

INCH-POUND

MIL-DTL-13074B  
27 June 2003  
SUPERSEDING  
MIL-W-13074A(EL)  
19 May 1965

## DETAIL SPECIFICATION

WIRE, ELECTRICAL, ANTENNA,  
(WIRE W-27 AND WIRE WS-19( ) /U)

Inactive for new design after 16 June 1997

This specification is approved for use by all Departments  
and Agencies of the Department of Defense.

### 1. SCOPE

1.1 Scope. This specification covers stranded, round electrical wire fabricated from silicon bronze, suitable for antenna applications.

1.2 Classification. Silicon bronze wires covered by this specification are of the following types (see 6.2).

1.2.1 Wire W-27. Wire W-27 consists of 7 strands of 0.064 inch diameter silicon bronze wire approximately equivalent to 26.300 circular mils (6 AWG) in area.

1.2.2 Wire WS-19( )/U. Wire WS-19( )/U consists of 7 strands of 0.040 inch diameter silicon bronze wire approximately equivalent to 10,400 circular mils (10 AWG) in area (see 6.3).

### 2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Defense Logistics Agency, Defense Supply Center, Columbus (DSCC-VAI), P.O. Box 3990, Columbus, OH 43216-5000 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A  
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2.2 Non-Government publications. The following document forms 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 NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z540.1 - Calibration Laboratories and Measuring Test Equipment—General Requirements.

(Application for copies should be addressed to the American National Standards Institute, 25 West 43<sup>rd</sup> Street, 4<sup>th</sup> Floor, New York, New York, 20036.)

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 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.2 Materials. The material for the wire shall be as specified herein.

3.3 Strands.

3.3.1 Wire W-27 (see 3.4.1). Each strand of wire W-27 shall consist of a silicon bronze alloy wire with a diameter of 0.064 inch,  $\pm 0.0015$  inch.

3.3.2 Wire WS-19( )/U (see 3.4.2). Each strand of wire WS-19( )/U shall consist of a silicon bronze alloy wire with a diameter of 0.040 inch,  $\pm 0.0015$  inch.

3.4 Conductor construction.

3.4.1 Wire W-27. Wire W-27 shall be constructed of 7 strands of wire as specified in 3.3.1, twisted with a left-hand lay of a maximum 3 inches in length.

3.4.2 WS-19( )/U. Wire WS-19( )/U shall be constructed of 7 strands of wire as specified in 3.3.2 twisted with a left-hand lay of a maximum 2 inch in length.

3.5 Conductor joints (see 4.6). Joints in conductors should be avoided, and in no case shall they exceed two joints per strand per length of wire, with joints spaced not less than 3 feet apart. All joints shall be butt brazed using silver alloy solder and a nonacid flux; and shall be finished smoothly in a workmanlike manner. No twist joints shall be used. The tensile strength of a section of each strand which includes a joint, shall not be less than 80 percent of the tensile strength of an adjacent section of the strand of equal length without a joint. The average tensile strength of a group of twelve strands which include joints, shall not be less than 90 percent of the adjacent sections of the strands.

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3.6 Breaking strength (see 4.6).

3.6.1 Wire W-27. Wire W-27 shall have a breaking strength of not less than 2200 pounds.

3.6.2 Wire WS-19( )/U. Wire WS-19( )/U shall have a breaking strength of not less than 790 pounds.

3.7 Elongation. The elongation shall be not less than 0.80 percent for a 60 inch length of stranded conductor.

3.8 Workmanship. Strands and wire shall be manufactured and finished in a careful and workmanlike manner in accordance with the good design and sound practice.

4. VERIFICATION

4.1 Test equipment and inspection facilities. Test and measuring equipment and inspection facilities of sufficient accuracy, quality, and quantity to permit performance of the required inspections shall be used. The establishment and maintenance of a calibration system to control the accuracy of the measuring and test equipment shall be in accordance with ANSI Z540.1 or equivalent.

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. Operator qualification test.
- b. Conformance inspection.

4.3 Operator qualification test. This test shall be performed at the start of production for each order for wire under this specification and shall be as follows.

4.3.1 Procedure. Each operator required to make joints in strands will submit a group of twelve specimens of strand which include a joint with a specimen of adjacent normal section of each. These specimens will be tested for breaking strength. An operator will be considered qualified after submitting a group of twelve specimens which meet the requirements of 3.5. Records of such qualifications shall be available for verification by the Government.

4.4 Conformance inspection. Conformance inspection shall consist of groups A and B inspections (see 4.4.5 and 4.4.6, respectively) and shall be performed on every lot of cable procured under this specification. Sampling inspection shall be accomplished for each lot in accordance with 4.4.2.

4.4.1 Lot. A lot shall consist of all cable manufactured under substantially the same conditions and offered for inspection at one time.

4.4.1.1 Lot size. The lot size shall be defined as the number of units of product submitted for inspection.

4.4.1.2 Unit of product. A unit of product shall be defined as the continuous length of cable contained on a single reel, spool, or in a package.

4.4.1.3 Specimen. A specimen is a single piece of finished wire which is taken from a sample unit and subjected to inspection.

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4.4.2 Sampling. A random sample shall be selected from each lot in accordance with table I.

TABLE I. Inspection sample.

Inspection lot size <u>1/</u>	Accept on zero sample size
1	1
2 to 8	2
9 to 90	3
91 to 150	12
151 to 280	19
281 to 500	21
501 to 1,200	27
1,201 to 3,200	36
3,201 to 10,000	38
10,001 to 35,000	46

1/ Lot size is based on the number of units of product.

4.4.3 Rejected lot. Failure of any sample to pass any inspection shall constitute a failure of the lot. If an inspection lot is rejected, the contractor may rework the lot to correct the defects or screen out the defective units, and resubmit the lot for re-inspection. Such lots shall be separated from new lots and shall be identified as re-inspected lots (see 4.4.4).

4.4.4 Noncompliance. If a sample fails to pass any inspection, the contractor shall notify the cognizant inspection activity of such failure and take corrective action on the materials or processes or both, as warranted on all units of the product. Acceptance and shipment of the product shall be discontinued until corrective action has been taken. After the corrective action has been taken, the conformance inspection shall be repeated on replacement articles. (This includes all tests and examinations, or only the test that the original sample failed, at the option of the cognizant inspection activity.) Final acceptance and shipment shall be withheld until inspection has shown that the corrective action was successful. In the event of failure after re-inspection, information concerning the failure shall be provided to the cognizant inspection activity.

4.4.5 Group A inspection. This inspection, including sampling, shall consist of visual dimensional examinations of paragraph 4.5 to determine compliance with the requirements of 3.2 through 3.5 and 3.8 as applicable.

4.4.6 Group B inspection. This inspection, including sampling, shall consist of the tests and examinations of 4.6.

4.5 Visual and dimensional inspection. Strands and completed wire shall be inspected to verify that the materials and all workmanship comply with this specification.

4.5.1 Construction and lay. Construction and lay shall be determined by physical examination and measurement of the complete wire.

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4.6 Breaking strength and elongation. Breaking strength and elongation shall be made on a tensile strength machine, preferably of the pendulum types. Breaking strength test shall be made after stranding, on the completed wire. The free length between grips of the test specimen shall be not less than 60 inches and the speed shall be not more than 3 inches per minute. Care shall be taken to insure that strands in the stranded wire are evenly gripped during test. (Successfully testing of stranded wire for tensile properties requires an adequate means of gripping the ends of the test specimen. Various means are available, such as a long tube or socket into which the wire may be soldered, or in which, after insertion, the wires may be swaged or pressed without serious distortion. Ordinary jaws or clamping devices are usually not suitable). At the conclusion of the test, the wire shall meet the requirements for breaking strength and elongation specified in 3.5 and 3.6, respectively.

## 5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

## 6. NOTES

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

6.1 Intended use. Wire covered by this specification is most commonly used in antenna applications.

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. Packaging requirements (see 5.1).
- d. Classification of wire required (see 1.1).
- e. Length of wire required.
- f. Size of spool or reel and length on each (see 5.1).
- h. Coil, spool, and reel marking requirements.

6.3 Nomenclature. The parenthesis in the nomenclature will be deleted or replaced by a letter identifying the particular design; for example: WS-19W/U. As soon as possible after the award of contract, the contractor should apply to the Government office specified in the contract for such information.

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6.4 Subject term (key word) listing.

Round  
Silicon bronze  
Stranded

6.5 Environmentally preferable material. Environmentally preferable materials should be used to the maximum extent possible to meet the requirements of this specification. Table II lists the Environmental Protection Agency (EPA) top seventeen hazardous materials targeted for major usage reduction. Use of these materials should be minimized or eliminated unless needed to meet the requirements specified herein (see Section 3).

Table II. EPA top seventeen hazardous materials.

Benzene	Dichloromethane	Tetrachloroethylene
Cadmium and Compounds	Lead and Compounds	Toluene
Carbon Tetrachloride	Mercury and Compounds	1,1,1, - Trichloroethane
Chloroform	Methyl Ethyl Ketone	Trichloroethylene
Chromium and Compounds	Methyl Isobutyl Ketone	Xylenes
Cyanide and Compounds	Nickel and Compounds	

6.6 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue, due to the extent of the changes.

## CONCLUDING MATERIAL

Custodians:  
Army - CR  
DLA - CC

Preparing activity:  
DLA - CC

(Project 6145-A088-000)

<b>STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL</b>			
<b>INSTRUCTIONS</b>			
1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given. 2. The submitter of this form must complete blocks 4, 5, 6, and 7, and send to preparing activity. 3. The preparing activity must provide a reply within 30 days from receipt of the form. NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.			
<b>I RECOMMEND A CHANGE:</b>	<b>1. DOCUMENT NUMBER</b> <b>MIL-DTL-13074B</b>	<b>2. DOCUMENT DATE (YYYYMMDD)</b> <b>20030627</b>	
<b>3. DOCUMENT TITLE</b> <b>WIRE, ELECTRICAL, ANTENNA, (WIRE W-27 AND WIRE WS-19( ) /U)</b>			
<b>4. NATURE OF CHANGE</b> <i>(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)</i>			
<b>5. REASON FOR RECOMMENDATION</b>			
<b>6. SUBMITTER</b>			
a. NAME <i>(Last, First, Middle Initial)</i>		b. ORGANIZATION	
c. ADDRESS <i>(Include zip code)</i>	d. TELEPHONE <i>(Include Area Code)</i> (1) Commercial (2) DSN <i>(if applicable)</i>	7. DATE SUBMITTED (YYYYMMDD)	
<b>8. PREPARING ACTIVITY</b>			
a. NAME Defense Logistics Agency Defense Supply Center, Columbus		b. TELEPHONE <i>(Include Area Code)</i> (1) Commercial 614-692-0538 (2) DSN 850-0538	
c. ADDRESS <i>(Include Zip Code)</i> DSCC-VAI P.O. Box 3990 Columbus, Ohio 43216-5000		<b>IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:</b> Defense Standardization Program Office (DLSC-LM) 8725 John J. Kingman Road, Suite 2533 Fort Belvoir, Virginia 22060-6621 Telephone 703 767-6888      DSN 427-6888	