

MIL-C-8104C(AS)
25 September 1980
SUPERSEDING
MIL-C-8104B(ASG)
20 November 1967

MILITARY SPECIFICATION

CLOTH, SHEETING, COTTON, TREATED

This specification is approved for use by the Naval Air Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense

1. SCOPE

1.1 Scope. This specification covers the requirements for one type of treated cotton cloth for use in aircraft.

2 APPLICABLE DOCUMENTS

2.1 Issues of documents. The following documents, of the issue in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

SPECIFICATIONS

FEDERAL

QQ-A-225/2	-Aluminum Alloy Bar, Rod, and Wire, Rolled Drawn or Cold Finished, 3003
QQ-B-637	-Brass, Naval; Rod, Wire, Shapes, Forgings, and Flat Products with Finished Edges (Bars, Flat Wire, and Strip)
PPP-P-1134	-Packaging and Packing of Cotton and Cotton-Synthetic Fiber Blend Fabrics (Excluding Duck Fabrics).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to Engineering Specifications and Standards Department (Code 93), Naval Air Engineering Center, Lakehurst, NJ 08733, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426), appearing at the end of this document or by letter

FSC 8305

MIL-C-8104C(AS)

STANDARDS

FEDERAL

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

MILITARY

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

(Copies of specifications, standards, drawings and publications required by suppliers in connection with specific acquisition functions should be obtained from the acquiring activity or as directed by the contracting officer)

2 : Other publications The following document forms a part of this specification to the extent specified herein Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

RULES AND REGULATIONS UNDER THE TEXTILE FIBER PRODUCTS IDENTIFICATION ACT

(Application for copies should be addressed to the Federal Trade Commission, Washington, DC 20580.)

(Technical society and technical association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies)

3 REQUIREMENTS

3 1 Standard sample The dyed finished cloth shall match the standard sample for shade and shall be equal to or better than the standard sample with respect to all characteristics for which the standard sample is referenced (see 6 4)

3 2 First article When specified (see 6.2), the contractor shall furnish one sample unit for first article inspection and approval (see 4.3 and 6 3)

3 3 Material The warp and filling shall be singles yarn spun from cleaned, carded and drawn cotton

3 4 Cloth properties. The finished cloth shall conform to the requirements specified in table I when tested as specified in 4 6

3 5 Dimensions

3 5 1 Width The width and width tolerance of the finished cloth shall be as specified by the acquiring activity (see 6 2)

MIL-C-8104C(AS)

3.5.2 Length of roll Rolls shall contain 100 to 250 linear yards, with no more than 5 pieces in each roll

3.6 Color The color of the finished cloth shall be as specified by the acquiring activity (see 6.2) and shall be obtained through the use of vat dyes.

3.6.1 Colorfastness When tested as specified in 4.6, the finished cloth shall show colorfastness to light, laundering, dry crocking, wet crocking and cold water equal to or better than the standard sample. When no standard sample for colorfastness is available, the finished cloth shall show "good" colorfastness to light, laundering, dry crocking, wet crocking and cold water.

3.6.2 Color matching The color shall match the standard sample when examined in accordance with 4.6.1.

3.7 Finish

3.7.1 Processing of the cloth Dyestuffs, detergents, and other chemicals or finishing agents used in the manufacture of the cloth shall not cause deterioration under normal warehouse storage conditions, nor cause dermatitis on prolonged skin contact.

3.7.2 Non-fibrous material. The total sizing, finishing, and other non-fibrous material content of the cloth, prior to the application of the fire retardant treatment, shall not exceed 20 percent when tested as specified in table II.

3.7.3 Corrosion The finished cloth shall be noncorrosive when tested as specified in 4.6.2.

3.8 Fiber identification Each roll of cloth shall be labeled, ticketed or invoiced for fiber content in accordance with the Textile Fiber Products Identification Act.

3.9 Workmanship The finished cloth shall conform to the quality and grade of product established by this specification. The demerit points per 100 square yards, when calculated as specified in section 4, shall not exceed the established maximum point value.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

MIL-C-8104C(AS)

4.1.1 Certificate of compliance. Where certificates of compliance are submitted, the Government reserves the right to check test such items to determine the validity of the certification.

4.2 Classification of inspection. The inspection requirements specified herein are classified as follows:

- 1 First article inspection (see 4.3).
- 2 Quality conformance inspection (see 4.4)

4.2.1 Inspection conditions Unless otherwise specified, all testing shall be performed in accordance with the test conditions specified in FED-STD-191

4.3 First article inspection When required (see 6.2), the first article sample submitted in accordance with 3.2 shall be visually inspected for appearance, color and finish, and shall be tested as specified in 4.6

4.4 Quality conformance inspection The quality conformance inspection shall consist of the tests specified in table II and the examinations in 4.4.1 through 4.5

4.4.1 Examination of the end item Examination of the end item shall be in accordance with the provisions of MIL-STD-105 and 4.4.1.1 through 4.4.4

4.4.1.1 Yard-by-yard examination Thirty yards from each roll in the sample shall be examined on the face side. The sample shall consist of 25 rolls taken from 25 containers. The cloth shall be run over a bank of lights having sufficient intensity to show defects at a normal inspection distance of 3 feet. Each sample unit shall be examined for the defects listed and defined in section I of FED-STD-4. All defects listed and defined in section I of FED-STD-4, which are clearly noticeable at normal inspection distance, shall be scored and assigned demerit points as listed in 4.4.1.1.1. No linear yard shall be penalized more than 4 points. The lot shall be unacceptable if the points per 100 square yards exceed 20.0 points. Point computation shall be as follows:

$$\text{Points per 100 square yards} = \frac{\text{Total points scored in sample} \times 3600}{\text{Contracted width of cloth in inches} \times 750}$$

4.4.1.1.1 Demerit points Demerit points shall be assigned as follows

- For defects 3 inches or less in any dimension - one point
- For defects exceeding 3 inches, but not exceeding 6 inches in any dimension - two points
- For defects exceeding 6 inches, but not exceeding 9 inches in any dimension - three points
- For defects exceeding 9 inches in any dimension - four points

MIL-C-8104C(AS)

The following defects, when present, shall be scored four points for each yard in which they occur

Baggy, ridgy or wavy cloth.
 Objectionable odor
 Width not as specified.
 Overall uncleanness
 Pronounced mottled or streaky color, or color contrasts

4.4.2 Examination for length.

4.4.2.1 Individual rolls During the yard-by-yard examination, each roll in the sample shall be examined for length. Any length found to be less than the minimum specified or more than two yards below 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 with respect to length.

4.4.2.2 Total yardage in sample The lot shall be unacceptable if the total of the actual lengths of rolls in the sample is less than the total of lengths marked on the tickets.

4.4.3 Examination for shade During the yard-by-yard examination, each roll in the sample shall be examined for shade. Any portion of the sample off shade, shaded side to side, side to center or end to end shall be cause for rejection of the entire lot represented by the sample.

4.4.4 Examination for compliance with the Rules and Regulations Under the Textile Fiber Products Identification Act During the yard-by-yard examination, each roll in the sample shall be examined for fiber identification. The lot shall be unacceptable if two or more rolls are not labeled or ticketed in accordance with the Rules and Regulations Under the Textile Fiber Products Identification Act.

4.5 Examination of packaging requirements An examination shall be made in accordance with the provisions of PPP-P-1134 to determine that packaging, packing and marking comply with section 5 requirements of this specification.

4.6 Testing of the end item The methods of testing specified in FED-STD-191, whenever applicable, and as listed in table II shall be followed. The physical and chemical values specified in section 3 apply to the average of the determinations made on a sample unit for test purposes as specified in the applicable test method. All test reports shall contain the individual values utilized in expressing the final result. The sample unit for testing shall be 4 continuous yards (full width) of the finished cloth and 1/2 yard (full width) of the untreated cloth. The lot size shall be expressed in units of one yard each. The lot shall be unacceptable if one or more units fail to meet any specified test requirement. The sample size shall be in accordance with the following

MIL-C-8104C(AS)

<u>Lot size</u> <u>(yards)</u>	<u>Sample size</u> <u>(units)</u>
800 or less	2
801 up to and including 22,000	3
22,001 and over	5

4 6 1 Color matching The color shall match the standard sample under artificial daylight having a color temperature of 7500° Kelvin and shall be a good approximation to the standard sample under incandescent lamplight at 2800° Kelvin

4 6 2 Corrosion Polished rods, 1/2 inch diameter by 5 inches long, of aluminum alloy conforming to QQ-A-225/2 and brass conforming to QQ-B-637 shall be wound spirally with a 1/2 by 8 inch strip of the finished cloth. The rod and cloth shall be placed in a humidity chamber at 52°C ± 2 °C (125° ± 5°F) and a relative humidity of 97 to 100 percent for 5 days. The cloth shall then be removed and the rods examined. The test shall be repeated on specimens of the cloth which have been thoroughly rinsed in distilled water at room temperature and dried. Corrosion, but not discoloration, of the metals shall be cause for rejection. One specimen of the finished cloth shall be prepared for each of the above specified metal rods. In the event of doubtful test results, a retest shall be made.

4 6 3 Breaking strength and elongation

4 6 3 1 Preparation of specimens Ten strips, 12 inches or over in length and not less than 4 inches in width, shall be cut from each sample in such manner that 5 of the 12 inch strips will be in the warp direction and 5 strips in the filling direction of the cloth. Each of the 12 inch strips shall be cut in half to form 2 specimens, each 4 by 6 inches. One of the 6 inch specimens shall be used for the oven aging test and the other shall be tested in the unaged (as received) condition. Thus, the as received and aged specimens shall represent the same warp and filling threads.

4 6 3 2 Method

4 6 3 2 1 As received condition Five specimens each from the warp and filling directions shall be tested for breaking strength and elongation in accordance with method 5100 of FED-STD-191.

4 6 3 2 2 Oven aging The specimens to be aged shall be suspended in an oven at a temperature range of 99°C to 104°C (210°F to 220°F) for 8 hours. The specimens shall be suspended in such a manner that each side of each specimen is exposed to the temperature. After removal from the oven, the samples shall be conditioned for at least 4 hours at standard conditions (see 4 2 1) and then tested for breaking strength in accordance with method 5100 of FED-STD-191. The average breaking strength of the aged specimens shall be compared with the average breaking strength of the as received specimens. The difference between the average breaking strength of the oven aged specimens and the as received specimens, computed as a percentage of the as received strength, shall not exceed the limits specified in table 1.

MIL-C-8104C(AS)

5 PACKAGING

5.1 Packaging Packaging shall be level A or C, as specified (see 6.2)

5.1.1 Levels A and C The cloth, put up in rolls (see 3.5.2), shall be packaged in accordance with the applicable requirements of PPP-P-1134

5.2 Packing Packing shall be level A, B or C, as specified (see 6.2)

5.2.1 Levels A, B and C The cloth shall be packed in accordance with the applicable requirements of PPP-P-1134

5.3 Marking In addition to any special marking required by the contract or order, shipments shall be marked in accordance with the requirements of PPP-P-1134

6 NOTES

6.1 Intended use The cloth of this specification is intended for use as sheeting to cover aircraft insulation and soundproofing blankets. The use of the cloth is limited to areas in aircraft where the temperature will not be high enough to cause the cloth to lose its strength properties.

6.2 Ordering data. Acquisition documents should specify the following

- a. Title, number and date of this specification.
- b. Color (see 3.6)
- c. Quantity in yards
- d. Width and tolerance (see 3.5.1).
- e. Selection of applicable levels of packaging and packing (see 5.1 and 5.2)
- f. Whether any special markings are required (see 5.3)
- g. First article, if required, (see 3.2 and 4.3) and where samples are to be forwarded (see 6.3).
- h. Minimum length of shortest piece in roll (see 3.5.2)

6.3 First article When a first article is required, it shall be tested and approved under the appropriate provisions of 7-104.55 of the Defense Acquisition Regulation (DAR). The first article shall be a preproduction item. The first article should consist of one sample unit. The contracting officer should include specific instructions in all acquisition instruments, regarding arrangements for examinations, tests and approval of the first article

6.4 Standard sample For access to standard sample, address the acquisition office issuing the invitation for bids or request for proposal

6.5 Changes from previous issue Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes

Preparing activity
Navy - AS
(Project No 8305-N756)

MIL-C-8104C(AS)

TABLE I Cloth properties

Characteristics	Requirements
Weave	Plain
Weight, ounces per square yard	3 0 to 4 0
Yarns per inch, minimum	
Warp	62
Filling	60
Breaking strength, pounds minimum	
As received	
Warp	60
Filling	60
After oven aging, percent loss maximum for warp and filling	10
Elongation, percent minimum	
Warp	7 5
Filling	7 5
Tearing strength, pounds minimum	
Warp	4 5
Filling	4 5
Acidity, pH	5 0 to 9 0
Air permeability, cubic feet per minute per square foot of area	175 to 260
Flame resistance	
Time of flaming, seconds maximum	
Warp	0
Filling	0
Time of glow, seconds maximum	
Warp	0
Filling	0
Length of char, inches maximum	
Warp	2 3
Filling	2 3

MIL-C-8104C(AS)

TABLE II. Test methods.

Characteristics	Requirements	FED-STD-191 test method and applica- ble paragraph reference
Material	3 3	1/
Acidity	Table I	2811
Air permeability	Table I	5450
Breaking strength and elongation as received	Table I	5100 2/
Breaking strength after oven aging	Table I	5100 2/
Tearing strength	Table I	5134
Yarn per inch	Table I	5050
Weight	Table I	5041
Flame resistance	Table I	5903
Weave	Table I	Visual 3/
Width	3.5 1	5020
Type of dye	3.6	1/
Colorfastness to light	3.6 1	5660
crocking (dry)	3 6 1	5651
crocking (wet)	3.6 1	5651
laundering	3 6 1	5610
cold water	3 6 1	5630
Processing of the cloth	3 7 1	1/
Non-fibrous materials	3 7 2	2611
Corrosion	3 7 3	4 6 2

- 1/ Contractor's certificate of compliance may be submitted for the stated requirement (see 4 1.1)
- 2/ Breaking strength and elongation specimens shall be prepared, oven aged and tested, as applicable, in accordance with 4 6.3 through 4 6 3 2 2
- 3/ One determination per sample unit and the result reported as, "pass" or "fail"

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DOCUMENT IDENTIFIER (Number) AND TITLE

MIL-C-8104C(AS) CLOTH, SHEETING, COTTON, TREATED
NAME OF ORGANIZATION AND ADDRESS OF SUBMITTER

☐ **VENDOR** ☐ **USER** ☐ **MANUFACTURER**

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DATE

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