

MIL-C-14366E

18 June 1986

SUPERSEDING

MIL-C-14366D

26 January 1972

MILITARY SPECIFICATION

CLOTH, COATED, NYLON TWILL (ONE SIDE COATED)

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

1. SCOPE

1.1 Scope. This document covers a coated cloth to be used in the fabrication of a raincoat (see 6.1).

1.2 Classification. The coated cloth shall be the following type as specified.

- Type I - Nylon cloth coated with polyvinyl butyral.
- Type II - Deleted (see 6.6).

2. APPLICABLE DOCUMENTS

2.1 Government documents. Unless otherwise specified, the following documents of the issue in effect on the date of invitation for bids or request for proposal, form a part of this document to the extent specified herein.

SPECIFICATION

FEDERAL

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

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be used 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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STANDARDS

FEDERAL

- FED-STD-191 - Textile Test Methods
- FED-STD-406 - Plastics; Methods of Testing
- FED-STD-601 - Rubber; Sampling and Testing

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- 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 officer.)

2.2 Other publications. Unless otherwise specified, the following documents of the issue in effect on the date of invitation for bids or request for proposal, form a part of this document to the extent specified herein.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- D 1424 - Tear Resistance of Woven Fabrics by Falling Pendulum (Elmendorf) Apparatus

(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 documents 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 (except for associated detail specifications, specification sheets or MS standards), 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 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 Materials.3.2.1 Base cloth.

3.2.1.1 Yarn. The warp yarn shall be semidull, 40 ± 2 denier, 13 filament nylon, with 6 to 8 turns per inch "Z" twist. The filling yarn shall be bright, 70 ± 3 denier, 32 to 34 filament nylon with 2 to 3 turns per inch of "Z" twist.

3.2.1.2 Weave. The weave shall be a two up, one down, right twill. Each selvage shall be composed of 34 ± 4 ends, weaving 2 as 1.

3.2.1.3 Physical requirements. The dyed, uncoated cloth shall conform to the requirements specified in table I when tested as specified in 4.2.1.

TABLE I. Physical requirements for base cloth

Weight, oz/sq. yd.	1.5 ± 0.1
Yarns per inch, minimum:	
Warp	116
Filling	76
Breaking strength, pounds, minimum:	
Warp	50
Filling	50

3.2.1.4 Finish.

3.2.1.4.1 Heat setting. The cloth, prior to dyeing, shall be heat set and after dyeing the heat set cloth shall show no appreciable distortion or puckering and not more than 2.0 percent dimensional change in either the warp or filling when tested as specified in 4.2.1.

3.2.1.4.2 Non fibrous material. The total chloroform-soluble and water-soluble material in the dyed base cloth shall not exceed 1.0 percent when tested as specified in 4.2.1.

3.2.1.4.3 pH. The pH value of the dyed base cloth shall not be less than 5.0 or more than 8.5 when tested as specified in 4.2.1.

3.2.1.4.4 Color. The base cloth shall be dyed with special nylon dyes, or with such other dyes that will show no more striation in the finished coated cloth than is exhibited by the standard coated cloth shade sample (see 6.3). The shade of the base cloth, prior to coating, shall be so selected that after coating the finished cloth shall match the standard shade sample on the uncoated side (AF Blue Shade No. 1157).

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3.2.2 Coating compound. The coating compound shall be thermosetting virgin polyvinyl butyral, pigmented. The use of plasticizers is prohibited.

3.2.3 Dusting powder. The dusting powder for application to the coated cloth shall be powdered mica not coarser than 160 mesh.

3.3 Coated cloth. The base cloth shall be coated with the specified coating compound, on the reverse side of the cloth only, after which the cloth shall be thermoset. There shall be no strike through of the coating compound to the face side of the cloth. The coated side shall have a uniform finish and may be dusted with the dusting powder specified in 3.2.3 to meet the blocking requirements or to prevent adherence on the roll. The coated cloth shall meet the requirements specified in table II when tested as specified in 4.2.3. Reverse side of cloth as used herein shall be the side with the twill line running up from right to left.

TABLE II. Physical requirements for coated cloth

Characteristic	Requirements
Weight, oz/sq. yd., maximum	3.5
Breaking strength, pounds, minimum:	
Warp	50
Filling	50
Tearing strength, grams, minimum:	
Warp	960
Filling	960
Hydrostatic resistance, lbs/sq. in., minimum:	
Initial	40
After strength of coating	20
After water immersion	30
After resistance to low temperature	30
After abrasion resistance	10 <u>1/</u>
After accelerated weathering	--
After 3 dry cleanings	--
Blocking at 200°F, scale reading, maximum	No. 2
Fastness to light	<u>2/</u>
Fastness to laundering	<u>2/</u>
Fastness to dry cleaning	--
Fastness to crocking - (wet and dry)	<u>2/</u>
Water wicking, inches, maximum	1/4
Resistance to accelerated weathering, minimum	Pass <u>3/</u>

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TABLE II. Physical requirements for coated cloth (cont'd)

Characteristic	Requirement
Resistance to leakage, minimum	Pass
Adhesion of coating, pound per 2-inch width, minimum:	
Initial	6.0
After water immersion	4.0
Stiffness, centimeters, maximum (warp only):	
At $70 \pm 2^{\circ}\text{F}$	6.0
At $30 \pm 2^{\circ}\text{F}$	7.0

- 1/ The test specimens shall withstand the 10 psi for not less than 3 minutes with no sign of leakage.
- 2/ The uncoated side of specimen shall show fastness equal to or better than the standard sample (see 3.1) or good fastness when no standard sample is available.
- 3/ Exposure shall not result in any increase in softness, tackiness, stiffness or brittleness.

3.4 Width. The width of the cloth shall be as specified (see 6.2) and shall be the minimum acceptable width inclusive of the selvage when fly shuttle looms or shuttleless with tuck-in selvage looms are used. For all other shuttleless looms the width measurement shall be made between the last warp yarn on each side excluding the protruding fringe(s).

3.5 Length and put-up. Unless otherwise specified (see 6.2), the cloth shall be put up on rolls as specified in 5.1. The coated side shall form the outside of the roll. The rolls shall be not less than 200 yards nor more than 250 yards in length. No roll shall contain more than six pieces, nor shall any one piece be less than 6 yards in length. There shall be no splices or seams.

3.6 Color. The face side of the cloth shall match the standard sample in luster and color (AF Blue Shade No. 1157). The coated side of the cloth shall be a shade of blue approximating the color of the standard sample.

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

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3.7 Workmanship. The finished cloth shall conform to the quality of product established by this document. 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 requirements 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.

4.2 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 used in expressing the final results. The sample unit for the base cloth shall be 2 continuous yards full width. The lot size shall be expressed in yards 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.

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

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TABLE III. Component tests

<u>Component</u>	<u>Characteristic</u>	<u>Requirement reference</u>	<u>Test method</u>
Yarn	Luster	3.2.1.1	<u>1/</u>
	Denier	3.2.1.1	<u>1/</u>
	Filaments	3.2.1.1	<u>1/</u>
	Twist	3.2.1.1	<u>1/</u>
Base cloth	Weave	3.2.1.2	Visual <u>1/</u>
	Weight	Table I	5041
	Yarns per inch	Table I	5050
	Breaking strength	Table I	5100
	Heat-set stability	3.2.1.4.1	4.2.1.1
	Nonfibrous material	3.2.1.4.2	2611
	pH	3.2.1.4.3	2811
Coating compound	Identification and no plasticizer used	3.2.2	<u>1/</u>
Dusting powder	Identification	3.2.3	<u>1/</u>

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

4.2.1.1 Heat-set stability test. The test specimen shall be a square of cloth at least 12 by 12 inches. It shall be laid flat without tension, and marked off with a square 10 by 10 inches, having sides parallel to the warp and filling directions of the cloth. The test specimen shall be placed in an oven maintained at $350^{\circ} \pm 2^{\circ}\text{F}$ for a period of 10 minutes. At the end of this period the specimen shall be removed from the oven and conditioned under standard atmospheric conditions in accordance with section 4 of FED-STD-191. The specimen shall then be measured for changes in dimension, and shall be visually compared with the original unheated cloth for the presence of distortion or puckering. One specimen shall be tested from each sample unit. Change in dimension shall be reported to nearest 0.1 percent for both warp and filling; distortion and puckering shall be reported as pass or fail.

4.2.2 End item examination.

4.2.2.1 Yard-by-yard examination. The coated cloth shall be examined for the defects listed below. The required yardage of each roll in the sample shall be examined on both sides. The same yardage shall be given a through-light inspection for pinholes, light areas, and windows. The through-light inspection shall be performed in accordance with MIL-STD-1487. The defects

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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 lot size shall be expressed in yards. 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 1.5 for major defects and 4.0 for total 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.

Part A - Coated side:

Defect	Classification	
	Major	Minor
Any cut, hole, tear, scratch, abrasion, or mark	X	
Any pinhole	X	
Any uncoated area	X	
Any scorch or burn	X	
Any blister, tunnel, or delamination of coating	X	
Any cracked coating	X	
Any lump or heavily coated area		X
Any brittle coating (crack, when flexed)	X	
Crease or wrinkle -- resulting in doubling or adhesion of surfaces that cannot be corrected by manual pressure	X	
Any light area or window -- resulting from improper distribution of pigment		X
Uneven coating -- thin area where coating is missing or noticeably thinner	X	
Jerk-in filling, slough-off, slub, slug, kink or knot resulting in coating streak or uneven coating	X	
Any permanent spot, stain, or streak	X	
Any removable spot, stain, or streak		X

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Part A - Coated side: (cont'd)

Defect	Classification	
	Major	Minor
Any foreign matter which on removal leaves an uncoated or poorly coated area	X	
Width less than minimum specified	X	
Any objectionable odor (not characteristic of coating compound)	X	
Ripples, waviness, dimensional distortion	X	
Folded or rolled		X
Variation in color of coating	X	
Tackiness (coating will adhere and not readily unroll)	X	
Color does not approximate standard sample	X	

Part B - Uncoated side:

Defect	Classification	
	Major	Minor
Bias filling -- over three inches from horizontal at greatest point of bias		X
Bowed filling -- over 1-1/2 inches from straight line cord to highest point of arc	X	
Broken or missing yarns:		
Three or more contiguous regardless of length	X	
Two contiguous, 2 inches or more missing	X	
Two contiguous, less than 2 inches missing, or single 1 inch or more missing		X
Any bruise, tender spot, or weak spot	X	
Any coarse end or coarse pick more than twice the thickness of the normal yarn		X
Fine or light filling bar, light place 1/	X	

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Part B - Uncoated side: (cont'd)

Defect	Classification	
	Major	Minor
Floats or skips:		
Multiple, 3/8 inch or more in either warp or filling direction	X	
Multiple, less than 3/8 inch in either warp or filling direction or single, floating over more than 1 inch		X
Fuzzy balls or stripbacks <u>1/</u>		X
Hang thread -- more than 1/4 inch long		X
Heavy filling bar or heavy place <u>1/</u>		X
Hitchback -- resulting in a thin area 1/2 inch or more in combined warp and filling directions	X	
Hitchback not resulting in a thin area <u>1/</u>		X
Knots -- extending from surface of cloth		X
Mispick or double pick -- one or more additional picks in the shed or resulting in a break in continuity of weave over 4 inches or more in width		X
Mixed filling or shade bar <u>1/</u>		X
Pick out mark <u>1/</u>		X
Reed mark -- resulting in warpwise separation markedly wider than normal <u>1/</u>		X
Slack end -- two or more contiguous, jerked in between picks, or forming loops on surface of cloth <u>1/</u>	X	
Slack end -- single, jerked in between picks, or forming loops on surface of cloth <u>1/</u>		X
Slough-off -- more than three yarns in shed	X	
Jerked-in filling -- three or less yarns in shed		X
Slub, slug, gout, or strip-back:		
More than 1/32 inch thick regardless of length	X	
More than 1/2 inch long and 1/32 inch or less thick		X

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Part B - Uncoated side: (cont'd)

Defect	Classification	
	Major	Minor
Any smash	X	
Any permanent spot, stain, or streak	X	
Any removable spot, stain or streak		X
Temple mark resulting in a streak <u>1/</u>		X
Tight end or tight pick resulting in a ridge or pucker <u>1/</u>		X
Wrong draw extending for more than 9 inches		X
Off shade, mottled, cloudy, or streaked <u>1/</u>	X	
Color does not match standard sample	X	
Luster not equal to standard sample	X	
Any strike through of coating to face side of cloth	X	
Not clean <u>1/</u>		X
Clearly noticeable contamination, specks, fly neps in colors other than that of the cloth	X	

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

TABLE IV. Sample size and acceptance criteria

Lot size (yards)	Sample size (rolls)	Acceptance number <u>2/</u>
Up to 1200 inclusive <u>1/</u>	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 defects only (see 4.2.2.2.1).

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4.2.2.2 Length examination.

4.2.2.2.1 Examination for length in individual roll. Each roll selected for yard-by-yard examination shall be examined for the defects listed below. If the total number of defects in the sample rolls exceed the acceptance number specified in table IV, the lot shall be rejected.

Any roll not having the coated side of the cloth facing the outside of the roll.

Any roll (gross length) less than minimum or more than maximum specified.

Any roll (gross length) more than 2 yards less than gross length marked on ticket.

Any splice or seam in any roll.

Any roll containing more than six pieces.

Any piece in roll less than 6 yards.

4.2.2.2.2 Total yardage in samples. The rolls examined shall be those selected for examination of individual rolls as specified in 4.2.2.2.1. The lot shall be unacceptable if the total of the gross lengths of the rolls in the sample is less than the total of the gross lengths marked on the tickets.

4.2.3 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 wherever applicable and as listed in table V shall be followed. The sample unit for testing shall be 3-1/2 continuous yards full width of the coated cloth. The lot shall be unacceptable if any sample unit fails to meet any requirement specified. All test reports shall contain the individual values used in expressing the final results. The sample size shall be in accordance with the following:

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

4.2.3.1 Standard test conditions. Results of physical tests obtained under testing conditions defined in FED-STD-191, FED-STD-406 or FED-STD-601 will be acceptable except in case of dispute. In disputed cases, tests shall be conducted with both the specimen and test apparatus under conditions as defined in FED-STD-191.

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TABLE V. End item test

Characteristics	Requirement paragraph	Test method	No. det. per sample unit	Results reported as	
				Pass or fail	Numerically to nearest
Weight oz./sq. yd.	Table II	5041	5		0.1 ounce
Breaking strength	Table II	5100	5		1 pound
Tearing strength	Table II	ASTM D1424	5		1 gram
Hydrostatic resistance:					
Initial	Table II	4.3.1.1	5		1 pound/sq. inch
After strength of coating	Table II	4.3.1.2	5		1 pound/sq. inch
After water immersion	Table II	4.3.1.3	5		1 pound/sq. inch
After resistance to low temperature	Table II	4.3.1.4	5		1 pound/sq. inch
After abrasion resistance	Table II	4.3.1.5	5	X	
After accelerated weathering	Table II	4.3.1.6	5		1 pound/sq. inch
After dry cleaning	Table II	4.3.1.7	5		1 pound/sq. inch
After state of cure	Table II	4.3.1.8	5		1 pound/sq. inch
Blocking	Table II	5872	1	X	
Fastness to light	Table II	5660 <u>1</u> /	1	X	
Fastness to laundering	Table II	5614	1	X	
Fastness to dry cleaning	Table II	5620	1	X	
Fastness to crocking (wet & dry)	Table II	5651	1	X	
Water wicking	Table II	4.3.2	3		1/32 inch
Accelerated weathering	Table II	4.3.3	1	X	
Resistance to leakage	Table II	4.3.4	1	X	

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TABLE V. End item tests (cont'd)

Characteristics	Requirement paragraph	Test method	No. det. per sample unit	Results reported as	
				Pass or fail	Numerically to nearest
Adhesion of coating:					
Initial	Table II	4.3.5	5		0.1 pound/2 inch width
After water immersion	Table II	4.3.5.1	5		0.1 pound/2 inch width
Stiffness:					
At 70 + 2°F	Table II	5204 2/	5		0.1 cm
At 30 + 2°F	Table II	5204 2/	5		0.1 cm

1/ The uncoated side of the cloth shall be exposed for a period of 40 hours.

2/ The specimen shall be exposed at the required temperature for 4 hours prior to testing. The test shall be performed in still air.

4.2.3.2 State of cure testing. A 1/4-yard full width sample shall be taken from each separate piece of coated cloth on each roll in the lot and tested for state of cure as specified in 4.3.1.8.

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

4.3 Methods of inspection.

4.3.1 Hydrostatic resistance tests.

4.3.1.1 Initial. The hydrostatic resistance test shall be conducted as specified in Method 5512 of FED-STD-191. The water shall be applied to the uncoated side of the cloth.

4.3.1.2 After strength of coating. Test specimens shall be subjected to the conditions specified in Method 5972 of FED-STD-191, except that a 20-pound load shall be applied parallel to the twill line. After completion of this procedure, the specimens shall be tested for hydrostatic resistance as specified in 4.3.1.1.

4.3.1.3 After water immersion. Test specimens shall be immersed in water at 70 + 2°F for 2 hours, withdrawn from the water, blotted to remove excess water from the surface, and tested immediately as specified in 4.3.1.1.

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4.3.1.4 After resistance to low temperature. After being subjected to the conditions specified in Method 5874 of FED-STD-191, except that the temperature shall be $0^{\circ} + 5^{\circ}\text{F}$ for not less than 4 hours, the hydrostatic resistance test shall be conducted as specified in 4.3.1.1.

4.3.1.5 After abrasion resistance. The specimen shall be abraded in accordance with Method 5302 of FED-STD-191 and the following:

- (a) A solid rubber diaphragm $0.030 + 0.010$ inch thick (no metallic contact) shall be used.
- (b) 3 psi air pressure shall be applied to the diaphragm and a load of 0.50 ± 0.05 pounds shall be applied to the abradant.
- (c) The abradant shall be the uncoated side of the coated cloth and shall be changed for each specimen tested.
- (d) The coated side of the specimen shall be abraded 50 double strokes. After abrasion, the specimen shall withstand 10 psi water pressure for a period of 3 minutes as specified in 4.3.1.1. If during the test, the pressure drops more than 2 psi, the machine shall be readjusted to 10 psi. Any sign of leakage through the specimen shall be considered a test failure.

4.3.1.6 After accelerated weathering. After being subjected to the weathering test specified in 4.3.3 (except that the specimen size shall be approximately 9-1/2 inches wide by 26 inches long), the hydrostatic resistance test shall be conducted as specified in 4.3.1.1.

4.3.1.7 After 3 dry cleanings. After being subjected to three dry cleaning cycles as specified in Method 5508 of FED-STD-191, the hydrostatic resistance test shall be conducted as specified in 4.3.1.1.

4.3.1.8 After state of cure. Five 4 by 4 inch test specimens shall be cut equidistant across the width of the piece, placed between two wire screens and immersed in toluene at room temperature for 15 minutes. At the end of the immersion period, the sample and screens shall be removed from the toluene and allowed to drain in a vertical position. The sample and screens shall then be blotted carefully with blotting paper or soft cloth. The screens shall then be removed and the samples allowed to dry for 30 minutes, examined for softness, tackiness, stiffness, or brittleness, and then tested for hydrostatic resistance as specified in 4.3.1.1.

4.3.2 Water wicking. A 2 by 7 inch sample of coated cloth with the long dimension in the filling direction shall be the test specimen. One end of the specimen shall be weighted (10 to 20 grams) across the full width of the specimen, immersed to a depth of 2 inches in distilled water at room temperature for 5 minutes, withdrawn from the water and the height of the wetted area above the water line shall be immediately and accurately measured to the nearest 1/32 inch. Three determinations shall be made per sample unit.

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4.3.3 Accelerated weathering. The test shall be performed with filters for a period of 72 hours with the coated side only exposed as specified in Method 5804 of FED-STD-191 except as follows:

- (a) 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.
- (b) After exposure the specimens shall be removed and allowed to condition for $24 \pm 1/2$ hours. The test specimen shall be compared with a sample of the unexposed specimen of the same sample unit. Any increase in softness, tackiness, stiffness or brittleness shall be regarded as a failure.

4.3.4 Resistance to leakage. Resistance to leakage test shall be performed as specified in Method 5514 of FED-STD-191. The test specimen shall be clamped in the test apparatus with the uncoated side of the cloth in contact with the water. The hydrostatic head shall be raised to 25 centimeters at a rate of approximately 1 centimeter per second and held at that pressure for 1 minute. During the exposure, the underside of the specimen shall be observed by use of the mirror attachment for any water penetration over any of the 4-1/2 inch diameter test area. Failure in the test shall be defined as the appearance of water at three or more places in the specimen within the 4-1/2 inch diameter test area. Five determinations shall be performed per sample unit and results shall be reported individually as "pass or fail". The lot shall be rejected if any single determination fails. Two specimens (one from each edge of the cloth) will be selected such that one edge of the specimen corresponds to one edge of the cloth and three specimens shall be selected at random throughout the remaining area of the sample unit.

4.3.5 Adhesion of coating. The test shall be performed as specified in Method 5970 of FED-STD-191 with the following exceptions:

- (a) The coated surfaces of the specimens shall be thoroughly cleaned with alcohol.
- (b) The coating shall be cut through to the cloth, making sure not to damage the cloth. The cut shall begin on one side 1 inch from the top of the specimen and run diagonally upward to within 1/2 inch of the top of the other side.
- (c) A suitable Buna-N adhesive (see 6.4) shall be applied to the test specimens and the specimens shall air dry for 30 ± 5 minutes before adhering as specified in Method 5970. Specimens shall be rolled with a 10-pound roller to insure good adhesion.

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- (d) Specimens shall be prepared for the oven as specified in Method 5970 except that a 5-pound weight shall be placed on the assembly. The entire assembly shall be removed from the oven after being exposed to the specified heat cycle and cooled at $72 \pm 4^{\circ}\text{F}$ for 30 ± 5 minutes, after which the adhesion test shall be immediately performed.
- (e) A specimen shall be considered as passing if the force necessary to separate the cemented specimen is equal to or greater than the requirement for adhesion of coating to the cloth. If the force necessary to separate the cemented specimen is less than the specified requirement and the coating is not removed from the cloth, the test shall be considered invalid and another specimen tested.

4.3.5.1 After water immersion. The original dry adhesion test shall be stopped after a 3-inch separation and the results recorded. The specimen shall then be immersed in distilled water at room temperature for 2 hours, withdrawn from the water, and blotted dry. The wet adhesion shall be determined on the remainder of the specimen.

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 coated cloth shall be put up and 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 in the contract or purchase order, shipments shall be marked in accordance with the applicable requirements of PPP-P-1136.

6. NOTES

6.1 Intended use. The coated cloth is for use in the manufacture of Raincoat, Man's, Lightweight, Blue, MIL-R-38213 (USAF).

MIL-C-14366E

6.2 Ordering data. Acquisition documents should specify the following:

- a. Title, number, and date of this document
- b. Width required (see 3.4)
- c. Put up required, if other than specified (see 3.5)
- d. Selection of applicable levels of preservation and packing (see 5.1 and 5.2)

6.3 Standard sample. For access to standard sample, address the contracting activity issuing the invitation for bids.

6.4 Adhesive. The following commercially available Buna-N type adhesive has been found satisfactory for performing the adhesion of coating test:

Adhesive No. 4025, Bostik Division, USM Corp., Middleton, MA 01949

6.5 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

6.6 Supersession data. Type II cloth and all its requirements have been deleted.

Custodians:

Army - GL
Navy - NU
Air Force - 99

Preparing activity:

Army - GL
Project No. 8305-0071

Review activities:

Army - MD
Navy - MC
Air Force - 11, 82
DLA - CT

