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AEROSPACE MATERIAL SPECIFICATION

AMS 3818

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Revised

BRAID, FLAT, POLYESTER, LACING AND TYING
Synthetic Rubber Coated, Low Outgassing

1. SCOPE:

1.1 Form: This specification covers a synthetic rubber-coated, high-tenacity, continuous-filament polyester in the form of flat braid.

1.2 Application: Primarily for tying and lacing electrical wire harness assemblies for use at -75° to +175°C (-100° to +350°F) where fungus resistance is required in a spacecraft environment.

1.3 Classification: This specification covers four classes, by size, as follows:

Size 15 -- 15 lb (65 N) minimum breaking strength
Size 25 -- 25 lb (110 N) minimum breaking strength
Size 50 -- 50 lb (220 N) minimum breaking strength
Size 80 -- 80 lb (355 N) minimum breaking strength

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications 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 D259 - Woven Tapes
ASTM E595 - Total Mass Loss and Collected Volatile Condensable Materials from Outgassing in a Vacuum Environment

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

2.3.1 Federal Standards:

Federal Test Method Standard No. 191 - Textile Test Methods

2.3.2 Military Standards:

MIL-STD-794 - Parts and Equipment, Procedures for Packaging and Packing of

3. TECHNICAL REQUIREMENTS:

3.1 Material and Fabrication:

3.1.1 Yarn: Braid shall be made from high-tenacity, continuous-filament polyester yarn which has been pretreated to give minimum outgassing characteristics.

3.1.2 Impregnation: Finished braid shall contain 7 - 15% by weight of a non-toxic, non-corrosive, non-slip, non-flaking fungistatic synthetic rubber finish. Fungicide containing mercury or copper, or compounds of mercury or copper, shall not be used.

3.1.3 Construction: Shall be as specified in Table I, determined in accordance with ASTM D259.

TABLE I

	Size Designation			
	15	25	50	80
Nominal Width, in.	0.050	0.060	0.085	0.110
Nominal Thickness, in.	0.010	0.012	0.014	0.015
Yards per lb, min	1800	1150	900	600
Total Ends, min	17	13	17	25
Picks per in., min	24	20	20	20

TABLE I (SI)

	Size Designation			
	15	25	50	80
Nominal Width, mm	1.25	1.50	2.15	2.80
Nominal Thickness, mm	0.25	0.30	0.35	0.38
Metres per kg, min	3630	2320	1815	1210
Total Ends, min	17	13	17	25
Picks per mm, min	0.94	0.79	0.79	0.79

3.1.4 Color: Shall be natural (off-white).

3.2 Properties: Braid shall conform to the following requirements:

3.2.1 Mechanical Properties: Shall be as specified in Table II, determined in accordance with ASTM D259.

TABLE II

	Size Designation			
	15	25	50	80
Breaking Strength, min avg	15 lb	25 lb	50 lb	80 lb
Elongation, max avg	40%	40%	40%	40%

TABLE II (SI)

	Size Designation			
	15	25	50	80
Breaking Strength, min avg	65 N	110 N	220 N	355 N
Elongation, max avg	40%	40%	40%	40%

3.2.2 Slip Resistance: Breaking strength test applied to a square knot made in two lengths of braid firmly tied together shall result in no slippage of the knot when loaded up to two-thirds the specified breaking strength of the braid.

3.2.3 Fray Resistance: A freshly cut end of the braid shall not fray open when held approximately 1/4 in. (6.0 mm) from the end and firmly tamped several times on a hard surface.

3.2.4 Fungus Resistance: The braid shall exhibit no fungus growth, determined in accordance with Federal Test Method Standard No. 191, Method 5760.

3.2.5 Outgassing: Braid shall exhibit a total mass loss of not more than 1.0% and collected volatile condensable materials of not more than 0.10%, determined in accordance with ASTM E595.

3.3 Quality: Braid, as received by purchaser, shall be uniform in quality and condition, clean, smooth, and free from foreign materials and from imperfections detrimental to usage of the braid.

3.4 Standard Sizes and Tolerances: Standard sizes shall be 15, 25, 50, and 80. Unless otherwise specified, width tolerance shall be ±15% and thickness tolerance shall be ±0.003 in. (±0.08 mm) of specified values except that thickness tolerance for size 15 shall be ±0.004 in. (±0.10 mm).

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of braid 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 4.5. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the braid conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to requirements for nominal width and thickness (Table I), breaking strength and elongation (Table II), slip resistance (3.2.2), fray resistance (3.2.3), and tolerances (3.4) are classified as acceptance tests and shall be performed on each lot.

4.2.2 Preproduction Tests: Tests to determine conformance to all technical requirements of this specification are classified as preproduction tests and shall be performed prior to or on the initial shipment of braid 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.

4.3 Sampling: Shall be as follows:

4.3.1 For Acceptance Tests: Sufficient braid 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 braid of the same size, produced in a single production run from the same lot of polyester filaments and the same batch of fungistatic resin, and presented for vendor's inspection at one time. A lot shall not exceed 450,000 ft (137,000 m) of braid and may be packaged and delivered in smaller 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) for the product 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 4.5.1 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 braid shall be approved by purchaser before braid for production use is supplied, unless such approval be waived by purchaser. Results of tests on production braid shall be essentially equivalent to those on the approved sample.

4.4.2 Vendor shall use ingredients, manufacturing procedures, and methods of inspection on production braid which are essentially the same as those used on the approved sample braid. 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 braid. Production braid made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5 Reports:

4.5.1 The vendor of braid shall furnish with each shipment a report showing the results of tests to determine conformance to the acceptance test requirements and stating that the braid conforms to the other technical requirements of this specification. This report shall include the purchase order number, lot number, AMS 3818, vendor's product designation, size, and quantity.

4.5.2 When parts made of this braid or assemblies requiring use of this braid are supplied, the part or assembly manufacturer shall inspect each lot of braid to determine conformance to the technical requirements of this specification and shall furnish with each shipment a report stating that the braid conforms. This report shall include the purchase order number, AMS 3818, part or assembly number, and quantity.

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

5. PREPARATION FOR DELIVERY:

5.1 Packaging and Identification: