

AEROSPACE
MATERIAL
SPECIFICATION

AMS 3785

Issued 7-1-85

Revised

CLOTH, META-ARAMID WARP
META-ARAMID/PARA-ARAMID OR META-ARAMID/NOVOLOID FILLING
Napped

1. SCOPE:

1.1 Form: This specification covers a non-melting synthetic fabric in the form of a napped cloth.

1.2 Application: Primarily for use in the manufacture of flight clothing.

2. APPLICABLE DOCUMENTS: The following publications 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:

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

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

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

Textile Fiber Products Identification Act, Rules and Regulations

3. TECHNICAL REQUIREMENTS: The finished cloth shall conform to the requirements in Table I and the following; tests shall be performed on the cloth supplied and in accordance with specified test methods insofar as practicable:

3.1 Material:

- 3.1.1 Warp: The yarn shall be 200/100 denier continuous filament meta-aramid. The yarn shall not char at lower than 355°C (675°F).

- 3.1.2 Filling: The yarn shall be 200/100 denier continuous filament meta-aramid and a 50/50 staple blend of meta-aramid and para-aramid intermediate modulus, or meta-aramid and novoloid, 12 s $\pm$ 2 cc.

- 3.2 Standard Sample for Nap: The napped side of the finished cloth shall match the degree of nap of the standard sample cloth.

- 3.3 Color: The continuous filament aramid shall be Sage Green 1565, solution dyed yarn. The color of all the staple fibers shall be natural.

- 3.3.1 Sage Green 1565 is a manufacturer identification number for that color.

- 3.4 Weave: Shall be an 8 harness warp face satin, 5 counter as relates to the staple filling yarn. The weave shall be 1 up, 3 down right twill for two ends and 3 down, 1 up reversal for two ends as related to the continuous filling aramid. The fabric shall be woven two picks continuous filament and two picks staple.

- 3.5 Width: Shall be 54 in. (1,350 mm) inclusive of selvages, unless otherwise specified.

- 3.6 Finish: Cloth shall be desized, scoured, heat set, and given a durable antistatic finish. The filling side of the fabric shall be napped with two passes through the machine.

- 3.7 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.

3.7.1 Yard-by-Yard (Metre-by-Metre) Examination:

- 3.7.1.1 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 length of the roll shall be examined. All defects, as defined in Section III of FED-STD-4, which are visible at a normal inspection distance of 1 yd (1 m) shall be scored and assigned demerit points as listed in 4.3.3.1 except as follows:

- 3.7.1.1.1 Only coarse yarns that exceed twice the normal yarn diameter shall be scored.
- 3.7.1.1.2 Mixed filling (shade bar) shall be scored only when resulting from wrong ply, wrong twist in the yarn, or off shade yarn.
- 3.7.1.1.3 Only knots and slubs which exceed the limits shown in Fig. 1 of FED-STD-4 shall be scored.
- 3.7.1.2 No linear yard (linear metre) increments of 1 yd (1 m) on the measuring machine from any one roll from within the sample shall be penalized more than 4 points. The lot shall be unacceptable if the points per 100 sq yd (84 m²) of the total length examined exceeds 50 points. The lot shall be unacceptable if the points per 100 sq yd (84 m²) of two or more individual rolls exceed 75 points. If one roll exceeds 75 points per 100 sq yd (84 m²), a second sample of 20 rolls shall be examined for individual roll quality only. The lot shall be unacceptable if one or more rolls in the second sample exceeds 75 points per 100 sq yd (84 m²). Point computation for lot quality and individual roll quality shall be as follows:

3.7.1.2.1 Using Inch/Pound Units:

$$\frac{\text{Total points scored in sample} \times 3,600}{\text{Width of cloth, in.,} \times \text{total length, yd, inspected}} = \text{Points per 100 sq yd}$$

3.7.1.2.2 Using 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. QUALITY ASSURANCE PROVISIONS:

- 4.1 Responsibility for Inspection: The vendor of 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 4.5. 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.
- 4.2 Classification of Tests: Tests to determine conformance to all technical requirements of this specification are classified as acceptance tests and as preproduction tests and shall be performed prior to or on the initial shipment of cloth to a purchaser, on each lot, when a change in material, processing, or both requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.3 Sampling:

- 4.3.1 The unit of cloth for property determination shall be not less than 5 yd (4.5 m), continuous piece, full width, of the finished cloth. The lot size shall be expressed in units of 1 yd (1 m). The lot shall be unacceptable if one or more units fail to meet any requirement specified. The sample size (number of sample units) shall be as follows:

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

- 4.3.2 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.

- 4.3.3 Yard-by-Yard (Metre-by-Metre) Examination: The sample size shall be 20 rolls selected from 20 containers.

- 4.3.3.1 Demerit Points: Demerit points shall be assigned to the examination as follows:

Defects	Points
Defects up to 3 in. (75 mm) in any dimension	1
Defects over 3 to 6 in. (75 to 150 mm), inclusive	2
Defects over 6 to 9 in. (150 to 225 mm), inclusive	3
Defects over 9 in. (225 mm) in any dimension	4
Baggy, ridgy, or wavy cloth, each yd (m)	4
Width less than specified, each yd (m)	4
Uneven weaving, each yd (m)	4

- 4.3.4 When a statistical sampling plan and acceptance quality level (AQL) in accordance with MIL-STD-105, other than as specified herein, 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 4.5.1 shall state that such plan was used.

4.4 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 Reports:

- 4.5.1 The vendor of cloth shall furnish with each shipment a report showing the results of tests to determine conformance to the technical requirements of this specification. This report shall include the purchase order number, AMS 3785, vendor's material designation, lot number, and quantity.
- 4.5.2 The vendor of finished or semi-finished cloth shall furnish with each shipment a report showing the purchase order number, AMS 3785, contractor or other direct supplier of cloth, supplier's product identification, and quantity. When material for making cloth 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 reports showing the results of tests to determine conformance.
- 4.6 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 rolls of not less than 80 yd (75 m) nor more than 400 yd (365 m) in length. Not more than two pieces less than 80 yd (75 m) in length shall be included in any one roll, unless specified by purchaser. Short pieces shall be rolled separately and sewn together with a butted type seam, using 10/3 cord cotton thread, with approximately 9 stitches per in. (25 mm). The number of pieces in a roll shall be marked on the outer surface of the last 6 in. (150 mm) of the roll.
- 5.1.2 Each roll shall have a label or tag legibly marked with not less than the following information and attached in such a manner as to remain in place until all cloth has been removed from the roll:

CLOTH, META-ARAMID WARP, META-ARAMID/PARA-ARAMID (or META-ARAMID/NOVOLOID)
FILLING, Napped

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WIDTH _____

WEIGHT PER YARD (METRE) _____

MANUFACTURER'S DESIGNATION _____

PRODUCT DESIGNATION _____

QUANTITY _____

LOT NUMBER _____

ROLL NUMBER (If used) _____

DATE OF MANUFACTURE _____

- 5.1.3 Each roll shall also be labeled, ticketed, or invoiced for fiber content in accordance with the Textile Fiber Products Identification Act.
- 5.1.4 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.
- 5.1.5 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, META-ARAMID WARP, META-ARAMID/PARA-ARAMID (or META-ARAMID/NOVOLOID)
FILLING, Napped

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PURCHASE ORDER NUMBER _____

MANUFACTURER'S NAME _____

MANUFACTURER'S MATERIAL DESIGNATION _____

DESCRIPTION _____

LOT NUMBER _____

NET WEIGHT _____