

MIL-C-20696E  
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 SUPERSEDING  
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## MILITARY SPECIFICATION

### CLOTH, COATED, POLYESTER OR NYLON, WATERPROOF

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

#### 1. SCOPE

1.1 Scope. This document covers the requirements for four types and four classes of coated nylon cloth (see 6.1).

\* 1.2 Classification. The coated cloth shall be of the following types and classes (see 6.2).

Type I	-	Cloth, Polyester or Nylon, 2.3 oz./sq. yd. uncoated
Type II	-	Cloth, Polyester or Nylon, 5.1 oz./sq. yd. uncoated
Type III	-	Cloth, Polyester or Nylon, 7.25 oz./sq. yd. uncoated
Type IV	-	Cloth, Polyester or Nylon, 4.8 oz./sq. yd. uncoated
Class 1	-	Base cloth coated with chloroprene (both sides)
Class 2	-	Base cloth coated with vinyl chloride polymer or copolymer containing a fire retardant (both sides)
Class 3	-	Base cloth coated with chloroprene containing a fire retardant (both sides)
Class 5	-	Base cloth coated with Nitrile-Butadiene rubber (NBR) (one side) (applicable to type III only)

#### 2. APPLICABLE DOCUMENTS

##### 2.1 Government documents.

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.

AMSC N/A

FSC 8305

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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.

## SPECIFICATIONS

## FEDERAL

PPP-P-1136 - Packaging of Coated (Plastic; Rubber)  
and Laminated Fabrics

## MILITARY

MIL-L-6082 - Lubricating Oil; Aircraft Reciprocating Engine  
(Piston)

## STANDARDS

## FEDERAL

FED-STD-191 - Textile Test Methods  
FED-STD-595 - Colors  
FED-STD-601 - Rubber; Sampling and Testing

## MILITARY

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

\* MIL-STD-1487 - Glossary of Cloth Coating 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.)

\* 2.2 Other publications. The following documents form a part of this document 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 issues of the nongovernment documents which are current on the date of the solicitation.

## AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

D 471 - Rubber Property - Effect of Liquids

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D 618 - Conditioning Plastics and Electrical Insulating Materials  
for Testing

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

- \* 2.3 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 Laboratory report approval. Unless otherwise specified (see 6.2), at the time of submission of bid, the bidder shall submit to the contracting officer a certified copy of a recent laboratory report covering material which he proposes to deliver. Unless otherwise specified by the contracting officer, the bidder shall certify that the material was manufactured in a plant where the coating will be performed if a contract is awarded. This laboratory report shall contain test data which demonstrates that the finished product which the bidder proposes to deliver has been tested in conformance with and found to comply with the requirements of this document. Any of the following types of reports will be satisfactory from the standpoint of this requirement:
- a. An independent or commercial laboratory report.
  - b. The prospective contractor's own laboratory report.
  - c. A governmental laboratory report from a contract within six months of date of submission of bid.

The purpose of the above requirement is to assist the Government to determine the capability of bidders to manufacture a cloth meeting all the requirements of this document. The submission of an acceptable report under this requirement shall not be construed as relieving a contractor from subsequently meeting all requirements of the document on all deliveries.

3.2 Standard sample. The coated 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).

3.3 Materials.

- \* 3.3.1 Base cloths. All base cloths shall consist of either bright or clear, high tenacity, filament polyester or nylon (see 4.2.2). Types I, II and III shall be woven and the weave shall be plain. Type IV shall be of weft inserted

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warp knit construction. The base cloths shall conform to the applicable requirements in table I when tested as specified in 4.2.1.

\*TABLE I. Base cloth requirement

Characteristic	Type I	Type II	Type III	Type IV
Weight, oz./sq. yd.	2.3 ± 0.2	5.1 ± 0.3	7.25 (max.)	4.8 ± 0.3
Yarns per/inch (min.):				
Warp	38	22	60	18
Filling	38	21	45	18
Breaking Strength, lbs. (min.):				
Warp	115	225	325	225
Filling	115	225	275	225
Tearing Strength, lbs. (min.)				
Warp and Filling	-	-	20	-

### 3.3.2 Coating compounds (see 4.2.2).

3.3.2.1 Class 1. Chloroprene rubber. Up to 20 percent of other elastomers such as, styrene-butadiene rubber (SBR) may be added to facilitate processing provided the coated cloth conforms to the requirements of 3.4.

3.3.2.2 Class 2. Virgin polymer or copolymer of vinyl chloride resin plasticized with only phosphate or phthalate esters and containing an evenly dispersed fire inhibitor.

3.3.2.3 Class 3. Chloroprene rubber containing an evenly dispersed fire inhibitor. Up to 20 percent of other elastomers such as styrene-butadiene rubber (SBR) may be added to facilitate processing provided the coated cloth conforms to the requirements of 3.4.

\* 3.3.2.4 Class 5. Nitrile-butadiene rubber (NBR).

3.3.3 Dusting powder. The dusting powder for application to classes 1, 3, and 5 coated cloths shall be whiting, talc, or other finely divided mineral material which does not support mildew growth (see 4.2.2).

\* 3.4 Coated cloth. The coating compound shall be applied to both sides of the base cloth, except for type III, class 5 which shall be coated on one side only. The face side shall be more heavily coated than the back except for type II, class 2, and type IV, class 2 which shall have a balanced coating unless otherwise specified by the contracting agency (see 6.2). Classes 1, 3, and 5

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coated cloths shall be fully vulcanized and classes 1, 3, and 5 coated cloths shall be dusted with the powder specified in 3.3.3 before curing. The physical properties for the coated cloth shall conform to the requirements specified in table II and 3.4.1 through 3.4.7 when tested as specified in 4.2.4. The heavily coated side of the cloth shall be marked "Face" at the beginning and end of each roll.

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\*TABLE II. Physical requirements of coated cloth

	Type I					Type II and Type IV					Type III
	Class 1	Class 2	Class 3	Class 1	Class 2	Class 3	Class 1	Class 2	Class 3	Class 5	
Weight, oz./sq. yd. ( $\pm$ 1.0 oz.)	8.0	9.0	10.5	16.0	18.0	18.0	18.0	18.0	18.0	12.0	
Breaking strength, pounds (minimum)											
Initial:											
Warp	115	115	115	225	225	225	225	225	225	325	
Filling	115	115	115	225	225	225	225	225	225	275	
After accelerated weathering:											
Warp	92	92	92	180	180	180	180	180	180	260	
Filling	92	92	92	180	180	180	180	180	180	220	
Tearing strength, pounds (minimum)											
Warp	12.0	12.0	12.0	45.0	45.0	45.0	45.0	45.0	45.0	20.0	
Filling	10.0	10.0	10.0	38.0	38.0	38.0	38.0	38.0	38.0	20.0	
Stiffness, centimeters (maximum)											
(warp only):											
at 70° + 2°F	10.0	10.0	10.0	14.5	14.5	14.5	16.5	16.5	14.5	-----	
at 100° + 5°F	--	13.0	--	--	--	--	22.0	22.0	--	-----	
at minus 40° + 5°F	12.0	--	12.0	20.0	20.0	20.0	--	--	20.0	-----	

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\*TABLE II. Physical requirements of coated cloth (cont'd)

	Type I					Type II and Type IV			Type III
	Class 1	Class 2	Class 3	Class 1	Class 2	Class 3	Class 3	Class 5	
Weight, oz./sq. yd. ( $\pm 1.0$ oz.)	8.0	9.0	10.5	16.0	18.0	18.0	18.0	12.0	
Adhesion of coating, pounds per 2 inch width (minimum)	10.0	10.0	10.0	15.0	15.0	15.0	15.0	12.0	
Blocking, scale rating (maximum)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(2)	
Resistance to accelerated aging	1/	-	1/	1/	-	-	1/	1/	
Flame resistance:									
After flame, seconds (maximum)	-	-	10	-	-	-	10	-	
Char length, inches (maximum)	-	-	3.5	-	-	-	3.5	-	

1/ The coating shall show no increase in softness, stiffness, tackiness, or brittleness when compared with an unexposed specimen.

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3.4.1 Hydrostatic resistance, initial and after abrasion. The coated cloth shall show no leakage of water in either the abraded or unabraded portion of the test specimen when tested as specified in 4.2.4.

3.4.2 Oil resistance (applicable only to type I, type II, and type IV). The coated cloth shall show no evidence of seepage of oil through the material when tested as specified in 4.2.4.

3.4.3 Resistance to aromatic hydrocarbons (applicable to type I, type II, and type IV). The coated cloth shall not crack when tested as specified in 4.2.4.

\* 3.4.4 Resistance to accelerated weathering. The coated cloth shall show no cracking, crazing, blooming, chalking, or appreciable color change when tested for resistance to accelerated weathering as specified in 4.2.4.

3.4.5 Resistance to low temperature (applicable only to type III, class 5). The coated cloth shall not crack or flake when tested as specified in 4.2.4.

3.4.6 Resistance to high temperature (applicable only to type III, class 5). The coated cloth shall show no evidence of tackiness, blistering, or softening when tested as specified in 4.2.4.

\* 3.4.7 Flame retardancy (applicable to type I, II, and IV class 2 cloths). The tip of the flame shall not pass beyond the top edge of the test specimen before 42 seconds after the start of the burner flame when tested as specified in 4.2.4.

3.5 Width. The selvages may be trimmed after coating. The residual minimum width shall be 39 inches or as specified in the contract or purchase order (see 6.2).

\* 3.6 Length and put-up. The coated cloth shall be put up in rolls in lengths of 80 to 125 yards. There shall be no more than two pieces in each roll and no piece shall be less than 25 yards in length. The ends of the pieces shall be overlapped and not joined by a seam. Acceptance of shorter lengths, if permitted, shall be based on the conditions stipulated in the contract or purchase order (see 6.2). The cloth shall be put-up on full width rolls as specified in 5.1.

3.7 Color. The color shall match the applicable color number of FED-STD-595 or shall match the approved color standard for the color specified where such a standard is applicable (see 6.2).

3.7.1 Matching. The color and shade shall match the standard sample when viewed under filtered tungsten lamps which approximate artificial daylight having a correlated color temperature of  $7000 \pm 500K$ , with illumination of  $100 \pm 20$  foot candles, and shall be a good match to the standard sample under incandescent lamplight at  $2300 \pm 100K$ .

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3.8 Workmanship. The finished coated cloth shall conform to the quality of product established by this document, and 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 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 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 Certificate 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. In addition, testing shall be performed for the characteristics specified in table III. All test reports shall contain the individual values utilized in expressing the final result. The sample unit shall be 1/2 yard full width of the base cloth. The lot size shall be expressed in units of 1 yard and the sample size shall be as specified below. The lot shall be unacceptable if one or more sample units fail to meet any requirement specified.

<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. Component tests

Component	Characteristic	Requirement reference	FED-STD-191 test method
Base cloth	Weave	3.3.1	Visual <u>1/</u>
	Weight, oz./sq. yd.	3.3.1	5041
	Yarns per inch	3.3.1	5050
	Breaking strength, lbs. (min)	3.3.1	5104
	Tearing strength, lbs. (min)	3.3.1	5134

1/ One determination shall be made and the results reported as pass or fail.

4.2.2 Certification. A certificate of compliance shall be furnished with each shipment or lot stating the following as applicable:

- a. The yarn used in the base cloth is comprised of either bright or clear, high tenacity, filament polyester or nylon.
- b. The class 1 coating is compounded as specified in 3.3.2.1.
- c. The class 2 coating is compounded as specified in 3.3.2.2.
- d. The class 3 coating is compounded as specified in 3.3.2.3.
- e. The class 5 coating is compounded from nitrile-butadiene rubber (NBR) exclusively.
- f. The dusting powder for application to classes 1, 3, and 5 coated cloths is whiting, talc, or other finely divided mineral material which does not support mildew growth (see 3.3.3).

4.2.3 End item examination.

- \* 4.2.3.1 Yard-by yard examination. The required yardage of each roll in the sample shall be examined on one side only for the defects listed below, however, the side shall be alternated for every other roll examined (except type III, class 5 cloth). The same yardage shall be given a through-light inspection for pinholes and thinly coated areas. The through-lighting inspection shall be performed in accordance with MIL-STD-1487. The 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 warpwise yard or fraction thereof in which it occurs. The sample unit shall be 1 linear yard. The inspection level shall be II and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 4.0 for major defects and 10.0 for total (major and minor combined) defects. The number of rolls from which the sample yardage is to be selected shall be in accordance with table IV. The sample yardage shall be apportioned equally among the selected rolls.

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Defect	Classification	
	Major	Minor
Any cut, hole, tear, scratch, or abrasion mark that results in baring the base cloth.	X	
Any pinhole	X	
Any surface scratch or abrasion mark that does not result in baring the base cloth.		X
Any uncoated area.	X	
Any pit, blister, tunnel, or delamination of coating.	X	
Any lump or heavily coated area.		X
Any crease or wrinkle resulting in doubling or adhesion of surfaces that cannot be corrected by manual pressure.	X	
Uneven coating, thin area where coating is missing or noticeably thinner.	X	
Any light area or window due to absence or poor blending of pigmentation.		X
Cloth edges rolled, curled, folded, doubled, scalloped, or wavy precluding a flat lay of the cloth.	X	
Any spot, stain, or streak more than 1 inch in combined directions. <u>1/</u>	X	
Trimmed width less than minimum specified.	X	
Any objectionable odor. <u>2/</u>		X
Color not as specified, off shade, uneven, or mottled.		X
Any tackiness (coating will adhere and not unroll readily).	X	
Deposition of coating not as required, i.e., not balanced or unbalanced as specified.	X	

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

2/ Odors of chemicals commonly used in coating compounds shall not be regarded as objectionable.

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- 3/ Specimens of classes 1, 3, and 5 which have been dusted with mineral powder shall be wiped with a wet cloth and allowed to dry before color matching.

TABLE IV. Sample size and acceptance criteria

Lot size (yards)	Sample size (rolls)	Maximum number of defects acceptable in sample 2/
Up to 1200 inclusive 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.

2/ Applicable to length examination only (see 4.2.3.2.1).

#### 4.2.3.2 Length examination.

4.2.3.2.1 Individual rolls. Each individual roll in the sample shall be examined for the defects listed below. If the total number of defects in the sample rolls exceed the maximum number specified in table IV, the lot shall be rejected.

Any roll containing more than two pieces.

Any piece in roll less than 25 yards (when applicable).

Any roll with a total length of less than 80 yards or more than 125 yards.

Any roll with a total length more than 2 yards less than that marked on ticket.

End of pieces in roll not overlapped.

End of pieces in roll joined by a seam.

4.2.3.2.2 Total yardage in sample. The rolls examined shall be those selected for examination of individual rolls as specified in 4.2.3.2.1. The lot shall be unacceptable if the total of the actual gross lengths of the rolls in the sample is less than the total gross lengths marked on the roll tickets.

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4.2.4 End item testing. The coated cloth shall be tested for the characteristics listed in table V. The methods of testing specified in FED-STD-191, whenever applicable and as listed in table V, shall be followed. The physical values specified in section 3 apply to the average of determinations made on a sample unit for test purposes as specified in the applicable test method. The sample unit shall be 3 continuous yards full width of the coated cloth when the cloth width is over 50 inches, and 5 continuous yards full width of the coated cloth when the cloth width is 50 inches or less. The lot size shall be expressed in units of 1 linear yard and the sample size (number of sample units) shall be as specified below. The lot shall be unacceptable if any sample unit fails to meet any requirements specified. All test reports shall contain the individual values used in expressing the final results.

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

4.2.4.1 Standard test conditions. Results of physical tests obtained under testing conditions defined in FED-STD-191, ASTM D 618, or FED-STD-601, will be acceptable except in cases of dispute. In dispute cases, tests shall be conducted with both the specimen and test apparatus under standard conditions as defined in FED-STD-191.

\*TABLE V. End item tests

<u>Characteristic</u>	<u>Requirement paragraph</u>	<u>Test method</u>
Weight	3.4	5041
Breaking strength:		
Initial	3.4	5102
After accelerated weathering <u>1/</u>	3.4	4.3.5
Tearing strength	3.4	5134 <u>2/</u>
Stiffness <u>3/</u>		
at 70° + 2° F	3.4	5204
at 10° + 5° F		5204
at -40 + 5° F		5204
Adhesion of coating	3.4	5970
Blocking	3.4	5872
Accelerated aging <u>4/</u>	3.4	5852

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\*TABLE V. End item tests (cont'd)

Characteristic	Requirement paragraph	Test method
Flame resistance:		
Flame time	3.4	5903
Char length	3.4	5903
Hydrostatic resistance:		
Initial	3.4.1	5516 <u>5/</u>
After abrasion	3.4.1	4.3.1
Oil resistance	3.4.2	4.3.2
Resistance to aromatic hydrocarbon	3.4.3	4.3.3
Resistance to accelerated weathering	3.4.4	4.3.6
Resistance to low temperature	3.4.5	4.3.7
Resistance to high temperature	3.4.6	4.3.8
Flame retardancy	3.4.7	5903 <u>6/</u>

- 1/ The specimens for test after accelerated weathering exposure shall be cut from each sample unit at the same time as specimens for original test and shall be marked to insure proper identification.
- 2/ Specimens of type IV cloth (weft inserted warp knit) shall be 8 inches by 10 inches.
- 3/ The specimens and test equipment shall be conditioned at the specified temperature for a minimum of 4 hours before testing and test shall be conducted in still air.
- 4/ Only one specimen shall be tested.
- 5/ Except that the water will be in contact with the lightly coated side. The hydrostatic head shall be 20 inches and the time of exposure shall be 10 minutes.
- 6/ Except that the specimen shall be observed for an additional 30 seconds after burner flame turn off. If the tip of the flame passes beyond the top edge of the specimen at any time during the 42 seconds after the burner is turned on, the specimen shall be reported as a test failure. Five specimens shall be tested in the warp direction and the results reported individually as "pass" or "fail".

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4.2.5 Packaging inspection. The inspection shall be in accordance with the quality assurance provisions of PPP-P-1136.

4.3 Methods of inspection.

\* 4.3.1 Hydrostatic resistance after abrasion test. A new specimen, 10 by 10 inches shall be taken for test. The specimen shall be abraded by means of a 2 inch square piece of grade 1/0 garnet paper which shall be uniformly loaded with a  $8 \pm 0.1$  ounce weight. The specimen shall be abraded on the heavily coated side by moving the weighted garnet paper filling-wise five times in each direction. The specimen shall then be turned over and abraded on the other side in such a manner that the center 2-inch square section is abraded on the other side i.e., the specimen is abraded in a north-south direction on one side and an east-west direction on the other side. The abraded 2-inch square area shall then be placed face up across the center line of the clamping head so that the center of the abraded area will coincide with the center of the exposed part of the specimen. Hydrostatic resistance shall then be determined as specified in Method 5516 of FED-STD-191. The hydrostatic head shall be 20 inches and the time of exposure shall be 10 minutes.

4.3.2 Oil resistance test. One 8- by 8-inch specimen of coated cloth shall be placed on a wood frame. The inside dimensions of wood frame shall be 6 by 6 by 1 inches. The specimen shall be forced into the frame by a wood block 5-3/4 by 5-3/4 inches (with round corner) to form a basin of uniform depth. The edges of the cloth shall be tacked to the frame and the block removed. Lubricating oil, conforming to grade 1100 of MIL-L-6082, shall be rapidly poured into the basin to a 1/2-inch depth. After the oil has been in the basin for 1 hour, the bottom of the fabric specimen forming the basin shall be examined to determine if oil has permeated the coated cloth to cause leakage.

4.3.3 Resistance to aromatic hydrocarbon fluid time. One 1-by 6-inch specimen with the long dimension parallel to the warp, shall be immersed for 5 minutes in aromatic hydrocarbon fluid conforming to Reference Fuel D of ASTM D 471. The specimen shall be allowed to dry at room temperature for 2 hours ( $\pm 5$  minutes) and shall be creased sharply on itself, face outward. A similar cut specimen with the long dimension parallel to the filling shall be tested in the same manner.

4.3.4 Accelerated weathering procedure. One specimen, 8 by 6 inches minimum, with the short dimension warpwise and one specimen, 8 by 6 inches minimum, with the short dimension filling wise shall be subjected to the procedure specified in Method 5804 of FED-STD-191. The procedure shall be performed with the heavily coated side exposed. The exposure times shall be as follows:

Types I, II, and IV class 2 - 150 hours for all colors.

Types I, II, and IV classes 1 and 3 - 150 hours for olive green and black only, all other colors - 50 hours.

Type III, class 5 - 150 hours for all colors.

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After exposure the specimens shall be removed and allowed to condition for at least 24 hours.

NOTE: Attention is called to contractors who own equipment which operates at one revolution in 2 hours. This equipment may continue to be used. However, the one revolution per minute shall be the standard procedure in the event of dispute, and the laboratory reports shall state the procedure used.

4.3.5 Breaking strength after accelerated weathering test. The coated cloth shall be subjected to the accelerated weathering procedure specified in 4.3.4. After completion of the procedure, the two specimens shall be subjected to the following conditions:

- a. 2 hours at  $180^{\circ} \pm 5^{\circ}\text{F}$
- b. 40 (+ 8) hours at  $70^{\circ} \pm 2^{\circ}\text{F}$  at a relative humidity of  $65 \pm 2$  percent

Each specimen shall then be tested for breaking strength as specified in Method 5102 of FED-STD-191.

4.3.6 Resistance to accelerated weathering test. The coated cloth shall be subjected to the accelerated weathering procedure specified in 4.3.4. After completion of the procedure, each specimen shall be folded by hand, face out, sharply upon itself and visually examined along the fold for cracking and crazing. Each specimen shall then be opened flat and examined for blooming, chalking, or appreciable color change. (An appreciable color change is one that is noticeable on first glance when comparing the tested specimen with the original.) The presence of any cracking, crazing, blooming, chalking, or appreciable color change shall be considered a test failure.

4.3.7 Resistance to low temperature test. A 1- by 4-inch specimen of the coated cloth with the long dimension warpwise and a 1- by 4-inch specimen of the coated cloth with the long dimension fillingwise shall be exposed for 4 hours at a temperature of  $\text{minus } 70 \pm 5^{\circ}\text{F}$  with the temperature recorded at the lowest point in the chamber. The sample, still in the test atmosphere, shall then be bent sharply, (heavily coated side out) 180 degrees over a 1/8 inch steel rod that has been exposed in the test chamber with the test specimen.

4.3.8 Resistance to high temperature test. A 2- by 6-inch specimen of the coated cloth shall be exposed for a period of 6 hours in an electrically heated oven maintained at a temperature of  $170 \pm 2^{\circ}\text{F}$ . At the end of this period, the specimen still maintained at the test atmosphere shall be bent (heavily coated side out) 180 degrees over a 1/8 inch steel rod.

\* 5. PACKAGING

\* 5.1 Preservation. Preservation shall be level A or Commercial as specified (see 6.2).

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- \* 5.1.1 Levels A and Commercial. The coated cloth, put up as specified, shall be preserved in accordance with the applicable requirements of PPP-P-1136.
- \* 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 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 by the contract or purchase order, shipments shall be marked in accordance with PPP-P-1136.

## 6. NOTES

- \* 6.1 Intended use. Type I, type II and type IV coated cloths are for use in the fabrication of covers and shelters. The type III coated cloth is for use in the manufacture of survival containers.
- \* 6.2 Ordering data. Acquisition documents should specify the following:
  - a. Title, number, and date of this document.
  - b. Type and class required (see 1.2).
  - c. When laboratory report is not required (see 3.1).
  - d. When type II, class 2 and type IV, class 2 shall have an unbalanced coating (see 3.4).
  - e. Width required (see 3.5).
  - f. If short lengths are acceptable, conditions for their acceptance (see 3.6).
  - g. Color and standard sample required (see 3.7).
  - h. Selection of applicable levels of preservation and packing (see 5.1 and 5.2).
- 6.3 Standard sample. For access to standard samples, address the contracting activity issuing the invitation for bids (see 3.2).
- 6.4 Coated fabric information. Vinyl coated fabrics should not be specified when the end use involves flexing or folding at temperature below 0°F, because of the fixed temperature range imposed by compounding limitations. In end usage involving flexing or folding down to temperature of -40°F, chloroprene coated fabrics are suitable. Only the dark shades of neoprene coating are recommended for exposure to natural weathering. However, the full range of colors in a properly compounded vinyl coating are recommended for exposure to natural weathering.
- \* 6.5 Subject term (key word).
  - Cloth, coated
  - Nylon
  - Polyester

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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 irrespective of the marginal notations and relationship to the previous issue.

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Army - GL  
Navy - NU  
Air Force - 99

Preparing activity:

Army - GL  
Project No. 8305-0110

Review activities:

Army - MD, ME, MI  
Navy - MC  
Air Force - 82  
DLA - CT  
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User activity:

Air Force - 45

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