

INCH-POUND

MIL-C-83517
AMENDMENT 4
7 July 1998
SUPERSEDING
AMENDMENT 3
15 April 1994

MILITARY SPECIFICATION

CONNECTOR, COAXIAL, RADIO FREQUENCY FOR COAXIAL,
STRIP OR MICROSTRIP TRANSMISSION LINE
GENERAL SPECIFICATION FOR

This amendment forms a part of MIL-C-83517, dated 20 September 1982, and is approved for use by all Departments and Agencies of the Department of Defense.

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2.1.1, Standards, Military, following MIL-STD-202, add the following:

MIL-STD-790 - Reliability Assurance Program for Electronic Parts Specifications.”

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2.2, following the American Society for Testing and Materials address, add the following:

“ELECTRTRONIC INDUSTRIES ASSOCIATION (EIA)

EIA 557 - EIA Standard Implementation of Statistical Process Control (SPC) in Manufacturing Process.

(Application for copies should be addressed to the Electronic Industries Association, Engineering Office, 2001 Eye Street, N.W., Washington, DC 20006.)”

Add the following paragraph:

“3.2.1 Product assurance requirements. The product assurance requirements of the connector sources furnished under this specification shall be established and maintained in accordance with the procedures and requirements specified in MIL-STD-790 with details specified to 4.1.3.”

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3.23, delete and substitute:

“3.23 Marking. Connectors and associated fittings shall be permanently and legibly marked in accordance with the general marking requirements of MIL-STD-130 with the military part number (see 1.2.1), manufacturer’s federal supply code, and final assembly date code. The marking location is optional. When practicable, a location should be picked that will least likely be covered in cable assembly or installation.”

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Add the following paragraph:

“3.23.1 JAN and J marking. The United States Government has adopted, and is exercising legitimate control over the certification marks “JAN” and “J”, respectively, to indicate that items so marked or identified are manufactured to, and meet all the requirements of military specifications. Accordingly, items acquired to, and meeting all of the criteria specified herein and in applicable specifications shall bear the certification mark “JAN” except that items too small to bear the certification mark “JAN” shall bear the letter “J”. The “JAN” or “J” shall be placed immediately before the part number except that if such location would place a hardship on the manufacturer in connection with such marking, the “JAN” or “J” may be located on the first line above or below the part number ^{1/}. Items furnished under contracts or orders which either permit or require deviation from the conditions or requirements specified herein or in applicable specifications shall not bear “JAN” or “J”. In the event an item fails to meet the requirements of this specification and the applicable specification sheets or associated specifications, the manufacturer shall remove the “JAN” or the “J” from the sample tested and also from all items represented by the sample. The “JAN” and “J” certification mark shall not be used on products acquired to contractor drawings or specifications. The United States Government has obtained Certificate of Registration Number 504,860 for the certification mark “JAN”.”

“^{1/} The “JAN” or “J” is not part of the part number but indicates a certification.”

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Section 4, delete paragraphs 4. through 4.5.2 and substitute paragraphs 4. through 4.4.3 as follows:

“4. VERIFICATION

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

- a. Qualification inspection (see 4.3).
- b. Conformance inspection (see 4.4).

“4.1.1 Test equipment and inspection facilities. Test and measuring equipment and inspection facilities of sufficient accuracy, quality, and quantity to permit performance of the required inspection shall be established and maintained by the contractor. The establishment and maintenance of the calibration system to control the accuracy of the measuring test equipment (Industry or Military Standard) shall be required.

“4.1.2 Product assurance program. A product assurance program shall be established maintained in accordance with MIL-STD-790. Evidence of such compliance shall be verified by the qualifying activity of this specification as a prerequisite for qualification and continued qualification.

“4.2 Inspection conditions. Unless otherwise specified, all inspections shall be performed in accordance with the test conditions specified in the “GENERAL REQUIREMENTS” of MIL-STD-202 and MIL-STD-1344. For each of threaded coupling connectors, where the test is performed on mated pairs, the pair shall be torqued to the specified value (see 3.1).

“4.3 Qualification inspection. Qualification inspection shall be performed at a laboratory acceptable to the Government (see 6.4) on sample units produced with equipment and procedures normally used in production.

“4.3.1 Sample size. Nine connectors of the same part number with its mating connector shall be subjected to qualification inspection.

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“4.3.2 Group qualification. For group qualification of all series of connectors covered by this specification, see 3.1. The Government reserves the right to authorize performance of any or all qualification inspection of additional types in the group that are considered necessary for qualification within each group.

“4.3.3 Inspection routine. The sample shall be subjected to the inspection specified in table II. All sample units shall be subjected to the inspection of group I. The sample units shall then be divided into three groups consisting of three connectors. The sample units shall then be subjected to the inspection for their particular group and in the sequence given for that group.

“4.3.4 Failures. One or more failures shall be cause for refusal to grant qualification approval.

“4.3.5 Retention of qualification. To retain qualification, the contractor shall verify in coordination with the qualifying activity the capability of manufacturing products which meet the performance requirements of this specification. Refer to the qualifying activity for the guidelines necessary to retain qualification to this particular specification. The contractor shall immediately notify the qualifying activity at any time that the inspection data indicates failure of the qualified products to meet the performance requirements of this specification.

“4.3.6 Extension of qualification. Manufacturers who have products listed on QPL-39012 and produce connectors of the same series in accordance with this specification, may apply to the qualifying activity for extension of qualification to this specification, provided the interfacial coupling, materials, and plating of the connectors are identical, and the connector successfully meets the requirements of groups I, II, and III of table II.

“4.4 Conformance inspection.

“4.4.1 Inspection of product for delivery. Inspection of product for delivery shall consist of groups A and B inspection.

“4.4.1.1 Inspection lot. An inspection lot shall consist of all connectors of the same part number produced under essentially the same conditions, and offered for inspection at one time.

“4.4.1.2 Group A inspection. Group A inspection shall consist of the inspections specified in table III in the order shown.

“4.4.1.2.1 Sampling plan (group A). Table III, subgroup 1 tests shall be performed on a production lot basis. Samples shall be selected in accordance with table IV. If one or more defects are found, the lot shall be screened for that particular defect and defects removed. A new sample of parts shall be selected in accordance with table IV and all group A tests again performed. If one or more defects are found in the second sample, the lot shall be rejected and shall not be supplied to this specification.

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"TABLE II. Qualification inspection.

| Inspection | Requirement paragraph | Test method paragraph |
|--|-----------------------|-----------------------|
| <u>Group I</u> | | |
| Visual and mechanical inspection: | | |
| Material | 3.3 | 4.6.1 |
| Finish | 3.3.1 | 4.6.1 |
| Dissimilar metals | 3.3.2 | 4.6.1 |
| Design and construction (dimensions) | 3.4 | 4.6.1 |
| Marking | 3.23 | 4.6.1 |
| Force to engage/disengage | 3.5 | 4.6.2 |
| Coupling force torque | 3.6 | 4.6.3 |
| Design and construction | 3.4 | 4.6.1 |
| Force to engage/disengage | 3.5 | 4.6.2 |
| Contact gaging | 3.7 | 4.6.4 |
| Permeability of nonmagnetic materials | 3.8 | 4.6.5 |
| Workmanship | 3.24 | 4.6.1 |
| Seal | 3.9 | 4.6.6 |
| Hermetic sealed connectors | 3.9.1 | 4.6.6.1 |
| Pressurized and waterproofed connectors | 3.9.2 | 4.6.6.2 |
| Insulation resistance | 3.10 | 4.6.7 |
| <u>Group II</u> <u>1/</u> | | |
| Center contact retention | 3.11 | 4.6.8 |
| Axial force | 3.11.1 | 4.6.8.1 |
| Torque | 3.11.2 | 4.6.8.2 |
| Dielectric withstanding voltage | 3.12 | 4.6.9 |
| Corrosion | 3.13 | 4.6.10 |
| Force to engage/disengage | 3.5 | 4.6.2 |
| <u>Group III</u> | | |
| VSWR | 3.14 | 4.6.11 |
| RF transmission loss <u>2/</u> | 3.15 | 4.6.12 |
| RF leakage <u>2/</u> | 3.16 | 4.6.13 |
| Connector durability | 3.17 | 4.6.14 |
| Force to engage/disengage | 3.5 | 4.6.2 |
| Contact gaging | 3.7 | 4.6.4 |
| <u>Group IV</u> | | |
| Contact resistance | 3.18 | 4.6.15 |
| Thermal shock | 3.19 | 4.6.16 |
| Dielectric withstanding voltage | 3.12 | 4.6.9 |
| Contact resistance | 3.18 | 4.6.15 |
| VSWR | 3.14 | 4.6.11 |
| Moisture resistance | 3.20 | 4.6.17 |
| Dielectric withstanding voltage | 3.12 | 4.6.9 |
| Insulation resistance | 3.10 | 4.6.7 |
| RF high potential withstanding voltage <u>2/</u> | 3.21 | 4.6.18 |
| Coupling mechanism retention force | 3.22 | 4.6.19 |
| Force to engage/disengage | 3.5 | 4.6.2 |

1/ See 3.1.

2/ These tests to be performed only during initial qualification as long as the qualifying design and manufacturing process has not been changed.

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"TABLE III. Group A inspection. 1/

| Inspection | Requirement paragraph | Test method paragraph | Sampling procedure |
|----------------------------------|-----------------------|-----------------------|--------------------|
| Visual and mechanical inspection | | | |
| Material | 3.3 | 4.6.1 | See table IV |
| Finish | 3.3.1 | 4.6.1 | |
| Dissimilar metals | 3.3.2 | 4.6.1 | |
| Design and construction | 3.4 | 4.6.1 | |
| Marking | 3.23 | 4.6.1 | |
| Workmanship | 3.24 | 4.6.1 | |
| Seal 2/ | 3.9 | 4.6.6 | |
| Hermetic seal connectors | 3.9.1 | 4.6.6.1 | |
| Pressurized and waterproof | 3.9.2 | 4.6.6.2 | |
| Dielectric withstanding voltage | 3.12 | 4.6.9 | |

1/ Verification may be accomplished using the manufacturer's process controls providing these controls are clearly equal to or more stringent than the requirements of this specification.

2/ These are in-process tests (100% inspection required).

"4.4.1.2.2 Visual inspection (group A inspection). Each connector shall be visually examined for completeness, workmanship, and identification requirements. Attention shall be given to those assemblies that require a gasket to determine the condition of the gasket. Gaskets missing, twisted, buckled, kinked, or damaged in any way shall be cause for rejection.

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"TABLE IV. Inspection level.

| Lot size | | | Visual and mechanical inspection | |
|----------|----|---------|----------------------------------|-----------------|
| | | | Major | Minor <u>1/</u> |
| 1 | to | 8 | All | 5 |
| 9 | to | 15 | All | 5 |
| 16 | to | 25 | 20 | 5 |
| 26 | to | 50 | 20 | 5 |
| 51 | to | 90 | 20 | 7 |
| 91 | to | 150 | 20 | 11 |
| 151 | to | 280 | 20 | 13 |
| 281 | to | 500 | 47 | 16 |
| 501 | to | 1,200 | 47 | 19 |
| 1,201 | to | 3,200 | 53 | 23 |
| 3,201 | to | 10,000 | 68 | 29 |
| 10,001 | to | 35,000 | 77 | 35 |
| 35,001 | to | 150,000 | 96 | 40 |
| 150,001 | to | 500,000 | 119 | 40 |
| 500,001 | to | over | 143 | 40 |

1/ Samples may be pulled from either the production lot itself or from samples pulled from the lot for major defect testing.

NOTES:

1. Major defect: A major defect is a defect, other than critical, that is likely to result in failure, or to reduce materially the usability of the unit of product for its intended purpose.
2. Minor defect: A minor defect is a defect that is not likely to reduce materially the usability of the unit of product for its intended purpose, or is a departure from established standards having little bearing on the effective use or operation of the unit.
3. Critical defect: A critical defect is a defect that judgment and experience indicate is likely to result in hazardous or unsafe conditions for individuals using, maintaining, or depending upon the product; or a defect that judgment and experience indicate is likely to prevent performance of the tactical function of a major end item such as a ship, aircraft, tank, missile, or space vehicle.

"4.4.1.3 Group B inspection. Group B inspection shall consist of the inspections specified in table V in the order shown, and shall be made on sample units which have been subjected to and passed the group A inspection. Connectors having identical piece parts may be combined for lot purposes and shall be in proportion to the quantity of each PIN numbered connector produced.

"4.4.1.3.1 Group B sampling plan. A sample of parts shall be randomly selected in accordance with table VI. If one or more defects are found, the lot shall be screened for that particular defect and defects removed. After screening and removal of defects, a new sample of parts shall be randomly selected and subjected to all tests in accordance with table V. If one or more defects are found in the second sample, the lot shall be rejected and shall not be supplied to this specification.

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“TABLE V. Group B inspection.”

| Inspection | Requirement paragraph | Test method paragraph |
|---------------------------------------|-----------------------|-----------------------|
| Force to engage/disengage | 3.5 | 4.6.2 |
| Coupling proof torque | 3.6 | 4.6.3 |
| Design and construction | 3.4 | 4.6.1 |
| Force to engage/disengage | 3.5 | 4.6.2 |
| Contact gaging | 3.7 | 4.6.4 |
| Permeability of nonmagnetic materials | 3.8 | 4.6.5 |
| Insulation resistance | 3.10 | 4.6.7 |
| VSWR | 3.14 | 4.6.11 |

“TABLE VI. Inspection level.”

| Lot size | Sample size | VSWR sample size |
|--------------------|-------------|------------------|
| 1 to 8 | 5 | 1 |
| 9 to 15 | 5 | 1 |
| 16 to 25 | 5 | 2 |
| 26 to 50 | 5 | 2 |
| 51 to 90 | 5 | 3 |
| 91 to 150 | 11 | 3 |
| 151 to 280 | 13 | 3 |
| 281 to 500 | 16 | 3 |
| 501 to 1,200 | 19 | 5 |
| 1,201 to 3,200 | 23 | 5 |
| 3,201 to 10,000 | 29 | 5 |
| 10,001 to 35,000 | 35 | 5 |
| 35,001 to 150,000 | 40 | 8 |
| 150,001 to 500,000 | 40 | 8 |
| 500,001 to over | 40 | 8 |

“4.4.1.3.2 Disposition of sample units. Sample units which have passed all the group B inspection may be delivered on the contract or purchase order, if the lot is accepted. Any connector deformed or otherwise damaged during testing shall not be delivered on the contract or order.

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“4.4.2 Periodic inspection. Periodic inspection shall consist of group C. Except where the results of these inspection shown noncompliance with the applicable requirements (see 4.5.2.1.4), delivery of products which have passed groups A and B shall not be delayed pending the results of these periodic inspections.

“4.4.2.1 Group C inspection. Group C inspection shall consist of the inspections specified in table VII, in the order shown. Group C inspection shall be made on sample units selected from inspection lots which have passed the groups A and B inspection.

“4.4.2.1.1 Sampling plan. Six sample units of the same part number shall be selected from the first lot produced after the date of notification of qualification. Thereafter, six sample units of the same part number shall be selected from current production after 200,000 connectors have been produced, or not less than once every year, whichever occurs first. The sample units shall be divided equally and subjected to the inspection of the three subgroups.

“4.4.2.1.2 Failures. If one or more sample units fails to pass group C inspection, the lot shall be considered to have failed.

“4.4.2.1.3 Disposition of sample units. Sample units which have been subjected to group C inspection shall not be delivered on the contract or order.

“4.4.2.1.4 Noncompliance. If a sample fails to pass group C inspection, the manufacturer shall notify the qualifying activity and the cognizant inspection activity of such failure and take corrective action on the materials or processes, or both, as warranted, and on all units of product which can be corrected and which are manufactured under essentially the same materials and processes, and which are considered subjected to the same failure. Acceptance and shipment of the product shall be discontinued until corrective action, acceptable to the qualifying activity has been taken. After the corrective action has been taken, group C inspection shall be repeated on additional sample units (all tests and examinations, or the test which the original sample failed, at the option of the qualifying activity). Groups A and B inspections may be reinstated; however, final acceptance and shipment shall be withheld until the group C inspection has shown that the corrective action was successful. In the event of failure after reinspection, information concerning the failure shall be furnished to the cognizant inspection activity and the qualifying activity.

“4.4.3 Inspection of packaging. The sampling and the inspection of the preservation, packing and container marking shall be in accordance with the requirements of MIL-C-55330.

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"TABLE VII. Group C inspection. 1/

| Inspection | Requirement paragraph | Test method paragraph |
|--|-----------------------|-----------------------|
| <u>Subgroup 1</u> | | |
| Center contact retention | 3.11 | 4.6.8 |
| Corrosion | 3.13 | 4.6.10 |
| Force to engage/disengage | 3.6 | 4.6.2 |
| <u>Subgroup 2</u> | | |
| VSWR | 3.14 | 4.6.11 |
| RF transmission loss <u>1/</u> | 3.15 | 4.6.12 |
| RF leakage <u>1/</u> | 3.16 | 4.6.13 |
| Connector durability | 3.17 | 4.6.14 |
| Contact gaging | 3.7 | 4.6.4 |
| Force to engage/disengage | 3.5 | 4.6.2 |
| <u>Subgroup 3</u> | | |
| Contact resistance | 3.18 | 4.6.15 |
| Thermal shock | 3.19 | 4.6.16 |
| Dielectric withstanding voltage | 3.12 | 4.6.9 |
| Contact resistance | 3.11 | 4.6.8 |
| VSWR | 3.14 | 4.6.11 |
| Moisture resistance | 3.20 | 4.6.17 |
| Dielectric withstanding voltage | 3.12 | 4.6.9 |
| Insulation resistance | 3.10 | 4.6.7 |
| RF high potential withstanding voltage <u>1/</u> | 3.21 | 4.6.18 |
| Coupling mechanism retention force | 3.22 | 4.6.19 |
| Design and construction | 3.4 | 4.6.1 |
| Force to engage/disengage | 3.5 | 4.6.2 |

1/ These test are only to be performed during initial qualification, as long as the qualifying design and manufacturing process does not change."

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* At the end of each of the following paragraphs 4.6.2, 4.6.3, and 4.6.4: Add:

“NOTE: As an option for this test , a qualified mating connector may be used in place of the standard steel jig with the approval of the qualifying agency.”

The margins of this amendment are marked with asterisks to indicate where changes from the previous amendment were made. This was done as a 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 amendment.

CONCLUDING MATERIAL

Custodians:

Army - CR
Navy - EC
Air Force - 85

Preparing activity:
DLA - CC

(Project 5935-4140)

Review activities:

Army - AR, AT, MI
Navy - AS, MC, SH
Air Force - 19, 99