

**INCH-POUND**

MIL-P-24216B(SH)  
27 APRIL 1990  
SUPERSEDING  
MIL-P-24216A(SH)  
2 NOVEMBER 1966

## MILITARY SPECIFICATION

### POLYPROPYLENE CORES, STRAND CENTERS, AND SUBSTRANDS FOR WIRE ROPE

*This specification is approved for use by the Naval Sea Systems Command, Department of the Navy, and is available for use by all departments and agencies of the Department of Defense.*

#### 1. SCOPE

1.1 **Scope.** This specification covers the requirements for monofilament, multifilament, and slit or fibrillated fiber polypropylene cores, strand centers, and substrands.

#### 2. APPLICABLE DOCUMENTS

##### 2.1 Government documents.

2.1.1 **Specifications, standards, and handbooks.** The following specification, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

#### FEDERAL

FED-STD-191                      Textile Test Methods

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Sea Systems Command, SEA 5523, Department of the Navy, Washington, DC 20362-5101 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 4020

**DISTRIBUTION STATEMENT A.** Approved for public release; distribution is unlimited.

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(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, BLDG 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

**2.2 Non-Government 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 are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

### AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

D1525	Standard Test Method for Vicat Softening Point of Plastics (DOD Adopted)
D2257	Standard Test Method for Extractable Matter in Yarns (DOD Adopted)

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

**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 takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

## 3. REQUIREMENTS

**3.1 Materials.** The material used in cores, strand centers, and substrands shall be virgin polypropylene fiber having a minimum of 3.6 grams and a maximum of 4.8 grams per denier. The material shall have a softening point of 300 degrees fahrenheit (°F) and a specific gravity no greater than 0.91. All fibers shall contain sufficient heat stabilizers to meet the softening point requirements when tested as specified in 4.2. The material may consist of multifilaments, monofilaments, connected monofilaments, or film, slit or fibrillated, as agreed between the wire rope producer and the core producer.

**3.1.1 Filaments and film.** Filaments and film used to produce cores, strand centers, and substrands shall be the same size. Filaments used for multifilament range in size from 6 denier to 15 denier per filament. When monofilament is used the size shall range from 100 to 800 denier per filament. Slit and fibrillated fiber shall be composed of tape whose size shall range in size to a maximum of 75,000 denier per filament.

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**3.1.2 Ultraviolet resistance.** Substrands for spring lay rope shall be resistant to ultraviolet degradation, fibers shall contain sufficient U.V. stabilizer to meet the requirements when tested as specified in 4.2.2. The specimens removed from the substrands shall not have a breaking strength loss greater than 50 percent when compared with the original specimens when tested as specified in 4.2.2.

**3.2 Non-fibrous material.** No extraneous material shall be added for the purpose of weighting the cores, centers, or substrands, except coloring pigments. The moisture content shall not exceed 1.0 percent of the dry weight of the core, strand center, or substrand. The cores, strand centers, and substrands shall be lubricated with a lubricant specified by the wire rope producer except the lubricant shall not contain asphaltic material or animal fats. The lubricant content shall be  $4 \pm 2$  percent when tested as specified in 4.2.3. Finished cores, strand centers, and substrands shall be resistant to aging and shall not cause specimen breaking strength loss greater than 10 percent when tested as specified in 4.2.1.

**3.3 Construction.** The cores, strand centers, and substrands shall consist of a laid construction usually using 3 strands. When specified, 4 strands may be used with a core (see 6.2). Either construction shall be a hard lay capable of supporting the wire rope and acceptable to the wire rope producer.

**3.4 Identification.** The producer of the polypropylene cores, centers, or substrands shall, if required, (see 6.1) identify his product by inserting a paper or colored polyoefin monofilament marker within one strand.

**3.5 Color.** Unless otherwise specified (see 6.2) the color of the cores and centers shall be charcoal grey or black, while the color of the substrands shall be black.

**3.6 Workmanship.** Cores centers and substrands shall be evenly laid. The individual strands in the cores, centers, and substrands shall be free from kinks, strand knots, and darting yarns or bulged strands.

## 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 (examinations and tests) 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 this specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

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**4.1.1 Responsibility for compliance.** All items shall meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of the manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of know defective material, either indicated or actual, nor does it commit the Government to accept defective material.

**4.2 Testing of the end item.** The methods of testing specified in FED-STD-191 or ASTM, where applicable, and as specified in table I shall be followed. The physical values specified in section 3 apply to the average of the determinations made on a sample unit for test purposes as specified in the applicable test methods (see 6.3).

TABLE I. *Test methods*

Characteristic	Req ref	Test method	No. of deter per indiv sample unit	Results reported
Material	3.1		1	Pass or fail
Softening point	3.1	ASTM D1525	1	Pass or fail
Heat aging	3.2	4.2.1 and 4100 <sup>1</sup>	3	Pass or fail
Ultraviolet resistance	3.2	4.2.2, 4100, and 5804.1 <sup>1</sup>	3	Pass or fail
Extractable matter	3.2	4.2.3, ASTM D2257	2	Pass or fail
Construction	3.3	Visual	1	Pass or fail
Identification marker	3.4	Visual	1	Pass or fail

<sup>1</sup>Tests to determine compliance with specification requirements may be made under prevailing atmospheric conditions except in settlement of dispute in which case the tests shall be made upon material which has reached equilibrium under standard conditions as defined in FED-STD-191.

**4.2.1 Heat aging test.** Three specimens shall be heated in a convection air oven at  $175 \pm 2$  °F for 5 days. These specimens shall then be removed from the oven and conditioned for 24 hours in a standard atmosphere for textiles prior to being tested for strength. The percent change in breaking strength shall be calculated based on the average found for three unexposed specimens as specified in method 4100 of FED-STD-191.

**4.2.2 Ultraviolet resistance test.** Three specimens shall be exposed for 500 hours in the weathering device described in method 5804.1 of FED-STD-191. The percent change in breaking strength shall be calculated on the average found for three unexposed specimens as specified in method 4100 of FED-STD-191.

**4.2.3 Extractable matter.** An extraction procedure, employing the Soxhlet apparatus, with chloroform as a solvent, shall be used in this determination. The procedure outlined in ASTM D2257 shall be followed.

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**5. PACKAGING**

5.1 Not applicable.

**6. NOTES**

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

**6.1 Intended use.** The polypropylene cores, strand centers, and substrands covered by this specification are intended for use in wire rope.

**6.2 Acquisition requirements.** Acquisition documents must specify the following:

- (a) Title, number, and date of this specification
- (b) Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1)
- (c) Type of laid construction required (see 3.3)
- (d) Manufactures identification, if required (see 3.4)
- (e) Color, if other than specified (see 3.5).

**6.3 Consideration of data requirements.** The following data requirements should be considered when this specification is applied on a contract. The applicable data item descriptions (DIDs) should be reviewed in conjunction with the specific acquisition to ensure that only essential data are requested/provided and that the DIDs are tailored to reflect the requirements of the specific acquisition. To ensure correct contractual application of the data requirements, a Contract Data Requirements List (DD Form 1423) must be prepared to obtain the data, except where DOD FAR Supplement 27.475-1 exempts the requirement for DD Form 1423.

Reference Paragraph	DID Number	DID Title	Suggested Tailoring
4.2	DI-MISC-80678	Certification/ Data Report	10.2.2 10.3.1 Does not apply

The above DIDs were those cleared as of the date of this specification. The current issue of DOD 5010.12-L, Acquisition Management Systems and Data Requirements Control List (AMSDL), must be researched to ensure that only current, cleared DIDs are cited on the DD Form 1423.

**6.4 Subject term (Key word listing).**

- Mono filament
- Multi filament
- Slit film
- Fibrillated film

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

**Review activity**  
DLA - DISC-ESA

**Preparing activity:**  
Navy-SH  
(Project 4020-N023)

