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MILITARY SPECIFICATION

CLOTH, COATED, SYNTHETIC RUBBER (NITRILE AND POLYCHLOROPRENE)

This specification is approved for use by the Naval Supply Systems Command, 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 four types of synthetic rubber coated cloth.

1.2 Classification The cloth, coated equally on both sides, shall be of the following types:

Type I - Cloth, nylon, flat knit, chloroprene coated
Type II - Cloth, cotton, duck, chloroprene coated
Type III - Cloth, cotton, duck, nitrile coated
Type IV - Cloth, cotton, airplane, chloroprene coated

2. APPLICABLE DOCUMENTS

* 2.1 Issues of documents The following documents of the issue in effect on date of invitation for bids or request for proposal form a part of this specification to the extent specified herein.

SPECIFICATIONS

FEDERAL

CCC-C-419 - Cloth, Duck, Cotton, Unbleached, Plied-yarns, Army and Numbered
PPP-P-1136 - Packaging and Packing of Coated (Plastic; Rubber) and Laminated 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 & Textile Research Facility, 21 Strathmore Road, Natick, MA 01760 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

FSC 8305

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MILITARY

MIL-C-5646 - Cloth, Airplane

STANDARDS

FEDERAL

FED-STD-191 - Textile Test Methods
FED-STD-595 - Colors

MILITARY

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-1487 - Glossary of Cloth Coating 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.)

* 2.2 Other publications The following document forms a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

NATIONAL MOTOR FREIGHT TRAFFIC ASSOCIATION, INC., AGENT

National Motor Freight Classification

(Application for copies should be addressed to American Trucking Associations, ATTN: Tariff Order Section, 1616 P Street, NW, Washington, DC 20036.)

UNIFORM CLASSIFICATION COMMITTEE, AGENT

Uniform Freight Classification

(Application for copies should be addressed to the Uniform Classification Committee, Room 1106, 222 South Riverside Plaza, Chicago, Illinois 60606.)

3. REQUIREMENTS

* 3.1 Standard sample When a standard sample is available, the finished coated cloth 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 a sample unit(s) for first article approval (see 6.2).

3.3 Materials

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3.3.1 Base fabrics:

3.3.1.1 Cloth, nylon, knitted The base fabric for type I material shall be a plain flat knit nylon and shall weigh 5.5 to 7.5 oz/sq. yd. (0.19 to 0.26 Kg/sq. m).

* 3.3.1.2 Cloth, cotton duck The base fabric for types II and III materials shall be cloth, cotton duck conforming to type I, No. 10, hard texture of CCC-C-419, except that the requirements for air permeability shall not apply.

3.3.1.3 Cloth, cotton, airplane The base fabric for type IV material shall be cloth, cotton, airplane conforming to MIL-C-5646, except that requirements covering length of roll, length of cut, and compatibility with dope shall not apply.

3.3.2 Coating compounds

* 3.3.2.1 Chloroprene The coating used for types I, II and IV coated fabrics shall be chloroprene rubber formulated to conform to the requirements of this specification. No rubber other than chloroprene shall be used with the exception that a maximun of 5.0 percent SBR (Styrene Butadiene Rubber) or natural rubber may be used for masterbatch purposes. The coating shall be pigmented to match Black No. 37038 of FEDSTD595, applied equally to both sides of base fabric, and shall be fully vulcanized.

* 3.3.2.2 Nitrile The coating used for type III coated fabric shall be nitrile rubber formulated to conform to the requirements of this specification. No rubber other than nitrile shall be used with the exception that a maximum of 5.0 percent SBR (Styrene Butadiene Rubber) or natural rubber may be used for masterbatch purposes. The coating shall be pigmented to match Black No. 37038 of FEDSTD595, applied equally to both sides of base fabric, and shall be fully vulcanized.

3.3.3 Finish

* 3.3.3.1 Dust When specified, dusting powder shall be whiting, talc, or other finely divided mineral material that does not support mildew growth, except that when blocking of coated surfaces during processing is not a serious problem, the use of zinc stearate is permitted. In order to acquire the cleanest finish possible, only the minimum amount of dusting powder necessary to prevent blocking should be applied.

* 3.3.3.2 Topcoat When specified, a thin lacquer or rubber base topcoat shall be used as a finish coat. The topcoat must be flexible, tack-free, nonstiffening, mildew resistant, weather resistant, and completely compatible with the chloroprene or nitrile coating compounds.

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* 3.4 Physical requirements The coated fabrics, after vulcanization, shall conform to the requirements listed in table I when tested as specified in 4.4.

Table I - Physical requirements

Characteristic	Type I Min	Type I Max.	Type II Min.	Type II Max.	Type III Min.	Type III Max	Type IV Min.	Type IV Max.
Thickness, inch	-	0.021	0.047	0.053	0.038	0.062	0.023	0.027
(mm)	-	(0.53)	(1.19)	(1.35)	(0.97)	(1.57)	(0.58)	(0.69)
Weight, oz/sq yd	-	19.0	49.0	59.0	-	43.0	24.0	29.0
(Kg/sq.m)	-	(0.65)	(1.67)	(2.00)	-	(1.46)	(0.82)	(0.99)
Breaking strength, lbs (N)								
Warp	100 (445)	-	245 (1090)	-	245 (1090)	-	90 (400)	-
Filling	100 (445)	-	160 (712)	-	160 (712)	-	90 (400)	-
Tearing strength, grams								
Warp	4500 1/		4000	-	4200	-	900	-
Filling	4500-		2500	-	3000	-	800	-
Hydrostatic resistance, psi (Pa) 2/								
Initial	70	-	250	-	250	-	150	-
After 100 hrs Weathermometer3/	65	-	250	-	200	-	150	-
Adhesion of coating								
Lbs/2 inch width	10	-	10	-	10	-	10	-
(N/5cm)	(25.4)	-	(25.4)	-	(25.4)	-	(25.4)	-
Blocking (scale rating)		No. 3		No.3		No.3		No. 3

1/ Tear test for type I material shall be conducted in accordance with Test Method 5136 of FED-STD-191 and the result reported in grams.

2/ For metric conversion multiply pounds per square inch by 6894.0 to obtain pascals.

3/ After subjection to weathering, but prior to hydrostatic, the test specimens shall be examined visually for deterioration. There shall be no signs of cracking, blistering, excessive stiffening or delamination of coating from base fabric.

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* 3.4.1 Color matching When dusting powder has been used as a finish the dust shall be removed from the vulcanized sample with a wet cloth and the sample allowed to dry before color matching.

* 3.5 Width All selvages of the coated fabric shall be trimmed. The finished trimmed width shall be as specified (see 6.2).

3.6 Length and put-up The coated fabric shall be put-up on rolls as specified in PPP-P-1136. The length of the rolls shall be as specified in Table II. Each roll shall contain not more than three (3) pieces and no piece shall be less than ten (10) yards. Splices (seams) in the coated fabric are not permitted in shipping rolls.

Table II - Length of rolls (maximum linear yards)

Type I	-	90 yards, linear
Type II	-	30
Type III	-	40
Type IV	-	50

3.7 Workmanship The finished coated fabric shall be clean, evenly coated, and shall conform to the quality of product 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 the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract, 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 First article approval When required, the first article, submitted in accordance with 3.2, shall be inspected for finish, color and overall appearance and shall be tested for physical properties in accordance with test methods specified in 4.4.

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

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4.3.1 Component and material inspection In accordance with 4.1 above, components and materials shall be inspected and tested in accordance with all requirements of referenced specifications and standards unless otherwise excluded, amended, modified or qualified in this specification or applicable purchase document. In addition, a certificate of compliance shall be submitted and will be acceptable for the base fabric requirements of 3.3 1, the coating compounds of 3.3.2, and the finish requirements of 3.3.3.

4.3.2 Examination of the end item Defects found during the examination shall be classified as specified in 4.3.2.1 thru 4.3.2.4. Definitions of coated fabric defects applicable to this specification are described in MIL-STD-1487.

4.3.2.1 Yard-by-yard examination The required yardage of each roll shall be examined on one side only; however, the side to be examined shall be alternated in every other roll. The defects listed below shall be counted regardless of their proximity to each other, except where two or more defects represent a single local condition of the coated cloth, in which case only the more serious defects shall be counted. A continuous defect shall be counted as one defect for each warpwise yard or fraction thereof in which it occurs. The unit of product for this examination shall be one linear yard. The inspection level shall be level II of MIL-STD-105. The acceptable quality level shall be 1.0 for major defects and 4.0 for total defects per 100 units. The number of rolls selected for this examination shall be in accordance with Table III. An approximate equal number of yards shall be examined from each roll in the sample.

Defects	Classification Major	Classification Minor
1. Any cut, hole, tear or uncoated area	X	
2. Any scratch or scuff mark resulting in a weak place or coating removal 1/	X	
3. Any blister or lump:		
a. hollow	X	
b. solid		X
4. Any permanent crease or wrinkle:		
a. Adhesion of surfaces	X	
b. No adhesion of surfaces		X
5. Any separation of coating from base cloth	X	
6. Permanent stain, streak or other blemish - one inch (2.5cm) or more in combined directions		X
7. Impression in coating resulting from seamed splicing		X
8. Any thinly coated area evidenced by light area or window - one inch (2.5cm) or more in combined directions		X

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Defects	Classification Major	Minor
9. Any scorched area	X	
10. Embedded foreign matter, affecting appearance or serviceability:		
a. Seriously	X	
b. Not seriously		X

1/ Clearly visible at normal inspection distance of 3 feet.

4.3 2.2 Overall examination Each defect listed shall be counted not more than once in each roll examined. The sample unit for this examination shall be one roll. The sample size (number of rolls selected as sample) for this examination and the acceptance numbers shall be as listed in table III.

Defects

Objectionable odor (odors of chemicals commonly used in coating compounds shall not be regarded as objectionable)
Width below minimum specified
Uneven coating
Excessive dusting powder
Not fully cured
Overall uncleanness
Color not as specified, off shade, not uniform, mottled, blotchy
Tackiness (coating adheres to opposite surface upon unrolling)
Puckering, waviness, dimensional distortion (material does not lie uniformly flat along its entire width when no tension is applied)
Selvages not trimmed
Trimmed edges curled, folded over, not straight, scalloped

Table II - Sample sizes and acceptance numbers for yard-by-yard and overall examinations

Lot size in yards	Sample size in rolls	Acceptance No.
Up to 1,200 1/	3	0
1,201 thru 3,200	5	0
3,201 thru 10,000	8	0
10,001 thru 35,000	13	0
35,001 and up	20	0

1/ If a lot contains fewer than 3 rolls, each roll in lot shall be examined.

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4.3.2.3 Examination for length of individual rolls The individual roll shall be examined for length and the number of pieces in the roll. Any length found to be more than 2 yards below the length marked on the ticket or any roll found to contain more than three pieces, or any one piece less than 10 yards in length, shall be considered a defect with respect to length. The unit of product for this examination shall be one roll. The sample size for this examination and the acceptance number shall be as listed in Table III.

4.3.2.4 Examination for total yardage in sample The lot shall be unacceptable if the total of the actual lengths of pieces in the sample is less than the total of the lengths marked on piece tickets.

4.3.3 Examination of delivery requirements Examination shall be made in accordance with the provisions of PPP-P-1136 to determine that the packaging, packing, and marking requirements of Section 5 are complied with.

4.4 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 values specified apply to the average of the determinations made on a unit of product for test purposes as specified in the applicable test method. The sample unit for test purposes shall be 2 yards full width of coated cloth. The lot size shall be expressed in units of 1 yard. The lot shall be unacceptable if one or more units fail to meet any requirement specified.

Lot size (yards)	Sample size
800 or less	2
801 thru 22,000	3
22,001 and up	5

Table IV - Instructions for testing

Characteristic	Requirement paragraph	Test method
Weight	Table I	5041
Thickness	Table I	5030
Breaking strength (Types I, II, III, IV)		
Warp	Table I	5100
Filling	Table I	5100

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Table IV - Instruction for testing (cont'd)

Characteristic	Requirement paragraph	Test method
Tearing strength (Types II, III and IV)		
Warp	Table I	5132
Filling	Table I	5132
Hydrostatic		
Initial	Table I	5512
After 100 hrs. weatherometer	Table I	5804 and 5512
Adhesion of coating	Table I	5970 1/
Blocking	Table I	5872

1/ If the coating can be separated from the base cloth of the test specimen, without the aid of a solvent or adhesive, the coating may be peeled off dry.

5. PACKAGING

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

5.1.1 Levels A and C The coated cloth, put up as specified (see 3.6), shall be packaged in accordance with the applicable requirements of PPP-P-1136.

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 coated cloth shall be packed in accordance with the applicable requirements of PPP-P-1136.

5.3 Marking In addition to any special marking required in the contract or order, shipments shall be marked in accordance with the applicable requirements of PPP-P-1136.

6. NOTES

6.1 Intended use The coated fabrics are intended for use in manufacturing various types of interior and exterior protective coverings (tarpaulins, awnings, shelters, welding curtains, etc.).

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6.2 Ordering data Procurement documents should specify the following:

a. Title, number and date of this specification
b. Type required (see 1.2)
c. Availability of standard sample (3.1)
d. First article requirements (3.2)
e. Type of finish required (see 3.3.3)
f. Width of cloth required (see 3.5)
g. Length required if other than specified (see 3.6)
h. Selection of applicable levels of packaging and packing (see 5.1 and 5.2)

6.3 Samples To determine availability of standard sample address the procuring office issuing the invitation for bids (see 3.1).

6.4 Changes from previous issue The margins of this specification are marked with an asterisk to indicate where changes (additions, modification, 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.

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