

INCH-POUND

MIL-C-87059A(NU)

6 February 1989

SUPERSEDING

MIL-C-87059(SA)

30 October 1978

MILITARY SPECIFICATION

CLOTH, KNITTED, NYLON, TRICOT

*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 a nylon tricot cloth.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

* 2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS

FEDERAL

PPP-P-1133 - Packaging of Synthetic Fiber Fabrics

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.

AMSC N/A

FSC 8305

*DISTRIBUTION STATEMENT A. Approved for public release, distribution is unlimited.

MIL-C-87059A(NU)

STANDARDS

FEDERAL

FED-STD-191 - Textile Test Methods

MILITARY

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

MIL-STD-1491 - Glossary of Knitting Imperfections

(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. Unless otherwise specified, the issues shall be those in effect on the date of the solicitation.

LAWS AND REGULATIONS

Rules and Regulations Under the Textile Fiber Products Identification Act

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

* 2.2 Other publications. The following document(s) form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted shall be those listed in the issue of the DODISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS shall be the issue of the nongovernment documents which is current on the date of the solicitation.

TECHNICAL MANUAL OF THE AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS

(Application for copies should be addressed to the AATCC National Headquarters, P.O. Box 12215, Research Triangle Park, NC 27709-9989.)

AMERICAN SOCIETY FOR TESTING MATERIALS

No. D 3787-80a - Bursting Strength of Knitted Goods -
Constant-Rate-of-Traverse (CRT) Ball Burst Test

(Application for copies should be addressed to the American Society for Testing Materials, 1916 Race St., Philadelphia, PA 19103-1187.)

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

MIL-C-87059A(NU)

2.3 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. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

* 3.1 Standard sample. The finished cloth shall match the standard 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). The standard sample is identified under piece number 79033.

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.

3.3.1 Fiber. The fiber shall be regular tenacity, dull luster, (front guide bar) and regular tenacity, mid-dull luster (back guide bar) nylon. Testing shall be as specified in 4.5.

3.3.2 Yarn. The yarn for the front guide bar shall be round cross section, nominal 30 denier, 10 filaments with built-in anti-static protection. The yarn for the back guide bar shall be tri-lobal cross section, nominal 40 denier, 13 filaments with built-in anti-static protection. Testing shall be as specified in 4.5.

3.4 Physical requirements. The finished cloth shall conform to the physical requirements shown in Table I when tested as specified in 4.5.

TABLE I. Physical requirements

Characteristics	Minimum	Maximum
Weight, oz/yd ² (g/m ²)	2.7 (91.5)	-
Wales/inch (2.54 cm)	32 (32)	-
Courses/inch (2.54 cm)	68 (68)	-
Bursting strength, lbs (N)	100 (445)	-

3.4.1 Knit. The cloth shall be knitted on a single needle bed warp knit machine having 31 needles per inch (12.2 per cm) minimum and two guide bars. Testing shall be as specified in 4.5.

3.4.2 Knit pattern. The guide bar stitch pattern shall be as follows when tested as specified in 4.5:

Front Bar 1/0, 0/1
Back Bar 1/0, 4/5

MIL-C-87059A(NU)

3.4.3 Width. Unless otherwise specified (see 6.2), the width of the finished cloth shall be a minimum of 50 inches (127.0 cm) inclusive of selvages.

3.5 Color. The color shall be white, shade 3006 and shall match the standard sample.

* 3.5.1 Matching. The finished cloth shall match the standard sample when viewed under filtered tungsten lamps which approximate artificial daylight having a correlated color temperature of 7500 ± 200 K, with illumination of 100 ± 20 foot candles, and shall be a good match to the standard sample under incandescent lamplight at 2300 ± 200 K.

* 3.5.2 Discoloration. The finished cloth shall show no more discoloration to combined laundering and bleaching, perspiration, and wet-dry cleaning than that of the standard sample when tested as specified in 4.5.

3.6 Dimensional stability. The finished cloth shall not shrink or elongate more than 5.0 percent in the wale direction or 2.5 in the course direction when tested as specified in 4.5.

3.7 Non-fibrous materials. The non-fibrous content including chloroform-soluble and water-soluble material shall not exceed 4.0 percent when tested as specified in 4.5.

3.8 Finish. The cloth shall be scoured, heat set, and dyed. The character of the finish shall be equal to that of the standard sample.

* 3.9 pH. The pH value of the water extract of the finished cloth shall be no less than 4.5 nor more than 7.0 when tested as specified in 4.5.

3.10 Face identification. The face side of the cloth shall be identified by stamping on that side with the word "Face" at each end of the roll.

3.11 Length and put-up. Unless otherwise specified (see 6.2), the finished cloth shall be furnished in continuous lengths, each not less than 40 yards (36.4 m). Each length shall be put-up on full width rolls as specified in PPP-P-1133.

3.12 Fiber identification. Each piece shall be labeled, or ticketed for fiber content in accordance with the Rules and Regulations Under the Textile Fiber Products Identification Act.

3.13 Workmanship. The finished cloth shall conform to the quality established by this document. The occurrence of defects shall not exceed the applicable quality level specified.

MIL-C-87059A(NU)

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 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.1.2 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. When required (see 3.2 and 6.2), the first article shall be visually examined for appearance, color and finish, and shall be tested for physical and chemical properties in accordance with methods specified in 4.5.

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.

4.4.2 Examination of the end item. Examination of the end item shall be in accordance with 4.4.2.1 through 4.4.2.3.

MIL-C-87059A(NU)

4.4.2.1 Yard-by-yard examination. The required yardage of each roll in the sample shall be examined on the face side and visual defects as defined in MIL-STD-1491 shall be classified as listed. All defects found shall be counted regardless of their proximity to each other, except where two or more defects represent a single local condition of the cloth, in which case only the more serious defect shall be counted. A continuous defect shall be counted as one defect for each wale-wise (lengthwise) yard (0.91m) or fraction thereof in which it occurs. The sample unit for this examination shall be one linear yard (0.91m). The acceptable quality levels for this examination shall be 2.5 major defects and 6.5 total defects (major and minor combined) per 100 units (yards) (91.4m). The sample size shall be based upon inspection level II of MIL-STD-105. The lot size shall be expressed in units of one yard (0.91m). The number of rolls from which the sample is to be selected shall be in accordance with Table II. An approximately equal number of yards (meters) shall be examined from each roll in the sample.

Defect	Classification	
	Major	Minor
Any hole, cut, tear, run	X	
Dropped stitch, end out	X	
Tuck stitch, pulled stitch or needle streak		X
Mend (any)	X	
Coarse or fine yarn <u>1/</u>	X	
Foreign matter <u>1/</u>		X
Knot oversize, extending above the surface of cloth	X	
Kink or untrimmed end		X
Crease or wrinkle, embedded		X
Stretch (stitch tension) knitting tension too tight or too loose	X	
Shade bar <u>1/</u>		X
Spot or stain	X	
Barre' marks, broken yarns or dye stains <u>1/</u>	X	

1/ Clearly visible at normal inspection distance (approximately 3 feet (0.91m)).

4.4.2.2 Overall examination. Each defect shall be counted no more than once in each roll examined. The sample unit shall be one roll. The sample size (number of rolls selected as sample) and the number of defects acceptable shall be as shown in Table II.

Defects

Face side of cloth not on inside

Width less than specified

Overall uncleanness

Uneven knitting throughout the piece

Off shade, shaded end to end, side to side, side to center, or throughout the roll

Poor dye penetration, mottled, streaky or cloudy

Cut edge is not paralalled to wales in the finished cloth

Not labeled in accordance with the Textile Fiber Products Identification Act

Face marking missing from either or both ends of the roll

Face marking on the wrong side

Hand and finish not equal to standard

MIL-C-87059A(NU)

Table II - Sample sizes

Lot size (yards) (0.91m)	Sample size (rolls)	Acceptance number
Up to 1200 1/	3	0
1201 up to and including 3200	5	0
3201 up to and including 10,000	8	0
10,001 up to and including 35,000	13	0
35,001 up to and including 150,000	20	1
150,001 and over	32	2

1/ If a lot contains fewer than three rolls, each roll in the lot shall be examined.

4.4.2.3 Examination for length.

4.4.2.3.1 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 less than the length marked on the ticket shall be considered a defect with respect to length. The sample unit shall be one roll. The sample size (number of rolls selected as sample) and the acceptance number shall be as shown in Table II.

4.4.2.3.2 Total yardage in sample. The lot shall be unacceptable if the total of the actual length of rolls in the sample is less than the total of the lengths marked on the ticket. The rolls examined shall be those selected for the examination of individual rolls.

4.4.3 Examination of packaging requirements. An examination shall be made in accordance with the provisions of PPP-P-1133 to determine that preservation, packaging, packing, and marking comply with section 5 requirements.

* 4.5 Testing of the end item. The methods of testing specified in FED-STD-191, wherever applicable, and as listed in Table IV 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 methods. The sample unit shall be 2 1/2 yards (2.3m) full width of the finished cloth. The sample size shall be as listed in Table III. 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 requirement specified. All test reports shall contain the individual values utilized in expressing the final results.

Table III - Sample size

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

MIL-C-87059A(NU)

Table IV - Test Methods

Characteristic	Requirement Paragraph	Test Method
Fiber identification	3.3.1	1/
Yarn denier and filament	3.3.2	1/
Weight	3.4	5041
Wales per inch	3.4	5070
Courses per inch	3.4	5070
Bursting strength	3.4	ASTM D3787-80a
Type of knit	3.4.1	1/
Knit pattern	3.4.2	1/
Discoloration to:		
Combined laundering & bleaching	3.5.2	5605
Perspiration	3.5.2	5680
Wet-dry cleaning	3.5.2	5622
Dimensional stability	3.6	4.5.1
Non-fibrous material	3.7	2611
pH	3.9	2811

1/ Unless otherwise specified in the contract or purchase order, the supplier shall submit a certificate of compliance for this characteristic. The certificate shall be accompanied by actual test, inspection, or other verifiable data.

4.5.1 Test for dimensional stability. The finished cloth shall be tested after 5 wash cycles according to AATCC Test Method 135-1973, Method II (120 $\pm$ 5° F (49 $\pm$ 3° C), drying procedure "B" (tumble).

5. PACKAGING

5.1 Put-up and preservation. Put-up and preservation 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 of PPP-P-1133.

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-1133.

5.3 Marking. In addition to any special marking required by the contract or order, shipments shall be marked in accordance with the applicable requirements of PPP-P-1133.

MIL-C-87059A(NU)

6. NOTES

* 6.1 Intended use. The cloth covered by this specification is intended for use as a lining material in the Navy women's white skirt and the Navy men's white trousers.

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

- a. Title, number and date of this document.
- b. When a first article is required (see 3.2 and 4.3). The item will be tested and should be a first article sample. The contracting officer should include specific instruction in acquisition documents regarding arrangements for examinations, quantity, testing, and approval of the first article.
- c. Width required (see 3.4.3).
- d. Length required if other than specified (see 3.11).
- e. Levels of put-up and 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 (see 3.1).

* 6.4 Subject term (key word) listing.

Cloth, knitted
 Cloth, nylon
 Cloth, tricot
 Lining, skirt
 Lining, trousers

* 6.5 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-N235

