

MIL-C-55021/3A
8 January 1968
SUPERSEDING
MIL-C-55021/3
10 December 1965
(See Section 6)

MILITARY SPECIFICATION

CABLES: TWISTED PAIR, INTERNAL HOOKUP,
SHIELDED AND JACKETED, HIGH
TEMPERATURE

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

1. SCOPE

1.1 This specification covers one type of two-conductor, polytetrafluoroethylene insulated, shielded and jacketed cable.

2. APPLICABLE DOCUMENTS

2.1 The following documents of the issue in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein:

SPECIFICATIONS

Military

MIL-W-16878	-	Wire, Electrical, Insulated, High Temperature
MIL-C-55021	-	Cables; Twisted Pairs and Triples, Internal Hookup, General Specification for

FSC 6145

MIL-C-55021/3A

STANDARDS

Military

MIL-STD-105 - Sampling Procedures and Tables for
Inspection by Attributes

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

3. REQUIREMENTS

3.1 Requirements. - The complete requirements for procuring cable described herein shall consist of this specification and the issue in effect of MIL-C-55021.

3.2 Material. - All material used in construction of cables furnished under this specification shall meet the requirements specified herein.

3.2.1 Insulated conductors. - Both insulated conductors of the twisted pair shall be the same gage and shall conform to the requirements of MIL-W-16878, type E. The conductors shall be composed of silver-coated copper strands.

* 3.2.2 Shielding. - The shielding over the twisted pair shall conform to the requirements of MIL-W-16878, except that the minimum allowable coverage shall be 80 percent, and the angle made by the shielding braid with the longitudinal axis of the twisted conductors shall be between 20 and 35 degrees. The shield shall have good push back characteristics.

* 3.2.3 Cable jacket. - The cable jacket shall be polytetrafluoroethylene of uniform thickness as specified in table I. The cable jacket shall be extruded or taped. If it is taped, two layers of tape shall be applied in opposite directions, each layer and adjacent convolutions being properly sealed together to form a homogeneous wall. The surface of the jacket shall be smooth, although a slight spiral ridge of the tape on the jacket shall not be cause for rejection. Prefused tape shall not be used.

3.3 Construction. - The cable furnished under this specification shall be constructed in accordance with the requirements in table I. The cable shall be capable of continuous operation in a temperature range of -62 degrees centigrade (C) (-80 degrees Fahrenheit (F) to 200 degrees C (392 degrees F) and shall be capable of continuous 600-volt root mean square (rms) operation.

MIL-C-55021/3A

3.3.1 Length of twist (lay). - The length of twist of the pair of conductors shall be approximately 24 times the diameter of one of the conductors in the cable.

- * 3.3.2 Moisture proofing. - The ends of each length of cable shall be processed in such a manner that moisture cannot enter the cable.

3.4 Electrical characteristics.

3.4.1 Insulation resistance. - The insulation resistance between each insulated conductor shall be not less than 1,000 megohms per 1000 feet.

- * 3.4.2 Heat resistance. - When the cable is subjected to the heat resistance test of 4.2.2, shrinkage of the conductor insulation shall be not greater than 1/32 inch (0.794 millimeters). Upon completion of the heat resistance test, the cable shall meet the requirements of the dielectric strength test of MIL-C-55021.

3.5 Color code. - The insulation of one of the individual conductors shall be colored black. The insulation of the other individual conductor shall be colored white.

4. QUALITY ASSURANCE PROVISIONS

4.1 Examination. - Examination shall be in accordance with MIL-STD-105. The ACL shall be 4.0 percent.

4.2 Testing. - The test specified in 4.2.1 shall be performed as part of the acceptance test and the test specified in 4.2.2 shall be performed on the preproduction sample only, when required.

4.2.1 Insulation resistance. - The insulation resistance of the insulated conductors shall be determined at 500 + 50 volts direct current (vdc). The insulation reading shall be made after the instrumentation confirms a steady current.

4.2.2 Heat resistance. - A specimen of finished cable shall be subjected to an air oven temperature of 245 to 255 degrees C (473 to 491 degrees F) for 96 hours. The cable specimen shall then be removed from the oven and allowed to return to room temperature. The length of exposed conductor, if any, at each end of the specimen shall be considered as shrinkage of the insulation. In no case shall the shrinkage at either end exceed the maximum value specified in 3.4.2. After 1 hour at room temperature, the cable specimen shall be wound two close turns around a mandrel having a diameter ten times the cable diameter. While in the wound position, the cable specimen must meet

MIL-C-55021/3A

*
Table I - Cable sizes

Insulated Conductor				Cable			
AWG size	Number of strands	Nominal Strand diameter	Diameter over conductor (nominal)	Maximum conductor resistance (dc) per 1,000 feet at 25°C. (OHMS)	Core diameter (nominal)	Diameter over shield (nominal)	Finished cable diameter
32	7	0.0031	0.009	179.0	0.066	0.074	0.090
30	7	0.0040	0.012	111.0	0.072	0.080	0.096
28	7	0.0050	0.015	69.0	0.078	0.086	0.101
26	7	0.0063	0.019	42.9	0.086	0.094	0.114
24	19	0.0050	0.024	26.8	0.096	0.104	0.123
22	19	0.0063	0.030	16.7	0.108	0.116	0.135
20	19	0.0080	0.038	10.5	0.124	0.132	0.150
18	19	0.0100	0.048	6.57	0.148	0.156	0.171
16	19	0.0113	0.057	4.85	0.174	0.182	0.192
14	19	0.0142	0.071	3.05	0.202	0.210	0.226
12	19	0.0179	0.090	1.92	0.240	0.248	0.264
10	37	0.0159	0.111	1.24	0.282	0.290	0.306

NOTE: Dimensions in inches. (1 inch is equal to 25.4 millimeters (mm)).

MIL-C-55021/3A

the dielectric strength test of MIL-C-55021.

5. PREPARATION FOR DELIVERY

5.1 Preparation for delivery shall be in accordance with MIL-C-55021.

6. NOTES

6.1 Intended use. - The cable covered by this specification is intended for use in an operating temperature range of -62 Degrees C. to 200 degrees C. (-80 degrees F. to 392 degrees F.) on military electronic equipment where an electromechanical and electrostatic shield is necessary.

* 6.2 Supersession data. This specification includes the requirements of MPD 9171, dated 31 October 1961, and Amendment 1 thereto, dated 13 September 1962.

* 6.3 The margins of this specification are marked with an asterisk to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

Custodians:

Army - MI
Air Force - 11

Preparing activity:

Army - MI

Review activities:

Army - EL
Air Force - 11
Other - IS, NSA

Project No. 6145-0525

User activities:

Army - WC, ME
Air Force - 85

SPECIFICATION ANALYSIS SHEET			Form Approved Budget Bureau No. 119-R004
<u>INSTRUCTIONS</u>			
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.			
SPECIFICATION			
ORGANIZATION		CITY AND STATE	
CONTRACT NO.	QUANTITY OF ITEMS PROCURED	DOLLAR AMOUNT	
MATERIAL PROCURED UNDER A			
<input type="checkbox"/> DIRECT GOVERNMENT CONTRACT <input type="checkbox"/> 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? <input type="checkbox"/> YES <input type="checkbox"/> 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