

MIL-W-6015A(ASG)
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MILITARY SPECIFICATION

**WIRE ROPE, STEEL, 6 BY 19, HIGH-STRENGTH
(FOR AIRCRAFT LAUNCHING AND ARRESTING)**

This specification has been approved by the Department of the Air Force and by the Navy Bureau of Aeronautics.

1. SCOPE

1.1 Scope.- This specification covers high strength 6 by 19 wire rope of one grade only for aircraft launching and arresting gear applications.

1.2 Classification.- The wire rope shall be furnished in the sizes shown in table II, as specified.

2. APPLICABLE SPECIFICATIONS, STANDARDS, DRAWINGS, AND PUBLICATIONS

2.1 The following specifications and standards, of the issue in effect on date of invitation for bids, form a part of this specification to the extent specified herein:

SPECIFICATIONS

Federal

QQ-M-151

Metals; General Specification for Inspection of

Military

JAN-B-121

Barrier-Materials, Greasproof

JAN-P-125

Packaging and Packing for Overseas Shipment -
Barrier-Materials, Waterproof, Flexible

STANDARDS

MIL-STD-129

Marking of Shipments

(Copies of specifications, standards, and drawings required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

3. REQUIREMENTS

3.1 Materials.-

3.1.1 Wire.- The wire used in the rope shall be made from the best quality of a suitable type of steel. The wires shall be uncoated, i.e., not galvanized, tinned, etc.

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3.1.2 Fiber.- The fiber of the core shall be the best quality of hard fiber commercially used for cores of wire ropes. The hard fibers are manila (abaca) and sisal (African, Java, Mauritius, Mexican, or Yucatan). A mixture of two or more kinds of hard fiber may be used. The core shall not contain jute fiber. The fiber core shall be thoroughly cleaned, free from waste, evenly twisted, and of uniform ply.

3.2 Rope Construction.- The rope shall be 6 by 19 construction, right-hand twist, regular lay, preformed, with a fiber core. The rope shall have one core, and six strands of 19 main wires and 6 filler wires each, making a total of 114 main wires and 36 filler wires in the strands.

3.3 Strand Construction.- Each of the six strands of the wire rope shall have a main wire center, 6 main wires in the inner layer, and 12 main wires in the outer layer. There shall be 6 filler wires between the inner layer and the outer layer. All the main wires in the inner layer shall be one diameter. All the main wires in the outer layer shall be one diameter. All the filler wires shall be one diameter. The strand shall be fabricated in one operation.

3.3.1 One Diameter.- Wires in a wire rope are one diameter if the difference between the diameter of the smallest wire and the diameter of the largest wire is not greater than the value specified in table I.

TABLE I

Wires of One Diameter

Wire Diameter	:	Difference Between the Diameter of the Smallest Wire and the Diameter of the Largest Wire
Inch	:	Inch
Up to 0.029	:	0.0015
0.030 to 0.059	:	0.0020
0.060 to 0.099	:	0.0025
0.100 to 0.149	:	0.0030

3.3.2 Pitch.- All the wires in a strand fabricated in one operation shall have the same pitch, and each wire shall be in contact with the same adjacent wires for its entire length.

3.4 Joints.- The strands of the wire rope shall contain no joints made after fabrication. If joints are made in the individual wires before the fabrication of the strands, the distance between a joint in any one wire and the joint in any other wire in the same strand shall be not less than 18 inches.

3.5 Seizing.- Each end of each length of wire rope shall be suitably seized.

3.6 Ductility.- Main wires taken from the completed wire rope shall not fracture when tested by the method specified in Section 4.

3.7 Mechanical Properties.- The mechanical properties of the wire rope shall conform to the requirement shown in table II for the size (diameter) specified in the contract or order.

3.8 Preforming.- With the seizing at one end of the wire rope removed, the difference between the actual unrestrained diameter and the initial diameter shall be not more than the limits given in table II.

TABLE II
Mechanical Properties

Diameter 1/			Max Permissible	Approx	Breaking Strength 2/			Pitch 3/
Nominal	Min	Max	Difference in Dia: When Seising is Removed		Weight per Foot	Nominal	Min	
Inches	Inches	Inches	Inch	Pounds	Pounds	Pounds	Inches	
5/8	5/8	21/32	1/32	0.63	40,300	39,500	4.0	
11/16	43/64	45/64	1/32	0.71	46,000	44,800	4.5	
7/8	7/8	59/64	3/64	1.23	73,000	71,200	5.7	
1	1	1-3/64	3/64	1.60	95,000	92,600	6.5	
1-1/8	1-1/8	1-11/64	3/64	2.03	119,000	116,000	7.3	
1-1/4	1-1/4	1-5/16	1/16	2.50	146,000	142,000	8.1	
1-3/8	1-3/8	1-7/16	1/16	3.03	175,000	171,000	8.9	
1-1/2	1-1/2	1-9/16	1/16	3.60	208,000	203,000	9.8	
1-5/8	1-5/8	1-23/32	3/32	4.23	242,000	236,000	10.6	
1-3/4	1-3/4	1-27/32	3/32	4.90	280,000	273,000	11.4	
1-7/8	1-7/8	1-31/32	3/32	5.63	314,000	306,000	12.2	
2	2	2-3/32	3/32	6.40	350,000	341,000	13.0	

- 1/ The diameter of a wire rope is the diameter of the circumscribing circle.
- 2/ Nominal breaking strength values are to be used for design purposes. Minimum breaking strength values are acceptable when testing rope under this specification to account for slight reduction in strength resulting from the use of short test lengths.
- 3/ The pitch of a wire rope is the distance, parallel to the axis of the rope, in which a strand makes one complete turn about the axis of the rope.

3.9 Lubrication.-

3.9.1 The fiber core shall be thoroughly impregnated with a suitable lubricant during the process of core manufacture.

3.9.2 A suitable asphalt-base lubricant shall be applied to the strands during fabrication of the wire rope. The lubricant shall possess corrosion-resisting properties.

3.10 Identification Marker.- A suitable printed tape or tapes shall be either incorporated into the fiber core or run into the wire rope along the fiber core when the wire rope is closed. This marker tape is to distinguish this grade of wire rope from other grades. The marker tape shall bear, at not more than 1-foot intervals, the name of the wire rope manufacturer, the nominal diameter of the wire rope, and the words "FOR AIRCRAFT LAUNCHING AND ARRESTING."

3.11 Length.- The length in which the wire rope is to be furnished shall be as specified in the contract or order. Not more than one size or length of wire rope shall be furnished on a single reel.

3.12 Workmanship.- The workmanship shall be first class in every respect. The wire rope shall be free from imperfections of manufacture affecting its appearance or which may affect its serviceability.

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4. SAMPLING, INSPECTION, AND TEST PROCEDURES

4.1 General.- All the tests required for the testing of the wire rope covered by this specification are classified as Inspection Tests, for which necessary sampling techniques and methods of testing are specified in this section. The contractor shall furnish all samples and shall be responsible for accomplishing the required tests. When inspection is conducted at the contractor's plant, all inspection and testing shall be under the surveillance of the Government Inspector. Contractors not having laboratory facilities satisfactory to the Government shall engage the services of a commercial testing laboratory acceptable to the procuring activity. The contractor shall furnish test reports, in duplicate, showing quantitative results for the tests required by this specification and signed by the authorized representative of the contractor or laboratory, as applicable. Acceptance or approval of material in course of manufacture shall in no case be construed as a guaranty of the acceptance of the finished product.

4.2 Examination of Product.- All rope shall be examined to insure conformance with the requirements for workmanship and for conformance with other requirements for which no test methods are specified herein. For this purpose, the rope shall travel no faster than 100 feet per minute and shall be stopped for closer inspection when deemed necessary.

4.2.1 The wire rope shall be unlayed a sufficient distance from the end and examined to determine that it contains a tape or tapes bearing the name of the wire rope manufacturer, the nominal diameter of the wire rope, and the words "FOR AIRCRAFT LAUNCHING AND ARRESTING" as specified in paragraph 3.10. The examination shall take place at the time the rope is wound on shipping reels.

4.3 Sampling Tests.- One 2-1/2 foot sample and one 7-foot sample shall be taken to represent each reeled length of wire rope. The Preforming test of paragraph 4.3.1 and the Ductility tests of paragraph 4.3.2 shall be made on the short sample. The wire rope construction shall be checked on either sample. The long sample shall be pulled to destruction to determine its breaking strength. Samples shall be in addition to the quantity specified in the contract or purchase order and shall be furnished without cost to the Government. Samples selected shall be subjected to the following tests.

4.3.1 Preforming.- The diameter of the cable adjacent to a seized end of the specimen shall be measured, the seizing removed, and the diameter at the unrestrained end determined. The increase due to removal of the seizing shall be computed.

4.3.2 Ductility.- From each short sample, not less than one specimen of each size of main wire from each strand shall be selected and the ductility determined. For wire rope 1 inch in diameter or smaller, the ductility shall be determined by the "Kink Test," while for wire rope larger than 1-inch diameter, the ductility shall be determined by the "Wrapping Test."

4.3.2.1 Kink Test.- The ductility shall be determined by the ability of the wire specimens to withstand, without fracture, one tight kink. The tight kink shall be made by bending the wire into a loop and then pulling the loop tight until the opening is no larger than the diameter of the wire. The loop shall then be opened so that the wire ends are straight and at right angles to each other.

4.3.2.2 Wrapping Test.- The ductility shall be determined by the ability of the wire specimens to withstand, without fracture, wrapping in a close helix for six complete turns around a mandrel. The diameter of the mandrel shall be the same as the diameter of the wire.

4.3.3 Breaking Strength.- Breaking strength of wire rope shall be determined on the long sample. The rope ends shall be socketed in zinc or other suitable metal. The loading conditions shall conform to the Tension test requirements of Specification QQ-M-151.

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4.4 Rejection and Retest.- Failure of any specimen to meet the specified minimum breaking strength requirements shall be cause for rejection of the reeled length represented, except that the manufacturer may, at his own expense, in the presence of the Inspector, subject one additional specimen from this length to retest when the Inspector considers that such retest is warranted. The Inspector may accept reels of wire rope shown to conform to the breaking strength requirement by this retest. Only one such retest may be permitted. Lengths rejected for nonconformance to other requirements of this specification shall be rejected.

5. PREPARATION FOR DELIVERY

5.1 Application.- The preservation, packaging, packing, and marking requirements specified herein apply only to direct purchases by or direct shipments to the Government.

5.2 Preservation.- Exterior surfaces of wire rope shall be protected from corrosion by coating with an asphalt base lubricant.

5.3 Packing.- Wire rope protected from corrosion or deterioration during shipment and storage as prescribed above, shall be wound on substantial commercial-type wooden reels so constructed as to insure acceptance by common or other carrier for safe transportation at the lowest rate to the point of delivery. The reels shall be capable of withstanding storage, rehandling, and reshipment without the necessity of repacking. Reels shall be provided with an exterior wood sheath. Flexible, waterproof, barrier-material conforming to Specification JAN-B-121 or JAN-P-125 shall be used to prevent the entrance of moisture to the enclosed cable.

5.4 Marking.- The marking of reels for shipment shall comply with Standard MIL-STD-129. The nomenclature shall be as follows: Wire Rope, Steel, 6 by 19, Diameter (to be entered by the contractor) Fibre Core, Specification MIL-W-6015A(ASG).

6. NOTES

6.1 Intended Use.- The wire rope covered by this specification is intended for use in aircraft arresting-gear installations, aircraft crash barriers, catapults, and other similar uses.

6.2 Ordering Data.- Requisitions, contracts, and purchase orders should state the nominal size (diameter) and length of wire rope to be furnished.

6.3 Supercoding Data.- This specification supercedes Specification MIL-R-6015 which was the number assigned by cover sheet to Specification 22R7(Aer). The Office of Standardization has authorized the revision to this specification, previously fully coordinated, as an ASG Limited Coordination Specification in view of its exclusively aeronautical application.

6.4 Definitions.-

6.4.1 Right-Hand Twist Wire Rope.- In a right-hand twist wire rope, the strands form a helix about the axis of the rope similar to the threads of a right-hand screw.

6.4.2 Regular Lay Wire Rope.- In a regular lay wire rope, the direction of the twist of the strands is opposite to the direction of the twist of the rope.

6.4.3 Preformed Wire Rope.- In a preformed wire rope, the strands have been permanently shaped to the helical form they assume in the finished rope before the strands have been fabricated into the rope.

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SPECIFICATION ANALYSIS SHEET

Form Approved
Budget Bureau No. 119-R004**INSTRUCTIONS**

This sheet is to be filled out by personnel either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity (as indicated on reverse hereof).

SPECIFICATION

ORGANIZATION (of submitter)

CITY AND STATE

CONTRACT NO.

QUANTITY OF ITEMS PROCURED

DOLLAR AMOUNT

\$

MATERIAL PROCURED UNDER A

DIRECT GOVERNMENT CONTRACT

SUBCONTRACT

1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?

A. GIVE PARAGRAPH NUMBER AND WORDING.

B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES.

2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID

3. IS THE SPECIFICATION RESTRICTIVE?

YES

NO IF "YES", IN WHAT WAY?

4. REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)

SUBMITTED BY (Printed or typed name and activity)

DATE