INCH-POUND

MIL-DTL-39030F
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SUPERSEDING
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2 December 2005

DETAIL 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

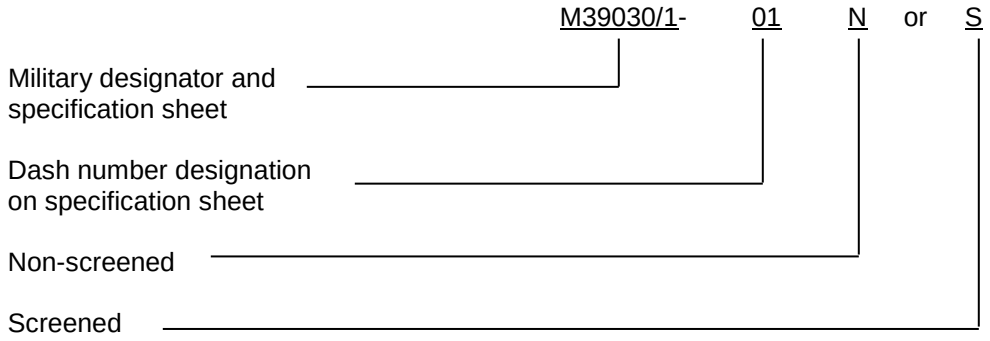
1.1 Scope. This specification covers the qualification and general requirements for coaxial and stripline electrical dummy loads (see 6.1).

1.2 Classification. Dummy loads are of the following types.

Type	RF connector interface series	Connection specification
I	SMA	MIL-STD-348
II	SMC	MIL-STD-348
III	BNC	MIL-STD-348
IV	TNC	MIL-STD-348
V	N	MIL-STD-348
VI	C	MIL-STD-348
VII	SC	MIL-STD-348
VIII	HN	MIL-STD-348
IX	LC	MIL-STD-348
X	LT	MIL-STD-348
XI	.875 inch (22.26 mm)	MIL-DTL-24044
XII	1.625 inch (41.28 mm)	MIL-DTL-24044
XIII	3.125 inch (79.38 mm)	MIL-DTL-24044
XIV	Stripline	---

Comments, suggestions, or questions on this document should be addressed to: DLA Land and Maritime, ATTN: VAI, P.O. Box 3990, Columbus, Ohio 43218-3990 or by email to RFConnectors@dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at https://assist.dla.mil.

1.2.1 Part or Identifying Number (PIN). The military PIN is to consist of the letter “M” followed by the basic number of the specification sheet, assigned dash number (see 3.1) and the letter N or S where N indicates a non-screened production item and S indicates a screened production item:



2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

FEDERAL STANDARDS

FED-STD-H28 - Screw-Thread Standards for Federal Services.

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-DTL-5541 - Chemical Conversion Coating on Aluminum and Aluminum Alloys.
MIL-A-8625 - Anodic Coatings for Aluminum and Aluminum Alloys.
MIL-DTL-14072 - Finishes for Ground Based Electronic Equipment.
MIL-DTL-24044 - Flange, Coaxial Line, Rigid Air Dielectric, General Specification For.
MIL-DTL-55302 - Connectors, Printed Circuit Subassemblies and Accessories.
MIL-P-24691/3 - Pipe and Tube, Corrosion-Resistant, Stainless Steel, Seamless or Welded.

(See supplement 1 for applicable specification sheets.)

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-202 - Electronic and Electrical Component Parts.
MIL-STD-348 - Radio Frequency Connector Interfaces for MIL-C-3643, MIL-C-3650, MIL-C-3655, MIL-C-25516, MIL-C-26637, MIL-PRF-39012, MIL-PRF-49142, MIL-PRF-55339, MIL-C-83517

MIL-STD-790 - Established Reliability and High Reliability Qualified Products list (QPL) Systems For Electrical, Electronic, and Fiber Optic Parts Specifications.
MIL-STD-889 - Dissimilar Metals.
MIL-STD-1285 - Marking of Electrical and Electronic Parts.

(Copies of these documents are available online at http://quicksearch.dla.mil.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

IEEE Operations Center

IEEE-STD-287 - Precision Coaxial Connectors.

(Copies of these documents are available online from http://www.corporate-communications@ieee.org.

ASTM INTERNATIONAL

ASTM-A240/240M- Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels.
ASTM-A484/A484M- Steel, Bars, Billets, and Forgings, Stainless.
ASTM-A582/A582M- Bars, Free-Machining Stainless Steel.
ASTM-A666 - Steel Sheet, Strip, Plate, and Flat Bar, Austenitic Stainless, Annealed or Cold-Worked.
ASTM-A693 - Precipitation-Hardening Stainless and Heat-Resisting Steel Plate, Sheet, and Strip.
ASTM-A967 - Chemical Passivation Treatments For Stainless Steel Parts.
ASTM-B16/B16M- Rod, Brass, Free-Cutting, Bar and Shapes for Use in Screw Machines.
ASTM-B26/B26M- Aluminum-Alloy Sand Castings.
ASTM-B36/B36M- Plate, Brass, Sheet, Strip, and Rolled Bar.
ASTM-B85/B85M- Aluminum–Alloy Die Castings.
ASTM-B108/108M- Aluminum-Alloy Permanent Mold Castings.
ASTM-B121/B121M- Plate, Leaded Brass, Sheet, Strip, and Rolled Bar.
ASTM-B124/B124M- Copper and Copper Alloy Forging Rod, Bar, and Shapes.
ASTM-B152/B152M- Copper Sheet, Strip, Plate, and Rolled Bar.
ASTM-B194 - Copper-Beryllium Alloy Plate, Sheet, Strip, and Rolled Bar.
ASTM-B196/B196M- Rod and Bar, Copper-Beryllium Alloy.
ASTM-B197/B197M- Wire, Alloy, Copper Beryllium.
ASTM-B209 - Aluminum and Aluminum-Alloy Sheet and Plate.
ASTM-B211 - Aluminum and Aluminum-Alloy Bar, Rod, and Wire.
ASTM-B221 - Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire Profiles, and Tubes.
ASTM-B241/B241M- Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube.
ASTM-B339 - Pig Tin.
ASTM-B488 - Gold for Engineering Uses, Electrodeposited Coatings of.
ASTM-B545 - Tin, Electrodeposited Coatings of.
ASTM-B607 - Coatings, Autocatalytic Nickel-Boron, for Engineering Use.
ASTM-B700 - Standard Specification for Electrodepoisted Coatings of Silver for Engineering Use.
ASTM-B733 - Metal, Autocatalytic Electroless Nickel-Phosphorous Coatings on.
ASTM-D2116 - Molding and Extrusion Materials, FEP-Fluorocarbon.

ASTM-D4894 - Standard Specification For, Polytetrafluoroethylene (PTFE) Grandular Molding and RAM Extrusion Materials,
ASTM-D4895 - Polytetrafluoroehylene (PTFE) Resins Produced From Dispersion.

(Copies of these documents are available from http://www.astm.org or ASTM International, P.O. Box C700, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

AMERICAN SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

SAE-AMS2700 - Steels, Passivation of Corrosion Resistant.
SAE-AMS-QQ-N-290 - Nickel Plating (Electrodeposited).
SAE-AMS2404 - Coatings, Electroless Nickel, Requirements For.

(Copies of these documents are available online from http://www.sae.org or from the Society of Automotive Engineers, 400 Commonwealth Drive, Warrandale. PA 15096-0001.)

2.4 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein (except for related specification sheets), the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Specification sheets. The individual item requirements shall be as specified herein and in accordance with the applicable specification sheets. In the event of any conflict between the requirements of this specification and the specification sheet, the latter shall govern (see 6.2).

3.2 Qualification. Dummy loads furnished under this specification shall be products that are authorized by the qualifying activity for listing on the applicable qualified products list before contract award (see 4.5 and 6.3).

3.2.1 QPL system. The manufacturer shall establish and maintain a QPL system for parts covered by this specification. Requirements for this system are specified in MIL-STD-790. In addition, the manufacturer shall establish a Statistical Process Control (SPC) system that meets the requirements of 3.2.2.

3.2.2 SPC system. As part of the overall, the manufacturer shall establish a SPC system that meets the requirements of MIL-STD-790 QPL system.

3.3 Critical interface materials. Materials shall be as specified herein. If materials other than those specified are used, the contractor shall certify to the qualifying activity that the substitute material enables the dummy loads to meet the requirements of this specification. Acceptance or approval of any constituent material shall not be construed as a guaranty of the acceptance of the product. When a definite material is not specified, a material shall be used which will enable the dummy load to meet the performance requirements of this specification.

3.3.1 Dissimilar metals. Dissimilar metals between which an electromotive couple may exist shall not be placed in contact with each other. Reference is made to MIL-STD-889 for definition of dissimilar metals.

3.3.2 Nonmagnetic materials. All parts shall be made from materials, which are classified, as nonmagnetic. (less than 2 mμ).

3.3.3 Brass. Brass shall be in accordance with ASTM B16/B16M, ASTM B36/B36M and ASTM B121/B121M.

3.3.4 Copper alloy. Copper alloy shall be in accordance with ASTM B124/B124M or ASTM B152/B152M.

3.3.5 Copper beryllium. Copper beryllium shall be in accordance with ASTM B194, ASTM B196//B196M and ASTM B197/B197M.

3.3.6 Corrosion-resisting steel. Corrosion-resisting steel shall be in accordance with ASTM A240/240M, ASTM A484/484M, ASTM A666, ASTM A693 and ASTM A582/A582M. Corrosion resisting steel pipe shall be in accordance with MIL-P-24691/3.

3.3.7 Aluminum alloy. Aluminum alloy shall be in accordance with ASTM B26/B26M, ASTM B85//B85M, ASTM B108/B108M, ASTM B209, ASTM B211, ASTM B221 and ASTM B241/B241M.

3.4. Configuration and features. Dummy loads shall be of the configuration and physical dimensions specified (see 3.1). It is not permitted to compensate for discontinuities of the dummy load by the design of the mating connector.

3.4.1 RF connection interface. The RF connection interface shall be in accordance with MIL-STD-348 or MIL-DTL-24044 as applicable (see 1.2 and 3.1). The material, plating and gauging for the connector interface shall conform to the application specifications. When specified, precision connectors shall be in accordance with IEEE-STD-287 or MIL-STD-348.

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

3.4.1.2 Receptacles. Receptacle connections for a specific dummy load shall be as specified (see 3.1).

3.4.1.3 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. These caps will be supplied with the dummy load.

3.4.1.4 Connection metal parts. Unless otherwise specified, the connector and male center pins shall be made of corrosion-resisting steel. The female center contact pins shall be made of copper beryllium, silver plating, or when otherwise specified, gold plated (see section 2).

3.4.1.5 Plastic. Plastic shall be in accordance with ASTM D2116, ASTM D4894 or ASTM D4895.

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

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

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. The average power equals the peak power times the duty cycle.

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

3.4.4.3 Duty cycle. The ratio of the average power to the peak power is the duty cycle and represents the percentage of time the power is present.

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 the shell material 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 (critical interface). Unless otherwise specified (see 3.1), the finish shall be as specified in 3.4.6.1, 3.4.6.2, or 3.4.6.3.

3.4.6.1 Materials.

3.4.6.1.1 Gold bodies. Gold bodies shall be plated to a minimum gold thickness of 50 micro inches (1.27 μm) in accordance with ASTM B488, type II code C, class 1.27, over 50 μ inches (1.27 μm) minimum of nickel in accordance with SAE-AMS-QQ-N-290, class 1, measured anywhere along the mating surface, for all series.

3.4.6.1.2 Gold contacts. The male pin shall be plated to a minimum gold thickness of 50 micro inches (1.27 μm) in accordance with ASTM B488, type II, code C, class 1.27, over 50 micro inches (1.27 micro meters) minimum of nickel in accordance with SAE-AMS-QQ-N-290, class 1, measured anywhere along the mating surface, for all series. The socket contact shall be plated to a minimum of 50 micro inches (1.27 micro meters) of gold in accordance with ASTM B488, type II, code C, class 1.27, over 50 micro inches (1.27 micro meters) of nickel in accordance with SAE-AMS-QQ-N-290, class 1, including the I.D., measured at a depth of .040 inch (1.01mm) minimum. The plating on non-significant surfaces in the I.D. shall be of sufficient thickness to ensure plating continuity and uniform utility and protection. This plating may consist of an underplate only. A silver underplate shall not be permitted on any contact, pin or socket.

3.4.6.1.3 Nickel. Nickel shall be in accordance with ASTM B607, ASTM B733, SAE-AMS2404 or SAE-AMS-QQ-N-290.

3.4.6.1.4 Silver. Silver shall be in accordance with ASTM B700.

3.4.6.1.5 Tin. Tin shall be in accordance with ASTM B339 or ASTM B545, 97% pure, maximum.

3.4.6.1.6 Paint. Paint shall be in accordance with MIL-F-14072, Enamel, Alkyd, Gloss, (for external and internal surfaces).

3.4.6.1.7 Anodic coating. Anodic coating shall be in accordance with MIL-A-8625.

3.4.6.2 Passivation treatment. Passivation treatments shall conform to ASTM A967 or SAE-AMS2700.

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

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

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) (see 4.6.2).

3.5.1 Bayonet and threaded types. When tested as specified in 4.6.2.1, 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 4.6.2.2, 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 4.6.3, the coupling mechanism (threaded types) shall not be dislodged, and the connector of the dummy loads shall meet the requirements of 3.5.1.

3.7 Connector durability (when specified for coaxial dummy loads). After the connector of the dummy loads is tested as specified in 4.6.4, the connector shall meet the requirements of 3.5.1 and 3.5.2.

3.8 Solderability (as applicable). When dummy loads with solderable connections are tested as specified in 4.6.5, there shall be no evidence of pinholes or blistering.

3.9 Resistance to soldering heat (as applicable). When dummy loads with solderable connections are tested as specified in 4.6.6, there shall be no damage to the dummy load or to the terminal insulator the will cause electrical failure. Chipping of the terminal insulator shall not be cause for failure unless that chipping extends to the outer periphery. After the test, the VSWR shall not exceed the values specified (see 3.1).

3.10 Resistance to solvents (as applicable). When dummy loads are tested as specified in 4.6.7, there shall be no evidence of illegible marking, mechanical damage, or deterioration of material of finishes.

3.11 Terminal strength (as applicable). When tested in accordance with 4.7.8, connectors shall not crack, nor break, and there shall be no loosening of parts. Connectors shall be in full engagement during vibration and the coupling device shall not loosen as a result of vibration. Interruptions of electrical continuity shall not last longer than 10 microseconds.

3.12 Burn-in (screened only). All screened dummy loads shall be burn-in as specified in 4.6.9. 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 4.6.10, the VSWR shall not exceed the value specified (see 3.1).

3.14 Thermal shock. After the thermal shock test specified in 4.6.11, 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 4.6.12, 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 4.6.13, 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 4.6.14, 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 4.6.15, the dummy load shall show no physical damage, and the VSWR shall not exceed the value specified (see 3.1).

3.19 Salt spray (when specified). After the salt spray test specified in 4.6.16, 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 4.6.17, 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 water shall not exceed the value specified (see 3.1).

3.21 Endurance. After the endurance test specified in 4.6.18, the 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 4.6.19, 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 4.6.20, 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 PIN and the manufacturer's CAGE code. The marking location is optional; when practicable, a location should be picked that will be least likely to be covered in cable assembly or installation. Marking is required on all parts manufactured to this specification unless specifically excepted (see 3.1).

3.24.1 Serialization. Screened parts are serialized, see 4.6.9. 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 (see 6.2).

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, sharp edges, deep scratches, and other defects that will affect life, serviceability, or appearance.

3.26 Recycled, recovered, or environmentally preferable, or biobased materials. Recycled, recovered, environmentally preferable, or biobased materials should be used to the maximum extent possible, provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

4. VERIFICATION

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

a. Qualification inspection (see 4.4).
b. Conformance inspection (see 4.5).
c. Periodic inspection (see 4.5.2.1.1).

4.2 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 (i.e., industry standard, military standards) shall be required.

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.

4.3.1 QPL system. The manufacturer shall establish and maintain a system to meet the requirements of MIL-STD-790 and the requirements herein (see 3.2.1). Evidence of such compliance shall be verified by the qualifying activity as a prerequisite for qualification and retention of qualification. The following exceptions to MIL-STD-790 shall apply.

a. Distributor, category A: An organization contractually authorized by a manufacturer to store and distribute (sell) completely finished parts. These parts shall have been completely assembled and inspected by the manufacturer to all the applicable requirements of the specification.

b. Basic plan: The manufacturer shall document a product assurance program plan in a manner adequate to demonstrate compliance to section 5 of MIL-STD-790 or intent to comply prior to receipt of qualification approval, or if qualified within 2 years (see 3.2.2). When the program plan indicates intent to comply, the documentation shall include an implementation schedule. One program plan shall be required by a single manufacturing facility. The qualifying activity shall determine the adequacy and approve the program plan in so far as it relates to the requirements specified in section 5 and appendixes A and B of MIL-STD-790.

c. Distributor organizations: The manufacturers shall identify each authorized category A, B or C distributor or distributor's assembly plant, the function each organization is authorized to perform, and the authorized address at which the functions are performed. Any change in functions or the addition or deletion of a distributor or a distributor's assembly plant shall be reported to the qualifying activity within 10 days after such an occurrence.

d. Corrective action plan: Where failures or defects are greater than the prescribed limits, the manufacturer shall prepare a plan or recommendation for corrective action. Corrective action recommendations for performance failures shall include failure mode information and shall be supported by verifying data, or a proposed evaluation test plan. Corrective action on parts covered by the specification, which after design parameters previously submitted to the qualifying activity shall not be made without approval from the qualifying activity, except those actions which consist only of improvements in control procedures. Corrective action affecting control procedures shall not be implemented for production until approved by qualified personnel responsible for the engineering, quality control, and reliability functions of the manufacturer.

e. Process control: Records shall cover the implementation of devices such as control charts (e.g., X bar and R charts) or other means of indication of the degree of control achieved in the production process. Records shall also indicate the action taken when each out of control condition is observed, and the disposition of product not conforming to the manufacturers established prescribed limits. Records associated with nonconforming products shall be held for a minimum of 3 years.

f. Self-audit requirements: Manufacturing flowcharts do not have to contain internal document control numbers pertaining to each process performed and quality control station.

4.3.2 SPC. A SPC program shall be established and maintained in accordance with MIL-DTL-790. Evidence of such compliance shall be verified by the qualifying activity as a prerequisite for qualification and retention of qualification.

4.4 Qualification inspection. Qualification inspection shall be performed at a laboratory acceptable to the Government (see 6.3) on sample units produced with materials, 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).

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

4.4.2 Inspection routine. Qualification inspection shall consist of the examinations and tests specified in table I in the order shown.

4.4.3 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.

TABLE I. Qualification inspection.

Inspection	Requirement paragraph	Test method paragraph
Visual and mechanical inspection and weight	3.1, 3.3 to 3.4.1, 3.4.5 to 3.4.8 incl. 3.24 and 3.25	4.6.1
Force to engage/disengage 1/	3.5	4.6.2, 4.6.2.1, 4.6.2.2
Coupling proof torque 1/	3.6	4.6.3
Connector durability 1/	3.7	4.6.4
Solderability 2/	3.8	4.6.5
Resistance to soldering heat 2/	3.9	4.6.6
Resistance to solvents 2/	3.10	4.6.7
Terminal strength 2/	3.11	4.6.8
VSWR	3.13	4.6.10
Thermal shock	3.14	4.6.11
Vibration	3.15	4.6.12
Shock	3.16	4.6.13
Moisture resistance	3.17	4.6.14
Barometric pressure 3/	3.18	4.6.15
Salt spray 3/	3.19	4.6.16
Power dissipation	3.20	4.6.17
Endurance	3.21	4.6.18
Over load 3/	3.22	4.6.19
Pressurization 3/	3.23	4.6.20

1/ For coaxial dummy loads, when specified (see 3.1).
2/ For stripline dummy loads, when specified (see 3.1).
3/ When specified (see 3.1).

4.4.4 Disposition of qualification sample units. Sample units which have been subjected to qualification testing shall not be deliverable 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.

4.4.5 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 product to meet the performance requirements of this specification.

4.5 Conformance inspection.

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

4.5.1.1 Inspection lot. An inspection lot shall consist of all dummy loads of the same PIN, 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 II, in the order shown.

TABLE II. Group A inspection.

Inspection	Requirement paragraph	Test method paragraph
Visual and mechanical inspection and weight	3.1, 3.3 to 3.4.1, 3.4.5 to 3.4.8 incl., 3.24 and 3.25	4.6.1
VSWR	3.13	4.6.10
Thermal shock 1/	3.14	4.6.11
Burn-in 1/	3.12	4.6.9

1/ For screened units only.

4.5.1.2.1 100% inspection plan. All units shall be subjected to group A inspection. No failures are permitted. If one or more units fail, the lot shall be considered to have failed. The lot may be screened for that particular defect and defects removed. After screening, the lot shall be retested. Any failure in the screened lot shall constitute failure of the lot and the lot shall be rejected.

4.5.1.2.2 Rejected items. If an inspection item is rejected, the contractor may rework it to correct the defect and resubmit for inspection. Such items shall be separate from new items and shall be clearly identified as reinspected items. Even if rejected items are reworked and resubmitted, no more than one failure in visual/mechanical examination and no more than one subsequent failure in electrical inspections (VSWR) shall be permitted. When more failures occur, they shall be reported to the qualifying activity (DSCC-VQE) as indication of process problems and potential threat to product reliability. Subsequent rejections for the same parameter shall be cause for reinspection of the entire lot.

4.5.2 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 4.5.2.1.4), delivery of products which have passed group A shall not be delayed pending the results of these qualification verification inspections.

4.5.2.1 Group B inspection. Group B inspection shall consist of the inspections specified in table III, 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 from various production runs.

TABLE III. Group B inspection.

Inspection	Requirement paragraph	Test method paragraph
Force to engage/disengage 1/	3.5	4.6.2
Coupling proof torque 1/	3.6	4.6.3
Connector durability 1/	3.7	4.6.4
Solderability 2/	3.8	4.6.5
Resistance to soldering heat 2/	3.9	4.6.6
Resistance to solvents 2/	3.10	4.6.7
Terminal strength 2/	3.11	4.6.8
VSWR	3.13	4.6.10
Thermal shock	3.14	4.6.11
Vibration	3.15	4.6.12
Shock	3.16	4.6.13
Moisture resistance	3.17	4.6.14
Barometric pressure 3/	3.18	4.6.15
Salt spray 3/	3.19	4.6.16
Power dissipation	3.20	4.6.17
Endurance	3.21	4.6.18
Over load 3/	3.22	4.6.19
Pressurization 3/	3.23	4.6.20

1/ For coaxial dummy loads, when specified (see 3.1).
2/ For stripline dummy loads, when specified (see 3.1).
3/ When specified (see 3.1).

4.5.2.1.1 Periodic inspection. 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.

4.5.2.1.2 Failures. If one or more sample units fail to pass group B 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 B inspection shall not be delivered on contract.

4.5.2.1.4 Noncompliance. If a sample fails to pass group B 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 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 reinstituted; however, final acceptance shall be withheld until the group B inspection has shown that the 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 Methods of inspection. The following identified tests and test methods assure dummy load integrity within typical operating conditions and applications. Alternate commercial industry standard test methods are allowed; however when an alternate method is used, the qualifying activity must be notified prior to the performance of the test. The test methods described herein are proven methods and shall be the referee methods in case of dispute.

4.6.1 Visual and mechanical examination. Dummy loads shall be examined to verify that the materials, design, construction, physical dimensions, finish, marking, and workmanship are in accordance with the applicable requirements (see 3.1, 3.3 to 3.4.1, 3.4.5 to 3.4.8 inclusive, 3.24 and 3.25).

4.6.2 Force to engage/disengage (see 3.5).

4.6.2.1 Bayonet and threaded types (see 3.5.1). 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 plans coincide. A bayonet coupled connector is fully engaged with its mating standard part when the bayonet stubs have passed the decent and their reference planes coincide. No additional torque shall be applied. The mating standard part is a steel jig containing the critical interface dimensions. It's spring members when applicable shall be heat treated copper beryllium. 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.

4.6.2.2 Push-on connector types (see 3.5.2). The connector of the dummy load under test shall be engaged with its standard mating part (gage). During the 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. 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

4.6.3 Coupling proof torque (see 3.6). The connector of the dummy load under test shall be engaged with its standard mating part (gage) 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. 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.

4.6.4 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 shall not be used for cleaning.

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

4.6.6 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 insertion in the molten solder – To a point 0.062 inch (1.57mm) + 0.031 (0.79mm), -0 inch (0.0 mm) from the body.
c. Test condition A.
d. Cooling time - stabilize to +25°C.

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

All portions of the dummy loads shall be brushed. Optional procedures for a fourth group are not applicable.

4.6.8 Terminal strength (see 3.11). Dummy loads shall be tested in accordance with method 211 of MIL-STD-202 test condition A, applied force1.5 pounds.

4.6.9 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 loads shall be considered to have failed. All dummy loads subjected to burn-in shall be serialized (see 3.24.1) for correlation of the VSWR data to the specific unit.

4.6.10 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 specific 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.

4.6.11 Thermal shock (see 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 4.6.10.

4.6.12 Vibration (see 3.15). Unless otherwise specified (see 3.1), dummy loads shall be tested as specified in 4.6.12.1. When specified (see 3.1), dummy loads shall be tested as specified in 4.6.12.2.

4.6.12.1 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 measurements 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 loads 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 mounting receptacle.

c. Test and measurements after vibration – VSWR shall be measured as specified in 4.6.10.

4.6.12.2 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 4.6.10.

4.6.13 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 provisions shall be considered normally mounted when mated with the complementary mounted receptacles.
b. Test condition letter – I.
c. Measurements after test – VSWR shall be measured as specified 4.6.10.

4.6.14 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 4.6.10.

4.6.15 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 mounting – Normal mounting means.
b. Test condition letter – As specified (see 3.1).
c. Measurement after test – VSWR shall be measured as specified in 4.6.10.
d. Tests during subjection to reduction pressure (see 3.1).
e. Exposure time prior to measurements (see 3.1).

4.6.16 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 cable entries (backends) 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 4.6.10.

4.6.17 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 the 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.

4.6.18 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 4.6.10 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.

4.6.19 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 4.6.10.

4.6.20 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 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Service or Defense Agency, or within the military service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

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

6.2 Acquisition requirements. Acquisition documents must specify the following:

a. Title, number, and date of this specification.
b. If required, the specific issue of individual documents referenced (see 2.1).
c. Packaging requirements (see 5.1).
d. Title, number and date of the applicable specification sheet.
e. The complete PIN of the dummy load ordered.
f. Serialization (see 3.24.1).

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Products List QPL No. 39030 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. Information

pertaining to qualification of products may be obtained from vqp@dla.mil. An online listing of products qualified to this specification may be found in the Qualified Products Database (QPD) at https://assist.dla.mil.

6.4 References to superseded specifications. All the requirements of MIL-DTL-39030 are interchangeable with those of MIL-PRF-39030, therefore, previously existing documents (OEM drawings, etc.) referencing MIL-PRF-39030 need not be changed.

6.5 Environmentally preferable material. Environmentally preferable materials should be used to the maximum extent possible to meet the requirements of this specification. As of the dating of this document, the U.S. Environmental Protection Agency (EPA) is focusing efforts on reducing 31 priority chemicals. The list of chemicals and additional information is available on their website http://www.epa.gov/osw/hazard/wastemin/priority.htm. Included in the EPA list of 31 priority chemicals are cadmium, lead, and mercury. Use of these materials should be minimized or eliminated unless needed to meet the requirements specified herein (see Section 3)

6.5 Subject term (key word) listing.

Copper beryllium
Interface
Nickel
VSWR

6.6 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

APPENDIX A

GROUP QUALIFICATION

A.1 SCOPE

A.1.1 Scope. This appendix is a mandatory part of this specification. The information contained herein is intended for compliance. 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. Alternate groupings may be offered by manufacturers for consideration by the qualifying activity.

TABLE A-1. Grouping for qualification.

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

CONCLUDING MATERIAL

Custodians:
Army – CR
Navy – EC
Air Force – 11
DLA - CC

Preparing activity:
DLA - CC

(Project 5985-2014-023)

Review activities:
Army – AV, MI
Navy – AS, MC, OS, SH
Air Force – 19, 99

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at https://assist.dla.mil.