



400 Commonwealth Dr., Warrendale, PA 15096

AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard

AMS 3907

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CLOTH, ARAMID Plain and Basket Weave

1. SCOPE:

- 1.1 Form: This specification and its supplementary detail specifications cover aramid fiber in the form of woven cloth.
- 1.2 Application: Primarily for use in fabricating special flight, shipboard, and ground combat clothing.
- 1.3 Classification: The requirements specified herein and in the detail specifications define each cloth by weight and type of weave as shown in the titles of the detail specifications.

2. APPLICABLE DOCUMENTS: The following documents form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

- 2.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

- 2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods

- 2.2 U.S. Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120 except as specified in 2.2.4.

- 2.2.1 Federal Specifications:

V-T-285 - Thread, Polyester

PPP-P-1133 - Packaging and Packing of Synthetic Fiber Fabric

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2.2.2 Federal Standards:

FED-STD-4 - Glossary of Fabric Imperfections
FED-STD-191 - Textile Test Methods

2.2.3 Military Standards:

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

2.2.4 Other Documents: Available from Federal Trade Commission, Washington, DC 20580.

Textile Fiber Products Identification Act, Rules and Regulations

2.3 Other Publications: Available from American Association of Textile Chemists and Colorists, P. O. Box 12215, Research Triangle Park, NC 27709.

Technical Manual of the AATCC, Method 76-1978 - Electrical Resistivity
of Fabrics

3. TECHNICAL REQUIREMENTS:

3.1 Detail Specifications: The requirements for a specific cloth shall consist
of the requirements specified herein in addition to the requirements
specified in the applicable detail specification. In case of conflict
between the requirements of this specification and the applicable detail
specification, requirements of the detail specification shall govern.

3.2 Material: Fiber used in construction of the cloth shall be a non-melting
aramid, 1.5 denier per filament, cut to a staple length of 1-1/2 to 2 in.
(38 to 50 mm). The fiber shall not char at a temperature lower than 357°C
(675°F).

3.3 Properties: Cloth shall conform to the requirements specified in the
applicable detail specifications; tests shall be performed on the cloth
supplied and in accordance with test methods specified in 4.5 and Table I.

3.4 Quality: Cloth, as received by purchaser, shall be clean, evenly woven, and
free from foreign materials and from imperfections detrimental to usage of
the cloth.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the cloth shall supply all
samples for vendor's tests and shall be responsible for performing all
required tests. Results of such tests shall be reported to the purchaser as
required by 4.6. Purchaser reserves the right to sample and to perform any
confirmatory testing deemed necessary to ensure that the cloth conforms to
the requirements of this specification and the applicable detail
specification.

4.2 Classification of Tests:

- 4.2.1 Acceptance Tests: Tests to determine conformance to the following requirements are classified as acceptance tests and shall be performed on each lot:

Requirement	Reference
Breaking Strength	See Detail Specification
Tear Strength	See Detail Specification
Air Permeability	See Detail Specification
Quality	3.4

- 4.2.2 Preproduction Tests: Tests to determine conformance to all technical requirements of this specification and the applicable detail specification are classified as preproduction tests and shall be performed prior to or on the initial shipment of cloth to a purchaser, when a change in material, processing, or both requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

- 4.2.2.1 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, the contracting officer, or the request for procurement.

4.3 Sampling: Shall be as follows:

- 4.3.1 For Acceptance Tests: Sufficient cloth shall be taken at random from each lot to perform all required 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 A lot shall be all cloth 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 under the basic lot approval provided lot identification is maintained.

- 4.3.1.2 The sample unit shall be 5 continuous yd (4.5 continuous m), full width of the finished cloth. Lot size shall be expressed in units of 1 yd (1 m). The lot shall be unacceptable if one or more sample units fail to meet any specified requirement. Sample size shall be as follows:

Lot Size				Sample Size
Yards		Metres		
	Up to 800, incl		Up to 730, incl	2
Over	800 to 22,000, incl	Over	730 to 20,100, incl	3
Over	22,000	Over	20,100	5

- 4.3.1.3 When a statistical sampling plan and acceptance quality level (AQL) have 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. Approval:

4.4.1 Sample cloth shall be approved by purchaser before cloth for production use is supplied, unless such approval be waived by purchaser. Results of tests on production cloth shall be essentially equivalent to those on the approved sample cloth.

4.4.2 Vendor shall use ingredients, manufacturing procedures, processes, and methods of inspection on production cloth which are essentially the same as those used on the approved sample cloth. 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 material, processing, or both and, when requested, sample cloth. Production cloth made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5 Test Methods: Shall be in accordance with Table I and the following:

4.5.1 Curling: Two specimens of cloth, 1-1/2 x 6 in. (37.5 x 150 mm) shall be cut, one having the long dimension parallel to the filling and the other with the long dimension parallel to the warp. Both specimens shall be placed on a flat surface for at least five min. and then shall be immediately visually examined for evidence of curling.

4.5.2 Flammability (For Type 456 Fiber Only): A circular cloth sample shall be held in a horizontal position between two metal plates with a 6-in. (150-mm) diameter fabric exposure. One side of the fabric shall be exposed to a Meker burner in the center at a 90 deg angle using natural gas (2 L per min. flow rate) for 30 sec with 2 in. (50 mm) distance between cloth and burner top.

4.5.3 Yard-by-Yard (Metre-by-Metre) Examination: Each roll in the sample shall be examined on the face side only. When the total length in the roll does not exceed 100 yd (90 m), the entire roll shall be examined. When the total length in the roll exceeds 100 yd (90 m), only 100 yd (90 m) shall be examined. All defects, as defined in FED-STD-4, Section III, which are visible at normal inspection distance of 3 ft (1 m) shall be scored and assigned demerit points as listed in 4.3.1.4.5 except as follows:

4.5.3.1 Only coarse yarns that exceed twice the normal yarn diameter shall be scored.

4.5.3.2 Mixed filling (shade bar) shall be scored only when resulting from wrong ply, wrong twist in the yarn, or off shade yarn.

4.5.3.3 Only knots and slubs which exceed the limits shown on the Sears Fabric Defect Scale (See 8.1), Size F for slubs and Size D for knots shall be scored.

- 4.5.3.4 No linear yd (linear m) (increments on the measuring device of the inspection machine) from any one roll within the sample shall be penalized more than 4 points. The sample size shall be 20 rolls selected from 20 containers. The lot shall be unacceptable if the points per 100 sq yd (85 m²) of the total length examined exceeds 50 points., The lot shall be unacceptable if the points per 100 sq yd (85 m²) of two or more individual rolls exceeds 75 points. If one roll exceeds 75 points per 100 sq yd (85 m²), a second sample of 20 rolls shall be examined only for roll quality (3.4). The lot shall be unacceptable if one or more rolls in the second sample exceeds 75 points per 100 sq yd (85 m²). Point computation for lot quality and individual roll quality shall be as follows:

In inch-pound units:

$$\frac{\text{Total points scored in sample} \times 3600}{\text{Width of cloth, in.,} \times \text{total length, yd, inspected}} = \text{Points per 100 sq yd}$$

In SI units:

$$\frac{\text{Total points scored in sample} \times 100,000}{\text{Width of cloth, mm,} \times \text{total length, m, inspected}} = \text{Points per 100 m}^2$$

- 4.5.3.5 Demerit Points: Shall be assigned as follows:

	Points
Defects up to 3 in. (75 mm), incl, in any dimension	1
Defects over 3 to 6 in. (75 to 150 mm), incl, in any dimension	2
Defects over 6 to 9 in. (150 to 225 mm), incl, in any dimension	3
Defects over 9 in. (225 mm) in any dimension	4

- 4.5.3.5.1 The following defects, when present, shall be scored 4 points for each linear yd (linear m) in which they occur:

Baggy, ridgy or wavy cloth
Width less than specified
Uneven weaving

- 4.5.4 Examination for Length:

- 4.5.4.1 Individual Rolls: During the yard-by-yard (metre-by-metre) examination, each roll in the sample shall be examined for length. Any length found to be less than the minimum specified or more than 2 yd (1.8 m) less than the length marked on the ticket shall be considered a defect with respect to length. The lot shall be unacceptable if two or more rolls in the sample are defective in respect to length.

4.5.4.2 Total Yardage (Metres) in Sample: The lot shall be unacceptable if the total of the actual lengths of the rolls in the sample is less than the total of the lengths marked on the ticket.

4.5.5 Examination for Shade: During the yard-by-yard (metre-by-metre) examination, each roll in the sample shall be examined for shade. Any roll in the sample off shade, shaded side to side, side to center, end to end shall be cause for rejection of the entire lot represented.

4.5.6 Examination for Compliance to the Textile Fiber Products Identification Act: Each roll not labeled or ticketed in accordance with this Act shall be a defect. The lot shall be unacceptable if two or more of these defects occur.

4.6 Reports:

4.6.1 The vendor of cloth shall furnish with each shipment a report showing the results of tests to determine conformance to the acceptance test requirements and stating that the cloth conforms to the other technical requirements of this specification and the applicable detail specification. This report shall include the purchase order number, AMS 3907, vendor's material designation, lot number, weight, and quantity.

4.6.2 The vendor of finished or semi-finished parts shall furnish with each shipment a report showing the purchase order number, AMS 3907 and the applicable detail specification number, contractor or other direct supplier of cloth, supplier's product identification, part number, and quantity. When cloth for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of cloth to determine conformance to the requirements of this specification and shall include in the report either a statement that the cloth conforms or copies of laboratory tests showing the results of tests to determine conformance.

4.7 Resampling and Retesting: If any specimen used in the above tests fails to meet the specified requirements, disposition of the cloth may be based on the results of testing three additional specimens for each original nonconforming specimen. Failure of any retest specimen to meet the specified requirements shall be cause for rejection of the cloth represented and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Packaging and Identification:

5.1.1 Cloth shall be furnished in continuous lengths, each not less than 40 yd (36 m), put up on full width rolls.

- 5.1.2 Each roll shall have a label or tag, legibly marked with not less than the following information, attached in such a manner as to remain in place until all cloth has been removed from the roll:

CLOTH, ARAMID, PLAIN (or BASKET) WEAVE

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MANUFACTURER'S NAME _____

MANUFACTURER'S MATERIAL DESIGNATION _____

WIDTH OF CLOTH, If other than specified _____

WEIGHT PER YARD (METRE) _____

COLOR _____

LOT NUMBER _____

ROLL NUMBER (If used) _____

DATE OF MANUFACTURE _____

QUANTITY _____

*Insert applicable detail specification number.

- 5.1.3 Individual rolls shall be wrapped in a suitable protective film and packaged in an exterior shipping container in such a manner that the rolls, during shipment and storage, will be protected from exposure to moisture, weather, or any other normal hazard.
- 5.1.4 Each exterior shipping container shall be legibly marked with not less than the following information in such a manner that the markings will not smear or be obliterated during normal handling or use:

CLOTH, ARAMID, PLAIN (or BASKET) WEAVE

AMS 3907/*

PURCHASE ORDER NUMBER _____

MANUFACTURER'S NAME _____

MANUFACTURER'S MATERIAL DESIGNATION _____

DESCRIPTION _____

LOT NUMBER _____

NET WEIGHT _____

QUANTITY _____

*Insert applicable detail specification number.

- 5.1.5 Containers of cloth shall be prepared for shipment in accordance with commercial practice and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the cloth to ensure carrier acceptance and safe delivery. Packaging shall conform to carrier rules and regulations applicable to the mode of transportation.
- 5.1.6 For direct U. S. Military procurement, packaging, packing, and marking shall be in accordance with PPP-P-1133, Level A, Level B, or Level C, as specified in the request for procurement. Commercial packaging as in 5.1.1, 5.1.3, and 5.1.5 will be acceptable if it meets the requirements of Level C.

- 5.1.7 Each roll of cloth shall be labeled or ticketed for fiber content in accordance with the Textile Fiber Products Identification Act.
6. ACKNOWLEDGMENT: A vendor shall mention this specification number and the applicable detail specification number in all quotations and when acknowledging purchase orders.
7. REJECTIONS: Cloth not conforming to this specification and the applicable detail specification or to modifications authorized by purchaser will be subject to rejection.
8. NOTES:
- 8.1 Sears Fabric Defect Scales are available from Sears, Roebuck & Co., Department 769, Fabric Replica Kit, 925 South Homan Avenue, Chicago, IL 60607.
- 8.2 Dimensions and properties in inch/pound units and the Celsius temperatures are primary; dimensions and properties in SI units and the Fahrenheit temperatures are shown as the approximate equivalents of the primary units and are presented only for information.
- 8.3 For direct U. S. Military procurement, purchase documents should specify not less than the following:
- Title, number and date of this specification and the applicable detail specification
Width of cloth desired
Color of cloth desired
Quantity of cloth desired
Applicable level of packaging (See 5.1.6)
- 8.4 Similar Specifications: This specification and its detail specifications are the equivalent of MIL-C-83429A, dated 12 April 1982.
- 8.5 Cloth meeting the requirements of this specification has been classified under Federal Supply Classification (FSC) 8305.

This specification and the applicable detail specifications are under the jurisdiction of AMS Committee "C P".