

INCH-POUND

A-A-59811

27 March 2008

COMMERCIAL ITEM DESCRIPTION

ROPES: HIGH MODULUS POLYETHYLENE (HMPE) FIBER

The General Services Administration has authorized the use of this commercial item description, for all federal agencies.

1. SCOPE. This commercial item description covers four-strand high modulus polyethylene (HMPE) fiber rope that is intended for use as mooring lines and floating dry dock tending lines.

2. SALIENT CHARACTERISTICS.

2.1 Description. The HMPE fiber rope shall be fabricated from four-strand right regular laid with a three-strand right regular laid polypropylene core. Each strand of the rope shall consist of HMPE yarns left laid helically around the strand core (1X36) with a braided jacket of alternating aramid and polyester yarns. The center core shall consist of three strands of polypropylene with a braided jacket of polyester yarns. The color of the finished rope shall be natural. The strength member material shall be Spectra 1000 or Dyneema SK 75. The reel shall be marked as to actual length.

2.1.1 Braided jacket. The strand jacket braid shall be twill type with ten picks per inch. The type of braid for the core shall be in accordance with table I. The jacket shall fit firmly around each HMPE strand and polypropylene core resulting in 100 percent full coverage when inspected with the rope in a relaxed state.

TABLE I. Structural requirement for core jacket.

Rope Diameter (in)	Core Diameter (in)	Braid Type	Number of Strands	Pick Count Per Inch
1½	¾ - ½	Twill	16 24	17.5
1¾	¾ - ½	Twill	16 24	17.5
2	½ - ⅝	Twill	16 24	14.0
2¼	½ - ⅝	Twill	16 24	14.0
2⅜	⅝ - ¾	Twill	24 32	9.3
2⅝	⅝ - ¾	Twill	24 32	9.3
2¾	¾ - ⅞	Twill	24 32	8.0
3¼	¾ - ⅞	Twill	24 32	8.0

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A-A-59811

2.2 Physical properties. The finished rope shall conform to the physical properties specified in table II when tested in accordance with CI 1500 and CI 1502.

TABLE II. Physical properties.

Diameter (in) ±5%	Linear Density (lb/100 ft) ±5%	Lay Length Maximum (in)	Breaking Strength Minimum (lb)
1½	54	6.59	140,000
1¾	69	7.69	180,000
2	102	8.79	230,000
2¼	120	9.89	300,000
2⅜	141	10.44	360,000
2⅝	159	11.53	405,000
2¾	169	12.08	510,000
3¼	205	14.28	660,000

2.2.1 Elongation. The total elongation of the rope shall not exceed six percent at the minimum breaking strength value of table II. The load elongation curve, drawn autographically, shall not exhibit evidence of sudden changes in load applications greater than five percent of the load measured at the instant of change. Changes due to splice slippage shall not be considered in this determination.

2.2.2 Failure mechanism. The failure mechanism shall consist of sequential rupturing. At least one strand shall remain intact at first break.

2.2.3 Lay length. The lay length shall not exceed the values in table II.

2.3 Identification marker. The manufacturer shall identify each product by inserting a water resistant marker inside one strand in all sizes of ropes. The manufacturer's name, the year of manufacture, and type of fiber (HMPE) shall be printed on the marker in bold, easy-to-read type. Italic or script type shall not be used. The printing shall not be affected by exposure to salt water or mineral oil.

2.4 Identification tag. In addition to the requirements specified in 2.3, each length of rope shall have an identification tag attached. The identification tag shall be legibly printed, stamped, or typed with water insoluble ink. The identification tag shall be made of leather, nylon, or other durable cloth. The identification tag shall be installed in the eye of the rope and shall contain the following information:

- a. Stock number
- b. Nomenclature
- c. Length
- d. Date of manufacture and year
- e. Contractor's name

2.5 Eye splice. The lines shall be furnished with one six-foot eye splice and a five-foot nylon chaffing sleeve installed inside the eye.

2.6 Put up. Unless otherwise specified (see 6.3), the rope shall be provided in standard lengths of 200- and 400-foot assemblies when measured in the relaxed condition and shall be furnished in a continuous length on non-returnable reels not larger than 7 feet in diameter.

3. REGULATORY REQUIREMENTS. The offeror/contractor is encouraged to use recovered materials to the maximum extent practicable, in accordance with paragraph 23.403 of the Federal Acquisition Regulation (FAR).

A-A-59811

4. PRODUCT CONFORMANCE PROVISIONS.

4.1 Product conformance. The products provided shall meet the salient characteristics of this Commercial Item Description, conform to the producer's own drawings, specifications, standards, and quality assurance practices, and be the same product offered for sale in the commercial marketplace. The government reserves the right to require proof of such conformance.

4.2 Inspection requirements. Unless otherwise specified (see 6.2), sampling for inspection shall be performed on one reduced recoil test sample per manufactured lot in accordance with CI 1502.

4.3 End item visual examination. Each lot shall be examined for the following defects:

- a. Defects in design, construction, or workmanship; any cut, kink, broken or loose ends, bulged strands; not of continuous length, contains knots, in-line splices or otherwise secured to make a continuous length; any spot or stain clearly noticeable; ends not secured, whipped or taped; identification marker omitted or not as specified. Results shall be reported as pass or fail. If any sample unit has one or more defects, the entire lot shall be rejected.
- b. The unit for this examination shall be one reel. The length of 31 meters (100 feet) shall be subjected to the visual examination. The sample units shall be randomly selected and the sample size shall be one reel per lot. If any sample unit has one or more defects, the entire lot shall be rejected.

4.4 Length and winding. The end item shall be examined for the following defects:

- a. Length of unit more or less than specified (including permitted tolerances).
- b. Length of unit less than marked on ticket.
- c. Reels not in continuous length.
- d. Reels improperly or not firmly wound, resulting in slippage during winding.
- e. Rope ends knotted or spliced to make a continuous length.

If any sample unit has one or more defects, the entire lot shall be rejected.

4.5 Testing of end item. The rope shall be tested as specified in 4.5.1 thru 4.5.5 of physical values apply to the average of the determinations made on the sample unit for test purposes as specified in the applicable test methods. The sample size shall be in accordance with 4.2 and shall be zero percent defective. The lot size shall be expressed in units of reels. The sample unit for test purposes shall be in accordance with CI 1502.

4.5.1 Diameter and picks per inch. The diameter shall be measured in accordance with CI 1500, and picks per inch shall be determined in accordance with method 6001 of FED-STD-191.

4.5.2 Linear density. The linear density shall be determined by weighing the rope designated for the test sample prior to splicing. The linear density is then calculated by dividing the gross weight by the length of the sample.

4.5.3 Breaking strength. Breaking strength determination shall be in accordance with CI 1502. Each sample specimen shall have a breaking strength not less than that specified in table II. Eye splices on HMPE fiber four-strand cordage shall be accomplished by tucking with the lay for a minimum of six full tucks. Tapered splices are permitted.

4.5.4 Elongation. The elongation shall be in accordance with CI 1502.

4.5.5 Failure mechanism. The failure mechanism shall be determined by testing one rope sample from each lot in accordance with CI 1502. The required warning time stretch factor shall be 0.01. This sample shall meet the breaking strength requirements of table II.

5. PACKAGING. Preservation, packing, and marking shall be as specified in the contract or order.

A-A-59811

6. NOTES.

6.1 Source of documents.

6.1.1 Cordage Institute International Standards. Cordage Institute (CI) Standards are available from the Cordage Institute, 994 Old Eagle Rd., Suite 1019, Wayne, PA 19087-1866 or online at <http://www.ropecord.com>.

6.1.2 FAR. The Federal Acquisition Regulation is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402 or online at <http://www.arnet.gov/far>.

6.1.3 Federal standards. FED-STDs are available online at <http://assist.daps.dla.mil/quicksearch/> or <http://assist.daps.dla.mil> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.

6.2 Ordering data. The contract or order should specify the following:

- a. CID document number and title.
- b. Diameter required (see 2.2).
- c. When continuous lengths, other than standard, are required (see 2.6).
- d. Inspection requirements other than those specified in 4.2.
- e. Packaging requirements.

6.3 Key words.

Braided jacket

Elongation

Eye splice

Fiber

High modulus polyethylene

HMPE

Lay length

MILITARY INTERESTS

Custodians:

Army – GL

Navy – SH

Air Force – 99

Review Activities:

Army – GL1

Navy – AS, CG

Air Force – 03

DLA – IS

CIVIL AGENCY COORDINATING ACTIVITY:

GSA – FSS

Preparing Activity:

Navy – SH

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