

MIL-C-87064A  
26 April 1985  

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SUPERSEDING  
MIL-C-87064  
23 January 1984

## MILITARY SPECIFICATION

### CLOTH, DENIM, COTTON/POLYESTER

This specification is approved for use by the Navy Clothing and Textile Research Facility, 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 65% cotton/35% polyester denim cloth.

#### 2. APPLICABLE DOCUMENTS

##### 2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. Unless otherwise specified, the following specifications, standards, and handbooks of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this specification to the extent specified.

### SPECIFICATIONS

#### FEDERAL

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Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Officer in Charge, Navy Clothing and Textile Research Facility, 21 Strathmore Road, Natick, MA 01760-2490 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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FSC 8305

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

MILITARY

MIL-T-43548 - Thread, Polyester, Cotton Covered and Rayon Covered  
MIL-T-43624 - Thread, Polyester, Spun

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 contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this specification to the extent specified herein.

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 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

3. REQUIREMENTS

3.1 Standard sample. The 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 6.3).

3.2 First article. When specified, the contractor shall furnish sample unit(s) for first article inspection and approval (see 4.3 and 6.2).

3.3 Material. (see 6.5).

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\* 3.3.1 Yarns. The filling yarns shall be a blend of 50 (+ 5%) polyester and the remainder cotton. The warp yarns shall be a blend of cotton and polyester in such a proportion so that the basic cloth without finishing materials shall analyze 64 (+ 5%) cotton and the remainder polyester.

3.4 Color. The color shall be Navy Shade Blue 3371 and shall match the standard sample. The warp shall be indigo dyed. The filling yarn may be tinted.

\* 3.4.1 Matching. The color of the finished cloth shall match the standard sample under artificial daylight, having a color temperature of 7000 (+ 500) Kevlin and shall be a good approximation to the standard sample under incandescent lamplight at 2850 (+ 100 Kevlin).

3.4.2 Colorfastness. The dyed cloth shall show colorfastness to light (after 20 hours exposure), laundering and dry crocking, equal to, or better than, the standard sample when tested as specified in 4.5. When no standard sample is available, or when the standard sample is not a reference for colorfastness, the dyed cloth shall show "good" colorfastness to light (after 20 hours exposure), and "fair" fastness to laundering and dry crocking.

3.5 Physical requirements. The finished cloth shall conform to the minimum requirements specified in Table I when tested as specified in 4.5.

Table I - Physical Requirements

Weight oz/sq yd (g/m <sup>2</sup> ) (min)	Yarns per inch (cm) (min)		Breaking Strength lbs (newtons)(min)		Tearing Strength lbs (newtons)(min)	
	Warp	Filling	Warp	Filling	Warp	Filling
10.0 (339.0)	68 (26.8)	42 (16.5)	170 (756.2)	80 (355.8)	10 (44.5)	5 (22.2)

3.6 Weave. The cloth shall be a 3-harness construction, 2 up and 1 down right-handed twill.

\* 3.7 Width. The width of the cloth shall be as specified (see 6.2), and shall be the minimum width, inclusive of selvage except when woven on shuttless looms the width shall be exclusive of selvages.

3.8 Nonfibrous materials. The starch and protein content including chloroform-soluble and water-soluble material, shall not exceed 12.0 percent when tested as specified in 4.5.

3.9 Dimensional stability. The finished cloth shall not shrink or elongate more than 2.0 percent in either direction of the warp or filling when tested as specified in 4.5. The preshrinking process used shall not be identified by name or trademark, either on the cloth or the ticket or package.

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3.10 Seam efficiency. The finished cloth shall have a seam efficiency of not less than 80% when tested as specified in 4.5.

3.11 pH. The pH of the cloth shall not be lower than 5.5 nor more than 8.5 when tested as specified in 4.5.

3.12 Length and put-up. Unless otherwise specified (see 6.2), the cloth shall be in continuous lengths, each not less than 40 yards. Each length shall be put up on full width rolls as specified in PPP-P-1134 with the face inwards.

3.13 Fiber identification. Each piece shall be ticketed or labeled for fiber content in accordance with the rules and regulations under the Textile Fiber Products Identification Act (see 2.1).

3.14 Workmanship. The finished cloth shall conform to the quality 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 or order, the contractor may use his own or any other facilities suitable for 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 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).

#### 4.3 First article inspection.

4.4 Quality conformance inspection. Sampling for inspection shall be performed in accordance with MIL-STD-105, except where otherwise indicated.

4.4.1 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 procurement documents.

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4.4.2 Examination of the end item. Examination of the end item shall be in accordance with 4.4.2.1 through 4.4.2.4.

\* 4.4.2.1 Yard-by-yard examination. Each roll in the sample shall be examined on face side only. When the total yardage in the roll does not exceed 100 yards (91.4m) the entire yardage in the roll shall be examined. When the total yardage in the roll exceeds 100 yards (91.4m) only 100 yards (91.4m) shall be examined. All defects as defined in Section 1 of FED-STD-4, which are clearly noticeable at normal inspection distance (3 feet) (0.91m), shall be scored and assigned demerit points as listed in 4.4.2.1.1, except that only the slubs and knots which exceed the limits shown on Sears Fabric Defect Scale (see 6.4), "E" for slubs and "C" for knots shall be scored. No linear yard (increments of 1 yard (0.91m) on the measuring device of the inspection machine) from any one roll within the sample shall be penalized more than 4 points. The sample size shall be in accordance with the following:

<u>Lot size (yards)</u>	<u>Sample size (rolls) 1/</u>
3200 or less	8
3201	13
10,001 and over	20

1/ Only one roll shall be taken from any shipping container, unless the number of shipping containers in the lot are less than the number of rolls required for sampling, in which case, all shipping containers shall be sampled.

The lot shall be unacceptable if the points per 100 square yards ( $83.6m^2$ ) of the total yardage examined exceeds 28 points. The lot shall be unacceptable if the individual points per 100 square yards ( $83.6m^2$ ) of two or more individual rolls exceeds 40 points. If one roll exceeds the point level per 100 square yards ( $83.6m^2$ ), a second sample, the same size as the final sample, shall be examined only for individual roll quality examination. The lot shall be unacceptable if one or more rolls in the second sample exceeds 38 points per 100 square yards ( $83.6m^2$ ). Point computation for lot quality and individual roll quality shall be as follows:

$$\frac{\text{Total points scored in sample} \times 3600}{\text{Contracted width of cloth (inches)} \times \text{Total yards inspected}} = \text{Points per 100 square yards (83.6m}^2\text{)}$$

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

For defects 3 inches (7.6cm) or less in any dimension	- one point
For defects exceeding 3 inches (7.6cm), but not exceeding 6 inches (15.2cm) in any dimension	- two points
For defects exceeding 6 inches (15.2cm), but not exceeding 9 inches (22.9cm) in any dimension	- three points
For defects exceeding 9 inches (22.9cm) in any dimension	- four points

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The following defects when present in the yard-by-yard and overall examination, shall be scored four points for each yard (0.91m) in which they occur:

- Baggy, ridgy or wavy cloth
- Width of cloth less than specified
- Characteristics of finish, hand and shade not equal to the standard sample
- Non-uniformity of shade (mottled, streaky or cloudy)
- Holes, cuts, tears

#### 4.4.2.2 Examination for length.

4.4.2.2.1 Individual rolls. During the yard-by-yard and overall 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 (1.8m) 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 in the sample are defective in respect to length.

4.4.2.2.2 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 the lengths marked on the tickets. The rolls examined shall be those selected for the examination of individual rolls.

4.4.2.3 Examination for shade variation. During the yard-by-yard examination, each roll in the sample shall be examined for shade variation. Any roll in the sample exhibiting uneven shade variation side-to-side, side-to-center, or end-to-end shall be cause for rejection of the entire lot represented by the sample.

4.4.2.4 Examination for identification of pre-shrinkage process and compliance with Textile Fiber Products Identification Act. During the yard-by-yard examination each roll in the sample shall be examined for these defects. The lot shall be unacceptable if two or more rolls in the sample contain identification of the preshrinkage process by name or trademark on the cloth or ticket, or are not labelled or ticketed in accordance with the Textile Fiber Products Identification Act.

4.4.3 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 complies with Section 5 requirements of this specification.

4.5 Testing of the end item. 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 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 3 continuous yards (2.7 continuous meters) full width of the finished cloth. The sample size (number of sample units) shall be as shown in the table below. The lot size shall be expressed in units of 1 yard (0.91m). The lot shall be unacceptable if one or more sample units fail to meet any test requirement specified.

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

Table II - Test Methods

<u>Characteristics</u>	<u>Requirement paragraph</u>	<u>Test Methods</u>
Fiber content:		
Polyester (percent)	3.3.1	2100 and 4.5.1
Cotton (percent)	3.3.1	2100 and 4.5.1
Dyestuff identification	3.4	<u>1/</u>
Colorfastness to:		
Light (20 hrs)	3.4.2	5660
Laundering	3.4.2	5610 <u>2/</u>
Dry crocking	3.4.2	5651
Weight	3.5	5041
Yarns per inch:		
Warp	3.5	5050
Filling	3.5	5050
Breaking strength:		
Warp	3.5	5100
Filling	3.5	5100
Tearing strength:		
Warp	3.5	5132
Filling	3.5	5132
Weave	3.6	Visual <u>3/</u>
Non-fibrous material	3.8	2611
Dimensional stability	3.9	5550
Seam efficiency	3.10	5110 <u>4/</u>
pH	3.11	2811

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

2/ Only the stain on the cotton and polyester fibers of the color transfer cloth shall be evaluated.

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

4/ The needle size shall measure 0.044 inch (+ 0.001) across the blade of the eye. The thread shall be polyester covered in accordance with MIL-T-43548, ticket no. #50, 2 or 3 ply for the needle and ticket #70, 2 or 3 ply for the looper.

5.5.1 Test for polyester fiber and cotton fiber content. The general procedues of test method 2100 shall be followed and the fiber content percentages shall be calculated as follows:

$$\frac{\text{Weight of dry residual fiber} \times 100}{\text{Weight of dry desized specimen}} = \text{percent polyester}$$

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100 - percent polyester = percent cotton

4.5.1.1 Report. Two specimens shall be tested from each sample unit and the average percent polyester and the average percent cotton of the two specimens shall be reported to the nearest 0.1 percent.

## 5. PACKAGING

5.1 Preservation-packing. Packaging shall be level A or C as specified (see 6.2).

5.1.1 Level A and C. The cloth shall be put-up and 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, 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 contract or order, shipments shall be marked in accordance with the applicable requirements of PPP-P-1134.

## 6. NOTES

6.1 Intended use. The cloth covered by this specification is intended for use in the manufacture of dungaree work trousers for Navy enlisted men and women.

\* 6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number and date of this specification.
- b. When first article sample is required (see 3.2). The item will be tested and should be a first article sample. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, quantity, and testing and approval of the first article.
- c. Width of cloth required (see 3.7).
- d. Length of roll required if other than specified (see 3.11).
- e. Levels of packaging and packing required (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 Sears Fabric Deect Scales are available from Sears, Roebuck and Company, Department 817 (Attn: BSC 23-29), Sears Tower, Chicago, IL 60694.

6.5 Recycled material. It is encouraged that recycled material be used when practical as long as it meets the requirements of this specification.



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\* 6.6 Changes from previous issue. The margins of this specification are marked with an asterisk to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

Custodian:  
Navy - NU

Preparing Activity:  
Navy - NU

Review Activity:  
DLA - CT

Project No. 8305-N998

**STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL***(See Instructions - Reverse Side)***1. DOCUMENT NUMBER**

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**2. DOCUMENT TITLE**

CLOTH, DENIM, COTTON/POLYESTER

**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)**