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AEROSPACE MATERIAL SPECIFICATION

AMS 3272

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Revised

CLOTH, NYLON, POLYURETHANE COATED
Thermally, Radio Frequency, or Ultrasonically Sealable

1. SCOPE:

1.1 Form: This specification and its supplementary detail specifications cover a woven nylon cloth coated with polyether (EU) urethane which is thermally, radio frequency, or ultrasonically sealable and having air holding characteristics.

1.2 Application: Primarily for use in inflatable survival equipment.

1.3 Classification: This product shall be classified by weight and type of weave as shown in the detail specifications.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM D751 - Testing Coated Fabrics
ASTM D1682 - Breaking Load and Elongation of Textile Fabrics
ASTM D2137 - Rubber Property - Brittleness Point of Flexible Polymers and Coated Fabrics
ASTM D2261 - Tearing Strength of Woven Fabrics by the Tongue (Single Rip) Method (Constant-Rate-of-Extension Tensile Testing Machine)
ASTM D3775 - Fabric Count of Woven Fabric
ASTM D3776 - Weight (Mass) per Unit Area of Woven Fabric

2.3 U.S. Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120 except as specified in 2.3.4.

2.3.1 Federal Specifications:

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

2.3.2 Federal Standards:

FED-STD-191 - Textile Test Methods

2.3.3 Military Standards:

MIL-STD-1487 - Glossary of Cloth Coating Imperfections

2.3.4 Other Publications: Available from the Federal Trade Commission, Washington, DC 20580.

Rules and Regulations under the Textile Fiber Products Identification Act

2.4 AATCC Publications: Available from the American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709; also published in the ASTM Book of Standards.

AATCC Test Method 16-1978 - Colorfastness to Light: General Method
AATCC Test Method 61-1975 - Colorfastness to Washing, Domestic; and Laundering, Commercial: Accelerated

3. TECHNICAL REQUIREMENTS:

3.1 Detail Specifications: The requirements for a specific material shall consist of all the requirements specified herein in addition to the requirements specified in the applicable detail specification. In case of conflict between the requirements of this basic specification and an applicable detail specification, the requirements of the detail specification shall govern.

3.2 Material and Fabrication: Cloth shall consist of a single ply of woven nylon fabric of the type specified in the applicable detail specification and in 3.2.1, coated on one side only with a polyether (EU) urethane compound as specified in 3.2.2 and containing a suitable water repellent finish.

3.2.1 Base Cloth: Shall be a continuous filament nylon.

3.2.2 Coating Compound: Shall be a polyether (EU) urethane containing not less than 60% by volume of elastomer.

3.3 Properties: Shall conform to the requirements specified in the applicable detail specification, shall be determined in accordance with test methods specified in 4.5.

3.4 Quality: Cloth, as received by purchaser, shall be uniform in quality and condition, as free from foreign materials as commercially practicable, and free from imperfections detrimental to usage of the cloth.

3.4.1 Acceptance quality levels for the quality of the cloth shall be as specified by purchaser.

3.4.2 Classification of defects is shown in Table I:

TABLE I. DEFECT CLASSIFICATION

Defect	Classification	
Uncoated Side	Major	Minor
a) Any hole, cut, or tear	x	
b) Any slub, smash, or multiple float	x	
c) Baggy, ridgy, or wavy cloth	x	
d) Any strike thru of coating		x
e) Any spot or stain		x
Coated Side		
a) Any cut, hole, tear, scratch, or abrasion in the coating that bares the base cloth	x	
b) Any scratch or abrasion in the coating that does not bare the base cloth		x
c) Any area where coating is noticeably thinner	x	
d) Any blister, tunnel, or delamination of the coating	x	
e) Any lump or heavier coated area		x
f) Foreign matter imbedded in the coating	x	
g) Crease or wrinkle that results in doubling or adhesion of surfaces that cannot be corrected by manual pressure	x	
h) Cracked or checked coating	x	
i) Lack of coating over full width of fabric	x	
j) Any pinhole	x	
k) Any light area or window resulting from improper distribution of pigment	x	
l) Coating streak		x
m) Any ripple, waviness, or dimensional distortion	x	
n) Any spot, stain, or streak having a combined length and width dimension of 1 in. (25 mm) or over	x	
o) Any spot, stain, or streak having a combined length and width dimension less than 1 in. (25 mm)		x
p) Width less than minimum specified		x
q Color not as specified, off shade, uneven, mottled		x
r) Any evidence of uncleanness		x
s) Any tackiness	x	
t) Any odor other than that which is characteristic of the coating compound		x

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the cloth shall supply all samples for vendor's tests and shall be responsible for performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.6. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the cloth conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to the following requirements are classified as acceptance tests and shall be performed on each lot:

Requirement	Reference
Type of Weave	See detail specification
Weight	See detail specification
Breaking Strength, as received	See detail specification
Breaking Strength, after humidity aging	See detail specification
Tear Strength	See detail specification
Coating Adhesion	See detail specification
Quality	See 3.4

4.2.2 Preproduction Tests: Tests to determine conformance to all technical requirements of this specification and the applicable detail specification are classified as preproduction tests and shall be performed prior to or on the initial shipment of cloth to a purchaser, when a change in material or processing, or both, requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.2.2.1 For direct U.S. Military procurement, substantiating test data and, when requested, preproduction test material shall be submitted to the cognizant agency as directed by the procuring activity, the contracting officer, or the request for procurement.

4.3 Sampling:

4.3.1 For Acceptance Tests: Sufficient cloth shall be taken at random from each lot to perform all required tests. The number of determinations for each requirement shall be as specified in the applicable test procedure or, if not specified therein, not less than three.

4.3.1.1 A lot shall be all cloth produced in one continuous coating operation from the same roll of cloth and the same batch of compound and presented for vendor's inspection at one time. An inspection lot shall not exceed 1000 lb (500 kg) and may be packaged in small quantities under the basic lot approval provided lot identification is maintained.

4.3.1.2 When a statistical sampling plan and acceptance quality level (AQL) have been agreed upon by purchaser and vendor, sampling shall be in accordance with such plan in lieu of sampling as in 4.3.1 and the report of 4.6 shall state that such plan was used.

4.3.2 For Preproduction Tests: As agreed upon by purchaser and vendor.

4.4 Approval:

4.4.1 Sample cloth shall be approved by purchaser before cloth for production use is supplied, unless such approval be waived by purchaser. Results of tests on production cloth shall be essentially equivalent to those on the approved sample cloth.

4.4.2 Vendor shall use ingredients, manufacturing procedures, processes, and methods of inspection on production cloth which are essentially the same as those used on approved sample cloth. If necessary to make any change in ingredients, in type of equipment for processing, or in manufacturing procedures, vendor shall submit for reapproval a statement of the proposed changes in material or processing, or both, and, when requested, sample cloth. Production cloth made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5 Test Methods: Shall be in accordance with the following:

Requirement	Test Method
Base Cloth	
Material Identification	(1)
Weave Type	Visual, ASTM D3775
Weight	ASTM D3776
Yarns per in. (25 mm)	FED-STD-191, Method 5050
Breaking Strength	ASTM D1682
Tearing Strength	ASTM D2261
Coating Compound	
Material Identification	(1)
Coated Cloth	
Weight	ASTM D751
Breaking Strength, as received	ASTM D751
Tearing Strength	ASTM D2261
Colorfastness	
Water	AATCC Test Method 61-1975
Light	AATCC Test Method 16-1978
Blocking	FED-STD-191, Method 5872
Adhesion of Coating	4.5.1 and ASTM D751
Air Retention	4.5.2
Low Temperature Effect	4.5.3
Breaking Strength, Humid aging	4.5.4

(1) A vendor's report certifying the material identity shall be acceptable.

4.5.1 Adhesion of Coating: Each seam specimen of the coated cloth shall be tested for adhesion. Each specimen shall be cut 1 in. ± 0.06 (25.0 mm ± 1.5) wide and not less than 6 in. (150 mm) long, with the length dimension in the warp direction of the coated cloth. One of the specimens shall be superimposed and aligned on another of the specimens with the coated sides in contact. The two specimens shall be heat sealed together, across the entire width, approximately 1/4 in. (6 mm) from one end. The width of the seal, (adhesive bond) shall be 0.125 in. ± 0.031 (3.12 mm ± 0.80). A suitable inspection apparatus equipped with an autographic recording device shall be used to conduct the test. The free ends of the specimen shall be clamped in the jaws (one end in each jaw) of the test apparatus with the bond centered midway between the jaws. The jaws shall be separated until the bond opens or the coating and the base cloth separate. The highest value at this point shall be recorded as the test result. Unless otherwise specified, the reported test results for each sample shall be the average of five determinations.

4.5.2 Air Retention: Shall be determined by a test jig as shown in Figure 1. The test specimen shall have a diameter of not less than 13 in. (325 mm). The specimen shall be placed, coated side down, on the holder and the plate collar tightly bolted thereon. Care shall be taken to ensure that there is no leakage at the seal. A sufficient quantity of water shall be poured on the specimen to keep it completely covered under maximum pressure. Increase the pressure to 10 psig (70 kPag). Air bubbles on the surface of the specimen produced by air pressure closing the spaces between the cloth and the coating shall be removed. The pressure shall be held at 10 psig (70 kPag) for 5.0 min. ± 0.1. At the end of the 5.0 min. period, the specimen shall be examined for evidence of bubble formation indicating leakage. Unless otherwise specified, five specimens from each inspection lot shall be tested.

4.5.3 Low-Temperature Effect: Shall be performed in accordance with ASTM D2137, except that determination of hydrostatic resistance shall not be required. Prior to testing, specimen shall be exposed for 4.0 hr ± 0.1 to -50°C ± 1 (-60°F ± 2). After testing, the specimen shall be examined for evidence of cracking, flaking, or separation.

4.5.4 Breaking Strength after Humid Aging: A 4 x 6 in. (100 x 150 mm) specimen shall be laid flat with the coated side up on a supporting plate. The assembly shall be placed in a desiccator containing water. The lid of the desiccator shall be put in place and the desiccator placed in a circulating-air oven at 95°C ± 1 (200°F ± 2) for not less than 7 days. At the end of the aging period, each specimen shall be removed from the desiccator and tested immediately for breaking strength.

4.6 Reports:

4.6.1 The vendor of cloth shall furnish with each shipment a report showing the results of tests to determine conformance to the acceptance test requirements and stating that the cloth conforms to the other technical requirements of this specification and the applicable detail specification. This report shall include the purchase order number, AMS 3272 and the applicable detail specification number, lot number, vendor's material designation, and quantity.

4.6.2 The vendor of finished or semi-finished parts shall furnish with each shipment a report showing the purchase order number, AMS 3272 and applicable detail specification number, contractor or other direct supplier of cloth, supplier's material designation, part number, and quantity. When cloth for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of cloth to determine conformance to the requirements of this specification and shall include in the report either a statement that the cloth conforms or copies of laboratory reports showing the results of tests to determine conformance.

4.7 Resampling and Retesting: If any specimen used in the above tests fails to meet the specified requirements, disposition of the cloth may be based on the results of testing three additional specimens from the same lot for each original nonconforming specimen. Failure of any retest specimen to meet the specified requirements shall be cause for rejection of the cloth represented and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Packaging and Identification:

5.1.1 Cloth shall be supplied in rolls wound on suitable cores not less than 3 in. (75 mm) in diameter.

5.1.1.1 Unless otherwise specified, the coated cloth shall be put up on rolls as specified in PPP-P-1136 and shall be in one continuous piece not less than 40 yd (35 m) or more than 250 yd (230 m) long.

5.1.2 Each roll shall be identified by a label attached on the inside of the core, using characters of such size as to be legible and which will not be obliterated by normal handling. Each label shall show not less than the following information:

CLOTH, NYLON, POLYURETHANE COATED
AMS 3272/*
MANUFACTURER'S DESIGNATION _____
LOT NUMBER _____
QUANTITY _____

*Enter applicable detail specification number.