

INCH-POUND

MIL-DTL-28751A  
23 May 2005  
SUPERSEDING  
MIL-C-28751(EC)  
27 July 1970

## DETAIL SPECIFICATION

### CABLE, RADIO FREQUENCY RG-373/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 This specification covers the design and construction of a high strength, single-conductor buoyant cable.

1.2 Part or Identifying Number (PIN). The PIN for the cable described by this specification is RG-373/U.

#### 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 cited in sections 3, 4 or 5 of this specification, whether or not they are listed.

##### 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 DESCRIPTIONS

[A-A-59551](#) - Wire, Electrical, Copper (Uninsulated)

Comments, suggestions, or questions on this document should be addressed to: Defense Supply Center Columbus, ATTN: VAI, P. O. Box 3990, Columbus OH 43218-3990 or by email to [RFConnectors@dsccl.dla.mil](mailto:RFConnectors@dsccl.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>.

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-C-17 - Cables, Radio Frequency, Flexible and Semirigid, General Specification for.

(Copies of these documents are available online at <http://assisst.daps.dla.mil/quicksearch/> or <http://assist.daps.dla.mil> or from the Standardization Documents Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.2.2 Other Government documents, drawings and publications. The following other Government documents, drawings, and publications 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.

NAVAL UNDERSEA WARFARE CENTER DIVISION NEWPORT (USRD)

USNUSL Technical Memorandum Number 220-74-62

(Application for copies should be addressed to Underwater Sound Reference Division, Code 216, Building 1171-B, 1176 Howell St., Newport, RI 02841-1708 or email [usrd@npt.nuwc.navy.mil](mailto:usrd@npt.nuwc.navy.mil).)

2.3 Non-Government publications. The following documents 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.

AMERICAN NATIONAL STANDARDS INSTITUTE (ASTM)

ASTM D1248 - Polyethylene Plastics Extrusion Materials For Wire and Cable.

(Copies of these documents are available from [www.astm.org](http://www.astm.org) or ASTM International, 100 Barr Harbor Drive, Conshohocken, PA 19428-2959.)

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

SAE-AS28775 - Packing, Preformed, Hydraulic, +275 Deg. F. ("O"-Ring).

(Copies of these documents are available online from <http://www.sae.org> or from the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096-001).

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for related specification sheets), 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 First article. When specified ([see 6.3](#)), a sample shall be subjected to first article inspection in accordance with [4.2](#).

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 Mechanical characteristics.

3.3.1 Specific gravity (see 4.4.3). The cable shall have the lowest possible overall specific gravity consistent with the requirements specified herein. The specific gravity shall not exceed 0.85 when measured under a hydrostatic pressure of 600 pounds per square inch gage (psig) and at room temperature (21°C to 23°C) in fresh water. The specific gravity, at atmospheric pressure, in fresh water shall be not less than 0.70.

3.3.2 Cold bend (see 4.4.4). The cable shall be subjected to and satisfactorily pass the cold bend requirements of MIL-C-17.

3.3.3 Crack resistance (see 4.4.5). The cable shall be resistant to stress cracking when tested as specified.

### 3.4 Construction.

3.4.1 Center conductor. The center conductor of the cable shall be a single strand of No. 16 AWG, type S, drawn and fully annealed copper wire in accordance with A-A-59551 and of continuous length (with no joint or splice).

3.4.2 Solid core dielectric. The solid core dielectric shall consist of type I, class B, grade E-4 as specified in ASTM D1248 having an outside diameter of  $0.180 \pm .004$  inch ( $4.57 \pm 0.10$  mm). The surface of the dielectric shall be smooth so that an O-ring of  $.070 \pm .003$  inch ( $1.78 \pm 0.08$  mm) cross section and  $.145 \pm .005$  inch ( $3.68 \pm 0.13$  mm) I.D. (SAE-AS28775) will seal on the dielectric without any leakage at any pressure from 0 to 600 psig.

3.4.3 Strength members. The strength members shall consist of at least seventeen strands of .038 inch (0.96 mm) diameter fiberglass as Owens-Corning Fiberglass Co.'s ECT 75-5/3 Latex 2.0 "S" coated or equivalent, laid on the solid core with a minimum left lay of 20 inches (508 mm).

3.4.4 Jacket. The jacket shall consist of two layers of black foamed polyethylene securely bonded together. The extreme diameter of the cable shall be  $.650 \pm .025$  inch ( $16.51 \pm 0.63$  mm). The surface of the jacket shall be smooth so that an O-ring of 0.360 inch (9.14 mm) cross section and .620 inch (17.75 mm) I.D. will seal anywhere along the entire length of the cable with zero leakage at any pressure from 0 to 600 psig when applied for 2 hours, minimum. The surface of the jacket shall be of uniform hardness and free of major imperfections such as blow holes, cuts, valleys, and bruises and abrupt changes of diameter with the tolerance range. Abrupt changes are defined as variations in diameter greater than .005 inch (0.13 mm) per inch (25.4 mm) of length.

3.4.4.1 Jacket bonding. The cable shall satisfactorily meet the bonding test of 4.4.6.

### 3.5 Strength.

3.5.1 Breaking strength (see 4.4.7). The cable shall have a minimum breaking strength of 2000 pounds (8896N).

3.5.2 Between center conductor and solid core dielectric. The shear strength between the center conductor and the solid core dielectric shall be a minimum of 20 pounds (89N) per linear foot (305 mm) of cable.

3.5.3 Between strength members and jacket. The shear strength between the strength members and the jacket shall be a minimum of 100 pounds (444.82N) per linear foot (305 mm) of cable. The shear strength between each layer of jacket shall be 100 pounds (444.82N) per linear foot (305 mm).

3.6 Length. Unless otherwise specified in the contract or order, the cable shall be provided in not less than 2000 feet (610 m) continuous lengths (with no joints or splices regardless of longer lengths).

### 3.7 Identification.

3.7.1 Manufacturer's identifications. Manufacturer's identification shall consist of coloring the solid dielectric core in accordance with a manufacturer's identification color to be assigned by a Government approved Laboratory. Coloring of the core shall not affect the characteristics of the cable.

## 4. VERIFICATION

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

- a. First article inspection (see 4.2).
- b. Conformance inspection (see 4.3).

4.1.1 Inspection conditions. Unless otherwise specified, all inspections shall be performed in accordance with the test conditions specified herein (applicable test method document or applicable paragraph(s) in the specification).

4.2 First article inspection. Unless otherwise specified (see 6.3), a 300-foot (91.4 m) sample of cable constructed in accordance with this specification shall be required for first article inspection.

### 4.3 Conformance inspection.

4.3.1 Sampling. A sample of cable shall be selected from each reel for the examination and tests of 4.3.2 and 4.4.4. Samples of sufficient length shall be selected from every 40,000 feet (12.2km) of cable for the tests of 4.4.2, 4.4.3, 4.4.5 and 4.4.6.

4.3.2 Visual and dimensional examination. The samples selected in accordance with 4.3.1 shall be examined to verify that the design, construction, physical dimensions, and workmanship are in accordance with this specification. Each reel of cable shall be supplied with diameter recordings specified in 4.4.1.

### 4.4 Test procedures.

4.4.1 Dimensions and out-of-round. The overall diameter of the outer jacket shall be measured. The cable making equipment shall be fitted with electronic or mechanical measuring device(s) to produce graphic records of the cable produced. Two recordings shall be made as nearly simultaneously as possible of each diameter, 90 degrees apart, and at a point in manufacturing where further dimensional changes such as cooling, tension, and so forth will not occur. The recordings shall be permanent and reproducible by a common commercial process. The recording accuracy shall be no less than 5% of the tolerance being measured, and any portion of the recording of the O.D. shall be identifiable to within  $\pm 2$  feet (.6 m) of the cable being measured and not less than 0.05 of an inch (1.27 mm) of paper per each 1 foot (305 mm) of cable being monitored. Each recording shall be identified with the reel of cable being monitored. The beginning of the cable length and end of the cable run shall be indicated on the recordings.

## MIL-DTL-28751A

4.4.1.1 Calibration. The zero position on the graph and an indication of which side of zero is over and which side is under the nominal cable diameters shall be required, and an indication of specific values in thousandths of an inch shall be made on the recording with regard to the dielectric and outer jacket outside diameters.

4.4.2 Shear strength. A suitable device such as Kellems grip shall be used to facilitate measurement of the shear strength between strength members and jacket.

4.4.3 Specific gravity (see 3.3.1). The specific gravity shall be measured under a hydrostatic pressure of 600 pounds per square inch (4.14 MPa) gage (psig) at room temperature (21°C to 23°C) in fresh water. The measurement shall be made after a continuous immersion of two hours, minimum. The cable sample shall not be removed from the pressure tank nor the pressure reduced until after the measurement is completed. An approved test method is contained in USNUSL Technical memorandum No. 220-74-62.

4.4.4 Cold bend (see 3.3.2). The cable shall be subjected to the cold bend test specified in MIL-C-17.

4.4.5 Crack resistance (see 3.3.3). The cable shall be tightly wrapped around a mandrel 3 inches in diameter continuously for 24 hours to determine conformance.

4.4.6 Jacket bonding (see 3.4.4.1). A knife cut .0635 of an inch (1.587 mm) deep shall be made across one side of the cable. The cable shall be bent back on itself with the cut on the outside of the bend. There shall be no indication of separation of the inner and outer jacket.

4.4.7 Breaking strength (see 3.5.1). The breaking strength of the cable shall be determined by means of a power-driven tensile machine. The rate of travel of the power actuated grip shall be adjusted to move at a rate of  $12 \pm 2$  feet (3.6 m  $\pm$  .6 m) per minute. Distance between grips shall be five (5) feet (1.5 m) prior to the application of the load. A reduction of the jacket diameter to .580 inch (14.73 mm) shall be considered a failure.

4.5 Inspection conditions. Unless otherwise specified herein, all inspection shall be made at room ambient temperature, pressure and humidity.

## 5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD 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's packaging activities within the Military Service or Defense Agency, or within the Military Service System Commands. 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. This cable is used in Naval submarines as a buoyant antenna device.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Length if other than specified in 3.6.
- c. Packaging requirements (see 5.1).

6.3 First article. Invitations for bids should provide that the Government reserves the right to waive the requirement for first article samples as to those bidders offering a product which has been previously procured or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending procurement.

6.4 Environmentally preferable material. Environmentally preferable materials should be used to the maximum extent possible to meet the requirements of this specification. Table I 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.

TABLE I. 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	

6.5 Term (key word) listing.

Polyethylene  
Copper

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:  
Navy – EC  
DLA - CC

Preparing activity:  
DLA - CC

(Project 6145-2376-000)

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 the information above using the ASSIST Online database at <http://assist.daps.dla.mil>.