

26 August 1977

SUPERSEDING

MIL-W-27657A(USAF)

15 July 1963

MILITARY SPECIFICATION

WEBBING, TEXTILE, WOVEN NYLON, FOR DECELERATORS

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

1. SCOPE

1.1 Scope. This specification covers six types of nylon webbing.

1.2 Classification. The webbing shall be of the types indicated in table I, as specified (see 6.2).

2. APPLICABLE DOCUMENTS

2.1 The following documents, of the issue in effect on date of invitation for bids or request for proposal, form a part of the specification to the extent specified herein:

SPECIFICATION

Military

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

STANDARDS

Federal

FED-STD-191 Textile Test Methods

Military

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

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: AFML/MXA, WPAFB, O. 45433 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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(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other publication. The following document forms a part of this specification to the extent specified herein. Unless otherwise otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

Federal Trade Commission

Textile Fiber Products Identification Act, Effective
3 March 1960.

(Copies may be obtained without charge from the Federal Trade Commission, Washington 25, D.C.)

3. REQUIREMENTS

3.1 First article. When specified (see 6.2) the supplier shall furnish a sample for first article inspection and approval (see 4.2 and 6.5)

3.2 Materials

3.2.1 Nylon yarn. The yarn shall be a bright, high tenacity, light and heat resistant nylon and shall be a polyimide prepared from hexamethylene diamine and adipic acid or its derivatives. It shall have a minimum melting point of 471°F. The supplier shall certify that the yarn has not been subjected to any type bleaching process. Testing shall be as specified in 4.3.1.

3.2.1.1 Denier and filament. The yarn used in the manufacturing of the webbing shall be of the denier and filament specified in Table 1.

3.2.1.2 Ply twist. The final ply of the warp and filling yarns shall have a minimum of 2-1/2 turns per inch. The number of single yarns specified in Table 1 shall be twisted together (plied) in one operation.

TABLE I. Construction and physical requirements

Requirement	Type I	Type II	Type III	Type IV	Type V	Type VI
Breaking strength (lbs min)	3,000	4,000	6,000	8,700	9,000	10,000
Weight (oz/linear yd) Max	0.95	1.25	1.65	2.40	2.40	2.70
Width (inches)	$3/4 \pm 1/16$	$1 \pm 1/16$	$1 \pm 1/16$	$1-23/32 \pm 1/16$	$1 \pm 1/16$	$1-3/4 \pm 1/16$
Ends (full width)(min) and denier	105(840/140) or 141(1260/210)	145(840/140) or 187(1260/210)	224(840/140) or 152(1260/210)	324(840/140) or 218(1260/210)	224(840/140) or 224(1260/210)	250(840/140) or 250(1260/210)
Binders (Min)	7	9	-	-	-	-
Picks/in (Min)	22	22	16	18	17	18
No. of single yarns for final plied yarn (Min)						
Warp	2(840) or 1(1260)	2(840) or 1(1260)	2	2	3(840) or 2(1260)	3(840) or 2(1260)
Binder	1	1	-	-	-	-
Filling	2(840) or 1(1260)	2(840) or 1(1260)	2(840) or 1(1260)	2(840) or 1(1260)	2(840) or 1(1260)	2(840) or 1(1260)
Thickness (inches)	.070 - .095	.090 - .110	.100 - .120	.080 - .100	.175 - .195	.115 - .135

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3.3 Construction and physical properties. The finished webbing shall conform to Table I and 3.3.1 through 3.7.

3.3.1 Weave.

3.3.1.1 Types I and II. The weave for types I and II shall be a double plain weave with a single filling. Separate binder warp ends shall weave 2 up, 2 down, 1 end as 1. All other warp yarns shall weave 2 ends as 1 except that the edge warp yarns shall weave 1 end as 1 not exceeding 8 ends on 1 selvage and 9 on the other.

3.3.1.2 Types III, IV, and VI. The weave for types III, IV and VI shall be a 5 up, 1 down, 1 up, 5 down herringbone twill with 1 reversal at the center of the webbing. The weave is shown on Figure 1.

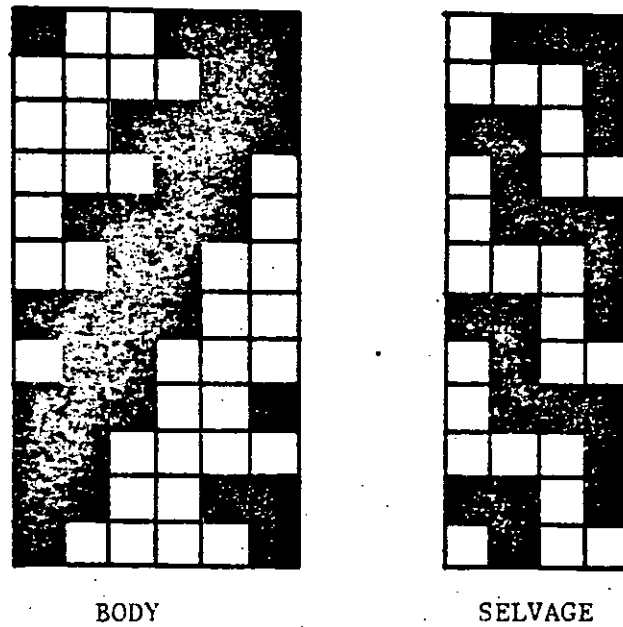
3.3.1.3 Type V. The weave for type V shall be a 5 up, 1 down, 1 up, 5 down, 1 up, 1 down twill. The weave is shown on Figure 2.

3.4 Color. The webbing shall be natural color.

3.5 Length. Unless otherwise specified by the procuring activity, each roll of webbing shall contain 90 to 110 yards. No roll shall contain more than 3 pieces, and no piece shall be less than 10 yards in length.

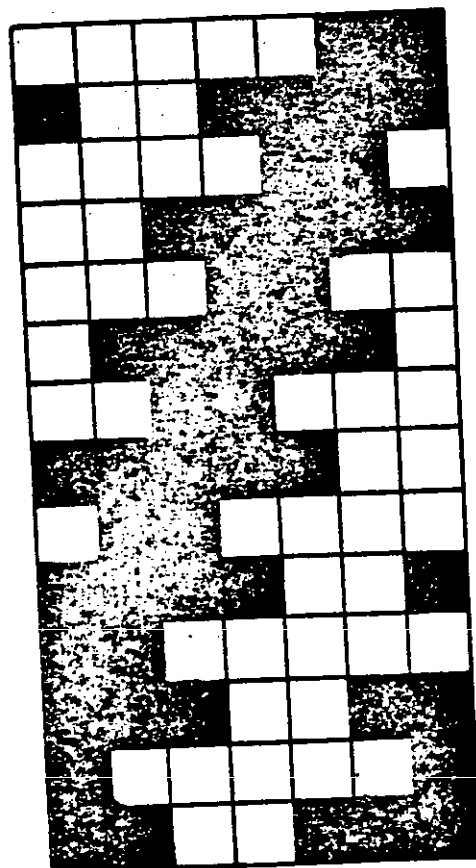
3.6 Identification tickets. Each roll shall have a ticket attached with not finer than 5-ply cotton string doubled to not less than 6 inches long. The tickets shall be made of paperboard not less than 0.020 inch in thickness and the color shall be manila or light in intensity to permit easy reading of printed, stamped, or typed markings. The use of handwritten entries is prohibited. The ticket shall have clipped corners at the end where a reinforcing patch (with or without a metal eyelet) is firmly affixed for attaching the typing string. The ticket shall be legibly printed with water insoluble ink with the following information:

- Stock number
- Nomenclature
- Specification number and type
- Fiber type
- Yardage
- Contract number and date
- Contractor's name
- Name of contracting agency
- Date of manufacture (month and year)

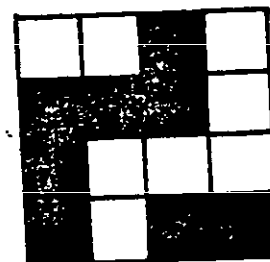


ONE REPEAT WARP
ONE REPEAT FILLING

FIGURE 1. WEAWE DIAGRAM - TYPES III, IV, AND VI



BODY



SELVAGE

ONE REPEAT WARP
ONE REPEAT FILLING

FIGURE 2. WEAWE DIAGRAM - TYPE V

3.6.1 Fiber identification. Each roll of webbing shall be labeled, ticketed, or invoiced for fiber content in accordance with the Textile Fiber Products Identification Act, 3 March 1960.

3.7 Workmanship. The finished webbing shall be clean, evenly woven, and shall conform to the quality and grade of product established by the specification. The occurrence of defects shall not exceed the levels set by the applicable acceptable quality levels.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to 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 assure supplies and services conform to prescribed requirements.

4.1.1 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 First article inspection. When required (see 6.2) the preproduction sample submitted in accordance with 3.2 shall be visually examined for appearance and shall be tested in accordance with methods specified in 4.4.

4.3 Inspection. Sampling for inspection shall be performed in accordance with MIL-STD-105, except where otherwise indicated hereinafter.

4.3.1 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 purchase documents. In addition to the quality assurance provisions of the subsidiary specifications, component materials listed in Table II 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 nylon 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 result. The sample size shall be as follows:

Lot size (pounds)Sample size

800 or less
 801 up to and including 22,000
 22,001 and over

2
 3
 5

TABLE II. Testing of Components

Characteristic	Requirement Reference	Test Method
Nylon identification	3.2.1	<u>1/</u>
Denier	Table I	4021
Tenacity	3.2.1	<u>1/</u>
Luster	3.2.1	<u>1/</u>
Melting point	3.2.1	1534 <u>1/</u>
Light resistance	3.2.1	<u>1/</u>
Heat resistance	3.2.1	<u>1/</u>
Unbleached	3.2.1	<u>1/</u>
Ply	Table I	Visual <u>2/</u>
Twist	3.2.1.1	4054

1/ A certificate of compliance shall be submitted for these requirements and it shall include: A certified statement that the yarn used is that specified in 3.2.1 along with the yarn supplier's type, identification data and melting point and supported by a certified copy of the yarn producer's certification to the manufacturer.

2/ One determination per sample unit and the result reported as "pass" or "fail".

4.3.2 Examination of the end item. Defects found during the examination shall be classified in accordance with 4.3.2 through 4.3.2.3.1.

4.3.2.1 Yard-by-yard examination. The required yardage of each roll shall be examined on both sides and visual defects classified as listed in Table IV. Defects found shall be counted regardless of their proximity to each other, 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 unit of product for this examination shall be 1 linear yard. The sample size shall be in accordance with Inspection Level III of Standard MIL-STD-105. The acceptable quality level shall be 2.5 minor defects per 100 units (yards) and the lot shall be unacceptable if one or more critical defects appears in the sample. 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 the sample size listed in Table III of this specification.

4.3.2.2 Overall examination. The unit of product for this examination shall be one roll. The rolls examined shall be those selected for yard-by-yard examination. The acceptable quality level shall be one defect per 100 units (rolls). Classification of defects for this visual examination shall be: objectionable odor, uncleanliness throughout, uneven weaving throughout, or identification ticket missing or nonconforming.

TABLE III. Sampling Plan

Lot size in yards	Sample size in rolls	Maximum No. of defects acceptable in sample
1,300 or less <u>1/</u>	5	0
1,301 to 3,200	7	0
3,201 to 8,000	10	0
8,001 to 22,000	15	0
22,001 to 110,000	25	0
110,001 and over	35	1

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

TABLE IV. Classification of defects

Defect	Description	Critical	Minor
Abrasion marks	Resulting in rupture of yarns, or in nap sufficient to obscure the identity of any yarn exceeding 10 percent of width or 1 inch in length.	X	
Broken or missing end	Two or more regardless of length or a single end exceeding 6 inch in length. Single end under 6 inches but exceeding 1/4 inch.	X	X
Broken or missing pick	Two or more regardless of extent Note: The filling tie-in or joining shall not be construed as a defect of any nature.	X	
Coarse or light filling bar	Resulting in clearly visible <u>1/</u> difference in stiffness or thickness of webbing and extending for more than 1/4 inch in the length direction.	X	
Twist or distortion	Webbing will not lay flat upon application of manual pressure due to twist or distortion.		X
Cut, hole, or tear	Any cut, hole, or tear.	X	
Drop-ply	Clearly visible <u>1/</u> , on more than 2 ends within same length and extending over 9 linear inches or more. Clearly visible <u>1/</u> , on 1 or 2 ends within same length and extending over 9 linear inches or more.	X	X

TABLE IV. Classification of defects - (Continued)

Defects	Description	Critical	Minor
Edges inferior	Cut, frayed, torn, slack, or otherwise poorly constructed and exceeding 1/4 inch in length.	X	
Floats or skips	Three or more, 1/2 inch or more in combined warp and filling directions or single float or skip over more than 1 inch. Three or more, less than 1/2 inch in combined warp or filling directions or single float or skip over more than 1/2 inch but not exceeding 1 inch, if in warp, nor more than 1/4 inch of the width but not exceeding 1 inch, if in filling.	X	X
Hitchback crack	Clearly visible <u>1/</u> opening between adjoining picks, or warpwise tension area over part of the width resulting in visible light and heavy places.		X
Jerked-in filling, slough-off slug	A clearly visible <u>1/</u> loop of filling pulled in at edges.		X
Kinks	More than 3 in any 9 linear inches.	X	
Knots	More than 1 knot in any 9 linear inches. One knot every 2 yards with untrimmed ends extending from surface of webbing.	X	X
Mispick, double pick	Two or more across the full width. Single across the full width	X	X

TABLE IV. Classification of defects - (Continued)

Defect	Description	Critical	Minor
Slack end	Two or more jerked in between picks, or forming clearly visible <u>1/</u> loops on the surface. Single jerked in between picks or forming clearly visible <u>1/</u> loops on the surface.	X	X
Slub or slug, gout	More than twice the thickness of the yarn (or ply, if plied).		X
Smash	Any smash.	X	
Spot, stain	Any clearly visible <u>1/</u> dirt, rust, grease, oil spot, stain, or streak.	<u>2/</u>	<u>2/</u>
Tight end	Clearly visible <u>1/</u> up to 12 inches in length.	X	
Wrong draw	Extending for more than 9 inches.	X	

1/ At normal inspection distance (approximately 3 feet).

2/ Any spot, stain, or streak up to 12 inches in length that can be covered with an approved white spotter shall be minor. Any spot, stain, or streak that cannot be covered or is longer than 12 inches shall be a critical defect.

4.3.2.3 Examination for length. The unit of product for this examination shall be one roll. The pieces examined shall be those selected for yard-by-yard examination. The acceptable quality level shall be one defect per 100 units (pieces). The piece shall be examined for gross length. Any gross length found to be less than the minimum or more than the maximum length specified, or gross length found to be more than 2 yards below the gross length marked on the piece ticket shall be considered a defect with respect to length. Any roll containing more than 3 pieces or a piece less than 10 yards in length shall be considered a defect with respect to length.

4.3.2.3.1 Examination for total yardage in sample. The lot shall be unacceptable if the total of the actual gross length of the rolls in the sample is less than the total of the gross lengths marked on the piece tickets.

4.4 Testing of the end item. The methods of testing specified in FED-STD-191, wherever applicable, and as listed in Table V and 4.3.1 shall be followed. Except for breaking strength, the physical and chemical values specified in section 3 apply to the average of the determinations made on a sample unit for test purposes as specified in the applicable test methods. For breaking strength, the lot shall be rejected if any individual determinations breaks lower than the required minimum. The sample unit for testing shall be 15 linear yards. The sample size shall be as shown in Table VI. The lot shall be unacceptable if one or more units fail to meet any requirement specified. The lot size shall be expressed in units of 1 linear yard.

TABLE V. Test methods

Characteristics	Requirement paragraph	Test method	No. determinations per sample unit	Results reported as
Thickness	Table I	5030	5	Average of 5 determinations to nearest 0.001
Weight	Table I	5041	5	Average of 5 determinations to nearest 0.01 oz.
Weave	3.2.1	Visual	1	Pass or Fail
Texture: (Full Width)				
Ends	Table I	5050	1	To nearest whole number
Binders	Table I	5050	1	To nearest whole number
Picks/in.	Table I	5050	1	To nearest whole number
Breaking strength	Table I	4108	5	Average of 5 determinations to nearest 1.0 lb.

TABLE VI. Sample size

Lot size (units)	Sample size
800 or less	2
801 to 22,000	3
22,001 and over	5

5. PACKAGING

5.1 Preservation-packaging. Preservation-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, shipments shall be marked in accordance with MIL-W-43334.

6. NOTES

6.1 Intended use. The webbing covered by this specification is intended for use in decelerators.

6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number, and date of this specification.
- b. Type
- c. When a first article is required (3.1)
- d. Length of roll required (if other than specified in 3.5)
- e. Selection of applicable levels of packaging and packing (see 5.1 and 5.2)

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