

MILITARY SPECIFICATION

ADAPTERS, CONNECTOR, COAXIAL, RADIO FREQUENCY,
(BETWEEN SERIES AND WITHIN SERIES),
GENERAL SPECIFICATION FOR

This amendment forms a part of MIL-A-55339A, dated 20 July 1982, and is approved for use by all Departments and Agencies of the Department of Defense.

PAGE 1

Paragraph 1.2.1 Military part number, delete and substitute new note as follows:

"NOTE: The first digit in the dash number designates the material of the adapter body; i.e., '0' for brass; '3' for corrosion-resisting steel; '4' for copper-beryllium; '6' to be used between series SMA and other series. SMA body to be corrosion resistance steel and the other series body to be brass. Succeeding digits will be assigned to designate the former 'UG' number or a nonsignificant number, as applicable."

PAGE 1,2 and 3

Paragraph 2.1 Government specifications and standards, and Table I Materials; delete the following references;

- "L-P-389 - Plastic Molding Materials, FEP fluorocarbon, Molding and Extrusion.
- L-P-403 - Plastic Molding Material, Polytetrafluoroethylene (TFE-Fluorocarbon).
- QQ-B-613 - Brass, Leaded and Nonleaded: Flat Products (Plate, Bar, Sheet, and Strip).
- QQ-B-626 - Brass, Leaded and Nonleaded: Rod, Shapes, Forgings, and Flat Products with Finished Edges (Bar and Strip).
- QQ-C-530 - Copper-beryllium Alloy Bar, Rod, and Wire (Copper Alloy Numbers 172 and 173).
- QQ-C-533 - Copper-Beryllium Alloy Strip (Copper Alloy Numbers 170 and 172).
- QQ-B-750 - Bronze, Phosphor; Bar, Plate, Rod, Sheet, Strip, Flat Wire, and Structural and Special Shaped Sections.
- QQ-C-576 - Copper Flat Products with Slit, Slit and Edge-Rolled, Sheared, Sawed, or Machined Edges, (Plate, Bar, Sheet, and Strip)."

and substitute the following references:

- "ASTM-D-2116-8 - FEP - Fluorocarbon Molding and Extrusion Materials.
- ASTM-D-1457 - Materials, PTFE, Molding and Extrusion.
- ASTM-B-36 - Plate Brass, Sheet, Strip, and Rolled Bar.
- ASTM-B-121 - Plate, Leaded-Brass, Sheet, Strip, and Rolled bar.
- ASTM-B-196 - Rod and Bar, Copper Beryllium Alloy.
- ASTM-B-197 - Wire, Copper Beryllium Alloy.
- ASTM-B-194 - Plate, Copper Beryllium Alloy, Sheet, Strip, and Rolled Bar.
- ASTM-B-139 - Phosphor Bronze, Rod, Bar and Shapes.
- ASTM-B-272 - Copper Flat Products with Finished (Rolled or Drawn) Edges (Flat wire and Strip)."

Delete the following Reference;

- "QQ-A-225/6 - Aluminum Alloy Bar, Rod, and Wire; Rolled, Drawn, or Cold Finished, 2024."

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AMSC N/A

FSC 5935

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Paragraph 3.4 Design and construction, The end of the last sentence, delete "or indicated on figures 1 and 2."

Add the following new paragraph; "3.4.4 Interface design. The adapter interface series specified (see 3.1) shall meet the dimensional requirement specified in MIL-STD-348."

Paragraph 3.4.1, delete and substitute the following;

"3.4.1 Finish. Unless otherwise specified (see 3.1), adapter center contacts and bodies shall be plated in the following manner.

3.4.1.1 Center contacts. Center contacts shall be gold plated to a minimum thickness of 0.00005 inch, minimum, in accordance with MIL-G-45204, type II, class 1 over a 0.00005 inch minimum nickel underplate in accordance with QQ-N-290, class 1. A silver underplate shall not be permitted.

3.4.1.2 Adapter bodies. All brass bodied adapters shall be silver plated in accordance with QQ-S-365 to a minimum thickness of 0.000200 inch minimum over a copper underplate. All copper beryllium bodied adapters shall be gold plated in accordance with MIL-G-45204, type II, class I over a copper flash. All corrosion resistant steel bodied adapters shall be passivated in accordance with QQ-P-35, unless otherwise specified (see 3.1). NOTE: Ferrous or nickel alloys shall not be used on brass or copper beryllium bodied connectors (i.e. coupling nuts, etc.)"

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Delete figures 1 and 2.

PAGE 12 - 17

Paragraph 3.26 Marking, Delete and substitute the first sentence with the following; "Marking of adapters shall conform to method I of MIL-STD-1285, and shall include the military part number (see 1.2.1), final assembly date code and manufacturer's CAGE code; other marking shall be as specified (see 3.1). 1/"

Add new paragraph; "3.28 Safety wire hole pullout: When applicable (see 3.1), adapters are to be tested as specified in 4.6.23. There shall be no evidence of hole tear out."

Section 4, delete paragraphs 4. through 4.5.2.1.4 and substitute the following:

4. QUALITY ASSURANCE PROVISIONS

"4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in this specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

1/ Marking of the final assembly date code will be required 12 months from the date of this specification. Existing stock is acceptable for Government use until stock is purged.

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4.1.2 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 shall be in accordance with MIL-STD-45662.

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

- a. Qualification inspection (see 4.4).
- b. Quality conformance inspection (see 4.5).

4.3 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 or MIL-STD-1344. For each test of threaded coupling connectors, where the test is performed on mated pairs, the pair shall be torqued to the specified value (see 3.1).

4.4 Qualification inspection. Qualification inspection shall be performed at a laboratory acceptable to the Government (see 6.3) on sample units produced with equipment and procedures normally used in production.

4.4.1 Sample size. Ten class 1 adapters of the same part number, or six class 2 adapters of the same part number, shall be subjected to qualification inspection.

4.4.2 Group qualification. For group qualification of all series of adapters 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.

4.4.3 Inspection routine. The sample shall be subjected to the inspections specified in table II. All sample units shall be subjected to the inspection of group I. The sample units shall then be divided equally into two groups of 5 units (Class 1) or three units each (Class 2) and subjected to the inspection for their particular group and in the sequence given for that group.

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

4.4.5 Retention of qualification. To retain qualification, the contractor shall forward a report at 12- or 36-month intervals to the qualifying activity. The qualifying activity shall establish the initial reporting date. Initial retention of qualification shall be at a 12-month interval; subsequent retention of qualification at a 36-month interval. The report shall consist of:

- a. A summary of the results of the test performed for inspection of product for delivery, groups A and B, indicating as a minimum the number of lots that have passed and the number that have failed shall be submitted every 12 months. The results of tests of all reworked lots shall be identified and accounted for.
- b. A summary of the results of test performed for periodic inspection, group C, including the number and mode of failures. The summary shall include results of all periodic inspection tests performed and completed during the 36-month period. If the summary of the test results indicates nonconformance with specification requirements, and corrective action acceptable to the qualifying activity has not been taken, action may be taken to remove the failing product from the qualified products list.

Failure to submit the report within 60 days after the end of each 12- or 36-month period may result in loss of qualification for the product. In addition to the periodic submission of inspection data, the contractor shall immediately notify the qualifying activity at any time during the 12- or 36-month period that the inspection data indicates failure of the qualified product to meet the requirements of this specification.

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TABLE II. Qualification inspection.

Inspection	Requirement paragraph	Test method paragraph
<u>Group I</u>		
Visual and dimensional inspection:		
Visual inspection	3.1, 3.3, 3.4 3.26, and 3.27	4.6.1.1
Dimensional inspection	3.1	4.6.1.2
Center contact retention	3.5	4.6.2
Force to engage/disengage:	3.6	4.6.3
Coupling force torque (threaded adapters)	3.7	4.6.4
Mating characteristics	3.8	4.6.5
Permeability (not applicable to hermetic-sealed adapters)	3.9	4.6.6
Workmanship	3.27	
Seal	3.10	4.6.7
Insulation resistance	3.11	4.6.8
<u>Group II</u>		
Voltage standing wave ratio (VSWR)	3.12	4.6.9
RF leakage <u>1/</u>	3.13	4.6.10
RF insertion loss <u>1/</u>	3.14	4.6.11
Durability	3.15	4.6.12
Force to engage/disengage	3.6	4.6.3
Coupling proof torque	3.7	4.6.4
Mating characteristics	3.8	4.6.5
VSWR	3.12	4.6.9
Dielectric withstanding voltage	3.16	4.6.13
<u>Group III</u>		
Contact resistance (center contact)		
Vibration, high frequency <u>1/</u>	3.17	4.6.14
Contact resistance (center contact)	3.18	4.6.15
Shock (specified pulse) <u>1/</u>	3.17	4.6.14
Contact resistance (center contact)	3.19	4.6.16
Dielectric withstanding voltage	3.17	4.6.14
Contact resistance (center contact)	3.16	4.6.13
Thermal shock (hermetic sealed adapters)	3.17	4.6.14
Dielectric withstanding voltage	3.20	4.6.17
Contact resistance (center contact)	3.16	4.6.13
Moisture resistance	3.17	4.6.14
Dielectric withstanding voltage	3.21	4.6.18
Corona level <u>1/</u>	3.16	4.6.13
Seal	3.22	4.6.19
RF high potential withstanding voltage <u>1/</u>	3.10	4.6.7
Corrosion (Salt spray)	3.23	4.6.20
Force to engage/disengage	3.24	4.6.21
Coupling mechanism retention force (when applicable see 3.1)	3.6	4.6.3
Force to engage/ disengage	3.25	4.6.22
	3.6	4.6.3

1/ 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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NOTE: In the event that no production occurred during the reporting period, a report shall be submitted certifying that the company still has the capabilities and facilities necessary to produce the item. If during 3 consecutive reporting periods there has been no production, the manufacturer may be required, at the discretion of the qualifying activity, to submit a representative product from each group, as defined by 4.4.2 to testing in accordance with the qualification inspection requirements.

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

4.5 Quality conformance inspection.

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

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

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

4.5.1.2.1 Sampling plan (Group A). Table III, tests shall be performed on a production lot basis. Samples shall be selected in accordance with table IV. If 1 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.

TABLE III. Group A Inspection.

Inspection	Requirement paragraph	Test method paragraph	Sampling procedure
Visual inspection	3.1, 3.3, 3.4 3.26 and 3.27	4.6.1.1	See table IV
Dimensional inspection	3.1	4.6 and 4.6.1.2	
Seal	3.10	4.6.7	
Dielectric withstanding voltage	3.16	4.6.13	

4.5.1.2.2 Visual inspection (group A inspection). Each adapter 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 ^{1/}
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 and 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.

4.5.1.3 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. Adapters having identical piece parts may be combined for lot purposes and shall be in proportion to the quantity of each PIN numbered adapter produced.

4.5.1.3.1 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
Center contact retention	3.5	4.6.2
Force to engage/disengage	3.6	4.6.3
Coupling proof torque (threaded adapters)	3.7	4.6.4
Force to engage/disengage (threaded adapters)	3.6.1	4.6.3.1
Mating characteristics	3.8	4.6.5
Permeability (not applicable to hermetic-sealed adapters)	3.9	4.6.6
Insulation resistance	3.11	4.6.8
VSWR ^{1/}	3.12	4.6.9
Contact resistance (center and outer contacts)	3.17	4.6.14

^{1/} Destructive test, non deliverable.

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 and over	40	8

4.5.1.3.2 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 adapter deformed or otherwise damaged during testing shall not be delivered on the contract or order.

4.5.2 Periodic inspection. Periodic inspection shall consist of group C. Except where the results of these inspections 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.

4.5.2.1 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.

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4.5.2.1.1 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 adapters have been produced, or not less than once every year, whichever occurs first. The sample units shall be divided equally and subjected to the inspections of the two subgroups.

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

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

4.5.2.1.4 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.

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TABLE VII. Group C inspection. ^{1/}

Inspection	Requirement paragraph	Test method paragraph
<u>Subgroup 1</u>		
VSWR	3.12	4.6.9
RF leakage	3.13	4.6.10
RF insertion loss	3.14	4.6.11
Durability	3.15	4.6.12
Force to engage/disengage	3.6	4.6.3
Coupling proof torque	3.7	4.6.4
Mating characteristics	3.8	4.6.5
VSWR	3.12	4.6.9
Dielectric withstanding voltage	3.16	4.6.13
<u>Subgroup 2</u>		
Contact resistance (center and outer contacts)	3.17	4.6.14
Vibration, high frequency	3.18	4.6.15
Contact resistance (center contact)	3.17	4.6.14
Shock (specified pulse)	3.19	4.6.16
Contact resistance (center contact)	3.17	4.6.14
Dielectric withstanding voltage	3.16	4.6.13
Contact resistance (center contact)	3.17	4.6.14
Thermal shock (hermetic- sealed adapters)	3.20	4.6.17
Dielectric withstanding voltage	3.16	4.6.13
Contact resistance (center contact)	3.17	4.6.14
Moisture resistance	3.21	4.6.18
Dielectric withstanding voltage	3.16	4.6.13
Corona level	3.22	4.6.19
Seal	3.10	4.6.7
RF high potential withstanding voltage	3.23	4.6.20
Corrosion (salt spray)	3.24	4.6.21
Force to engage/disengage	3.6	4.6.3
Coupling mechanism retention force	3.25	4.6.22
Force to engage/disengage	3.6	4.6.3

^{1/} Manufacturers who have products listed on QPL-39012 and produce adapters of the same series, may apply to the qualifying activity for waiver in performing Group C, subgroup 2, retention testing, providing the interfacial coupling, materials, and plating of the adapter and connectors are identical."

Add the following new paragraph; "4.6.23 Safety wire hole pullout (see 3.28). A single strand of safety wire shall be looped through the safety wire hole and secured to itself. Forces of 15 pounds (67 newtons) minimum shall be applied to the safety wire pulling away from the adapter. One pull shall be parallel to the adapter axis and one pull perpendicular to the adapter axis (see figure 10). The safety wire shall be corrosion resistant steel .020 inch diameter (24 gage) or .015 inch diameter, (27 gage) in accordance with MS20995. This test is to be conducted under static conditions. All holes are to be tested individually."

Add new figure 10 as follows:

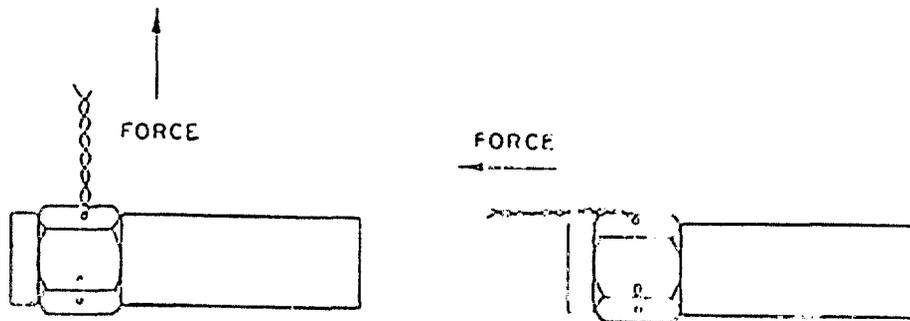


FIGURE 10. Safety wire hole pullout procedure.

CONCLUDING MATERIAL

Custodians:

Army - CR
Navy - EC
Air Force - 85
NASA - NA

Preparing activity:

DLA - ES

Review activities:

Army - AR, AT, MI
Navy - AS, MC, SH, OS
Air Force - 11, 19, 99
DLA - ES

(Project number 5935-3895)