

CCC-C-432D  
October 13, 1972  

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SUPERSEDING  
Fed. Spec. CCC-C-432C  
June 16, 1967

## FEDERAL SPECIFICATION

### CLOTH, SHEETING, COTTON, (UNBLEACHED, BLEACHED, AND DYED)

This specification was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

#### 1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers cloth, cotton, sheeting (see 6.1).

1.2 Classification.

1.2.1 Types and classes. The cloth, cotton, sheeting shall be of the types as specified in table I and in the following classes as specified (see 6.2):

- Class 1 - Unbleached.  
Coating quality when specified, types VI, VII and VIII.
- Class 2 - Bleached or dyed.  
Coating quality when specified, types VI, VII and VIII.  
Mildew resistance when specified.  
Water repellent and mildew resistant when specified.
- Class 3 - Bleached or dyed, preshrunk.

Note: The types designate grey texture which are of the same construction as class 1.

#### 2. APPLICABLE DOCUMENTS

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

FSC 8305

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Federal Specifications:

- V-T-276 - Thread. Cotton.
- CCC-D-950 - Dyeing and Aftertreating Processes for Cotton Cloths.
- PPP-P-1134 - Packaging and Packing of Cotton and Cotton-Synthetic Fiber Blend Fabrics (Excluding Duck Fabrics).

Federal Standards:

- Fed. Std. No. 4 - Glossary of Fabric Imperfections.
- Fed. Std. No. 191 - Textile Test Methods.

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards, and Handbooks as outlined under General Information in the Index of Federal Specifications and Standards and at the prices indicated in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

(Single copies of this specification and other Federal Specifications required by activities outside the Federal Government for bidding purposes are available without charge from Business Service Centers, at the General Services Administration Regional Offices in Boston, New York, Washington, D.C., Atlanta, Chicago, Kansas City, Mo., Fort Worth, Denver, San Francisco, Los Angeles, and Seattle, Washington.

(Federal Government activities may obtain copies of Federal Specifications, Standards, and Handbooks and the Index of Federal Specifications and Standards from established distribution points in their agencies.)

Military Standard:

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

(Copies of Military Specifications and Standards required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

Laws and Regulations:

- Rules and Regulations Under the Textile Fiber Products Identification Act (16 CFR 303).

(Copies may be obtained without charge from the Federal Trade Commission, Washington, DC 20580.)

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### 3. REQUIREMENTS

3.1 Standard sample. When a standard sample is available, the 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 6.3).

#### 3.2 Material.

3.2.1 Yarn. The yarn shall be made from clean cotton, carded, drawn and spun into singles yarn for both the warp and filling.

3.3 Color. Classes 2 and 3 cloth shall be dyed or bleached, as specified (see 6.2). The use of sulfur dyes and compounds capable of oxidation to sulfuric acid is prohibited. The dyestuffs shall be chosen and applied so that the dyed and finished cloth shall show no more labile sulfur than that shown by the standard sample when tested as specified in 4.4. When a standard sample is not available, the dyed and finished cloth shall show no more than a slight trace of labile sulfur when tested as specified in 4.4. When bleached cloth is specified, the cloth shall be chemically bleached and may be supplemented with optical brighteners which fluoresce to the blue region. The degree of whiteness shall match the standard sample. The finished bleached cloth shall not discolor to a degree greater than that shown by the standard sample when tested as specified in 4.4. When a standard sample is not available, the discoloration shall be no worse than the rating of "fair" when tested as specified in 4.4.

3.3.1 Matching. When a standard sample is available, the dyed cloth shall match the sample under natural (north sky) daylight or artificial having a color temperature of 7500° Kelvin and shall be a good approximation to the standard sample under incandescent lamplight at 2800° Kelvin.

3.3.2 Colorfastness. The dyed and finished cloth shall show colorfastness to light, laundering (after 3 cycles), perspiration, and crocking equal to, or better than, the standard sample. When no standard sample is established or not designated as applicable, the dyed and finished cloth shall show "good" colorfastness to light, laundering (after 3 cycles), perspiration, and crocking. Testing shall be as specified in 4.4.

3.4 Weave. The weave for all types shall be plain when tested as specified in 4.4.

3.5 Physical requirements. The cloth shall conform to the requirements specified in table I when tested as specified in 4.4.

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3.5.1 Width. The width of the cloth shall be as specified (see 6.2), and shall be the minimum acceptable width inclusive of selvages.

TABLE I.- Physical requirements

Type	Class	Yarns per inch, minimum		Weight per square yard, minimum Ounces	Breaking strength minimum	
		Warp	Filling		Warp Pounds	Filling Pounds
I	1	44	40	3.4	40	35
	2	46	38	3.2	37	32
	3	48	42	3.5	38	33
II	1	56	48	3.3	44	29
	2	58	46	3.1	41	26
	3	60	50	3.4	42	27
III	1	48	48	3.8	48	35
	2	50	46	3.6	44	32
IV	1	48	44	4.3	55	40
	2	50	42	4.1	52	37
	3	52	46	4.4	54	38
V	1	56	60	4.0	45	40
	2	58	58	3.8	41	37
	3	60	62	4.1	43	38
VI	1	64	68	4.6	55	50 <sup>1/</sup>
	2	66	66	4.4	50	47 <sup>1/</sup> <sub>2/</sub>
	3	68	68	4.7	51	48
VII	1	48	48	5.0	60	50 <sup>1/</sup>
	2	50	46	4.8	56	47 <sup>1/</sup> <sub>2/</sub>
	3	52	48	5.1	57	48
VIII	1	48	48	5.6	65	55 <sup>1/</sup>
	2	50	46	5.4	61	52 <sup>1/</sup> <sub>2/</sub>
	3	52	48	5.7	62	53

<sup>1/</sup> When required for coating quality (see 6.2) the cloth shall conform with the requirements specified in 3.6.3 and 3.6.3.1.

<sup>2/</sup> When mildew resistance or water repellent and mildew resistant are specified (see 6.2) the cloth shall be treated in accordance with 3.6.3.2 or 3.6.3.3.

### 3.6 Nonfibrous materials.

3.6.1 Class 1. The starch and protein content including chloroform-soluble and water-soluble material of class 1 cloth shall not exceed 13.0 percent when tested as specified in 4.4.

3.6.2 Classes 2 and 3. The starch and protein content including chloroform-soluble and water-soluble material of classes 2 and 3 cloths shall not exceed 2.0 percent when tested as specified in 4.4.

3.6.3 Classes 1 and 2 (coating quality). When class 1 or 2 cloth is specified for use as the base cloth for coating, the starch and protein content including chloroform-soluble and water-soluble materials shall not exceed 4.0 percent when tested as specified in 4.4. The finished cloth shall be singed, scoured, and calendered.

3.6.3.1 Copper and manganese. When class 1 or 2 cloth is specified as a base cloth for coating (see 6.2), the finished cloth, prior to coating, shall contain not more than 0.003 percent copper and 0.0015 percent manganese when tested as specified in 4.4.

3.6.3.2 Mildew resistance. When specified (see 6.2), class 2 cloth shall be made mildew resistant to conform to finished requirements of class D of CCC-D-950 except that the requirements for colorfastness, as specified, shall not apply. Treatment shall be in accordance with inhibitor (a) of CCC-D-950.

3.6.3.3 Water repellent and mildew resistant. When specified (see 6.2), class 2 cloth shall be made water repellent and mildew resistant to conform to finished requirements of class B of CCC-D-950, except that the requirements for hydrostatic resistance and colorfastness as specified shall not apply. Treatment shall be in accordance with inhibitor (a) of CCC-D-950.

3.7 Shrinkage. The residual shrinkage for class 2 cloth shall be not more than 7.5 percent in the warp direction and not more than 2.0 percent in the filling direction, and for class 3 cloth not more than 2.0 percent in either the warp or filling direction when tested as specified in 4.4. The preshrinking process shall not be identified on the cloth, the ticket, or on the package.

3.8 Seam efficiency. Classes 2 and 3 cloth shall have a seam efficiency of not less than 80 percent when tested as specified in 4.4.

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3.9 pH The pH value of the water extract of the finished cloth shall be no less than 5.5 nor more than 9.5 when tested as specified in 4.4.

3.10 Length and put-up. Unless otherwise specified (see 6.2), the cloth shall be in one continuous length of not less than 40 yards and shall be put up in flat folded pieces as specified in PPP-P-1134.

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

3.12 Face identification. The face side of the cloth shall be identified by stamping the word "Face" at each end of the piece.

3.13 Workmanship. The finished cloth shall conform to the quality established by this specification. The occurrence of defects shall not exceed the applicable acceptable quality levels.

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier 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 that supplies and services conform to prescribed requirements.

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 Inspection. Sampling for inspection shall be performed in accordance with MIL-STD-105, except where otherwise indicated hereinafter.

4.2.1 Component and material inspection. In accordance with 4.1 above, components and materials shall be tested in accordance with all the requirements of referenced specifications, drawings and standards unless otherwise excluded, amended, modified or qualified in this specification or applicable purchase document.

4.2.2 Examination of the end item. Defects found during this examination shall be classified in accordance with 4.2.2.1 through 4.2.2.4.

4.2.2.1 Yard-by-yard examination. The required yardage of each piece shall be examined, and defects clearly noticeable at normal inspection distance (3 feet) shall be classified as listed. The defects found shall be counted regardless of their proximity to each other, except when two or more defects represent a single local condition of the cloth, only one shall be scored. A continuous defect shall be counted as one defect for each yard or fraction thereof in which it occurs. The sample unit shall be 1 yard, full width of the finished cloth. The acceptable quality level shall be 6.5 defects per 100 units (yards). The sample size shall be in accordance with inspection level I of MIL-STD-105. The lot size shall be expressed in units of one yard each. The number of pieces selected shall be in accordance with table II.

Defects

Hole, cut or tear  
Smash  
Knot 1/  
Grease or oil stain  
Embedded crease or wrinkle  
Area of no finish

1/ To be scored when larger than limits shown on figure 1 of Fed. Std. No. 4.

4.2.2.1.1 Overall examination. Each defect shall be counted no more than once in each piece examined. The sample unit shall be one piece. The size (number of pieces selected as sample) and the acceptance number shall be as shown in table II.

Defects

Color not as specified  
Baggy, ridgy, or wavy cloth  
Objectionable odor  
Poor dye penetration, mottled,  
streaky, or cloudy  
Width less than specified 1/

1/ Shall not be scored unless it occurs for more than 5 yards per piece.

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TABLE II

Lot size (yards)	Sample size (pieces)	Acceptance number
Up to 3700 <sup>1/</sup>	3	0
3201 up to and including 10,000	5	0
10,001 up to and including 35,000	8	0
35,001 up to and including 150,000	13	1
150,001 and over	20	2

<sup>1/</sup> If a lot contains fewer than three pieces, each piece in the lot shall be examined.

#### 4.2.2.2 Examination for length.

4.2.2.2.1 Individual pieces. During the yard-by-yard examination, each piece in the sample shall be examined for length. Any length found to be less than the minimum specified or more than two yards less than the length marked in the ticket shall be considered a defect with respect to length. The lot shall be unacceptable if two or more pieces in the sample are defective in respect to length.

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

4.2.2.3 Examination for color and shade. During the yard-by-yard examination, each piece in the sample shall be examined for color and shade. Any piece in 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.

4.2.2.4 Examination for identification of preshrinkage process, compliance with Textile Fiber Products Identification Act and Face Marking. During the yard-by-yard examination, each piece in the sample shall be examined for defects listed below. The lot shall be unacceptable if two or more of the following defects are present in the sample:

- Preshrinkage process identified by name or trademark on cloth or ticket.
- Not labeled, ticketed or invoiced in accordance with the Rules and Regulations Under the Textile Fiber Products Identification Act.
- Face stamping missing from either or both ends.
- Face stamping on wrong side.

4.3 Examination of preparation for delivery requirements. An examination shall be made in accordance with the provisions of PPP-P-1134, to determine whether packaging, packing and marking comply with section 5 requirements.

4.4 Testing of the end item. The methods of testing specified in Fed. Std. No. 191 wherever applicable and as listed in table III, 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 shall be 1 yard, full width of class 1 cloth and 4-1/2 continuous yards, full width of classes 2 and 3 cloth. The lot shall be unacceptable if one or more sample units fail to meet any test requirements specified. The lot size shall be expressed in units of 1 linear yard. The sample size (number of sample units) shall be in accordance with the following:

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

TABLE III.- Test methods

Characteristic	Requirement paragraph	Test method
Identification of cotton	3.2.1	1200 <u>1/</u>
Weave	3.4	Visual <u>2/</u>
Yarns per inch:		
Warp	3.5	5050
Filling	3.5	5050
Weight	3.5	5041
Breaking strength:		
Warp	3.5	5100
Filling	3.5	5100
Shrinkage	3.7	5550
Seam efficiency	3.8	5110 <u>3/</u>
Copper and Manganese content	3.6.3.1	2053
Nonfibrous material content	3.6	2611

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Characteristic	Requirement paragraph	Test method
Presence of labile sulfur	3.3	2020
Discoloration (bleached cloth)	3.3	5660 <u>2/</u> <u>4/</u>
Colorfastness to:		
Light	3.3.2	5660
Laundering (after 3 cycles)	3.3.2	5610 <u>5/</u> <u>6/</u>
Perspiration	3.3.2	5680
Crocking	3.3.2	5651
pH	3.9	2810

- 1/ Unless otherwise specified, a certificate of compliance is required and will be acceptable for the requirements stated.
- 2/ One determination shall be made from each sample unit and the result shall be reported as "pass" or "fail".
- 3/ The thread shall conform to type IA1 of V-T-276. The needle size shall be 0.044 + 0.001 inch, and needle thread shall be ticket No. 50, 3 ply, and the looper thread shall be ticket No. 60, 3 ply.
- 4/ Method 5660 shall be used, except that exposure of the specimen and standard sample shall be for 20 standard fading hours. Any specimen showing discoloration less than or equal to that of the standard sample shall be rated "pass". Any specimen showing discoloration greater than that of the standard sample shall be rated "fail". When no standard sample is available, the discoloration shall be considered satisfactory if it is not worse than the rating of "fair" indicated in method 5660.
- 5/ The specimens must be dried after each of the 3 laundering cycles.
- 6/ On the color transfer cloth evaluation, only the stain on the cotton fibers of the color transfer cloth shall be evaluated.

## 5. PREPARATION FOR DELIVERY

5.1 Put-up and packaging. Put-up and packaging shall be level A or C as specified (see 6.2).

5.1.1 Levels A and C. The cloth shall be put-up and packaged in accordance with the applicable requirements for PPP-P-1134.

5.2 Packing. Packing shall be level A, B, or C (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 The cloth covered by this specification is intended for use in the manufacture of clothing and equipage items. The cloth of types VI, VII and VIII in class 1 or class 2 may be used for coating quality in the manufacture of equipage items.

6.2 Ordering data. Purchasers should select the preferred options permitted herein and include the following information in procurement documents:

- (a) Title, number, and date of this specification.
- (b) Type and class of cloth required (see 1.2).
- (c) Color (see 3.3).
- (d) When type VI, VII or VIII, class 1 or 2 is required for coating - quality cloth (see 3.6.3).
- (e) When mildew resistance is required (see 3.6.3.2).
- (f) When water repellent and mildew resistant treatment is required for coating - quality cloth (see 3.6.3.3).
- (g) Width (see 3.5.1).
- (h) When put-up is other than specified (see 3.10).
- (i) Selection of applicable levels of packaging and packing required (see 5.1 and 5.2).

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6.3 Standard sample. For access to standard sample, address the procuring office issuing the invitation for bids.

Custodians:

Army - GL  
Navy - SA  
Air Force - 82

Preparing activity:

Army - GL

Civil Agency Coordinating Activities:

GSA-FSS  
VA-DMS

Review activities:

Army - MD  
Air Force - 11

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Orders for this publication are to be placed with General Services Administration, acting as an agent for the Superintendent of Documents. See section 2 of this specification to obtain extra copies and other documents referenced herein. Price 15 cents each.

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