



<b>AEROSPACE MATERIAL SPECIFICATION</b>	<b>AMS3799™</b>	<b>REV. C</b>
	Issued 1983-10 Reaffirmed 2006-01 Revised 2016-01 Superseding AMS3799B	
(R) Webbing, Tubular, Low-Modulus Aramid-54		

### RATIONALE

This standard has been revised as a result of the normal 5 year review process. The revisions made update some of the test methods and reference documents for more specific detail and methodology.

#### 1. SCOPE

##### 1.1 Form

This specification covers a low-modulus aramid in the form of tubular webbing.

##### 1.2 Application

This webbing has been used typically in construction of parachutes, but usage is not limited to such applications.

##### 1.3 Classification

Tubular aramid webbing shall be as specified in the applicable detail specification, classified by width and breaking strength. An example is shown in 8.2. The webbing covered by each detail specification appears as part of the title.

##### 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.

#### 2. APPLICABLE DOCUMENTS

The issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

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## 2.1 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, [www.astm.org](http://www.astm.org).

ASTM D123	Terminology Relating to Textile Materials
ASTM D1423	Standard Test Method for Twist in Yarns by Direct-Counting
ASTM D1777	Measuring Thickness of Textile Materials
ASTM D3774	Width of Woven Fabric
ASTM D3775	Standard Test Method for Warp (End) and Filling (Pick) Count of Woven Fabrics
ASTM D3776/D3776M	Mass per Unit Area (Weight) of Woven Fabric

## 2.2 U.S. Government Publications

Copies of these documents are available online at <http://quicksearch.dla.mil>.

FED-STD-4	Glossary of Fabric Imperfections
FED-STD-595	Color
MIL-W-43334	Webbing and Tape, Textile, Packaging and Packing of

## 2.3 ASQ Publications

Available from American Society for Quality, 600 North Plankinton Avenue, Milwaukee, WI 53203, Tel: 800-248-1946 (United States or Canada), 001-800-514-1564 (Mexico) or +1-414-272-8575 (all other locations), [www.asq.org](http://www.asq.org),

ANSI/ASQ Z1.4	Sampling Procedures and Tables for Inspection by Attributes
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## 2.4 Other Publications

Available from Federal Trade Commission, Washington, DC 20580.

Rules and Regulations Under the Textile Fiber Products Identification Act

## 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 applicable detail specification. In case of conflict between requirements of this basic specification and an applicable detail specification, requirements of the detail specification shall govern.

### 3.2 Material

Webbing shall be woven from low modulus aramid fibers, which shall not begin to char at lower than 671 °F (355 °C), determined in accordance with 4.5.1. The yarn shall be of the filament count, denier, twist, color, and 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 the test methods shown in Table 1.

**Table 1 - Test methods**

Property	Test Method
Carbonization (see 3.3.1)	4.5.1
Denier	4.5.2
Twist	ASTM D1423

#### 3.3.1 Carbonization

Yarn manufacturer's statement of conformance may be used in lieu of actual test; however, if testing is performed after weaving, the sample for test shall be obtained by unraveling the woven webbing.

### 3.4 Properties of Webbing

Shall be as specified in the applicable detail specification, determined in accordance with test methods shown in 4.5.

### 3.5 Quality

The webbing, as received by purchaser, shall be 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 2 herein. Definitions of terms used herein are covered in ASTM D123. The terms "clearly noticeable" and "noticeable" contained in defect descriptions of Table 2, shall be interpreted to mean visible at normal inspection distance; approximately 1 yard (0.9 m).

#### 3.5.2 Yard-by-Yard Examination

The required length of each piece shall be inspected and visual imperfections classified as listed in Table 2. The 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 (0.9 m) or fraction thereof in which it occurs. For critical imperfections, the lot shall be rejected when one or more critical imperfections are found in the sample. The acceptable quality level shall be 0.15 critical imperfections, 0.4 major and 1.5 total (major and minor imperfections combined) imperfections per 100 units. The lot size shall be expressed in units of 1 linear yard (0.9 m) each. An approximate equal number of yards (meters) shall be examined from each roll selected.

**Table 2 - Classification of imperfections**

Imperfection	Description	Classification
Abrasion marks	Resulting in rupture of yarns or in nap sufficient to obscure the identify of any yarn, over 10% of width or 1 inch (25 mm) in length.	Critical
Broken or missing end	Two or more regardless of length or a single end over 6 inches (152 mm) in length.	Critical
	Single end over 0.25 to 6.0 inches (6.4 to 152 mm), inclusive.	Minor
Broken or missing pick	Two or more regardless of extent.	Critical
Coarse or light filling bar	Resulting in noticeable difference in stiffness of webbing and extending over 0.25 inch (6.4 mm) in the length direction.	Major
	Resulting in noticeable difference in stiffness or thickness of webbing and extending 0.25 inch (6.4 mm) or under in length direction.	Minor
Crease or wrinkle	Twisted or distorted. Will not lay flat upon application of manual pressure.	Minor
Cut, hole, or tear	Any cut, hole, or tear.	Critical
Drop ply	Clearly noticeable on more than two ends within same length and extending over 9 linear inches (229 linear mm) or more.	Critical
	Clearly noticeable on one or two ends within same length and extending 9 linear inches (229 linear mm) or more.	Minor
Edge beaded or corded	Noticeable increase in edge thickness or misformed edge.	Minor
Edge folded or rolled	(See crease or wrinkle defect)	Minor
Edge loopy	Forming clearly noticeable filling loops, or edge tied loosely to body of webbing for 2 linear inches (51 linear mm) or over.	Major
Edge loose	Resulting in waviness, distortion in orientation of filling, or looseness along edge.	Major
Edge nicks or bumps	Any nick or bump falling outside the width tolerance as specified or over 0.25 inch (6.4 mm) in length.	Major
Edge cut, torn, or frayed	Any cut, torn, or frayed edge or clearly noticeable rupture of yarn along edge.	Critical
Edge tight	Resulting in noticeable tension along edge, or pucker, waviness, bagginess, or slackness that cannot be flattened by manual pressure.	Critical
Fine or light filling bar, light place	Clearly noticeable.	Major

**Table 2 - Classification of imperfections (continued)**

Imperfection	Description	Classification
Floats or skips	Multiple 0.5 inch (12.7 mm) or over in combined warp and filling directions or single float or skip over 1 inch (25 mm).	Critical
	Multiple, under 0.5 inch (12.7 mm) in combined warp or filling directions or single float or skip over more than 0.5 inch (12.7 mm), but not over 1 inch (25 mm) if in warp, or more than 0.25 inch (6.4 mm) of the width but not over 1 inch (25 mm), if in filling.	Minor
Hitchback crack	Clearly noticeable opening between adjoining picks, or warpwise tension area over part of the width resulting in noticeable light and heavy places.	Minor
Jerked-in filling, slough-off, and slug	More than twice the thickness of the normal yarn.	Minor
Kinks	More than three kinks in any linear inch (25 linear mm).	Major
Knots	More than two knots in any 9 linear inches (229 linear mm).	Major
Mispick, double pick	Two or more across the full width.	Major
	Single across the full width.	Minor
Slack end	Two or more in the same length, jerked in between picks, or forming clearly noticeable loops on the surface.	Major
	Single, jerked in between picks, or forming clearly noticeable loops on the surface.	Minor
Slub or slug	More than twice the thickness of the yarn, (or ply if plied).	Minor
Smash	Any smash.	Critical
Spot, stain, or streak	Any clearly noticeable dirt, rust, grease, oil spot, stain, or streak.	Major
Tight end	Clearly noticeable.	Major
Tight pick or tight filling	Resulting in rolling of webbing.	Major
Wrong draw	Extending over 9 inches (229 mm).	Major

### 3.5.3 Overall Examination

Each imperfection consisting of objectionable odor, unclean throughout, uneven shading, spottiness, poor penetration, or uneven weaving throughout 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 3.

**Table 3 - Sampling for overall examination**

Lot Size Yards		Lot Size Meters		Sample Size, Rolls	Maximum Number of Imperfections Accepted in Sample
Up to	1300, inclusive	Up to	1189, inclusive	1	0
Over	1300 to 3200, inclusive	Over	1189 to 2926, inclusive	3	0
Over	3200 to 8000, inclusive	Over	2926 to 7315, inclusive	5	0
Over	8000 to 22000, inclusive	Over	7315 to 20117, inclusive	7	0
Over	22000 to 110000, inclusive	Over	20117 to 100584, inclusive	10	1
Over	110000	Over	100584	15	1

### 3.6 Sizes and Tolerances

Shall be as specified in the applicable detail specification.

## 4. QUALITY ASSURANCE PROVISIONS

### 4.1 Responsibility for Inspection

The vendor of 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.

### 4.2 Classification of 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, 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 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 for quality (3.5) and sampled 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 specified in Table 5, taken from 3 linear yards (2.7 linear m) of webbing.

##### 4.3.1.1 Yarn Tests

Prior to weaving the webbing, the yarn shall be sampled as shown in Table 4, using one cone, one tube, or one spool as the sample unit. The lot shall be unacceptable if one or more units fail to meet any specified requirement.

**Table 4 - Yarn sampling**

Lot Size Yards	Lot Size Meters	Number of Sample Units
Up to 800, inclusive	Up to 732, inclusive	2
Over 800 to 10000, inclusive	Over 732 to 9144, inclusive	3
Over 10000	Over 9144	5

#### 4.3.1.2 Webbing Tests

##### 4.3.1.2.1 Yard-by-Yard Examination of Webbing

The unit of webbing for this examination shall be 1 linear yard (0.9 linear m). The sample size shall be in accordance with MIL-STD-105, Inspection Level III.

##### 4.3.1.2.2 Webbing - Overall Examination

The sample unit for this examination shall be in accordance with ANSI/ASQ Z1.4, General Inspection Level III.

##### 4.3.1.2.2.1 If a lot contains less than three rolls, each roll in the lot shall be examined.

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. For mechanical property testing, a lot shall not exceed 5000 yards (4572 m).

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.

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 re-approval a statement of the proposed changes in ingredients and/or processing and, when requested, sample webbing. Production webbing made by the revised procedures shall not be shipped prior to receipt of re-approval.

#### 4.5 Test Methods

Shall be as specified in Table 5 and as follows:

**Table 5 - Test methods**

Characteristics	Test Method	Number of Determinations	Results Reported as
Width	ASTM D3774	3	Pass or fail
Thickness	ASTM D1777 <sup>(A)</sup>	3	Nearest 0.001 inch (0.025 mm)
Weight	ASTM D3776	3	Nearest 0.01 pound (4.5 kg)
Breaking Strength			
Unaged	4.5.3	5	Nearest 1.0 pound force (4.4 N)
Aged	4.5.4	5	Nearest 1.0%
Elongation	4.5.3	5	Nearest 0.1%
Ends	ASTM D3775	3	Nearest whole number
Picks	ASTM D3775	3	Nearest whole number
Weave	Visual	1	Pass or fail
Color	FED-STD-595, Visual		

(A) A 6-ounce (1.7-N) total load shall be applied and the presser foot diameter shall be 3/8 inch (9.5 mm).

#### 4.5.1 Carbonization

Except for breaking strength, the physical and chemical values specified apply to the average of the determinations made on a sample unit for test purposes as specified in the applicable test method. For breaking strength, the lot is not acceptable if any individual determination breaks at a load lower than the required minimum. The sample unit for testing shall be 8 linear yards (7.3 linear m). The lot shall be unacceptable if one or more samples fail to meet any requirement specified. The sample size shall be as specified in 4.3.1.

##### 4.5.1.1 Apparatus

A suitable melting point apparatus shall be used.

##### 4.5.1.2 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.

#### 4.5.2 Denier

Shall be determined as follows:

4.5.2.1 Measure a 900 mm length of yarn to the nearest millimeter.

4.5.2.2 Weigh the yarn sample in grams to the nearest 10 milligrams.