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SUPERSEDING
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MILITARY SPECIFICATION

CLOTH, NETTING; NYLON OR POLYESTER

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This document covers two types of nylon or polyester netting.

1.2 Classification. The netting shall be of the following types, as specified (see 6.2).

Type I - Woven
Type II - Warp knitted

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Documents. The following documents form a part of this document 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.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: U.S. Army Natick Research, Development, and Engineering Center, Natick, MA 01760-5014 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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SPECIFICATIONS

FEDERAL

PPP-P-1133 - Packaging of Synthetic Fiber Fabrics

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

MIL-STD-1491 - Glossary of Knitting Imperfections

(Copies of documents required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.1.2 Other Government documents. The following other Government documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues shall be those in effect on the date of the solicitation.

Rules and Regulations Under the Textile Fiber Products Identification Act

(Application for copies should be addressed to the Federal Trade Commission, Pennsylvania Avenue at Sixth Street, N.W., Washington, DC 20580.)

2.2 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document shall take precedence. Nothing in this document, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Standard sample. The dyed and finished cloth shall match the standard sample for shade and appearance 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).

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3.2 Material.

3.2.1 Nylon. The yarn shall be 70 denier, bright or semi-dull multifilament nylon with sufficient twist to meet the requirements of this document. Testing shall be as specified in 4.2.4.

3.2.2 Polyester. The yarn shall be 70 denier, semi-dull, regular tenacity, multifilament polyester with sufficient twist to meet the requirements of this document. Testing shall be as specified in 4.2.4.

3.3 Color. The cloth shall be dyed Olive Green 106. The use of pigmented resin emulsion finishes to provide color and finish in one operation is permitted.

* 3.3.1. Matching. The color of 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.

3.3.2 Colorfastness. The dyed and finished cloth shall show colorfastness to laundering and accelerated weathering equal to or better than the standard sample or equal to or better than a rating of "good" when tested as specified in 4.2.4.

3.4 Physical requirements. The finished cloth shall conform to the requirements shown in table I when tested as specified in 4.2.4.

TABLE I. Physical requirements

Characteristics	Type I	Type II
Weight per sq yd, ounces (max)	1.6	2.0
Yarns per inch:		
Warp	54 min, 56 max	---
Filling	54 min, 56 max	---
Breaking strength, pounds (min):		
Warp	50	---
Filling	50	---
Length	---	50
Width	---	50

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TABLE I. Physical requirements - Continued

Characteristics	Type I	Type II
Mesh size, initial (inches): ^{1/}		
Warp (max)	0.035	---
Filling (max)	0.035	---
Vertical pillars and horizontal inlay (max)	---	0.035
Mesh size, inches after 3 launderings and slippage yarn tests (max)	0.100	0.100
Meshes per sq in:		
(min)	729	470
(max)	784	635

^{1/} Requirements based on the distance between the two warp yarns and the primary filling yarns forming the mesh opening for type I, and the distance between the two vertical pillars and the horizontal inlay yarns forming the mesh opening for type II. The average values of these measurements shall not exceed the maximum specified.

3.4.1 Weave (type I). The cloth shall be woven with three picks of plain and one pick of leno and repeated as shown in figure 1, causing the three picks of plain to be pushed together on each side of the leno pick forming well defined mesh openings. Selvages shall be not less than 1/4 inch nor more than 1/2 inch in width (see 4.2.4).

3.4.2 Knit (type II). The netting shall be of the mesh type produced on warp knitting equipment utilizing the pillar inlay principle to form a rectangular shaped mesh. One bar shall knit the vertical pillars (chain stitch) and the other bar shall be used for producing the horizontal inlays (see 6.4).

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

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3.5 Finish. The cloth shall be given a permanent resin finish (see 4.2.4) and the character of the finished cloth shall be equal to that of the standard sample. In order to assure the proper number of meshes per inch and the size of the meshes, the cloth shall be heat set and framed to appropriate dimensions.

3.6 Shrinkage. The finished cloth shall not show a greater shrinkage than 2.0 percent in length (warp) and 2.0 percent in width (filling) when tested as specified in 4.2.4. The preshrinking process shall not be identified by name or trademark on the cloth, ticket, or package.

3.7 Length and put-up. Unless otherwise specified (see 6.2), the cloth shall be furnished in continuous lengths, each not less than 100 yards. The pieces shall be put up in full-width rolls as specified in 5.1.1.

* 3.7.1 Length (type II). The type II netting length to be marked on each piece ticket shall be determined as follows:

- a. The net weight of the roll shall be determined to the nearest 1/2 pound.
- b. The grand average weight of cloth shall be obtained (this is the lot average weight of cloth in ounces per square yard as calculated in 4.2.4).
- c. The actual width of the cloth shall be determined to the nearest 1/4 inch. There shall be 10 determinations with no determination within 10 yards of a previous measurement.
- d. The length of the roll shall be calculated as follows:

$$\frac{\text{Net weight of roll} \times 36 \times 16}{\text{Grand average ounces per sq yd (to nearest 0.1 ounce)} \times \text{Actual width (in)}}$$

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

3.9 Workmanship. The finished cloth shall conform to the quality established by this document. The demerit points per 100 square yards for type I cloth, when calculated as specified in section 4, shall not exceed the established maximum point value. The occurrence of defects for type II cloth shall not exceed the specified acceptable quality levels.

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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 this document 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 document shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirement in the document 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 Certificates of compliance. When certificates of compliance are submitted, the Government reserves the right to inspect 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 documents unless otherwise excluded, amended, modified, or qualified in this document or applicable purchase document.

4.2.2 Examination of the end item (type I).

4.2.2.1 Yard-by-yard examination (type I). 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. All defects as defined in Section III 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. No linear yard (increment of 1 yard on the measuring device of the inspection machine) shall be penalized more than four points. The lot shall be unacceptable if the points per hundred square yards exceed 30.0 points. Point computation shall be as follows:

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$$\frac{\text{Total points scored in sample} \times 3600}{\text{Contracted width of cloth (inches)} \times 750} = \text{Points per 100 sq yd}$$

4.2.2.1.1 Demerit points (type I). 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:

Width less than specified

Finish not equal to the standard sample

Poor dye penetration, mottled, streaky, or cloudy

Width of selvage not as specified

4.2.2.2 Roll length examination (type I). During the yard-by-yard examination, each roll in the sample (specified in 4.2.2.1) shall be examined for length. Any length 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 in the sample are defective with respect to length, or if the total of the actual lengths of rolls in the sample is less than the total of the lengths marked on the roll tickets.

4.2.2.3 Shade and appearance examination (type I). During the yard-by-yard examination, each roll in the sample shall be examined for shade and for finish appearance. Any roll in the sample off shade, shaded to side to side, shaded side to center, or shaded end to end, or any roll that does not have the same appearance as the standard sample shall be cause for rejection of the lot.

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4.2.2.4 Roll identification examination (type I). During the yard-by-yard examination, each roll in the sample shall be examined for the defects listed below. The lot shall be unacceptable if two or more rolls 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 Examination of the end item (type II).

- * 4.2.3.1 Yard-by-yard examination (type II). The required yardage of each roll shall be examined for the defects listed below and as defined in MIL-STD-1491. All defects which are clearly noticeable at normal inspection distance (3 feet) shall be counted regardless of their proximity to each other, except when 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 yard lengthwise or fraction thereof in which it occurs. The sample unit shall be 1 linear yard. The lot size shall be expressed in units of 1 yard. The inspection level shall be III and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be as follows:

For fabric width up to 50 inches, - 4.0 - for all defects except holes and runs
1.5 - for holes and runs

For fabric width over 50 inches - 6.5 - for all defects except holes and runs
2.5 - for holes and runs

The number of rolls from which the sample is to be selected shall be in accordance with table II. The sample yardage shall be apportioned equally among the selected rolls.

Defects

Any mend, cut, tear, or opening larger than the required mesh opening
Any run or dropped stitch
Any loose or floated yarn
Any abrasion resulting in weak area
Any thin yarn variation or uneven knitting
Any tight twisted yarn
Any embedded crease or wrinkle
Edge frayed, raveled, curled, rolled, folded, scalloped, or uneven
Any loose or tight yarn tension
Any knot extending above surface of cloth
Any shade bar, spot, or stain

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TABLE II. Sample size and examination criteria

Lot size (yards)	Sample size (rolls)	Acceptance number <u>2/</u>
Up to 10,000 inclusive <u>1/</u>	8	0
10,001 up to and including 35,000	13	0
35,001 and over	20	1

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

2/ Applicable to length examination only (see 4.2.3.2).

- * 4.2.3.2 Overall examination (type II). Each roll selected for yard-by-yard examination in accordance with table II shall be examined over its entire length for the defects listed below. Each defect listed shall be counted not more than once in each roll examined. The sample size shall be the applicable number of rolls indicated in table II. The lot shall be rejected if the total number of defects in the sample exceeds the acceptance number specified in table II.

Overall defects

Character of finish not equal to standard sample
 Width less than specified
 Objectionable odor 1/
 Overall uncleanness
 Uneven knitting throughout
 Width of selvage not as specified

1/ Normal residual odor of chemicals commonly used to applied resins and pigments for color and finish shall not be regarded as objectionable.

4.2.3.3 Individual roll length examination (type II). Each roll in the yard-by-yard examination sample shall be examined for length. Length shall be determined as specified in 3.7.1. Any length found to be less than the minimum specified or any roll more than 5 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 in the sample are defective with respect to length or if the total of the calculated lengths of rolls in the sample is less than the total of the lengths marked on the roll tickets.

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4.2.3.4 Shade examination (type II). During the yard-by-yard examination, each roll in the sample shall be examined for shade and appearance. Any roll in the sample off shade, shaded side to side, shaded side to center, shaded end to end, or that does not have the same appearance as the standard sample shall be cause for rejection of the lot.

4.2.3.5 Roll identification examination (type II). During the yard-by-yard examination, each roll in the sample shall be examined for the defects listed below. The lot shall be unacceptable if two or more rolls 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.

- * 4.2.4 End item testing (types I and II). The cloth shall be tested for the characteristics listed in table III. The methods of testing specified in FED-STD-191, wherever applicable, and as listed in table III shall be followed. The physical and chemical values specified in section 3, except where otherwise specified, apply to the results of the determination made on the 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. For all tests except weight, the sample unit shall be 3 1/2 continuous yards full width of the finished cloth and the sample size shall be as specified below. If one or more sample units fail to meet any test requirement (except weight), the lot shall be rejected. For the weight test, the sample unit shall be 1/2 yard full width of the finished cloth and the sample size shall be ten 1/2-yard sample units regardless of lot size. If the average weight of the ten sample units is greater than specified, the lot shall be rejected.

<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

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TABLE III. End item tests

Characteristic	Requirement paragraph	Test method
Nylon identification	3.2.1	1530 <u>1/</u>
Polyester identification	3.2.2	1600 <u>1/</u>
Denier	3.2.1 and 3.2.2	<u>1/</u>
Luster	3.2.1 and 3.2.2	<u>1/</u>
Multifilament	3.2.1 and 3.2.2	Visual <u>1/</u>
Tenacity	3.2.2	<u>1/</u>
Dye identification	3.3	<u>1/</u> <u>2/</u>
Colorfastness to:		
Laundering	3.3.2	5614
Accelerated weathering	3.3.2	5671 <u>3/</u>
Weight	3.4	5041
Yarns per inch (type I):		
Warp	3.4	5050
Filling	3.4	5050
Breaking strength: (type I)		
Warp	3.4	5100
Filling	3.4	5100
Breaking strength: (type II)		
Length	3.4	5100 <u>4/</u>
Width	3.4	5100 <u>4/</u>
Mesh size:		
Initial	3.4	<u>5/</u>
After 3 launderings and yarn slippage tests	3.4	5410, 5552 <u>5/</u> <u>6/</u>
Meshes per sq in	3.4	Visual <u>7/</u>

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TABLE III. End item tests - Continued

Characteristic	Requirement paragraph	Test method
Weave (type I)	3.4.1	Visual <u>8/</u>
Knit (type II)	3.4.2	Visual <u>8/</u>
Resin finish	3.5	<u>1/</u> <u>2/</u>
Shrinkage in laundering	3.6	5552 <u>6/</u>

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

2/ The contractor shall indicate on the test report the type of dye and process used (resin bonded, premetallized, etc.).

3/ The time of exposure shall be 80 hours.

4/ Except that only a constant-rate-of-extension (CRE) tester shall be used.

5/ Mesh size shall be measured with a traveling microscope or other suitable apparatus which can be read to nearest 0.001 inch. For type I, dimensions of the individual mesh opening shall be obtained by measuring and recording the distance between two parallel filling yarns which form the mesh opening. For type II, dimensions of the individual mesh opening shall be obtained by measuring and recording the distance between the two parallel vertical pillar yarns and the distance between the two parallel horizontal inlay yarns which form the mesh opening. A total of twenty dimensions shall be obtained and averaged from the ten mesh openings measured, and the averaged obtained shall be reported to the nearest 0.001 inch.

6/ The type II fabric shall be subjected to the same pressing procedure as prescribed for woven cloth.

7/ Five determinations shall be made on each sample unit and the results reported as the average of five determinations to the nearest whole number.

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8/ One determination shall be made on each sample unit and the result reported as "pass" or "fail."

4.2.5 Packaging examination. The examination shall be in accordance with the quality assurance provisions of PPP-P-1133.

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 and preserved in accordance with the applicable requirements of PPP-P-1133.

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-1133.

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

6. NOTES

6.1 Intended use. This cloth is intended for use in tentage and equipage items.

6.2 Ordering data. Acquisition documents should specify the following:

- a. Title, number, and date of this document.
- b. Type required (see 1.2).
- c. Width of cloth required (see 3.4.3).
- d. Length required if other than specified (see 3.7).
- e. Selection of applicable levels of preservation and packing (see 5.1 and 5.2).

6.3 Sample. For access to standard samples, address the contracting activity issuing the invitation for bids (see 3.1).

6.4 Knitting machine. The following is for information only and is not a mandatory requirement (see 3.4.2). The type II material has been made on a 2-bar 21 gage FNF tricot machine and has been produced on a 40 and 48 gage Raschel machine. The cloth may be produced on other tricot or Raschel machines of suitable gage.

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* 6.5 Subject term (key word) listing.

Cloth, netting
Cloth, nylon
Cloth, polyester
Equipage
Tentage

6.6 Changes from previous issue. The margins of this document 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, as written, irrespective of the marginal notations and relationship to the last previous issue.

Custodians:

Army - GL
Navy - NU
Air Force - 11

Preparing activity:

Army - GL
Project No. 8305-0183

Review activities:

Army - MD
Navy - MC
Air Force - 82, 99
DLA - CT

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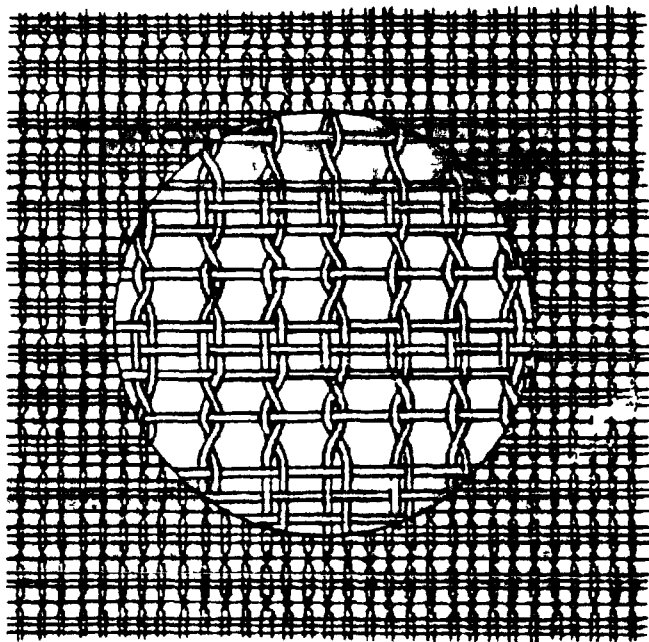


FIGURE 1. Leno weave - 3 and 1.

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