

AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard

SAE AMS 3853

Issued 10-1-86

CORD, AROMATIC POLYAMIDE, NONMELTING

1. SCOPE:

1.1 Form: This specification and its supplementary detail specifications cover an aromatic polyamide in the form of cord.

1.2 Application: Primarily for use as personnel parachute suspension lines.

1.3 Classification: Cord shall be as specified in the applicable detail specification, classified by breaking strength and weight per unit length.

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 Specification:

AMS 2350 - Standards and Test Methods

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

2.2.1 Federal Specifications:

UU-T-81 - Tags, Shipping and Stock

2.2.2 Federal Standards:

FED-STD-191 - Textile Test Methods

SAE Technical Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

AMS documents are protected under United States and international copyright laws. Reproduction of these documents by any means is strictly prohibited without the written consent of the publisher.

2.2.3 Military Specifications:

MIL-C-3131 - Cordage, Packaging of

2.2.4 Military Standards:

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

3. TECHNICAL REQUIREMENTS:

3.1 Detail Specifications: The requirements for a specific cord shall consist of all 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 the applicable detail specification, requirements of the detail specification shall govern.

3.2 Material: Yarn used to manufacture the cord shall be a nonmelting, aromatic polyamide which will not char at a temperature lower than 355°C (675°F).

3.2.1 Yarn shall not be subjected to a stretching operation.

3.2.2 Neither yarn nor cord shall be subjected to any type of bleaching process.

3.2.3 Yarn used to fabricate the cord shall be not more than two years old. The cord shall be not more than one year of age from date of manufacture to date of delivery.

3.2.4 Lapping of core ends is (See 8.1.1) is permissible using overlaps with a length of 5 - 10 in. (125 - 250 mm). Splicing (See 8.1.2) or knotting of core lines is not permitted. The minimum distance between a core end overlap or any adjacent core end shall be 500 ft (150 m). The approximate center of each overlap shall be marked by inserting a bright red thread through the sleeve. The free ends of the marker shall extend approximately 3 in. (75 mm) on either side of the sleeve. Removal of the marker shall be accomplished by a light pull on either end. When colored cord is specified, the color of the marker shall be white. Core end markers should not be removed until used in a manufactured item.

3.2.4.1 When any core end projects through the sleeve as a result of overlapping, the ends shall be cut flush with the surface of the sleeve with the cord in a relaxed position (See 8.2).

3.3 Properties: Shall be as specified in the applicable detail specification. Tests shall be performed on the cord supplied and in accordance with test methods specified in Table II, insofar as practicable.

3.4 Quality: Cord, as received by purchaser, shall be clean, evenly woven, and free from foreign materials and from imperfections detrimental to usage of the cord.

4. QUALITY ASSURANCE PROVISIONS:

- 4.1 Responsibility for Inspection: The vendor of cord 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 cord conforms to the requirements of this specification and the applicable detail specification.
- 4.2 Classification of Tests: Tests to determine conformance to all technical requirements of this specification and the applicable detail specification are classified as acceptance tests and as preproduction tests and shall be performed prior to or on the initial shipment of cord to a purchaser, on each lot, when a change in material, processing or both requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.
- 4.2.1 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: Shall be as follows:
- 4.3.1 For acceptance Tests: Each lot of cord shall be visually examined for quality (3.4) and sampled at random for all other 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 cord of a single weight and configuration produced in a single production run under the same fixed conditions and presented for vendor's inspection at one time. For mechanical property testing, an inspection lot shall not exceed 5000 yd (4570 m). A lot may be packaged and delivered in smaller quantities under the basic lot approval provided lot identification is maintained.
- 4.3.1.2 Properties specified in the applicable detail specification apply to the average of the determinations made on a sample unit.
- 4.3.1.3 Examination for Visual Defects: The defects listed in Table I shall be counted regardless of their proximity to each other, except where two or more defects represent a single local condition, in which case only the more serious defect shall be counted. The sample unit shall be one spool or reel. Ten percent of the length contained in the sample unit, but not less than 100 ft (30 m), shall be subject to the visual examination. The lot size shall be expressed in units of spools or reels. The inspection level shall be in accordance with MIL-STD-105, Level III. The acceptance quality level (AQL) shall be zero critical defects, 1.5 major defects, and 6.5 total defects (major and minor combined) per 100 units./

4.3.1.3.1 In the critical defect class, inspection lot sizes of 150 or less shall be inspected 100 percent. For inspection lot sizes over 150 to 3200, use a sample of 150 units. For larger lot sizes, use the sample size for Level III, MIL-STD-105.

4.3.1.4 Examination for Length and Winding: The sample unit for this examination shall be one spool or reel. The inspection level shall be level S-3 and the acceptance quality level (AQL) shall be 4.0% defective. For lots consisting of 500 or fewer units, the sample size shall be 10 and the acceptance number 1. The lot size shall be the number of spools or reels in the lot. Defects shall be as listed in 4.3.1.4.1 and 4.3.1.4.2. The length on the spool or reel shall be determined using the following formula:

$W \times L$ = Length per spool or reel in feet (metres)

Where: W = The net weight of the spool or reel in 0.1 lb (kg)

L = The lot average of the weight-length relationship
length/pound (metres/kilogram) as determined in 4.5.5.

4.3.1.4.1 Defects with Regard to Length: Defects shall be considered to exist if any of the following are determined during inspection:

4.3.1.4.1.1 The length of cord on spool or reel is less than specified or more than 10% in excess of the length specified.

4.3.1.4.1.2 Length of cord on spool or reel is more than 6 ft (2 m) less than length marked on ticket or label.

4.3.1.4.2. Defects with Regard to Winding: Defects shall be considered to exist if any of the following are determined during inspection:

4.3.1.4.2.1 Improperly or not firmly wound resulting in kinking, knotting, entangling, or slippage during unwinding or otherwise affecting free unhampered unwinding of cord.

4.3.1.4.2.2 Put-up not as specified.

4.3.1.4.2.3 Any end not heat sealed.

4.3.1.4.2.4 Cord not in a continuous length.

4.3.1.4.2.5 Knot or otherwise joining of ends to make a continuous length.

4.3.1.4.2.6 Any core end lap less than 500 ft (150 m) apart (when applicable).

4.3.1.4.2.7 Any spool or reel found to contain more than two pieces of cord.

4.3.1.4.2.8 Any piece of cord less than 300 ft (90 m) in length.