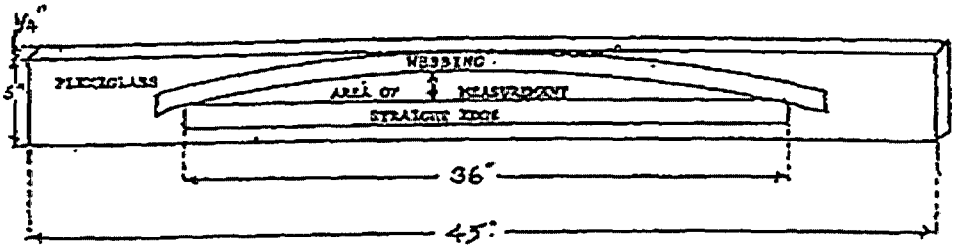


FIGURE 2

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requriements.

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER	2. DOCUMENT DATE *(YYMMDD)*
	MIL-PRF-5038J	96/11/05

3. DOCUMENT TITLE

TAPE, TEXTILE AND WEBBING, TEXTILE REINFORCING, NYLON

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBNITTER

a. NAME *(Last, First, Middle Initial)*	b. ORGANIZATION	
c. ADDRESS *(Include Zip Code)*	d. TELEPHONE *(Include Area Code)* (1) Commercial (2) AUTOVON *(if applicable)*	7. DATE SUBMITTED *(YYMMDD)*

8. PREPARING ACTIVITY

a. NAME	b. TELEPHONE *(Include Area Code)*
DLA - CT	(1) Commercial: (215)-737-8105 (2) AUTOVON: (DSN) 444-8105
c. ADDRESS *(Include Zip Code)* DEFENSE PERSONNEL SUPPORT CENTER 2800 S. 20th STREET (DPSC-FNS/Bldg. 12-3-C) PHILADELPHIA, PA 19145-5099	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Chruch, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340