

FEDERAL SPECIFICATION

CLOTH, SHEETING, COTTON, AND POLYESTER AND COTTON

This specification is approved by the Assistant Administrator, Office of Federal Supply and Services, General Services Administration, for the use of all Federal agencies.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers cotton sheeting, and polyester and cotton sheeting.

1.2 Classification.

1.2.1 Types, classes, and styles. The sheeting shall be of the following types, classes, and styles as specified (see 6.2).

Type I	-	Unbleached
Type II	-	Bleached or dyed
Class 1	-	Unshrunk
Class 2	-	Shrunk
Style A	-	Commercial designation No. 140 (muslin)
Style B	-	Commercial designation No. 128 (muslin)
Style C	-	Commercial designation No. 180 (percale)
Style D	-	Polyester and cotton blend, 65/35 percent, commercial designation No. 180 (percale)
Style E	-	Polyester and cotton blend, 50/50 percent, commercial designation No. 180 (percale)
Style F	-	Polyester and cotton blend, 50/50 percent, commercial designation No. 128 (muslin)
Style G	-	Polyester and cotton blend, 65/35 percent, commercial designation No. 128 (muslin)

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

Federal Specification:

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

Federal Standards:

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

(Activities outside the Federal Government may obtain copies of Federal specifications, standards, and commercial item descriptions as outlined under General Information in the Index of Federal Specifications, Standards and Commercial Item Descriptions. The Index, which includes cumulative bimonthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

(Single copies of this specification, and other Federal specifications and commercial item descriptions required by activities outside the Federal Government for bidding purposes are available without charge from General Services Administration Business Service Centers in Boston, MA; New York, NY; Philadelphia, PA; Washington, DC; Atlanta, GA; Chicago, IL; Kansas City, MO; Fort Worth, TX; Houston, TX; Denver, CO; San Francisco, CA; Los Angeles, CA; and Seattle, WA.

(Federal Government activities may obtain copies of Federal standardization documents and the Index of Federal Specifications, Standards and Commercial Item Descriptions from established 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 contractors 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

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

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal shall apply:

Textile Color Card Association

(Application for copies should be addressed to the Textile Color Association of the United States, Inc., 24 East 38th Street, New York, NY 10016.)

American Association of Textile Chemists and Colorists (AATCC)

Chromatic Transference Scale

(Application for copies should be addressed to the American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709.)

American Society for Testing and Materials (ASTM)

D-1424 - Tear Resistance of Woven Fabrics by the Falling-Pendulum (Elmendorf) Apparatus

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

(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. When a standard sample is available, the finished cloth shall match the standard sample for shade (dyed only) 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.

3.2.1.1 Styles A and B. The yarn for styles A and B shall be made from carded, drawn and spun cotton.

3.2.1.2 Style C. The yarn for style C shall be made from carded, combed, drawn, and spun cotton.

3.2.1.3 Styles D and G. The yarn for styles D and G shall be a blend of polyester and cotton fiber, consisting of 65 plus or minus 5 percent polyester and the remaining percentage cotton.

3.2.1.4 Styles E and F. The yarn for styles E and F shall be a blend of polyester and cotton fiber, consisting of 50 plus or minus 5 percent polyester and the remaining percentage cotton.

3.3 Color. The color shall be as specified and where applicable (see 3.1) shall match the standard sample (see 6.2 and 6.3).

3.3.1 Labile sulfur. The use of dyes and compounds containing elementary or labile sulfur capable of oxidation to sulfuric acid is prohibited. The dye-stuffs shall be chosen and applied so that the dyed and finished cloth shall show no more labile sulfur than shown by the standard sample when tested as specified in 4.2.3. When a standard sample is not available, the dyed cloth shall show not more than a slight trace of labile sulfur as defined in the test method, when tested as specified in 4.2.3.

3.3.2 Matching. The color shall match the standard sample under artificial daylight having a color temperature of 7000 ± 500 kelvins and shall be a good approximation to the standard sample under incandescent lamplight at 2850 ± 100 kelvins.

3.3.3 Colorfastness.

3.3.3.1 Dyed cloth intended for bed sheets. The dyed and finished cloth shall show colorfastness to laundering (after 3 cycles), crocking, and light after 40 standard fading hours equal to or better than the standard sample. When no standard sample is established or when the standard sample is not a reference for colorfastness, the dyed and finished cloth shall show "good" colorfastness to laundering (after 3 cycles), and light, and shall show an AATCC Chromatic Transference Scale rating for crocking not lower than 3.5 when tested as specified in 4.2.3.

3.3.3.2 For all other dyed cloth. The dyed and finished cloth shall show colorfastness to laundering (after 3 cycles), crocking, and light equal to or better than the standard sample. When no standard sample is established or when the standard sample is not a reference for colorfastness, the dyed and finished cloth shall show "good" colorfastness to laundering (after 3 cycles), light, and shall show an AATCC Chromatic Transference Scale rating for crocking not lower than 3.5 when tested as specified in 4.2.3.

3.4 Physical requirements. The cloth shall conform to the requirements specified in table I when tested as specified in 4.2.3.

TABLE I. Physic requirements

Characteristics	Style A		Style B		Style C, D and E		Style F and G		Style G	
	Type I		Type I		Type II		Type II		Type II	
	Class	Class	Class	Class	Class	Class	Class	Class	Class	Class
Weight (min.) oz/sq yd	4.5	4.6	4.2	4.4	4.1	4.2	4.0	4.1	3.5	3.5
Total yarns per inch (min.)	140	140	140	140	128	128	128	128	128	128
Min. No. ends per inch <u>l</u> /	68	74	74	74	64	70	68	70	68	68
Min. No. picks per inch <u>l</u> /	72	69	66	69	64	63	60	63	60	60
Breaking strength pounds (min.):										
Warp	60	60	60	60	55	55	55	55	55	55
Filling	60	60	60	60	55	55	55	55	55	55
Tearing strength pounds (min.):										
Warp	-	-	-	-	-	-	-	-	-	6.0
Filling	-	-	-	-	-	-	-	-	-	3.8
Air permeability cu. ft./min./sq.ft.:										
Minimum	-	-	-	-	-	-	-	-	-	120
Maximum	-	-	-	-	-	-	-	-	-	180

CCC-C-430F

l/ A minus tolerance of 6 yarns per inch for the 128 count, 7 yarns per inch for the 140 count and 8 yarns per inch for the 180 count, in either the warp or filling will be permitted, provided there is a total of not less than 128, 140 to 180 yarns per inch respectively (warp and filling).

3.4.1 Weave. The weave shall be plain.

3.4.2 Width. The width of the cloth shall be as specified (see 6.2) and shall be the minimum width inclusive of selvages when fly-shuttle looms are used and exclusive of selvages and fringes when shuttleless looms are used.

3.5 Nonfibrous materials.

3.5.1 Type I, unbleached, styles A, B, or C. The starch and protein content including chloroform-soluble and water-soluble material shall not exceed 12.0 percent when tested as specified in 4.2.3.

3.5.2 Type II, bleached or dyed, styles A, B, or C. The starch and protein content including chloroform-soluble material shall not exceed 4.0 percent when tested as specified in 4.2.3.

3.5.3 Type II, bleached or dyed, styles D, E, F or G. The acid hydrolyzable material shall not exceed 6.0 percent when tested as specified in 4.2.3.

3.6 pH. The pH value of the water extract of the dyed and finished cloth shall be not less than 5.0 nor more than 8.5 when tested as specified in 4.2.3.

3.7 Dimensional stability. Class 2 cloth shall not shrink more than 2.0 percent in either the direction of the warp or of the filling when tested as specified in 4.2.3. The stabilizing process shall not be identified on the cloth, the ticket or on the package.

3.8 Length and put-up. Unless otherwise specified, the cloth shall be in a continuous length, each not less than 40 yards and shall be put up in rolls or folded pieces as specified in 5.1.

3.9 Fiber identification. Each roll or folded piece shall be labeled, or ticketed, for fiber content in accordance with the Textile Fiber Products Identification Act.

3.10 Workmanship. The finished cloth shall conform to the quality established by this specification. The demerit points per 100 square yards shall not exceed the established maximum point value.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, 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.

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 Quality conformance inspection. Unless otherwise specified, sampling for inspection shall be performed in accordance with MIL-STD-105.

4.2.1 Component and material inspection. In accordance with 4.1, components and materials shall be inspected 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 End item examination.

4.2.2.1 Yard-by-yard examination. Each roll or folded piece in the sample shall be examined on the face side only. When the total yardage in the roll or folded piece does not exceed 100 yards, the entire yardage in the roll or piece shall be examined. When the total yardage in the roll or folded piece exceeds 100 yards, only 100 yards shall be examined. All defects, as defined in section I of FED-STD-4, which are clearly noticeable at normal inspection distance (3 feet) shall be scored and assigned demerit points as listed in 4.2.2.1.1, except that only those slubs and knots which exceed the maximum limits shown on Sears Fabric Defect Scales (see 6.4) E for slubs and D for knots shall be scored. No linear yard (increments of 1 yard on the measuring device of the inspection machine) from any one roll or folded piece within the sample shall be penalized more than four points. The sample size shall be 20 rolls or folded pieces selected from 20 containers. The lot shall be unacceptable if the points per 100 square yards of the total yardage examined exceed the following values:

30.0 points for type II - styles D, E, F, and G
 30.0 points for type II dyed cloth
 35.0 points for type II white cloth
 45.0 points for type I cloth

The lot shall be unacceptable if the points per 100 square yards of two or more individual rolls or pieces exceed the following point values:

45.0 points for type II - styles D, E, F, and G
 45.0 points for type II dyed cloth
 53.0 points for type II white cloth
 68.0 points for type I cloth

If no individual roll or folded piece exceeds the point level, the lot shall be accepted. If one roll or folded piece exceeds the point level, a second sample of 20 rolls or folded pieces shall be examined only for individual roll quality. The lot shall be unacceptable if one or more rolls or folded pieces in the second sample exceeds the point level. Point computation for lot quality and individual roll or folded piece quality shall be as follows:

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

4.2.2.1.1 Demerit points. Demerit points shall be assigned as follows:

- For defects up to and including 3 inches 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

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

- Baggy, ridgy, or wavy cloth
- Width less than specified
- Poor dye penetration, mottled, streaky, or cloudy
- Excessive neppiness

4.2.2.2 Length examination.

4.2.2.2.1 Individual rolls or folded pieces. During the yard-by-yard examination, each roll or folded piece in the sample shall be examined for length. Any roll or piece found to be less than the minimum specified or more than 2 yards less than 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 or folded 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 lengths of rolls or folded pieces in the sample is less than the total of the lengths marked on the tickets.

4.2.2.2.3 Shade examination. During the yard-by-yard examination, each roll or folded piece of dyed cloth in the sample shall be examined for shade. Any roll or folded piece in the sample off shade or 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 Roll marking examination. During the yard-by-yard examination, each roll or folded piece in the sample shall be examined for the defects listed below. The lot shall be unacceptable if two or more rolls or folded pieces in the sample contain one or more of the following defects:

The preshrinkage process is identified by name or trademark on the cloth, ticket, or package.

Not labeled or ticketed in accordance with the Textile Fiber Products Identification Act.

4.2.3 End item testing. The cloth shall be tested for the characteristics listed in table II. The methods of testing specified in FED-STD-191, wherever applicable, and as listed in table II shall be followed. The physical and chemical values specified in section 3, except where otherwise specified, apply to the results 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 2 continuous yards full width of the finished cloth for class 1, and 3 continuous yards full width of the finished cloth for class 2 cloth. The lot shall be unacceptable if one or more sample units fail to meet any requirement specified. The sample size shall be as follows:

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

TABLE II. End item tests

<u>Characteristic</u>	<u>Requirement reference</u>	<u>Test method</u>
Yarn identification, Styles A, B, and C	3.2.1.1 and 3.2.1.2	<u>1/</u>
Fiber content: Styles D, E, F and G except style G, type II, class 1, dyed	3.2.1.3 and 3.2.1.4	2535 <u>1/</u>
Style G, type II, class 1, dyed	3.2.1.3	2535
Labile sulfur	3.3.1	2020

TABLE II. End item tests (cont'd)

Characteristic	Requirement reference	Test method
Colorfastness to:		
Light	3.3.3	5660
Laundering (after 3 cycles)	3.3.3	5610
Crocking	3.3.3	5651
Weight	3.4	5041
Total yarns per inch	3.4	5050
Ends per inch	3.4	5050
Picks per inch	3.4	5050
Breaking strength	3.4	5100
Tearing strength <u>2/</u>	3.4	ASTM D 1424
Air permeability <u>2/</u>	3.4	5450
Weave	3.4.1	Visual <u>3/</u>
Nonfibrous material	3.5.1 and 3.5.2	2611
Acid hydrolyzable material	3.5.3	2610
pH	3.6	2811
Dimensional stability (class 2)	3.7	5550

1/ Unless otherwise specified, a certificate of compliance shall be submitted and will be acceptable for the stated requirement.

2/ Applicable to type II, class 1, style G dyed cargo parachute canopy fabric only.

3/ One determination per sample unit and the result reported as "pass" or "fail".

4.2.4 Packaging inspection. The inspection shall be in accordance with the quality assurance provisions of PPP-P-1134.

5. PACKAGING

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

5.1.1 Levels A and Commercial. The cloth, shall be put-up as specified, shall be preserved in accordance with the applicable requirements of PPP-P-1134.

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

5.2.1 Levels A, B, and Commercial. 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 purchase order, shipments shall be marked in accordance with PPP-P-1134.

6. NOTES

6.1 Intended use.

- a. Type I, class 1, style A, natural, for mattress, bed; and flags, ensign, guidons. (AS)
- b. Type I, class 2, style A for pillow covers.
- c. Type I, class 2, style B, natural, for mattress covers. (N)
- d. Type II, class 1, style A, white and gray-green, for pillowcases and bed sheets. (AS) (DPSC)
- e. Type II, class 1, style B, white, for bed sheets, men's and women's shirts. (N, AF)
- f. Type II, class 2, style A, white, for coat, food handler; mattress cover; hat, service; trousers, men; uniform men. (N, MC)
- g. Type II, class 2, style B, white, for cover, mattress; pad mattress, and stars for U.S. Flags and Union Jacks. (AS)
- h. Type II, class 1, style C, white, for pillowcases and bed sheets. (VA)
- i. Type II, class 2, styles D and E, white, for pillowcases and bed sheets, for Navy use. (N)
- j. Types I and II, class 1, style A, used by civil government agencies for sheets, pillowcases, mattress and furniture covers, garment and laundry bags, and ironing-board covers.
- k. Type II, class 1, style G dyed canopy fabric for the 12-foot cargo parachute which replaces cloth, muslin, cotton, type III of MIL-C-4279.

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, class, and style required (see 1.2).
- c. Color of cloth required (see 3.3).
- d. Width of cloth required (see 3.4.2).
- e. If other than 40-yard minimum length is required (see 3.8).
- f. Selection of applicable levels of preservation and packing (see 5.1 and 5.2).

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

6.4 Fabric defect scales. Fabric Defect Replica Kits are available from Sears, Roebuck and Company, Department 817 (ATTN: BSC 23-29), Sears Tower, Chicago, IL 60684.

MILITARY INTERESTS

Custodians

Army - GL
Navy - NU
Air Force - 99

Review Activities

Army - MD, EA
Navy - MS, SH
Air Force - 82
DLA - CT

User Activities

Navy - MC
Air Force - 45

CIVIL AGENCY COORDINATING ACTIVITIES:

GSA - FSS
DCC
VA - OSS
JUS - FPI

PREPARING ACTIVITY:

Army - GL
Project No. 8305-0905

INSTRUCTIONS: In a continuing effort to make our standardization documents better, the DoD provides this form for use in submitting comments and suggestions for improvements. All users of military standardization documents are invited to provide suggestions. This form may be detached, folded along the lines indicated, taped along the loose edge (*DO NOT STAPLE*), and mailed. In block 5, be as specific as possible about particular problem areas such as wording which required interpretation, was too rigid, restrictive, loose, ambiguous, or was incompatible, and give proposed wording changes which would alleviate the problems. Enter in block 6 any remarks not related to a specific paragraph of the document. If block 7 is filled out, an acknowledgement will be mailed to you within 30 days to let you know that your comments were received and are being considered.

NOTE This form may not be used to request copies of documents, nor to request waivers, deviations, or clarification of specification requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

(Fold along this line)

(Fold along this line)

DEPARTMENT OF THE ARMY
S Army Natick Research and Development Center
Natick, Massachusetts 01760

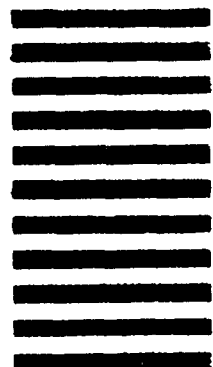


NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE \$300
STRNC-ES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO 12062 WASHINGTON D C
POSTAGE WILL BE PAID BY THE DEPARTMENT OF THE ARMY

Commander
US Army Natick Research and Development Center
ATTN: STRNC-ES
Natick, MA 01760



STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL*(See Instructions - Reverse Side)*

1 DOCUMENT NUMBER

CCC-C-430F

2 DOCUMENT TITLE

Cloth, Sheeting, Cotton, and Polyester and Cotton

3a. NAME OF SUBMITTING ORGANIZATION

4 TYPE OF ORGANIZATION *(Mark one)* VENDOR USER MANUFACTURER OTHER *(Specify)* _____b. ADDRESS *(Street, City, State, ZIP Code)*

5 PROBLEM AREAS

a. Paragraph Number and Wording

b. Recommended Wording

c. Reason/Rationale for Recommendation

6 REMARKS

7a. NAME OF SUBMITTER *(Last, First, MI) - Optional*b. WORK TELEPHONE NUMBER *(Include Area Code) - Optional*c. MAILING ADDRESS *(Street, City, State, ZIP Code) - Optional*8. DATE OF SUBMISSION *(YYMMDD)*DD FORM 1426
82 MAR

PREVIOUS EDITION IS OBSOLETE

NATICK OP, 1 APR 83