

**Webbing, Woven Nylon
For Decelerators**

FOREWORD

This Revision contains format/editorial changes only.

1. SCOPE:

1.1 Form:

This specification and its supplemental detail specifications covers a woven nylon in the form of webbing.

1.2 Application:

Primarily for use in construction of decelerators.

1.3 Classification:

Webbing is classified by width and breaking strength as shown in the titles of the detail specifications.

1.4 Safety - Hazardous Materials:

While the materials, methods, applications, and processes described or referenced in this specification may involve the use of hazardous materials, this specification does not address the hazards which may be involved in such use. It is the sole responsibility of the user to ensure familiarity with the safe and proper use of any hazardous materials and to take necessary precautionary measures to ensure the health and safety of all personnel involved.

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2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The applicable issue of referenced publications shall be the issue in effect on the date of the purchase order.

2.1 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

FED-STD-4	Glossary of Fabric Imperfections
FED-STD-191	Textile Test Methods
MIL-P-43334	Packaging of Textile Webbing and Tape
MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes

2.2 Other Publications:

Available from Federal Trade Commission, Washington, DC 20580.

Textile Fiber Products Identification Act, Rules and Regulations

3. TECHNICAL REQUIREMENTS:

3.1 Detail Specifications:

The requirements for a specific webbing shall consist of all requirements specified herein in addition to requirements specified in the detail specification. In case of conflict between requirements of this specification and an applicable detail specification, requirements of the detail specification shall govern.

3.2 Material:

The yarn shall be a bright, high tenacity, light and heat resistant nylon and shall be a polyamide prepared from hexamethylene diamine and adipic acid or its derivatives. It shall have a melting point not lower than 244 °C (471 °F). Supplier shall certify that the yarn has not been subjected to any type of bleaching process. Yarn shall be of the filament count, denier, twist, and color and webbing shall be of the weave specified in the applicable detail specification.

3.3 Properties of Yarn:

Shall be as specified in the applicable detail specification, determined in accordance with test methods specified in 4.5. The final ply of the warp and filling yarns shall have not less than 2.5 turns per inch (25.4 mm) and be twisted together (plied) in one operation.

3.4 Properties of Webbing:

Shall be of natural color and meet the requirements specified in the detail specification, determined in accordance with test methods specified in 4.5.

3.5 Quality:

Webbing, as received by purchaser, shall be clean, evenly woven, and free from foreign materials and from imperfections detrimental to usage of the webbing.

3.5.1 Imperfections: Acceptability of each lot of webbing shall be based on imperfections defined in FED-STD-4 and as specified in Table 1.

3.5.2 Yard-by-Yard (Meter-by-Meter) Examination: The required length of each roll shall be examined on both sides and visual imperfections classified as in Table 1. Imperfections found shall be counted, regardless of their proximity to each other, except where two or more imperfections represent a single local condition of the webbing, in which case only the more serious imperfection shall be counted. A continuous imperfection shall be counted as one imperfection for each warpwise yard (meter), or fraction thereof, in which it occurs. The lot shall be unacceptable if one or more critical imperfections appear in the sample. The lot size shall be expressed in units of 1 linear yard (1 linear meter) each. An approximately equal length shall be examined from each roll selected.

TABLE 1 - Classification of Imperfections

Imperfection	Description	Critical	Minor
Abrasion marks	Resulting in rupture of yarns, or in nap sufficient to obscure the identity of any yarn over 10% of width or 1 inch (25 mm) in length.	X	
Broken or missing end	Two or more regardless of length or a single end over 6 inches (152 mm) in length.	X	
	Single end under 6 inches (152 mm) but over 0.25 inch (6.4 mm).		X
Broken or missing pick	Two or more regardless of extent.	X	
	Note: The filling tie-in or joining shall not be construed as an imperfection of any nature.		
Coarse or light filling bar	Resulting in clearly visible difference in stiffness or thickness of webbing and extending more than 0.25 inch (6.4 mm) 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	

TABLE 1 - Classification of Imperfections (Continued)

Imperfection	Description	Critical	Minor
Drop-ply	Clearly visible on more than 2 ends within the same length and extending over 9 linear inches (229 linear mm) or more.	X	
	Clearly visible on 1 or 2 ends within the same length and extending over 9 linear inches (229 linear mm) or more.		X
Edges inferior	Cut, frayed, torn, slack, or otherwise poorly constructed and over 0.25 inch (6.4 mm) in length.	X	
Float or skips	Three or more, 0.50 inch (12.7 mm) or more in combined warp and filling directions or single float or skip over more than 1 inch (25 mm).	X	
	Three or more, under 0.50 inch (12.7 mm) in combined warp or filling directions or single float or skip over more than 0.50 inch (12.7 mm) but not over 1 inch (25 mm), if in warp, nor more than 0.25 inch (6.4 mm) of the width but not over 1 inch (25 mm), if in filling.		X
Hitchback crack	Clearly visible 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 loop of filling pulled in at the edges.		
Kinks	More than 3 kinks in any 9 linear inches (229 linear mm).	X	
Knots	More than 1 knot in any 9 linear inches (229 linear mm).	X	
	One knot every 2 yards (2 m) with untrimmed ends extending from surface of webbing.		X
Mispick, double pick.	Two or more across the full width.	X	
	Single across the full width.		X
Slack end	Two or more jerked in between picks, or forming clearly visible loops on the surface.	X	
	Single jerked in between picks or forming clearly visible loops on the surface.		X
Slub or slug, gout	More than twice the thickness of the yarn (or ply, if plied).		X
Smash	Any smash.	X	
Spot, stain, or streak	Any clearly visible dirt, rust, grease, oil spot, stain, or streak.	3.5.2.2	
Tight end	Clearly visible up to 12 inches (305 mm) in length.	X	
Wrong draw	Extending more than 9 inches (229 mm).	X	

- 3.5.2.1 Clearly visible, as used in Table 1, is defined as being visible at an inspection distance of 3 feet (1 m).
- 3.5.2.2 Any spot, stain, or streak up to 12 inches (305 mm) 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 (305 mm) shall be a critical imperfection.
- 3.5.3 Overall Examination: Each imperfection 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 below. The imperfections are objectionable odor, unclean throughout, uneven weaving throughout, and identification ticket missing or nonconforming.

TABLE 2

Lot Size Yards		Lot Size Meters		Sample Size Rolls	Max No. Imperfections Accepted in Sample
Up to	1,300, incl	Up to	1,189, incl	1	0
Over	1,300 to 3,200, incl	Over	1,189 to 2,926, incl	3	0
Over	3,200 to 8,000, incl	Over	2,926 to 7,315, incl	5	0
Over	8,000 to 22,000, incl	Over	7,315 to 20,117, incl	7	0
Over	22,000 to 110,000, incl	Over	20,117 to 100,584, incl	10	1
Over	110,000	Over	100,584	15	1

- 3.5.3.1 If a lot contains fewer than 3 rolls, each roll in the lot shall be examined.
- 3.5.4 Length Examination: The units 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 (2 m) below the gross length marked on the ticket shall be considered an imperfection with respect to length. Any roll containing more than 3 pieces, or a piece under 10 yards (9 m) in length, shall be considered an imperfection with respect to length.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of the webbing shall supply all samples for vendor's tests and shall be responsible for performing all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the webbing conforms to the requirements of this specification and the applicable detail specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests for all technical requirements are acceptance tests and preproduction tests and shall be performed prior to or on the initial shipment of webbing to a purchaser, on each lot, and when a change in ingredients and/or processing requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.2.1.1 For direct U.S. Military procurement, substantiating test data and, when requested, preproduction test material shall be submitted to the cognizant agency as directed by the procuring activity, contracting officer, or request for procurement.

4.3 Sampling and Testing:

Shall be as follows:

4.3.1 For Acceptance Tests: Each lot of webbing shall be visually examined as required below for roll quality (3.5) and samples taken at random for all other tests. The number of determinations for each requirement shall be as specified in the applicable test procedure or, if not specified therein, not less than three.

4.3.1.1 Yarn Tests: Prior to weaving the webbing, the yarn shall be sampled as specified below, using 500 yards (457 m) as the sample unit. The lot shall be unacceptable if one or more units fail to meet any requirement specified.

TABLE 3

Lot Size Pounds	Lot Size Kilograms	Sample Size
Up to 800, incl	Up to 363, incl	2
Over 800 to 22,000, incl	Over 363 to 9979, incl	3
Over 22,000	Over 9979	5

4.3.1.2 Webbing Tests: Unless otherwise specified in the applicable test methods, test requirements apply to the average of the determinations made on a sample unit. The sample unit for testing shall be 15 linear yards (14 linear m). The sample size shall be as shown below:

TABLE 4

Lot Size Pounds	Lot Size Kilograms	Sample Size
Up to 800, incl	Up to 363, incl	2
Over 800 to 22,000, incl	Over 363 to 9,979, incl	3
Over 22,000	Over 9,979	5

- 4.3.1.2.1 Overall Examination: The unit for this examination shall be one roll. The rolls examined shall be those selected for the yard-by-yard (meter-by-meter) examination and shall be in accordance with 3.5.2.
- 4.3.1.2.2 Yard-by-Yard (Meter-by-Meter) Examination: The unit for this examination shall be 1 linear yard (1 linear m). The sample size shall be in accordance with MIL-STD-105, Inspection Level III. The number of rolls from which the sample is to be selected shall be in accordance with 3.5.3.
- 4.3.1.2.3 Length Examination:
- 4.3.1.2.3.1 Individual Roll: The unit for this examination shall be one roll. The pieces examined shall be selected for the yard-by-yard (meter-by-meter) examination and shall be in accordance with 3.5.2.
- 4.3.1.2.3.2 Total Length of Sample: The lot shall be unacceptable if the total length of the actual gross length of the rolls in the sample is less than the total gross lengths marked on the piece tickets.
- 4.3.1.3 A lot shall be all webbing of a single size and configuration produced in a single production run under the same fixed conditions and presented for vendor's inspection at one time. A lot may be packaged in small quantities and delivered under the basic lot approval provided lot identification is maintained.
- 4.3.1.4 When a statistical sampling plan has been agreed upon by purchaser and vendor, sampling shall be in accordance with such plan in lieu of sampling as in 4.3.1 and the report of 4.6 shall state that such plan was used.
- 4.3.2 For Preproduction Tests: As agreed upon by purchaser and vendor.
- 4.4 Approval:
- 4.4.1 Sample webbing shall be approved by purchaser before webbing for production use is supplied, unless such approval be waived by purchaser. Results of tests on production webbing shall be essentially equivalent to those on the approved sample webbing.
- 4.4.2 Vendor shall use ingredients, manufacturing procedures, processes, and methods of inspection on production webbing which are essentially the same as those used on the approved sample webbing. If necessary to make any change in ingredients, in type of equipment for processing, or in manufacturing procedures, vendor shall submit for reapproval a statement of the proposed changes in ingredients and/or processing and, when requested, sample webbing. Production webbing made by the revised procedure shall not be shipped prior to receipt of reapproval.
- 4.5 Test Methods:
- Shall be in accordance with Table 5, 4.5.1, and 4.5.2.

TABLE 5

Characteristics	Test Method, FED-STD-191, Method	Number of Determinations Per Sample Unit	Results Reported As
Yarn:			
Denier	4021		
Melting Point	1534		
Twist	4054		
Webbing:			
Thickness	5030	5	Average of 5 determinations to nearest 0.001 inch (2.5 μ m)
Weight	5041	5	Average of 5 determinations to nearest 0.01 ounce (0.3 gram)
Texture: (Full Width)			
Ends	5050	1	To nearest whole number
Binders	5050	1	To nearest whole number
Picks/inch (25.4 mm)	5050	1	To nearest whole number
Breaking Strength	4108	5	Average of 5 determinations to nearest 1.0 pound force (4.5 N)

- 4.5.1 A certificate of compliance shall be submitted for nylon identification, tenacity, luster, melting point, light resistance, heat resistance, and unbleached requirements of yarn and it shall include a certified statement that the yarn used is that specified in 3.2 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.
- 4.5.2 Ply of yarn and weave of webbing shall be determined visually; one determination per sample unit and the result reported as "pass" or "fail".