

AEROSPACE
MATERIAL
SPECIFICATION

AMS 3804C

Superseding AMS 3804B

Issued 1-1-46
Revised 1-1-84

CLOTH, AIRPLANE, COTTON, MERCERIZED
65 lb (290 N) Breaking Strength

1. SCOPE:

1.1 Form: This specification covers one strength and one weave of mercerized cotton known as "airplane cloth."

1.2 Application: Primarily for covering aircraft surfaces, such as wings, fuselage, ailerons, elevators, and other airfoil surfaces.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications (AMS) 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 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM D629 - Quantitative Analysis of Textiles

ASTM D1682 - Breaking Load and Elongation of Textile Fabrics

ASTM D1910 - Construction Characteristics of Woven Fabrics

2.3 U.S. Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Military Standards:

MIL-STD-794 - Parts and Equipment, Procedures for Packaging and Packing of

REAFFIRMED

10/91

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3. TECHNICAL REQUIREMENTS:

3.1 Material:

3.1.1 Mercerization: The cloth shall be piece mercerized or the yarn may be mercerized under tension.

3.1.2 Yarn: The cloth shall be woven from 1- or 2-ply, combed cotton yarn.

3.1.3 Weave: The weave shall be plain (one up and one down).

3.1.4 Finishing: The cloth shall be uniformly finished in accordance with the best practice for high-grade airplane cloth. Finishing shall consist of washing, framing, and calendering. The calendering shall be sufficient to lay any nap present and shall provide a smooth, even surface. Nap may be removed by singeing.

3.2 Properties: The cloth shall conform to the following requirements; tests shall be performed on the cloth supplied and in accordance with specified test methods:

3.2.1 Weight:

ASTM D1910

oz per sq yd, max	4.0
(g/m ² , max)	(135)

3.2.2 Thread Count, ends per in. (25.4 mm):

ASTM D1910

Warp and Fill, each, max	80 to 94
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3.2.3 Breaking Strength, each direction:

ASTM D1862,
Ravelled strip
method

lbf per in. width, min	65
(N/25 mm width, min)	(290)

3.2.4 Elongation:

Warp	Fill
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ASTM D1862,
(See 4.5.1)

At 57 lb (255 N) load, max	13%	11%
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3.2.5 Sizing, Finishing, and Other

ASTM D629,
Equation 3

<u>Non-Fibrous Materials, max:</u>	2.5%
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3.2.5.1 A desizing operation may be performed to reduce the sizing content to the maximum specified.

3.3 Quality: The cotton fibers shall be evenly spun into yarns of proper and uniform yarn count, twist, and diameter to produce the texture and weight required. The yarn shall be reasonably free from nap breaks, broken ends, uneven threads, and knots. Yarns shall be closely woven into fabric uniform in body and appearance, and which shall be reasonably free from striations due to variable weaving operations.

3.4 Tolerances: Unless otherwise specified, the following tolerances apply:

3.4.1 Width:

Ø	Nominal Width	Tolerance, Inches	Nominal Width	Tolerance, Millimetres
	Inches	plus and minus	Millimetres	plus and minus
	36	1/2	915	13
	42	5/8	1065	16
	60	1	1525	25
	69	1	1750	25
	90	1-1/2	2285	38

3.4.2 Length of Cut: The length of a single cut shall be not less than 40 yd (36.5 m) except that 10% of the total yardage of one width under any contract or order may be in short lengths of 10 to 25 yd (9 to 23 m). However, short lengths shall be rolled together and the roll properly labeled to indicate that it is composed of short lengths.

3.4.3 Length of Roll: The cloth shall be furnished on rolls containing the following lengths:

Nominal Width	Roll Length	Nominal Width	Roll Length
Inches	Yards	Millimetres	Metres
36 and 42	500 to 600	915 and 1065	457 to 548
60 and 69	250 to 300	1525 and 1750	229 to 274
90	175 to 200	2285	160 to 183

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 requirements for weight (3.2.1), thread count (3.2.2), breaking strength (3.2.3), elongation (3.2.4), quality (3.3), and tolerances (3.4) are classified as acceptance tests and shall be performed on each lot.

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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 or 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: Each lot of cloth shall be 100% visually examined for quality (3.3). 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, taken from the full width of the cloth.

4.3.1.1 A lot shall be all cloth produced in a single production run under the same conditions and presented for vendor's inspection at one time. An inspection lot shall not exceed 5000 yd (4600 m). A lot may be packaged in small quantities under the basic lot approval provided the lot identification is maintained.

4.3.1.2 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 4.6.1 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 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.

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 or processing, or both, and, when requested, sample cloth. Production cloth made by the revised procedure shall not be shipped prior to receipt of reapproval.