



AEROSPACE MATERIAL SPECIFICATION

AMS3841™

REV. B

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Superseding AMS3841A

Cloth, Cotton Twill
Fire Retardant Treated

RATIONALE

This document has been determined to contain basic and stable technology which is not dynamic in nature.

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Documents

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1. SCOPE:

1.1 Form: This specification covers a fire-retardant-treated cotton twill in the form of cloth.

1.2 Application: Primarily for use in 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 2.2.3.

2.2.1 Federal Specifications:

V-T-276 - Thread, Cotton

PPP-P-1134 - Packaging and Packing of Cotton and Cotton-Synthetic Fiber Blend Fabrics (Excluding Duck Fabrics)

2.2.2 Federal Standards:

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

2.2.3 Other Publications: Available from Federal Trade Commission, Washington, DC 205801

Textile Fiber Products Identification Act, Rules and Regulations

3. TECHNICAL REQUIREMENTS:

3.1 Material: The cloth shall be made from cotton which has been cleaned, carded, drawn, and spun into two ply yarns for both warp and filling.

3.2 Properties: The cloth shall conform to the requirements of Table I and the following, determined in accordance with test methods specified in Table II:

TABLE I

Property	Requirement
Weight of desized, mercerized, dyed cloth prior to treatment	4.4 oz per sq yd $\pm$ 0.2 (150 g/m ² $\pm$ 7)
Increase in weight after treatment and finishing operation	18 to 28%
Yarns per in. (25.4 mm), min	
Warp	105
Filling	100
Yarn Ply	2
Breaking Strength, grab, min	
warp	95 lb (420 N)
Filling	60 lb (265 N)
Tearing Strength, min	
Initial	
Warp	4.0 lb (18 N)
Filling	4.0 lb (18 N)
After 15 launderings	
Warp	3.0 lb (13 N)
Filling	3.0 lb (13 N)
Air Permeability at 0.5 in. (12.7 mm) Water Pressure	18 to 60 cu ft/min. per sq ft (5.4 to 18.0 m ⁵ /min. per m ²)
Shrinkage in Laundering, max	
Warp	2.0%
Filling	2.0%

TABLE I
(Continued)

Property	Requirement
Acidity, pH	5.5 to 9.0
Sewability, Seam Efficiency, min	80%
Stiffness of Cloth, cantilevered bending load, max	0.005 lb (0.002 N)

3.2.1 Weave: Shall be 3 up and 3 down, right-hand steep twill, determined visually.

3.2.2 Finish:

3.2.2.1 Cloth Preparation: Prior to treatment, the cloth shall be desized and mercerized. The starch and protein content, including the chloroform-soluble and water-soluble material of the finished cloth, shall not exceed 2.0%.

3.2.2.2 Fire Retardancy: Before and after 15 launderings, the treated cloth shall show no more than 2.0 sec average flame time, not more than 2.0 sec average glow time, and not more than 5.5 in. (140 mm) average and 6.5 in. (165 mm) single determination char length.

3.2.3 Color: Cloth collar shall match one of the following listed colors:

Shade No. 1, Khaki
Shade No. 107, Olive Green
Shade No. 338, Orange
Shade No. 1524, Sage Green

3.2.3.1 The use of dyes, or substances containing elementary sulfur compounds, capable of oxidation to sulfuric acid, is prohibited. The dyed and finished cloth shall contain no more labile sulfur than that shown by the standard sample.

3.2.3.2 Matching: The color of the finished cloth shall match the standard sample under natural (north sky) daylight or artificial daylight having a color temperature of 7500° K and should be a good approximation to the standard sample under incandescent lamplight at 2800° Kelvin.

3.2.3.3 Colorfastness: The dyed and finished cloth shall show fastness to light, salt water and soap, perspiration, laundering, and cracking equal to, or better than, the standard sample.

3.2.3.3.1 When a standard sample is not referenced for colorfastness, the dyed and finished cloth shall show "good" fastness to light (40 standard fading hr), saltwater and soap, perspiration, laundering, and crocking.

- 3.2.4 Width: Shall be as ordered.
- 3.2.5 Fiber Identification: Each roll shall be labeled, ticketed, or invoiced for fiber content in accordance with Rules and Regulations under the Textile Fiber Products Identification Act.
- 3.3 Finishing Procedure: Shall be approved by purchaser prior to the finishing of any cloth.
- 1.4 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.
- 3.4.1 Imperfections: Acceptability of each lot of cloth shall be based on defects as defined in FED-STD-4.

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 4.6. 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.

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	Paragraph
Weight	Table I
Breaking Strength	Table I
Quality	3.4

- 4.2.2 Preproduction Tests: Tests to determine conformance to all technical requirements of this 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.