

MILITARY SPECIFICATION
 DUMMY LOADS, ELECTRICAL, COAXIAL AND STRIPLINE,
 GENERAL SPECIFICATION FOR

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

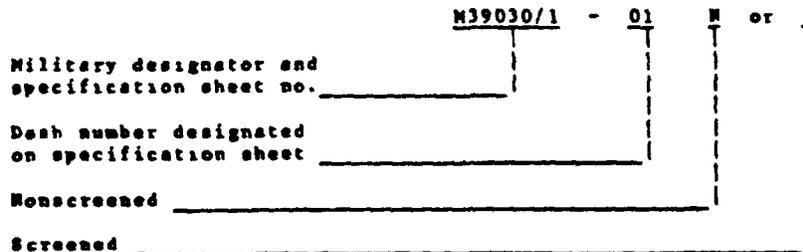
1. SCOPE

1.1 Scope. This specification covers the qualification and general requirements for coaxial and stripline electrical dummy loads (see 6.1).

1.2 Classification. Dummy loads shall be of the types shown as specified.

Type	RF connection	Connection specification
I	SMA	MIL-C-39012
II	SWC	MIL-C-39012
III	BNC	MIL-C-39012
IV	TNC	MIL-C-39012
V	N	MIL-C-39012
VI	C	MIL-C-39012
VII	SC	MIL-C-39012
VIII	NM	MIL-C-3643
IX	LC	MIL-C-3650
X	LT	MIL-C-26637
XI	7/8 inch	MIL-F-24044
XII	1-5/8 inch	MIL-F-24044
XIII	3-1/8 inch	MIL-F-24044
XIV	Stripline	---

1.3 Military part number. The military part number shall consist of the letter "M" followed by the basic number of the specification sheet, an assigned dash number (see 3.1), and the letter M or S where M indicates a non-screened production item and S indicates a screened production item:



2. APPLICABLE DOCUMENTS

2.1 Issues of documents. 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.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Naval Electronic Systems Command, ATTN: ELKX 8111 Washington, DC 20360 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

SPECIFICATIONS

FEDERAL

- L-P-403 - Plastic Molding Material, Polytetrafluoroethylene (TFE-Fluocarbon).
- MN-P-71 - Pallet, Materials-handling, Wood (General Construction Requirements).
- QQ-A-200/9 - Aluminum Alloy Bar, Rod, Shapes, Tube, and Wire, Extruded 6063.
- QQ-A-250/11 - Aluminum Alloy 6061, Plate and Sheet.
- QQ-A-225/3 - Aluminum Alloy Bar, Rod, and Wire, Rolled, Drawn, or Cold Finished 2011.
- QQ-A-591 - Aluminum Alloy Die Castings.
- QQ-A-596 - Aluminum Alloy Permanent and Semipermanent Mold Castings.
- QQ-A-601 - Aluminum-alloy Sand Castings.
- 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-N-290 - Nickel Plating (Electrodeposited).
- QQ-P-35 - Passivation Treatments for Corrosion-resisting Steel.
- QQ-S-365 - Silver Plating, Electrodeposited, General Requirements For.
- QQ-S-763 - Steel Bars, Wire, Shapes, and Forgings, Corrosion-Resisting
- QQ-S-766 - Steel Plates, Sheets, and Strip-Corrosion Resisting
- QQ-S-781 - Strapping, Steel, and Seals.
- TT-E-489 - Enamel, Alkyd, Gloss, (For Exterior and Interior Surfaces)
- PPP-B-566 - Box, Folding, Paperboard.
- PPP-B-585 - Boxes, Wood, Wirebound.
- PPP-B-601 - Boxes, Wood, Cleated-Plywood.
- PPP-B-621 - Boxes, Wood, Nailed And Lock-Corner.
- PPP-B-636 - Boxes, Shipping, Fiberboard.
- PPP-B-676 - Boxes, Setup.
- PPP-T-60 - Tape Packaging, Waterproof.
- PPP-T-76 - Tape, Packaging, Paper, (For Carton Sealing)

MILITARY

- MIL-P-116 - Preservation-Packaging, Methods of.
- MIL-P-1144 - Pipe, Stainless Steel, (Corrosion-resistant), Seamless or Welded.
- MIL-C-3643 - Connector, Coaxial, Radio Frequency, Series MN, and Associated Fittings, General Specification For.
- MIL-C-3650 - Connector, Coaxial, Radiofrequency, Series LC.
- MIL-S-4043 - Steel, Corrosion-resisting (Extra Low Carbon Type 304), Plate, Sheet, and Strip.
- MIL-C-5541 - Chemical Conversion Coatings on Aluminum and Aluminum Alloys.
- MIL-A-8625 - Anodic Coatings, For Aluminum and Aluminum Alloys.
- MIL-T-10727 - Tin Plating, Electrodeposited or Hot-dipped, For Ferrous and Nonferrous Metals.
- MIL-F-14072 - Finishes For Ground Signal Equipment.
- MIL-P-19468 - Plaster Rod, Polytetrafluoroethylene, Molded and Extruded.
- MIL-I-23011 - Iron-Nickel Alloys for Sealing to Glasses and Ceramics.
- MIL-F-24044 - Flanges, Coaxial Line, Rigid Air Dielectric, General Specification For.
- MIL-C-26074 - Coating, Electroless Nickel, Requirement For.
- MIL-C-26637 - Connectors, Coaxial, Radio Frequency, Series LT, General Specification For.
- MIL-H-28719 - Readers-Hermetically Sealed.
- MIL-C-39012 - Connectors, Coaxial, Radiofrequency, General Specification For.
- MIL-G-45204 - Gold Plating, Electrodeposited.
- MIL-C-55302 - Connectors, Printed Circuit Subassembly and Accessories.

STANDARDS

FEDERAL

FED-STD-W28 - Screw Thread Standards for Federal Services.

MILITARY

MIL-STD-129 - Marking for Shipment and Storage.
 MIL-STD-147 - Palletized Unit Loads.
 MIL-STD-202 - Test Methods for Electronic and Electrical Component Parts.
 MIL-STD-454 - Standard General Requirements for Electronic Equipment.
 MIL-STD-794 - Parts and Equipment, Procedures for Packaging and Packing of.
 MIL-STD-889 - Dissimilar Metals.
 MIL-STD-1188 - Commercial Packaging of Supplies and Equipment.
 MIL-STD-1276 - Leads for Electronic Component Parts.
 MIL-STD-1285 - Marking of Electrical and Electronic Parts.
 MIL-STD-45662 - Calibration Systems Requirements.

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

2.2 Other publications. The following document forms a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE-STD-287 - Precision Coaxial Connectors.

(Application for copies should be addressed to the Institute of Electrical and Electronics Engineers Headquarters, 345 East 47 Street, New York, NY 10017).

AMERICAN SOCIETY FOR TESTING AND MATERIALS

A484-76 - General Requirements for Stainless and Heat-Resisting Wrought Steel Products (Except Wire).
 A582-75 - Free-Machining Stainless and Heat-Resisting Steel Bars, Hot-Rolled or Cold-Finished.

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103).

3. REQUIREMENTS

3.1 Specification sheets. The individual item requirements shall be as specified herein and in the applicable specification sheets. In the event of any conflict between requirements of this specification and the specification sheets, the latter shall govern.

3.2 Qualification. Dummy loads furnished under this specification shall have been produced by a supplier who has been qualified by inspection in accordance with 4.5 and 6.3.

3.3 Material. The material shall be as specified. When a definite material is not specified, a material shall be used which will enable the dummy loads to meet the performance requirements of this specification. Acceptance or approval of any constituent material shall not be construed as a guaranty of the acceptance of the finished product.

3.3.1 Brass. Brass shall conform to QQ-B-626 or QQ-B-613.

3.3.2 Copper alloy. Copper alloy sheet shall conform to QQ-B-613.

3.3.3 Copper-beryllium. Beryllium copper shall conform to QQ-C-530 or QQ-C-533.

3.3.4 Corrosion-resisting steel. Corrosion-resisting steelplates, sheets, and strips shall conform to QQ-S-766 and MIL-S-4043. Corrosion-resisting forging shall conform to QQ-S-763, ASTM A484or A582 and corrosion-resisting steel pipe shall conform to MIL-P-1144.

3.3.5 Aluminum alloy. Aluminum alloy plates and sheets shall conform to composition 6061 of QQ-A-250/11, extruded aluminum alloy shall conform to composition 6063 of QQ-A-200/9 or composition 6061 of QQ-A-250/11. Aluminum alloy casting shall conform to alloy A360 of QQ-A-591, class 8 of QQ-A-596, or alloy 40E of 00-A-601, or 2011 of QQ-A-225/3.

3.3.6 Dissimilar metals. Unless suitably protected against electrolytic corrosion, dissimilar metal as defined in MIL-STD-889 shall not be in intimate contact.

3.3.7 Plastic. Plastic shall conform to L-P-403 or PTPE of MIL-P-19468.

3.3.8 Fungus. Material used in the construction of dummy loads shall be fungus inert in accordance with Requirement 4 of MIL-STD-454.

3.4 Design and construction. Dummy loads shall be of the design, construction, and physical dimensions specified (see 3.1).

3.4.1 Operating frequency range. The frequency range shall be as specified (see 3.1).

3.4.2 Impedance. The nominal impedance shall be as specified (see 3.1).

3.4.3 RF connection. The RF connection shall be in accordance with MIL-C-39012, MIL-C-3643, MIL-C-3650, MIL-C-26637, or MIL-F-24644 as applicable (see 1.2 and 3.1). The material and gaging for the connection shall conform to the requirements of the applicable specification. When specified (see 3.1), precision connectors shall be in accordance with IEEE-STD-287.

3.4.3.1 Connector metal parts. Unless otherwise specified, the connector and the male center contact pins shall be made of corrosion-resisting steel, type 302 or 304 in accordance with QQ-S-763 or type 302 in accordance with ASTM A582. The female center contact pins shall be made of beryllium copper conforming to QQ-C-530, silver plated in accordance with QQ-S-365 or, when specified (see 3.1), gold plated in accordance with MIL-G-45204, type II, class 2.

3.4.3.2 Printed circuit connectors. Printed circuit connectors for a specific dummy load shall conform to MIL-C-55302 as applicable (see 3.1).

3.4.3.3 Leads Lead connections for a specific dummy load shall be a chemical composition conforming to MIL-STD-1276 or MIL-I-23011 and shall be solderable unless otherwise specified (see 3.1)

3.4.3.4 Socket pins. Socket pins for a specified dummy load shall be in accordance with header specification MIL-H-28719 unless otherwise specified (see 3.1).

3.4.3.5 Receptacles. Receptacle connections for a specific dummy load shall be as specified.

3.4.3.6 Connection caps. All coaxial connections shall be sealed with push-on plastic caps to prevent both damage and the entrance of moisture and foreign material during storage.

3.4.4 Power handling capability.

3.4.4.1 Average power rating. The average power rating shall be as specified (see 3.1) at the ambient temperature or heat sink temperature.

3.4.4.2 Maximum peak power. The maximum peak power if applicable, shall be as specified (see 3.1).

3.4.5 Fabrication of shell. The shell of the dummy load shall be forged cast, or fabricated of plate, sheet, drawn or extruded stock, or a combination of some of or all of the methods. The choice of shell material and configuration shall provide sufficient heat transfer to prevent the exceeding of the maximum specified exposed temperature under conditions of simultaneous maximum (1) rated power, (2) ambient temperature, and (3) altitude (see 3.1).

3.4.6 Finish. Unless otherwise specified (see 3.1), the finish shall be as specified in 3.4.6.1 thru 3.4.6.7.

3.4.6.1 Gold. Gold shall conform to MIL-G-45204.

3.4.6.2 Nickel. Nickel shall conform to MIL-C-26074 or QQ-N-290.

3.4.6.3 Silver. Silver shall conform to QQ-S-365.

3.4.6.4 Tin. Tin shall conform to MIL-T-10727.

3.4.6.5 Paint. Paint shall conform to MIL-P-14072 and TT-E-489.

3.4.6.6 Anodic coating. Anodic coating shall conform to MIL-A-8625.

3.4.6.7 Passivation treatments. Passivation treatments shall conform to QQ-P-35.

3.4.6.8 Aluminum alloys. Aluminum alloys surfaces shall be chemically treated in accordance with MIL-C-5541.

3.4.7 Threaded parts. All threaded parts shall have screw threads in the unified screw thread series in accordance with FED-STD-H28 and supplements thereto.

3.4.8 Weight. The weight shall be as specified (see 3.1).

3.4.9 Ambient temperature. The ambient temperature shall be as specified (see 3.1).

3.4.10 Coolant pressure (when specified). The coolant pressure shall be as specified (see 3.1).

3.5 Force to engage/disengage (when specified for coaxial dummy loads).

3.5.1 Bayonet and threaded types. When tested as specified in 4.7.2.1, the torque necessary to completely couple or uncouple the connector of the dummy load shall not exceed that specified (see 3.1). Also the longitudinal force necessary to initiate the engaging or disengaging cycle shall not exceed that specified (see 3.1).

3.5.2 Push-on connector types. When tested as specified in 4.7.2.2, the forces necessary to fully engage or disengage the connector of the dummy load shall not exceed that specified (see 3.1).

3.6 Coupling proof torque (when specified for coaxial dummy loads). When tested as specified in 4.7.3, the coupling mechanism (threaded types) shall not be dislodged, and the connector of the dummy load shall meet the requirements of 3.5.1.

3.7 Connector durability (when specified for coaxial dummy loads). After the connector of the dummy load is tested as specified in 4.7.4, the connector shall meet the requirements of 3.5.1.

3.8 Solderability (as applicable). When dummy loads with solderable connection are tested as specified in 4.7.5, there shall be no evidence of pinholes and blistering.

3.9 Resistance to soldering heat (as applicable). When dummy loads with solderable connection are tested as specified in 4.7.6, there shall be no damage to the dummy load or to the terminal insulator that will cause electrical failure. Chipping of the terminal insulator shall not be cause for failure unless the chipping extends to the outer periphery. After the test, the VSWR shall not exceed that specified (see 3.1).

3.10 Resistance to solvents (as applicable). When dummy loads are tested as specified in 4.7.7, there shall be no evidence of illegible marking, mechanical damage, or deterioration of material or finishes.

3.11 Terminal strength (as applicable). When dummy loads are tested as specified in 4.7.8, the terminal strength shall be no less than the value specified (see 3.1).

3.12 Burn-in (screened only). All screened dummy loads shall be burned in as specified in 4.7.9. After burn-in, the VSWR shall not exceed the value specified and there shall be no evidence of mechanical damage.

3.13 Voltage standing wave ratio (VSWR). When dummy loads are tested as specified in 4.7.10, the VSWR shall not exceed the value specified (see 3.1).

3.14 Thermal shock. After the thermal shock test specified in 4.7.11, the dummy load shall show no physical damage, and the VSWR shall not exceed the value specified (see 3.1).

3.15 Vibration. After the vibration test specified in 4.7.12, the dummy load shall show no physical damage, and the VSWR shall not exceed the value specified (see 3.1).

3.16 Shock. After the shock test specified in 4.7.13, the dummy load shall show no physical damage, and the VSWR shall not exceed the value specified (see 3.1).

3.17 Moisture resistance. After the moisture resistance test specified in 4.7.14, the dummy load shall show no physical damage, and the VSWR shall not exceed the value specified (see 3.1).

3.18 Barometric pressure (when specified). After the barometric pressure test specified in 4.7.15, the VSWR of the dummy load shall not exceed the value specified (see 3.1).

3.19 Salt spray (when specified). After the salt spray test specified in 4.7.16, the dummy load shall show no physical damage, and the VSWR shall not exceed the value specified (see 3.1).

3.20 Power dissipation. After the power dissipation test specified in 4.7.17, the dummy load shall show no physical damage and the VSWR shall not exceed the value specified (see 3.1). For liquid cooled loads, the outside temperature of the dummy load shall not rise more than 12°C above ambient temperature.

3.21 Endurance. After the endurance test specified in 4.7.18, the non-screened dummy loads shall show no physical damage and the VSWR shall not exceed the value specified (see 3.1). For liquid cooled loads, the outside temperature of the water shall not exceed the value specified (see 3.1).

3.22 Overload (when specified). After the overload test specified in 4.7.19, the dummy load shall show no physical damage, and the VSWR shall not exceed the value specified (see 3.1).

3.23 Pressurization (when specified). During the pressurization test specified in 4.7.20, there shall be no evidence of loss of pressure as detected by a continuous stream of escaping air bubbles.

3.24 Marking. Dummy loads shall be marked in accordance with MIL-STD-1285 with the part number and the manufacturer's source code. Marking characters shall be approximately 1/8-inch in height. The marking shall be placed on the identification plate, using a method which will provide legible and permanent marking for the life of the dummy load. The manufacturer's name or trademark may also be included in the marking provided such is not expressly forbidden in the contract or order. Where

space does not permit use of an identification plate, marking may be directly on a flat or cylindrical surface of the body. Letter size may be reduced to accommodate the following:

PREFERRED	M39030/ XX-YYY ZZZZZ	PART NUMBER MANUFACTURER'S SOURCE CODE
PERMISSIBLE	M 39030/ XX-YYY ZZZZZ	

3.24.1 Serialization. When the contract requires that dummy loads be serialized, each dummy load shall be marked with a unique serial number assigned consecutively within the inspection lot, allowing traceability of the dummy load.

3.25 Workmanship. Dummy loads shall be manufactured and processed in such a manner as to be uniform in quality, and the shell of the dummy load shall be free from tool marks, burrs, deep scratches, and other defects that will affect life, serviceability, or appearance, or violate OSHA restrictions.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract, 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 the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

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 supplier. 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 inspection. The inspections specified herein are classified as follows:

- a. Materials inspection (see 4.3).
- b. Qualification inspection (see 4.5).
- c. Quality conformance inspection (see 4.6).

4.3 Materials inspection. Materials inspection shall consist of qualification supported by verifying data that the materials listed in table 1, used in fabricating the dummy loads, are in accordance with the applicable referenced specifications or requirements prior to such fabrication.

4.4 Inspection conditions. Unless otherwise specified herein, all inspections shall be performed in accordance with the test conditions specified in the "GENERAL REQUIREMENTS" of MIL-STD-202.

4.5 Qualification inspection. Qualification inspection shall be performed at a laboratory acceptable to the Government (see 6.3) on sample units produced with material, equipment, and procedures that will be used in subsequent production. Group qualification can be obtained by submitting the proper item within the group (see appendix).

4.5.1 Sample size. Four dummy loads from each group to be qualified shall be subjected to qualification inspection.

TABLE I. Materials inspection.

Material	Requirement paragraph	Applicable specification
Aluminum alloy - - - - -	3.3.5	QQ-A-200/9, QQ-A-250/11, QQ-A-225/3
Corrosion-resisting steel - - -	3.3.4	QQ-S-766, MIL-S-4043
Corrosion-resisting steel pipe -	3.3.4	MIL-P-1144
Corrosion-resisting forging - -	3.3.4	QQ-S-763, ASTM A484, ASTM A582
Copper alloy sheet - - - - -	3.3.2	QQ-B-613
Aluminum alloy casting - - - -	3.3.5	QQ-A-591, QQ-A-596, QQ-A-601
Brass - - - - -	3.3.1	QQ-B-626 or QQ-B-613
Beryllium copper - - - - -	3.3.3	QQ-C-533, QQ-C-530
Plastic - - - - -	3.3.7	L-P-403, MIL-P-19468
PC connections - - - - -	3.4.3	MIL-C-55302
Pins - - - - -		MIL-H-28719, MIL-STD-1276
Leads - - - - -		MIL-I-23011
Finish - - - - -	3.4.6	MIL-G-45204, MIL-C-26074, MIL-T-10727, MIL-F-14072, MIL-A-8625, QQ-S-365, TT-E-489, QQ-P-35, MIL-C-5541, QQ-N-290

4.5.2 Qualification inspection. Qualification inspection shall consist of the examinations and tests specified in table II in the order shown.

TABLE II. Qualification inspection.

Inspection	Requirement paragraph	Test method paragraph
Visual and mechanical inspection and weight - - - - -	3.1, 3.3 to 3.4.8, incl. 3.24 and 3.25	4.7.1
Force to engage/disengaged <u>2/</u> - - -	3.5	4.7.2
Coupling proof torque <u>2/</u> - - - -	3.6	4.7.3
Connector durability <u>2/</u> - - - -	3.7	4.7.4
Solderability <u>3/</u> - - - - -	3.8	4.7.5
Resistance to soldering heat <u>3/</u> - - -	3.9	4.7.6
Resistance to solvents <u>3/</u> - - - -	3.10	4.7.7
Terminal strength <u>3/</u> - - - - -	3.11	4.7.8
VSWR - - - - -	3.13	4.7.10
Thermal shock - - - - -	3.14	4.7.11
Vibration - - - - -	3.15	4.7.12
Shock - - - - -	3.16	4.7.13
Moisture resistance - - - - -	3.17	4.7.14
Barometric pressure <u>1/</u> - - - - -	3.18	4.7.15
Salt spray <u>1/</u> - - - - -	3.19	4.7.16
Power dissipation - - - - -	3.20	4.7.17
Endurance - - - - -	3.21	4.7.18
Overload <u>1/</u> - - - - -	3.22	4.7.19
Pressurization <u>1/</u> - - - - -	3.23	4.7.20

1/ When specified (see 3.1).

2/ For coaxial dummy loads, when specified (see 3.1).

3/ For stripline dummy loads, when specified (see 3.1).

4.5.3 Failures. One or more failures shall be cause for refusal to grant qualification approval. Failure criteria for sample units shall be as specified in the applicable requirement paragraph.

4.5.4 Disposition of qualification sample units. Sample units which have been subjected to qualification testing shall not be delivered on any contract. The Government reserves the right to retain the sample units or to require the contractor to furnish the sample units with the qualification inspection report.

4.5.5 Retention of qualification. The contractor shall forward a report at 48-month intervals to the cognizant qualification organization. The cognizant qualification organization shall establish the initial reporting date. The report shall consist of

- a. A summary of the results of the tests performed for inspection of product for delivery, (group A), indicating as a minimum the number of lots that have passed and the number that have failed. The results of tests of all reworked lots shall be identified and accounted for.
- b. The results of tests performed for qualification verification inspection, (group B) including the number and mode of failures. The test report shall include results of all group B quality conformance inspection performed and completed during the 48-month period. If the test results indicate nonconformance with specification requirements, and corrective action acceptable to the qualifying organization has not been taken, action may be taken to remove qualification.

Failure to submit the report within 60 days after the end of the 48-month period may result in loss of qualification. In addition to the submission of inspection data, the contractor shall immediately notify the qualifying activity at any time during the 48-month period that the inspection data indicates failure of the product to meet the requirements of this specification.

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 two 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 of each group to testing in accordance with the qualification inspection requirements.

4.6 Quality conformance inspection.

4.6.1 Inspection of product for delivery. Inspection of product for delivery shall consist of group A inspection.

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

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

TABLE III. Group A inspection.

Inspection	Requirement paragraph	Test method paragraph
Visual and mechanical inspection and weight - - - - -	3.1, 3.3 to 3.4.8, incl., 3.24 and 3.25	4.7.1
VSWR - - - - -	3.13	4.7.10
Thermal shock <u>1/</u> - - - - -	3.14	4.7.11
Burn-in <u>1/</u> - - - - -	3.12	4.7.9

1/ For screened units only.

4.6.1.2.1 Sampling plan. All units shall be subjected to group A inspection. No failures are allowed. If one or more sample units fail, the sample shall be considered to have failed.

4.6.1.2.2 Rejected lots. If an inspection lot is rejected, the contractor may rework it to correct the defects, or screen out the defective units, and resubmit for reinspection. Such lot shall be separate from new lots, and shall be clearly identified as reinspected lots.

4.6.2 Qualification verification inspection. Qualification verification inspection shall consist of group B. Except where the results of these inspections show noncompliance with the applicable requirements (see 4.6.2.1.4), delivery of products which have passed group A shall not be delayed pending the results of these qualification verification inspections.

4.6.2.1 Group B inspection. Group B inspection shall consist of the inspections, specified in table IV, in the order shown. Group B inspection shall be made on sample units selected from inspection lots which have passed the group A inspection. These samples may be comprised of various models of the same group (see appendix) selected from various production runs.

TABLE IV. Group B inspection.

Inspection	Requirement paragraph	Test method paragraph
Force to engage/disengaged 2/ - -	3.5	4.7.2
Coupling proof torque 2/ - - - -	3.6	4.7.3
Connector durability 2/ - - - -	3.7	4.7.4
Solderability 3/ - - - - - - - -	3.8	4.7.5
Resistance to soldering heat 3/ -	3.9	4.7.6
Resistance to solvents 3/ - - - -	3.10	4.7.7
Terminals strength 3/ - - - - -	3.11	4.7.8
Thermal shock - - - - - - - - -	3.14	4.7.11
Vibration - - - - - - - - - - -	3.15	4.7.12
Shock - - - - - - - - - - - - -	3.16	4.7.13
Moisture resistance - - - - - - -	3.17	4.7.14
Barometric pressure 1/ - - - - -	3.18	4.7.15
Salt spray 1/ - - - - - - - - -	3.19	4.7.16
Power dissipation - - - - - - - -	3.20	4.7.17
Endurance - - - - - - - - - - -	3.21	4.7.18
Overload 1/ - - - - - - - - - -	3.22	4.7.19
Pressurization 1/ - - - - - - - -	3.23	4.7.20

1/ When specified (see 3.1).

2/ For coaxial dummy loads, when specified (see 3.1).

3/ For stripline dummy loads, when specified (see 3.1).

4.6.2.1.1 Sampling plan. Four sample units shall be selected every 24-months. If this level of sampling is passed two successive times, the contractor may select four sample units every 48-months. In the event of a failure, sampling shall revert to the 24-month interval.

4.6.2.1.2 Failures. If one or more sample units fail to pass group B inspection, the sample shall be considered to have failed.

4.6.2.1.3 Disposition of sample units. Sample units which have been subjected to group B inspection shall not be delivered on contract.

4.6.2.1.4 Noncompliance. If a sample unit fails to pass group B inspection, the manufacturer shall notify the qualifying activity and 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 were manufactured under essentially the same conditions, with essentially the same materials and processes, and which are considered subject to the same failure. Acceptance and shipment of the product shall be discontinued until corrective action, acceptable to the Government, has been taken. After the corrective action has been taken, group B inspection shall be repeated on additional sample units (all inspection, or the inspection which the original sample failed), at the option of the qualifying activity. Group A inspection may be reinstated; however, final

acceptance shall be withheld until the group B inspection has shown that corrective action was successful. In the event of failure after reinspection, information concerning the failure and corrective action taken shall be furnished to the cognizant inspection activity and the qualifying activity.

4.6.3 Inspection of packaging. Except when commercial packaging is specified, the sampling and inspection of the preservation and interior package marking shall be in accordance with the group A and B quality conformance inspection requirements of MIL-P-116. The sampling and inspection of the packing and marking for shipment and storage shall be in accordance with the quality assurance provisions of the applicable container specification and the marking requirements of MIL-STD-129. The inspection of commercial packaging shall be as specified in the contract (see 6.2).

4.7 Methods of inspection.

4.7.1 Visual and mechanical inspection. Dummy loads shall be examined to verify that the materials, design, construction, physical dimensions, finish, marking, workmanship, and weight are in accordance with the applicable requirements (see 3.1, 3.3 to 3.4.8 inclusive, 3.24 and 3.25).

4.7.2 Force to engage/disengaged (see 3.5).

4.7.2.1 Bayonet and threaded types. The RF connector of the dummy load shall be engaged with its mating standard part. During the entire coupling/uncoupling cycle (until the connector is fully engaged/disengaged) the force and/or torque necessary shall not exceed those specified (see 3.1). A threaded coupled connector is fully engaged with its mating standard part when their reference planes coincide. A bayonet coupled connector is fully engaged with its mating standard part when the bayonet studs have passed the detent and their reference planes coincide. No additional torque shall be applied. The mating standard part is a steel jig containing the critical interface dimensions. Its spring members when applicable shall be heat treated beryllium copper.

4.7.2.2 Push-on connector types. The connector of the dummy load under test shall be engaged with its standard mating part (gag). During this engaging cycle, the force necessary to fully engage the connector shall not exceed that specified (see 3.1). Upon completion of engagement, an opposite force necessary for disengagement shall be applied. This force shall be within the limits specified, and shall include any unlatching force required.

4.7.3 Coupling proof torque (see 3.6). The connector of the dummy load under test shall be engaged with its mating standard part (gag) and the coupling nut tightened to the torque specified (see 3.1). After one minute, the connector of the dummy load and its mating standard part shall be disengaged.

4.7.4 Connector durability (see 3.7). The connector of the dummy load shall be subjected to the number of cycles of mating and unmating specified (see 3.1). The connector of the dummy load and its mating part shall be completely engaged and completely disengaged during the cycle. Lubrication of the threads or rotational parts shall not be employed for this test unless specified (see 3.1). It is permissible to shake or blow debris from the threads or interface surfaces at intervals of not less than 50 cycles. Solvents or tools shall not be used for cleaning.

4.7.5 Solderability (see 3.8). The terminal of the dummy load shall be tested in accordance with method 208 of MIL-STD-202. Where applicable a heat sink may be used.

4.7.6 Resistance to soldering heat (see 3.9). Dummy loads shall be tested in accordance with method 210 of MIL-STD-202. The following details and exceptions shall apply:

- a. Special preparation - The terminal shall not have been soldered previously.
- b. Depth of immersion in the molten solder - To a point $1/16 \pm 1/32$, -0 inch from the body.
- c. Test condition - A.
- d. Cooling time - stabilize to $\pm 25^\circ\text{C}$.

4.7.7 Resistance to solvents (see 3.10). Dummy loads shall be tested in accordance with method 215 of MIL-STD-202. The following detail shall apply

- a. All portions of the dummy loads shall be brushed.

4.7.8 Terminal strength (see 3.11). Dummy loads shall be tested in accordance with method 211 of MIL-STD-202, test condition A, applied force 1.5 pounds.

4.7.9 Burn-in (screened only) (see 3.12). All screened dummy loads shall be subjected to the specified rated average power (see 3.1), at the highest specified operating temperature (see 3.1) for a period of 96 ± 5 , -0 hours. Where applicable (see 3.1), the dummy loads may be mounted to a heat sink. After the burn-in, the VSWR of the dummy load shall be measured and the measured value shall be no greater than the value specified (see 3.1). If the VSWR value exceeds that specified, the dummy load shall be considered to have failed. All dummy loads subjected to burn-in shall be serialized for correlation of the VSWR data to the specific unit.

4.7.10 VSWR (see 3.13). The VSWR shall be measured across the frequency range (see 3.1) using a sweep frequency technique or at 10 equally spaced points evenly distributed across the frequency range using a slotted-line method. The test equipment(s) shall be capable of providing a continuous measurement of VSWR over the specified frequency range. A means shall be provided for producing a permanent record of the dummy load's VSWR versus frequency. If VSWR is not directly measured, that is, if return loss is measured and VSWR is calculated from that measurement, the permanent record shall indicate the worse case VSWR numerically for each frequency band and shall provide the calculation used to obtain the calculated value. The permanent record of each dummy load shall be packaged with the unit when shipped. The measurement system and permanent record shall provide a minimum accuracy of .01 over the frequency ranges below 26.5 GHz and a minimum accuracy of .02 over the frequency ranges 26.5 GHz and above

4.7.11 Thermal shock (3.14) With the RF connection uncovered, dummy loads shall be tested in accordance with method 107 of MIL-STD-202. The following details shall apply

- a. Test condition - B, unless otherwise specified (see 3.1).
- b. Final measurement - VSWR shall be measured as specified in 4.7.10.

4.7.12 Vibration (see 3.15). Unless otherwise specified (see 3.1), dummy loads shall be tested as specified in 4.7.12.1. When specified (see 3.1), dummy loads shall be tested as specified in 4.7.12.2.

4.7.12.1 Simple harmonic nature. Dummy loads shall be tested in accordance with method 201 of MIL-STD-202. The following details shall apply

- a. Tests and measurement prior to vibration - None.
- b. Method of mounting - Rigidly mounted to the test platform by its normal mounting means. Dummy loads which employ rubber bumpers as isolators shall have these isolators removed and the dummy load in turn held secure to the test platform during the test. Small dummy loads not equipped with other mounting provisions shall be considered normally mounted when mated with the complementary mounted receptacle.
- c. Test and measurements after vibration - VSWR shall be measured as specified in 4.7.10.

4.7.12.2 Random nature. Dummy loads shall be tested in accordance with method 214 of MIL-STD-202. The following details shall apply:

- a. Method of mounting - Rigidly mounted to the test platform by its normal mounting means.
- b. Test condition - II D and 15 minutes duration, unless otherwise specified.
- c. Test and measurements after vibration - VSWR shall be measured as specified in 4.7.10.

4.7.13 Shock (see 3.16). Dummy loads shall be tested in accordance with method 213 of MIL-STD-202. The following details shall apply

- a. Mounting - Mounted securely on mounting table to simulate service conditions. Small dummy loads not equipped with other mounting provision shall be considered normally mounted when mated with the complementary mounted receptacle.
- b. Test condition letter - 1.
- c. Measurements after test - VSWR shall be measured as specified in 4.7.10.

4.7.14 Moisture resistance (see 3.17). Dummy loads shall be tested in accordance with method 106 of MIL-STD-202. The following details shall apply:

- a. Loading voltage - Not applicable.
- b. Final measurement - After drying period, VSWR shall be measured as specified in 4.7.10.

4.7.15 Barometric pressure (see 3.18). Dummy loads shall be tested in accordance with method 105 of MIL-STD-202. The following details shall apply:

- a. Method of mounting - Normal mounting means.
- b. Test condition letter - As specified (see 3.1).
- c. Measurement after test - VSWR shall be measured as specified in 4.7.10.
- d. Tests during subjection to reduction pressure (see 3.1).
- e. Exposure time prior to measurements (see 3.1).

4.7.16 Salt spray (see 3.19). Dummy loads shall be tested in accordance with method 101 of MIL-STD-202. The following details shall apply

- a. Mounting - Normal mounting means. Normal mounting means shall include mating to complementary connectors whose rears are sealed against salt spray penetration (see 3.1).
- b. Test condition letter - B, salt solution - 5 percent.
- c. Measurement after test - VSWR shall be measured as specified in 4.7.10.

4.7.17 Power dissipation (see 3.20). The specified peak and average power shall be applied simultaneously at any frequency within the specified range (see 3.1). When no peak power is specified, apply 1.5 times rated average power. Power shall be maintained for a period of 15 minutes after the dummy load has reached thermal equilibrium. It is considered that thermal equilibrium has been reached when the temperature of the dummy load has not changed by more than 5°C over a period of 5 minutes. For pressurized dummy loads, the internal pressure shall be as specified (see 3.1). For liquid cooled dummy loads, the minimum flow rate and coolant pressure specified (see 3.1) shall be used with the input temperature specified.

4.7.18 Endurance (see 3.21). Dummy loads shall be subjected to the specified peak power (when applicable) and average power for test purposes, for 10 cycles of 1 hour power on and a minimum of 1 hour off, at any frequency within the specified frequency range (see 3.1). The VSWR shall be measured as specified in 4.7.10 preceding the test, and at intervals of 1 hour thereafter during the off period. For pressurized loads, the internal pressure shall be as specified (see 3.1). For liquid cooled loads the minimum flow rate and coolant pressure specified (see 3.1) shall be used with the input temperature as specified.

4.7.19 Overload (see 3.22). The specified overload power shall be applied for the time specified (see 3.1). The load shall then be checked for breakdown and deterioration. VSWR shall then be measured as specified in 4.7.10.

4.7.20 Pressurization (see 3.23). Dummy load RF path shall be subjected to the specified (see 3.1) internal air pressure for at least 5 minutes while immersed in tap water of approximately 20°C. For liquid cooled loads, coolant chamber shall be subjected to an internal air pressure as specified (see 3.1) for at least 5 minutes while immersed in tap water of approximately 20°C.

5. PACKAGING

5.1 Preservation. Preservation shall be level A, C or commercial, or as specified (see 6.2).

5.1.1 Level A.

5.1.1.1 Cleaning. Dummy loads shall be cleaned in accordance with MIL-P-116, process C-1.

5.1.1.2 Drying. Dummy loads shall be dried in accordance with MIL-P-116.

5.1.1.3 Preservative application. Preservatives shall not be used.

5.1.1.4 Unit packs. Dummy loads shall be individually unit packed in accordance with MIL-P-116 specified herein insuring compliance with the applicable requirements of that specification.

5.1.1.4.1 Dummy loads without cooling fins. Unless otherwise specified (see 5.4.3.1 and 6.2), these dummy loads shall be unit packed in accordance with submethod IA-8.

5.1.1.4.2 Dummy loads with cooling fins. Unless otherwise specified (see 5.4.3.1 and 6.2), these dummy loads shall be unit packed in accordance with submethod IA-15. For those less than ten pounds in weight or ten inches in length, the container shall conform to PPP-B-566 or PPP-B-676. For those exceeding either of these limits, the container shall conform to PPP-B-636.

5.1.1.5 Intermediate packs. Dummy loads, unit packed as specified in 5.1.1.4.1, shall be placed in intermediate containers conforming to PPP-B-566 or PPP-B-676. Intermediate containers shall be uniform in size, shape and quantities, shall be of minimum tare and cube and shall contain multiples of five unit packs, not to exceed 100 unit packs. No intermediate packs are required when the total quantity shipped to a single destination is less than 100 unit packs or for those unit packed in accordance with 5.1.1.4.2.

5.1.2 Level C. The level C preservation for dummy levels shall conform to the MIL-STD-794 requirements for this level.

5.1.3 Commercial. The commercial preservation of dummy loads shall be in accordance with MIL-STD-1188.

5.2 Packing. Packing shall be level A, B, C or commercial, or as specified (see 6.2).

5.2.1 Level A. The packaged dummy loads shall be packed in fiberboard containers conforming to PPP-B-636, class weather resistant style optional, special requirements. In lieu of the closure and waterproofing requirement in the appendix of PPP-B-636, closure and waterproofing shall be accomplished by sealing all seams, corners and manufacturer's joints with tape, two inches minimum width, conforming to PPP-T-60, class 1 or PPP-T-76. Banding (reinforcement requirements) shall be applied in accordance with the appendix to PPP-B-636 using nonmetallic or tape banding only.

5.2.2 Level B. The packaged dummy loads shall be packed in fiberboard containers conforming to PPP-B-636, class domestic, style optional, special requirements. Closures shall be in accordance with the appendix thereto.

5.2.3 Level C. The level C packing for dummy loads shall conform to the MIL-STD-794 requirements for this level.

5.2.4 Commercial. The preserved dummy loads shall be packed in accordance with the requirements of MIL-STD-1188.

5.2.5 Unitized loads. Unitized loads, commensurate with the level of packing specified in the contract or order, shall be used whenever total quantities for shipment to one destination equal 40 cubic feet or more. Quantities less than 40 cubic feet need not be unitized. Unitized loads shall be uniform in size and quantities to the greatest extent practicable.

5.2.5.1 Level A. Dummy loads, packed as specified in 5.2.1, shall be unitized on pallets in conformance with MIL-STD-147, load type I, with a fiberboard cap (storage aid 4) positioned over the load.

5.2.5.2 Level B. Dummy loads, packed as specified in 5.2.2, shall be unitized as specified in 5.2.5.1 except that the fiberboard caps shall be class domestic.

5.2.5.3 Level C. Dummy loads, packed as specified in 5.2.3, shall be unitized as specified in MIL-STD-794 except that conformance to MIL-STD-147 is not required.

5.3 Marking.

5.3.1 Levels A, B and C. In addition to any special or other identification marking required by the contract (see 6.2), each unit pack, intermediate and exterior container and unitized load shall be marked in accordance with MIL-STD-129.

5.3.2 Commercial. Commercial marking shall be in accordance with the requirements of MIL-STD-1188.

5.4 General.

5.4.1 Exterior containers. Exterior containers (see 5.2.1, 5.2.2 and 5.2.3) shall be of a minimum tare and cube consistent with the protection required and shall contain equal quantities of identical stock numbered items to the greatest extent practicable.

5.4.2 Packaging inspection. The inspection of these packaging requirements shall be in accordance with 4.6.3.

5.4.3 Army procurements.

5.4.3.1 Level A unit and intermediate packs. MIL-P-116 submethods IC-1 and IC-2 shall be used in lieu of submethods IA-8 and IA-15, respectively (see 5.1.1.4.1, 5.1.1.4.2 and 6.2). All intermediate containers shall be either weather (or water) resistant or overwrapped with waterproof barrier materials (see 5.1.1.5).

5.4.3.2 Level A and Level B packing. For level A packing the fiberboard containers shall not be banded but shall be placed in a close fitting box conforming to PPP-B-601, overseas type, PPP-B-621, class 2, style 4 or PPP-B-585, class 3, style 2 or 3. Closure and strapping shall be in accordance with applicable container specification except that metal strapping shall conform to QQ-S-781, type I, finish A. When the gross weight exceeds 200 pounds or the container length and width is 48 x 24 inches or more and the weight exceeds 100 pounds, 3 x 4 inch skids (laid flat) shall be applied in accordance with the requirements of the container specification. If not described in the container specification, the skids shall be applied in a manner which will adequately support the item and facilitate the use of material handling equipment. For level B packing, fiberboard boxes shall be weather resistant as specified in level A and the containers shall be banded (see 5.2.1 and 5.2.2).

5.4.4 Level A and B unitization. For level A and B unitization, softwood pallets conforming to MN-P-71, type IV, size 2 shall be used. Weather resistant fiberboard caps shall also be used for level B unitization. The loads for both levels shall be bonded to the pallets by strapping conforming to QQ-S-781, type I, finish A or shrink film (see 5.2.5.1 and 5.2.5.2).

6. NOTES

6.1 Intended use. Dummy loads covered by this specification are intended for terminating coaxial and strip lines.

6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number, and date of this specification.
- b. Title, number, and date of the applicable specification sheet, the type and complete part number (see 3.1).
- c. Inspection of commercial packaging (see 4.6.3).

- d. Levels of preservation and packing required (see 5.1 and 5.2).
- e. Method of preservation, if other than submethods IA-8 and IA-15 (see 5.1.1.4, 5.1.1.4.2 and 6.2).
- f. If special or other identification marking is required (see 5.3.1)

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are at the time set for opening of bids, qualified for inclusion in the applicable Qualified Products List whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. The activity responsible for the Qualified Products List is the Naval Electronic Systems Command, ELEX 8111, Department of the Navy, Washington, DC 20360. Information pertaining to qualification of products may be obtained from either the Naval Electronic Systems Command or the Defense Electronics Supply Center (DESC-EQ), Dayton, Ohio 45444, agent for administration of the qualification program.

6.4 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue, due to the extensiveness of the changes.

Custodians

Army - ER
Navy - EC
Air Force - 11

Review activities:

Army - ER, MI
Navy - OS, SH
Air Force - 17, 85, 99
DLA - ES

User activities:

Army - AV
Navy - AS, MC
Air Force - 19

Preparing activity:

Navy - EC

Agent:

DLA - ES

(Project 5985-0950)

GROUP QUALIFICATION

10. PURPOSE

10.1 Purpose. The purpose of this appendix is to provide manufacturers a grouping that can be used to obtain qualification for a number of items by qualifying one item. The grouping shall be in accordance with the following table.

TABLE V. Grouping for qualification.

Group number	Qualifying part number	Part number of dummy loads qualified
1	M39030/1-07	M39030/1-01 thru -06, -08 thru -11 and M39030/2-01, -02
2	M39030/4-01	M39030/4-02 and M39030/3-01 thru -15
3	M39030/3-11	M39030/3-01 thru -10, M39030/3-12 thru -15
4	M39030/9-01	M39030/8-01; M39030/5-01 thru -07; M39030/7-01 thru -06
5	M39030/5-05	M39030/7-01 thru -06; M39030/8-01; M39030/5-01 thru -04, -06 and -07
6	M39030/11-04	M39030/6-01 thru -07; M39030/10-01, -02; M39030/11-01 thru -03; M39030/12-01
7	M39030/10-02	M39030/6-01 thru -07; M39030/10-01; M39030/11-01 thru -03; M39030/12-01
8	M39030/6-06	M39030/6-01 thru -05 and -07
9	M39030/16-02	M39030/13-01; M39030/14-01 thru -03; M39030/15-01 thru -03; M39030/16-01, -03
10	M39030/14-02	M39030/13-01; M39030/14-01 and -03; M39030/15-01 thru -03
11	M39030/15-02	M39030/13-01; M39030/15-01 and -02
12	M39030/22-01	M39030/17-01; M39030/18-01 and -02; M39030/19-01 and -02
13	M39030/17-01	M39030/18-01, -02; M39030/19-01, -02
14	M39030/20-06	M39030/20-01 thru -05; M39030/21-01, -04
15	M39030/20-04	M39030/20-01 thru -03, -05, -06; M39030/21-01 thru -04

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