INCH-POUND

MIL-DTL-13075B
14 January 2008
SUPERSEDING
MIL-DTL-13075A
15 March 2002

DETAIL SPECIFICATION

WIRE, ELECTRICAL
(WIRE W-124, W-125, W-128)

Inactive for new design after 7 October 1991.

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

1. SCOPE

1.1 Scope. This specification covers the following three types of No. 14 AWG Buna-S insulated wire used for antenna and ground connections:

Wire W-124	Single Conductor (braided)
Wire W-125	Two Parallel Conductors (common outer braid)
Wire W-128	Single Conductor (without outer braid)

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 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 of documents cited in sections 3, 4, or 5 of this specification, whether or not they are listed.

Comments, suggestions, or questions on this document should be addressed to Defense Supply Center, Columbus, ATTN: DSCC-VAI, P.O. Box 3990, Columbus, OH 43218-3990, or email to WireCable@dscc.dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at http://assist.daps.dla.mil.

AMSC N/A FSC 6145

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

COMMERCIAL ITEM DESCRIPTION

A-A-59551 - Wire, Electrical, Copper.

DEPARTMENT OF DEFENSE SPECIFICATION

MIL-DTL-3432 - Cables, (Power and Special Purpose) And Wire, Electrical (300 And 600 Volts)

(Copies of this document are available online at http://assist.daps.dla.mil or http://assist.daps.dla.mil/quicksearch/ or from the Standardization Document Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the documents are the issues of the documents cited in the solicitation or contract (see 6.2).

NCSL INTERNATIONAL

NCSL-Z540.1 Calibration Laboratories and Measuring and Test Equipment, General Requirements

(Copies of these documents are available online at http://www.ncsli.org or from NCSL International 2995 Wilderness Place, Suite 107 Boulder, Colorado 80301-5404.)

2.4 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 Material. The material for the wire shall be as specified herein. The best material commercially available for the intended purpose shall be used when a definite material is not designated.

3.2 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.

3.3 Design and construction.

3.3.1 Conductors. Each conductor shall be equivalent to 4107 circular mils, (No. 14 AWG), class K stranded in accordance with A-A-59551.

3.3.2 Buna-S insulation. The Buna-S insulation shall meet the requirements specified in MIL-DTL-3432.

3.3.3 Wire W-124. Wire W-120 shall consist of a single conductor, insulated and braided (see 3.3.6). The conductor shall be insulated with Buna-S to a minimum diameter of 0.245 inch (6.22 mm) and a maximum diameter of 0.265 inch (6.73 mm).

3.3.4 Wire W-125. Wire W-125 shall consist of two conductors, each insulated and braided (see 3.3.6). The two insulated and braided conductors shall be laid parallel and covered with a common, lacquered, moisture-proof, flame and fungus-resistant braid, similar to that provided on the individual conductors. The conductors shall be insulated with Buna-S to a minimum diameter of 0.245 inch (6.22 mm) and a maximum diameter of 0.265 inch (6.73 mm).

3.3.5 Wire W-128. Wire W-128 shall consist of a single insulated, unbraided conductor. The conductor shall be insulated with Buna-S to a minimum diameter of 0.345 inch (8.76 mm) and a maximum diameter of 0.365 inch (9.27 mm).

3.3.6 Braid. For Wire W-124 and W-125, each insulated conductor shall be covered with a braid made of black cotton thread No. 20 or finer, closely woven. A similar braid shall be applied over the two insulated and braided conductors of Wire W-125. The braid shall be given a flexible, flame-proof, lacquer finish, rendering the braid completely waterproof and presenting a polished surface. The lacquer shall contain 5 to 6% of salicylinide based on the solids content of the lacquer.

3.4 Performance. Unless otherwise specified herein, all requirements shall be met on finished wire.

3.4.1 Dielectric withstanding voltage. The wire shall withstand the voltage as specified in 4.3.2 for 5 minutes (minimum) without breakdown.

3.4.2 Insulation resistance. After meeting the dielectric strength test specified in 4.3.3, the insulation resistance of each length of wire shall be not less than the following values:

Wires W-124 and W-125	1500 megΩ – thousand feet
Wire W-128	1800 megΩ – thousand feet

3.4.3 Electrostatic capacitance and power factor. Samples from each lot of each type of wire submitted for inspection shall be subjected to the test for electrostatic capacitance as specified in 4.3.4. The capacitance shall not exceed the following values:

Wires W-124 and W-125	55 mmf per foot
Wire W-128	35 mmf per foot

The power factor shall not exceed 2% at a frequency of 1 megacycle, when measured in conjunction with the capacitance test.

3.4.4 Continuity. Each conductor shall have continuous continuity.

3.4.5 Conductor insulation tests. Physical properties and cold bend tests of the Buna-S insulations shall meet the requirements of 3.3.2.

3.5 Workmanship. The wire shall be uniform in quality and free from defects that affect performance, serviceability, or appearance, such as lumps, kinks, splits, abrasions, scrapes, corroded surfaces, and skin impurities. The wire shall be a uniform and consistent product and shall be free from defects that adversely affect the serviceability of the product.

4. VERIFICATION

4.1 The inspection requirements specified herein are classified as follows:

a. Conformance inspection (see 4.2.5 and 4.2.6).

4.1.1 Conformance inspection. Conformance inspection consists of the group A and B inspections (see 4.2.5 and 4.2.6, respectively) specified in table I and shall be performed on specimens taken from the finished wire of each lot of reels, spools, or coils to be delivered. Sampling inspection shall be accomplished for each lot specified in 4.2.2.

TABLE I. Group A and B inspections.

Inspection	Requirement	Verification	Group A	Group B
Visual and dimensional	3.1, 3.3, 3.5	4.3.1	X	-
Dielectric strength	3.4.1	4.3.2	X	-
Insulation resistance	3.4.2	4.3.3	X	-
Continuity	3.4.4	4.3.5	X	-
Electrostatic capacitance and power factor	3.4.3	4.3.4	-	X
Conductor insulation tests	3.4.5	4.3.6	-	X

4.2 Test equipment and inspection facilities. Test and measuring equipment and inspection facilities of sufficient accuracy, quality, and quantity to permit performance of the required inspection shall be established and maintained by the contractor. The establishment and maintenance of a calibration system to control the accuracy of the measuring and test equipment (i.e., non-Government standard [NGS] or federal or military standard) shall be in accordance with NCSL-Z540.1 or equivalent.

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

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

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

4.2.1.3 Specimen. A specimen consists of the individual piece of a unit of product upon which a test is made.

4.2.2 Sampling. A random sample shall be selected from each lot as specified in table II.

TABLE II. Inspection sample.

Inspection lot size 1/	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

4.2.3 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 4.2.4).

4.2.4 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.

4.2.5 Group A inspection. Group A inspection shall include the applicable inspections specified in table I.

4.2.6 Group B inspection. Group B inspection shall include the applicable inspections specified in table I. Unless otherwise specified (see 6.2), group B inspection shall be performed on sample units that have been subjected to and have passed the group A inspection.

4.3 Inspections.

4.3.1 Visual and dimensional inspection. Inspect the strands, finished wire, and Buna-S insulation to verify that the material and all workmanship comply with this specification. Certification of compliance of materials may be accepted at the option of the Government.

4.3.2 Dielectric strength. Lengths of insulated conductor shall be tested for dielectric strength. The insulated conductors to be tested shall be immersed in water for at least 12 hours with the ends protruding not less than 24 inches. A 60-cycle per second rms alternating voltage of the value specified below shall then be applied for five minutes between the conductor and the water.

4.3.2.1 Wires W-124 and W-125. Wires W-124 and W-125 shall withstand a test voltage of 5000 Vrms. The test shall be performed on each insulated conductor of those wires (after the braid is applied).

4.3.2.2 Wire W-128. Wire W-128 shall withstand a test voltage of 12,500 volts rms.

4.3.3 Insulation resistance. For the insulation resistance test, an electromotive force of not less than 100 volts dc shall be used, the conductor being maintained negative with respect to the water. The insulation resistance shall be computed from the galvanometer deflection obtained after electrification of one minute. If measurement is made at other than the specified water temperature, the measured insulation resistance shall be multiplied by a coefficient corresponding to the measurement temperature. The contractor shall demonstrate that the coefficient is accurate for his compound. In making the insulation resistance test, the test may be terminated in less than one minute if the galvanometer has ceased fluctuating and the reading indicates that the required minimum insulation resistance has been obtained. However, test results on 5% of the lengths after one minute electrification shall be recorded to permit a continuous check on quality.

4.3.4 Electrostatic capacitance and power factor. For wire W-124, the test shall be conducted on the finished wire (with the braid on). For wire W-125, the common outer braid shall be removed from the sample and the test performed separately on each one of the braided conductors. The sample shall be dried in an oven at a temperature of 80 ± 3 °C for a period of 18 hours. When the sample has cooled to room temperature, it shall be insulated at one end with a suitable wax and immersed in mercury, and the capacitance between the conductor and the mercury measured by means of capacitance bridge at a frequency of 1 megacycle per second.

4.3.5 Continuity. Each finished length of wire shall be tested to verify continuity using a potential of not more than 7 volts dc.

4.3.6 Conductor insulation tests. Physical properties and cold bend tests of the Buna-S insulations shall be performed as specified in with 3.3.2.

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, or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point packaging activities within the Military Service or Defense Agency, or within the military service's system command. Packaging data retrieval is available from the managing Military Service 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. The wire covered by this specification is most commonly used in antenna and ground connections. This specification is retained as a military detail specification because of the unique military requirements for testing to ensure the integrity of any conductor joints.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification.

b. 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. Group B inspection sample, if other than as specified (see 4.2.6).

g. Size of spool and length on each (see 5.1).

h. Coil, spool, and reel marking requirements.

6.3 Subject term (key word) listing.

Antenna
Buna-S insulation
Ground connection
Lacquer finish

6.4 Environmentally preferable material. Environmentally preferable materials should be used to the maximum extent possible to meet the requirements of this specification. As of the dating of this document, the U.S. Environmentally Protection Agency (EPA) is focusing efforts on reducing 31 priority chemicals. The list of chemicals is available on their website at http://www.epa.gov/epaoswer/hazwaste/minimize/chemlist.htm. Further information is available at the following EPA site: http://www.epa.gov/epaoswer/hazwaste/minimize/. Included in the EPA list of 31 priority chemicals are cadmium, lead, and mercury. Use of the materials on the list should be minimized or eliminated unless needed to meet the requirements specified herein (see section 3).

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 extent of the changes.

CONCLUDING MATERIAL

Custodians:
Army - CR
DLA - CC

Preparing activity:
DLA - CC

(Project 6145-2007-008)

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of this information above using the ASSIST Online database at http://assist.daps.dla.mil.