

MILITARY SPECIFICATION

WEBBING, TEXTILE, WOVEN NYLON

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

1. SCOPE

1.1 Scope. This specification covers the requirements for woven nylon webbing, woven on shuttle or shuttleless looms.

1.2 Classification. The webbing shall be one of type, and shall be procured in the following classes as specified (see 6.2).

1.2.1 Class. The class of webbing shall consist of the following:

Class 1 - Lifesaving Equipment (Shuttle Construction - Nylon 6,6)

Class 2 - Loadcarrying Equipment (Shuttle or Shuttleless Construction - Nylon 6 or Nylon 6,6)

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Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Officer in Charge, Navy Clothing and Textile Research Facility, 21 Strathmore Road, Natick, MA 01760-2490 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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AMSC N/A

FSC 8305

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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 shall be 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).

SPECIFICATIONS

MILITARY

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

STANDARDS

FEDERAL

FED-STD-191 - Textile Test Methods  
FED-STD-595 - Colors

MILITARY

MIL-STD-105 - Sampling Procedure and Tables for Inspection by Attributes  
MIL-STD-129 - Marking for Shipment and Storage

(Unless otherwise indicated, copies of federal and military specification, 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.

LAWS AND REGULATIONS

RULES AND REGULATIONS UNDER THE TEXTILE FIBER PRODUCTS IDENTIFICATION ACT

(Copies may be obtained without charge from the Federal Trade Commission, Washington, DC 20580).

2.2 Non-Government publications. The following document(s) form a part of this specification to the extent specified herein. Unless otherwise specified, the issue of documents which are DOD adopted shall be those listed in the issue of the DODISS cited in the solicitation. Unless otherwise

the issues of documents not listed in the DODISS shall be the issue of the documents cited in the solicitation.

NATIONAL MOTOR FREIGHT TRAFFIC ASSOCIATION, INC., AGENT

National Motor Freight Classification

(Application for copies should be addressed to the American Trucking Association Inc., Traffic Department, 1616 P Street, NW, Washington, DC 20036.)

UNIFORM CLASSIFICATION COMMITTEE, AGENT

Uniform Freight Classification

(Application for copies should be addressed to the Uniform Classification Committee, Room 1106, 222 South Riverside Plaza, Chicago, ILL 60606).

TECHNICAL MANUAL OF THE AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS

Method No. 8-1988 Colorfastness to Crocking: AATCC Crockmeter Method

(Application for copies should be addressed to the AATCC National Headquarters, P.O. Box 12215, Research Triangle Park, NC 27709-2215.)

\* 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 Standard sample. Samples, when furnished, are solely for guidance and information to the contractor (see 6.3). Variations from this specification may appear in the sample in which case this specification shall govern.

3.2 First article. When specified, the contractor shall furnish sample unit(s) for first article inspection and approval (see 4.3 and 6.2).

3.3 Material.

3.3.1 Yarn. The yarn for the warp and filling shall be singles, bright, high tenacity, continuous filament nylon, which has not been subjected to any type of bleaching process (see 4.4.1). For the class 1 webbing, only nylon 6,6 shall be used. For the class 2 webbing, either nylon 6 or nylon 6,6 shall be used.

3.3.2 Yarn size. The yarn size shall be 840 denier (warp and filling) for shuttle loom construction and a combination of 840 denier warp and 420 denier filling for shuttleless loom construction (see 3.5.1 and 4.4.1).

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3.4 Color. Unless otherwise specified (see 6.2), the webbing shall be furnished in the following colors:

- a. Natural White
- b. Yellow No. 1365 Air Force Color
- c. Olive Drab Army Color No. 7
- d. Deck Grey No. 26081 of FED-STD-595

3.4.1 Dyeing. When dyed webbing is required, the webbing shall be yarn or piece dyed.

3.4.2 Matching. The dyed webbing shall match the standard sample when viewed under filtered tungsten lamps which approximate artificial daylight having a correlated color temperature of 7500 + 200 K, with illumination of 100 + 20 foot candles, and shall be a good match to the standard sample under incandescent lamplight at 2300 + 200 K.

3.4.3 Colorfastness. The dyed webbing shall show fastness to light, laundering, and crocking equal to or better than the standard sample when tested as specified in 4.5. As a limit of acceptability or when no standard sample is available, the dyed webbing shall show a minimum of "good" fastness to light; "fair" fastness to laundering and shall have an AATCC reading not lower than 3.0 for dry crocking and an AATCC reading not lower than 2.0 for wet crocking.

3.5 Physical requirements. The construction and physical requirements of the finished webbing shall be as specified in Table I when tested as specified in 4.5. The webbing shall be furnished in the width as specified (see 6.2).

TABLE I - CONSTRUCTION AND PHYSICAL REQUIREMENTS

WIDTH	THICKNESS	WEIGHT/	BREAKING	YARNS/	THREADS FULL WIDTH		
		LINEAR	STRENGTH	INCH	TOTAL	WARP	BINDER
		YARD	WARP, FULL	FILLING	WARP	ENDS	ENDS
		(MAX)	(MIN)	(MIN)			
INCH	INCH	OZ.	LBS				
1 (+ 1/16)	.038 - .050	0.71	1200	48 1/	119	97	22
1 1/2 (+ 1/16)	.038 - .050	1.07	1800	48 1/	179	145	34
2 (+ 1/16)	.038 - .050	1.42	2200	48 1/	239	193	46
3 (+ 1/16)	.038 - .050	2.20	3200	48 1/	355	287	68

1/ When a shuttleless loom is employed, 96 picks (two picks per shed) of 420 denier yarn is required.

3.5.1 Catch-cord. When latch type shuttleless looms are utilized, the filling yarn shall traverse the full width of the webbing and shall be held by an extra catch-cord end interlacing with the filling yarn in a method as shown in figures 1 or 2. 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 (see figure 3). For Class 2 webbing, dyed or natural, the catch-cord shall be 200 denier or 210 denier nylon for latch type shuttleless looms and 420 denier nylon for bobbin type shuttleless looms.

3.5.2 Curvature in shuttleless construction. Finished shuttleless webbing shall show no more lateral curvature than  $1/4$  inch when tested as specified in 4.5. (see figure 4).

3.5.3 Weave. The weave shall consist of a face warp and back warp bound together by a binder warp and filling. The face warp shall weave plain with picks shown on the face and the back warp shall weave plain with picks that show on the back. The binder warp end shall be evenly spaced across the width of the webbing. One binder warp end shall weave 2 up and 2 down. The adjacent binder warp end shall weave 2 down and 2 up. Testing shall be in accordance with 4.5.

3.6 Non-fibrous materials. The chloroform soluble material only of the finished webbing shall not exceed 4.0 percent when tested as specified in 4.5.

3.7 pH. The pH value of the water extract of the finished webbing shall be not less than 5.0 nor more than 8.5 when tested as specified in 4.5.

3.8 Length of roll. Unless otherwise specified, each roll shall contain 90 to 110 yards. No roll shall contain more than 2 pieces and no piece shall be less than 10 yards in length.

3.9 Identification ticket. Each roll of webbing shall have an identification ticket conforming to MIL-W-43334.

3.10 Fiber identification. Each roll of webbing shall be labeled or ticketed for fiber content in accordance with the Textile Fiber Products Identification Act (see 2.1.2).

3.11 Workmanship. The finished webbing shall conform to the quality established by this specification. The occurrence of defects shall not exceed the applicable 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 order, the contractor may use his own or any other facilities suitable for 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 the specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

\*4.1.1 Responsibility for compliance. All items must 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 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 acceptance of defective material.

4.1.2 Certificate of compliance. Where certificates of compliance are submitted, the Government reserves the right to check test such items to determine the validity of the certification.

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

1. First article inspection (see 4.3).
2. Quality conformance inspection (see 4.4).

4.3 First article inspection. When required, the first article submitted in accordance with 3.2, shall be inspected as specified in 4.4.2 for compliance with design, construction, workmanship, appearance and dimensional requirements.

4.4 Quality conformance inspection. Sampling for inspection shall be performed in accordance with MIL-STD-105, except where otherwise indicated.

4.4.1 Component and material inspection. In accordance with 4.1 above, components and materials shall be tested 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.

4.4.2 Examination of the end item. Examination of the end item shall be in accordance with 4.4.2.1 through 4.4.2.4.

4.4.2.1 Length examination. The required length of each roll shall be examined on both sides and visual defects classified as listed in Table III. All defects found shall be counted, regardless of the 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 warpwise yard or fraction thereof in which it occurs. The sample unit for this examination shall be one 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 II of this specification

TABLE II - sample size

<u>Lot Size in Yards</u>	<u>Sample Size by Roll 1/</u>	<u>Max. number of defects</u>
1200 or less	3	0
1201 to 3200 inclusive	5	0
3201 to 10,000 inclusive	8	0
10,001 to 3500 inclusive	13	0
35,001 to 150,000 inclusive	20	1
150,001 and over	32	2

1/ If a lot contains less than 3 rolls, each roll in the lot shall be examined.

TABLE III - Classification of Defects

<u>Examine</u>	<u>Defect</u>	<u>Classification</u>	
		<u>Major</u>	<u>Minor</u>
1. Abrasion mark(s)	Any, resulting in rupture of individual yarns; distortion in the orientation of yarns; or areas visibly thinner than adjoining areas <u>1/</u>	X	
2. Broken or missing warp end	a. Two or more regardless of length b. Single more than 1/4 inch in length	X	X
3. Broken or missing	a. Two or more within a linear inch regardless of the size of missing portion b. Single more than 1/4 inch in length	X	X
4. Cut, hole, tear	Any	X	
5. Course or heavy filling bar	Noticeably stiffer or thicker than adjoining unaffected area <u>1/</u> a. Width of bar more than 1/4 inch b. Width of bar 1/4 inch or less	X X	 X
6. Edge(s)	Frayed, loopy, wavy, slack, noticeably thick or otherwise poorly constructed for a distance of 1 inch or more	X	
7. Float(s)	a. Multiple, in combined warp and filling directions: 1. 1/2 inch or more	 X	

Table III - Classification of Defects (cont'd)

Examine	Defect	Classification	
		Major	Minor
	2. Less than 1/2 inch		X
	b. Single in warp direction more than 1/2 inch in length		X
	c. Single in filling direction: More than 1/4 inch of the width but not more than 1 inch		X
8. Knot(s)	a. More than one knot in any 9 linear inches		X
	b. Knot on surface or partially exposed <u>1/</u>		X
	c. Knot with untrimmed ends extending more than 1/8 inch from surface		X
9. Slack end(s)	a. Multiple in the same length, jerked in between picks or forming loops on the surface <u>1/</u>	X	
	b. Single jerked in between picks or forming loops on the surface <u>1/</u>	X	
10. Tight end	Any		X
11. Hitch-back	Weave distortion caused by warp tension, light and heavy places over part of width <u>1/</u>		X
12. Crack or open place	Opening between adjoining picks <u>1/</u>		X
13. Kinks	More than three in any 9 linear inches		X
14. Mispick double	a. Two or more across the full width	X	
	b. Single across the full width		X
15. Slub, slug or jerked in filling	More than twice the thickness of normal yarn <u>1/</u>		X
16. Spot, stain or	Any		X
17. Smash	Any		X



TABLE III - Classification of Defects (cont'd)

Examine	Defect	Classification	
		Major	Minor
18. Wavy or puckered	Will not lay flat upon application of manual pressure (due to twist distortion, or uneven tension) 2/	X	
19. Wrong draw	a. Extending 9 linear inches or more	X	
	b. Less than 9 linear inches		X
20. Yarns (filling)	Two yarns per shed (shuttle construction)	X	
21. Dropped knitted stitch on edge	Any (shuttleless construction)	X	
22. Catchcord missing	Any (shuttleless construction)	X	

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

2/ A three yard length of webbing shall be laid on a flat and smooth surface without tension. If the webbing does not lie flat or if the webbing is wavy or puckered, it shall be scored 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 II.

Identification ticket missing, incomplete, illegible or insecurely attached  
 Objectionable odor  
 Uneven weaving throughout roll  
 Overall uncleanness  
 Off shade (not within established tolerance)  
 Mottled, cloudy, streaky, or poor color penetration throughout  
 Not labeled in accordance with Textile Fiber Products Identification Act  
 Width beyond tolerance

4.4.2.3 Examination for length of individual roll. 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 shown in Table II.

#### Defects

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

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Gross length more than 2 yards less than gross length marked on ticket.  
 Any piece less than 10 yards in length.  
 Any roll containing more than 2 pieces.

4.4.2.4 Examination for total yardage. 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 Examination of packaging requirements. An examination shall be made in accordance with the provisions of MIL-W-43334 to determine that packaging, packing and marking complies with Section 5 requirements of this specification.

4.5 Testing of the end item. The methods of testing and reporting shall be specified in FED-STD-191, wherever applicable, and as listed in Table IV shall be followed. The physical and chemical values specified in Section 3 apply to the results of the determination 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 result. The sample size is as follows:

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

The lot shall be unacceptable if one or more sample units fail to meet any requirement specified. The lot size shall be expressed in units of 1 linear yard. The sample unit for testing shall be 12 linear yards.

Table IV - Test Methods

<u>Characteristics</u>	<u>Requirement paragraph</u>	<u>Test Method</u>
Colorfastness to:		
Light	3.4.3	5660 1/, 4/
Laundering	3.4.3	5614 2/
Crocking	3.4.3	AATCC TM 8-1988
Weight	3.5	5041
Thickness	3.5	5030
Breaking Strength	3.5	4108
Texture:		
Yarns per inch (filling)	3.5	5050
Warp ends	3.5	5050
Binder ends	3.5	5050
Curvature	3.5 2	4 5.1

Table IV - Test Methods (cont'd)

Characteristics	Requirement paragraph	Test Method
Weave	3.5.3	Visual 3/
Non-fibrous material	3.6	2611 5/
pH	3.7	2811

1/ The specimen shall be exposed for 20 hours.

2/ Only the stain in the nylon portion of the color transfer cloth shall be evaluated.

3/ One determination shall be made per sample unit, and the results reported as "pass" or "fail".

4/ The calibration of the fadeometer and the definition of AATCC Fading Units shall be according to AATCC Test Method 16-1982. Using the formula below, 16 to 22 AFU's are acceptable as 20 SFH's.

$$\text{AATCC Fading Units} = \frac{(\Delta E^*) (20)}{1.7}$$

Where ( E\*) is the color difference in CIELAB\* units of color difference.

5/ Unless otherwise specified, a certificate of compliance shall be submitted and will be acceptable for the stated requirements.

#### 4.5.1 Measurement of lateral curvature.

4.5.1.1 Test specimen. The test specimen shall be length of shuttleless type webbing, 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. Five specimens shall be tested from each sample unit and averaged

#### 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 specimen 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

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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 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 inch perpendicularly from the straight edge. Record the highest measure (see figure 4).

5. PACKAGING

5.1 Preservation-packaging. Packaging shall be level A, B or C as specified (see 6.2).

5.1.1 Levels A, B and C. Webbing, put up as specified, shall be packaged in accordance with the applicable requirements of MIL-W-43334.

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

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

5.3 Marking. In addition to any special marking required by the contract or order, interior packages, shipping containers, and palletized unit loads shall be marked in accordance with MIL-W-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 covered by this specification is intended for use in the manufacture of life preservers, rucksacks, and other similar equipment.

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

- a. Title, number, and date of this specification
- b. Width of cloth as specified (see 3.5)
- c. Class of cloth required (see 1.2.1)
- d. Color of cloth required (see 3.4)
- e. 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).
- f. When first article sample is required (see 3.2). The item will be tested and should be a first article sample. The contracting officer should

include specific instructions in acquisition documents regarding arrangements for examination, quantity, testing and approval of the first article.

- g. Levels of packaging and packing required (see 5.1 and 5.2)
- h. Length of roll required (see 3.8)

6.3 Samples and patterns. For access to samples and patterns, address the procuring activity issuing the invitation for bids (see 3.1 and 3.5).

6.4 Recycled materials. It is encouraged that recycled materials be used when practical as long as it meets the requirements of this specification.

\* 6.5 Changes from previous issue. The margins of this specification are marked with an asterisk 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 last previous issue.

\* 6.6 Subject term (key word) listing.

- Catch-cord
- Equipment, loadcarrying
- Equipment, lifesaving
- Loadcarrying, equipment
- Life preservers
- Lifesaving, equipment
- Preservers, life
- Rucksacks

Custodian:  
Navy - NU  
Army - GL

Preparing Activity:  
Navy - NU

Review Activity:  
Navy - AS  
DLA - CT

Project No. 8305-0323

User Activities:  
Navy - SH

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**NOTE** This form may not be used to request copies of documents, nor to request waivers, deviations, or clarification of specification 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 requirements.

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