MIL-W-38282A (USAF)
3 April 1980
SUPERSEDING
MIL-W-38282 (USAF)
10 September 1964

MILITARY SPECIFICATION

WEBBING, TEXTILE, ARAMID, TUBULAR

This specification is approved for use by Air Force Wright Aeronautical Laboratories (Materials Laboratory), 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 woven Aramid tubular webbing of aircraft quality.

1.2 Classification. The webbing shall be of three types, as specified in Table I.

2. APPLICABLE DOCUMENTS

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

SPECIFICATIONS

MILITARY

MIL-W-4334	Webbing and Tape, Textile, Packaging and Packing of

STANDARDS

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: ASD/ENESS, WPAFB, OH 45433 by using the self-addressed Standardization Docuemnt Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

FSC 8305

FEDERAL

FED-STD-191	Textile Test Methods

MILITARY

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

(Copies of specifications, standards, drawings, and publications required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless 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

(Application for copies should be addressed to the Federal Trade Commission, Washington, D C 20425.)

3. REQUIREMENTS

3.1 Materials.

3.1.1 Yarn. The yarn shall be an aramid. The yarn shall not begin to char at a temperature less than 675°F when tested as specified in 4.3.

3.1.1.1 Denier and filament. The yarn shall be 200 ± 15 denier and shall consist of 100 filaments.

3.1.1.2 Twist. The final ply of yarn shall be twisted so as to have a minimum of 2½ turns per inch.

3.2 Construction and physical properties. The finished webbing shall conform to Table I and 3.2.1 through 3.4.

TABLE I. Construction and physical characteristics.

Characteristic	Type I	Type II	Type III	Type IV
Width, inches	9/16 ± 1/16	3/4 ± 1/16	1 ± 1/16	3 3/16 ± 1/16
Thickness, inches (max.)	0.080	0.095	0.120	0.045
Weight, oz/yd (max.)	0.65	1.1	1.75	1.85
Breaking Strength, lb				
Unaged (min.)	1400	2300	4000	2250
Aged (percent of unaged)	85	85	85	85
Elongation, percent (min.)	12.0	15.0	20.0	-
Ends (min.)	177	145	251	309
Picks per inch (min.)	24	24	24	60
Ply (min.)	4	8	8	4

3.2.1 Weave. The weave shall be tubular, plain, one up and one down.

3.3 Color. Unless otherwise specified (see 6.2). The color of the webbing shall be Sage Green 1565. The color shall be obtained by use of melt spun solution dyed yarn.

3.4 Length and put-up. Unless otherwise specified (see 6.2), webbing shall be furnished on spools containing yardage as given below:

Type	Yardage	No. of pieces (max.)
I	425 ± 10	5
II	260 ± 10	3
III	160 ± 10	2
IV	160 ± 10	2

No piece shall be less than 20 yards in length.

3.5 Identification of product. Each spool shall have a label or tag marked with the following information and attached in such a manner as to remain in place until all webbing has been removed from the spool.

WEBBING, TEXTILE, ARAMID, TUBULAR
Number and date of this specification
Width
Actual yardage; net yardage
Contract or order number
Name of contractor
Stock number
Date of manufacture (month and year).

3.6 Fiber identification. Each spool of webbing shall be labeled, ticketed, or invoiced for fiber content in accordance with the Textile Fiber Products Identification Act, effective 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 this specification. The occurence of defects shall not exceed the levels set by the applicable quality levels.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract, 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 the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.2 Quality conformance tests. All the tests required for the testing of webbing are classified as quality conformance tests. Except when otherwise specified, sampling shall be in accordance with MIL-STD-105.

4.3 Testing of the yarn. The methods of testing specified in FED-STD-191, as listed in Table II shall be followed. The sample unit shall be 1 cone, 1 tube or 1 spool. The lot shall be unacceptable if one or more units fail to meet any requirement specified. The sample size shall be as follows:

Lot size (yards)	Number of samples
800 or less	2
801 to 10,000	3
10,001 and over	5

TABLE II. Testing of yarn.

Characteristic	Requirement paragraph	Number of determinations	Test method
Denier	3.1.1.1	3	1/
Ply	Table I	1	Visual
Twist	3.1.1.2	3	4054
Carborization 2/	3.1.1	1	1534

1/Denier shall be calculated as follows and shall be reported to the nearest whole number:

$$\text{Denier} = \frac{\text{Weight of speciment in grams} \times 9840}{\text{Length of specimen in yards}}$$

2/The supplier's certificate of compliance showing that the yarn identified in 6.3 was used may be submitted in lieu of test method. If a determination is made, the specimen shall be taken from the woven webbing.

4.3.1 Carbonization.

4.3.1.1 Apparatus. A suitable melting point apparatus meeting test method requirements, shall be used to determine the carbonization point of the yarns.

4.3.1.2 Procedure. A sufficient number of fibers shall be removed from the yarn sample for observation of carbonization. The temperature at which the yarn begins to stiffen or char shall be considered the end point of the test.

4.4 Examination of end item.

4.4.1 Yard-by-yard examination. The required yardage of each piece shall be inspected and visual defects classified as listed in Table III. The 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 MIL-STD-105. For critical defects, the lot shall be rejected when one or more critical defects are found in the sample size. The acceptable quality level shall be 0.15 critical defects, 0.4 major and 1.5 total (major and minor defects combined) defects per 100 units. The lot size shall be expressed in units of 1 linear yard each. An approximate equal number of yards shall be examined from each spool selected.

TABLE III. Classification of defects.

Defect	Description	Critical	Major	Minor
Abrasion marks	Resulting in rupture of yarns, or in nap sufficient to obscure the identify of any yarn, exceeding 10 percent of width or 1 inch in length.		X	

TABLE III. Classification of defects. (continued)

Defect	Description	Critical	Major	Minor
Broken or missing end	2 or more regardless of length or a single end exceeding 6 inches in length.	X		
	Single end under 6 inches but exceeding ¼ inch.			X
Broken or missing pick	2 or more regardless of extent.	X		
Course or light filling bar	Resulting in noticeable difference in stiffness of webbing and extending for more than ¼ inch in the length direction. 1/			X
	Resulting in noticeable difference in stiffness or thickness of webbing and extending for ¼ inch or less in the length direction.			X
Crease or wrinkle	Twisted or distorted. Will not lay flat upon application of manual pressure.			X
Cut, hole or tear	Any cut, hole or tear.	X		
Drop-ply	Clearly noticeable on more than 2 ends within same length and extending over 9 linear inches or more. 1/	X		
	Clearly noticeable on 1 or 2 ends within same length and extending over 9 linear inches or more.			X
Edge beaded or corded	Noticeable increase in edge thickness or misformed edge.			X
Edge folded or rolled	(See Crease or wrinkle defect).			X
Edge loopy	Forming clearly noticeable filling loops, or edge tied loosely to body of webbing for 2 linear inches or more		X	
Edge loose (slack)	Resulting in waviness, distortion in orientation of filling or looseness along edge.		X	
Edge-nicks or bumps	Any nick or bump falling outside the width tolerance as specified or exceeding ¼ inch in length.		X	

TABLE III. Classification of defects. (continued)

Defect	Description	Critical	Major	Minor
Edge cut, torn or frayed	Any cut, torn or frayed edge, clearly noticeable rupture of yarn along edge.	X		
Edge tight	Resulting in noticeable tension along edge or pucker, waviness, bagginess or slackness that cannot be flattened by manual pressure.	X		
Fine or light filling bar, light place	Clearly noticeable.		X	
Floats or skips	Multiple, ½ inch or more in combined warp and filling directions or single float or skip over more than 1 inch.	X		
	Multiple, less than ½ inch in combined warp or filling directions or single float or skip over more than ½ inch but not exceeding 1 inch, if in warp, or more than ¼ inch of the width but not exceeding 1 inch, if in filling.			X
Hitchback crack	Clearly noticeable opening between adjoining picks, or warpwise tension area over part of the width resulting in noticeable light and heavy places.			X
Jerked-in filling, slough-off and slug	More than twice the thickness of the normal yarn.			X
Kinks	More than 3 in any 9 linear inches.		X	
Knots	More than 2 knots in any 9 linear inches.		X	
	Single knot with untrimmed ends extending more than 1/16 inch from surface.			X
Mispick, double pick	2 or more across the full width.		X	
	Single across the full width.			X
Slack end	2 or more in the same length, jerked in between picks, or forming clearly noticeable loops on the surface.		X	

TABLE III. Classification of defects. (continued)

Defect	Description	Critical	Major	Minor
Slack End	Single jerked in between picks, or forming clearly noticeable 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 noticeable dirt, rust, grease, oil spot, stain or streak			X
Tight end	Clearly noticeable.		X	
Tight pick or tight filling	Resulting in rolling of webbing (also, see Edge scalloped defect).		X	
Wrong draw.....	Extending for more than 9 inches.		X	

1/ The terms "clearly noticeable" and "noticeable" contained in defect descriptions shall be interpreted to mean clearly visible at normal inspection distance (approximately 3 feet).

4.4.2 Overall examination. Each defect listed below shall be counted no more than once in each spool examined. The sample unit for this examination shall be one spool. The sample size and acceptance number shall be as shown in Table IV.

Defects

Objectionable odor
Unclean throughout
Uneven shading, spottiness, poor penetration
Uneven weaving throughout

TABLE IV. Sampling for overall examination.

Lot size in yards	Sample size in spools	Maximum number of defects acceptable in sample
up to 1,300 1/	1	0
1,301 to 3,200	3	0
3,201 to 8,000	5	0
8,001 to 22,000	7	0
22,001 to 110,000	10	1
110,001 and over	15	1

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

4.4.3 Examination of length.

4.4.3.1 Individual spool. The spool shall be examined for gross length and the number and length of pieces in the spool. Any gross length (spool) found to be more than 2 yards below the gross length marked on the piece ticket, or any spool found to contain more than the number of pieces allowed (see 3.4) or any one piece less than yards in length shall be considered as a defect with respect to length. The unit of product for this examination shall be 1 spool. The sample size and acceptance number shall conform to Table IV.

4.4.3.2 Total yardage in sample. The lot shall be unacceptable if the total of the actual gross length of spools in the sample is less than the total of the gross lengths marked on the ticket.

4.4.4 Examination for compliance with Textile Fiber Products Identification Act. During the examination of individual spool for length, each spool in the sample shall be examined for conformance to the Textile Fiber Products Identification Act. Each spool not labeled in accordance with this act shall be a defect. The lot shall be unacceptable if two or more of these defects occur.

4.5 Examination of preparation for delivery. An examination shall be made to determine conformance with the packaging, packing, and marking requirements of the applicable specification. Defects shall be scored as specified below. The sample unit shall be one shipping container fully prepared for delivery, with the exception that it need not be sealed. Defects of closure listed below shall be examined on shipping containers fully prepared for delivery. The lot size shall be the number of containers in the inspection lot. The inspection level shall be S-2 and the AQL shall be 4.0 defects per 100 units.

Examine	Defects
Marking (exterior and interior)	Omitted, incorrect, illegible, of improper size, location, sequence, or method of application.
Materials	Any component missing.
	Any component damaged, affecting serviceability.
Workmanship	Inadequate application of components, such as incomplete closure of case liners, container flaps, loose strapping, inadequate stapling.
	Bulging or distortion of containers.
Weight (exterior)	Gross/net weight exceeds requirements.

4.6 Testing of the end item. The methods of testing specified in wherever applicable, as listed in Table V and 4.6.1 and 4.6.2 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 determination breaks lower than the required minimum. The sample unit for testing shall be 8 linear yards. The lot shall be unacceptable if one or more samples fail to meet any requirement specified. The sample size shall be as specified in 4.3.

TABLE V. Test methods.

Characteristic	Requirement Reference	Test Method	Number of Determinations	Results Reported As
Width	Table I	5040 1/	3	Pass or Fail
Thickness	Table I	5030 1/	5	Nearest 0.001 inch
Weight	Table I	5040	3	Nearest 0.01 lb
Breaking Strength				
Unaged	Table I	4.6.1	5	Nearest 1.0 lb
Aged	Table I	4.6.2	5	Nearest 1.0% loss
Elongation	Table I	4.6.1	5	Nearest 0.1%
Ends	Table I	Visual	3	Nearest Whole Number
Picks	Table I	Visual	3	Nearest Whole Number
Weave	3.2.1	Visual	1	Pass or Fail

1/ Except that a 6-ounce total load shall be applied and the presser foot diameter shall be 3/8 inch.

4.6.1 Breaking strength and elongation. The breaking strength shall be determined by testing of full width specimens. Tests shall be conducted on a machine of an approved type. The test grips for holding the specimens shall be of the split-drum type approximately 3 3/4 inch in diameter and 4 inches in length. The no-load rate of jaw separation shall be 4 inches per minute. The distance between the center of the holding drum at the start of the test shall be 10 $\pm$ ½ inches. The minimum length of the specimens taken for test shall be 40 inches. This length will vary with thickness of the webbing being tested.

4.6.2 Aging. The size of the specimens for oven aging shall be the same as specified in 4.6.1 for the unaged tests. The specimens shall be placed in an oven at 500 °± 10°F for 4 hours. Upon removal, the specimens shall be conditioned at 70 °± 2°F and 65 ± 2 percent relative humidity for 4 hours and then tested for breaking strength as specified in 4.6.1. The loss in breaking strength due to the aging treatment shall be reported as percent loss from the unaged specimens.

5. PACKAGING

5.1 Packaging, packing and marking. The webbing shall be packaged, packed and marked in accordance with MIL-W-43334.

6. NOTES

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

6.2 Ordering data. Procurement documents should specify:

a. Title, number and date of this specification.
b. Type (see Table I.).
c. Quality,
d. Length of spool required, if other than specified in 3.4.

6.3 An acceptable material for these webbings, NOMEX, is manufactured by the E. I. du Pont de Nemours and Company. Inc.

Custodian:
Air Force - 11

Preparing Activity:
Air Force - 11

Review Activity:
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Project No. 8305-F743

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