

INCH-POUND

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 SUPERSEDING
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PERFORMANCE 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.

<u>Type</u>	<u>RF connector interface series</u>	<u>Connection specification</u>
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	7/8 inch	MIL-F-24044
XII	1-5/8 inch	MIL-F-24044
XIII	3-1/8 inch	MIL-F-24044
XIV	Stripline	---

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be sent to: Defense Supply Center Columbus, ATTN: DSCC-VAI, 3990 East Broad Street, Columbus, Ohio 43216-5000.
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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 documents 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 listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

DEPARTMENT OF DEFENSE

MIL-F-24044 - Flanges, Coaxial Line, Rigid Air Dielectric<, General Specification For.
MIL-H-28719 - Headers-Hermetically Sealed.

STANDARDS

FEDERAL

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

DEPARTMENT OF DEFENSE

MIL-STD-348 - Radio Frequency Connector Interfaces.
MIL-STD-202 - Test Methods for Electronic and Electrical Component Parts.
MIL-STD-889 - Dissimilar Metals.
MIL-STD-1276 - Leads for Electronic Component Parts.
MIL-STD-1285 - Marking of Electrical and Electronic parts.

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Defense Printing Service Detachment Office, Bldg. 4D (Customer Service), 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

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2.3 Non-Government publications. The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation (see 6.2).

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 47th Street, New York, NY 10017).

AMERICAN SOCIETY FOR TESTING AND MATERIALS

ASTM A967 - Chemical Passivation Treatments For Stainless Steel Parts.

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

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for related associated specifications or 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 the applicable specification sheet. In the event of conflict between requirements of this specification and the specification sheet, the latter shall govern.

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).

3.3 Critical interface materials. Material 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. ^{1/}

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 mu).

3.3.3 Brass. Brass shall be of sufficient quality in order to assure that the dummy loads produced under specification meet the performance requirements. See section 6.8 for guidance.

^{1/} Past experience has shown that these materials allow these dummy loads to meet the performance requirements of this specification. Other material options may be permitted with the approval of the preparing and qualifying activities (see section 6.8 for guidance).

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3.3.4 Copper-alloy. Copper alloy shall be of sufficient quality in order to assure that the dummy loads produced under this specification meet the performance requirements. See section 6.8 for guidance.

3.3.5 Copper-beryllium. Copper-beryllium shall be of sufficient quality in order to assure that the dummy loads produced under this specification meet the performance requirements. See section 6.8 for guidance.

3.3.6 Corrosion-resisting steel. Corrosion-resisting steel shall be of sufficient quality in order to assure that the dummy loads produced under this specification meet the performance requirements. See section 6.8 for guidance.

3.3.7 Aluminum alloy. Aluminum alloy shall be of sufficient quality in order to assure that the dummy loads produced under this specification meet the performance requirements. See section 6.8 for guidance.

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-F-24044 as applicable (see 1.2 and 3.1). The material, plating, and gauging for the connector interface shall conform to the applicable 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-C-55302 as applicable (see 3.1).

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

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

3.4.1.4 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.

3.4.1.5 Connector 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 beryllium copper, silver plating, or when otherwise specified, gold plated. See section 6.8 for guidance.

3.4.1.6 Plastic. Plastic shall be of sufficient quality in order to assure the dummy loads produced under this specification meet the performance requirements. See section 6.8 for guidance.

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.

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 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).

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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. 2/

3.4.6.1 Materials. Gold, Nickel, Silver, Tin, Paint, or Anodic coating.

3.4.6.2 Passivation treatment. Passivation treatments shall conform to ASTM A967.

3.4.6.3 Aluminum alloys. Aluminum alloys surfaces shall be chemically treated.

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 4.6.2.1, 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 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 4.6.4, 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 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).

2/ Past experience has shown that these materials allow these dummy loads to meet the performance requirements of this specification. Other material options may be permitted with the approval of the preparing and qualifying activities (see section 6.8 for guidance).

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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 or finishes.

3.11 Terminal strength (as applicable). When dummy loads are tested as specified in 4.6.8, 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 4.6.9. 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 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 4.6.16, 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 nonscreened 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 values 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. When the contact 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, sharp edges, deep scratches, and other defects that will affect life, serviceability, or appearance.

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4. VERIFICATION

4.1 Test equipment and inspection facilities. Test and measuring equipment and inspection facilities of sufficient accuracy, quality, and quantity to permit performance of the required inspection shall be established and maintained by the contractor. The establishment and maintenance of a calibration system to control the accuracy of the measuring and test equipment (i.e., industry standards, military standards) shall be required.

4.2 Classification of inspection. The inspections 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)

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

4.4 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).

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

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

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TABLE I 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	4.6.1
Force to engage/disengage <u>1/</u>	3.5	4.6.2
Coupling proof torque <u>1/</u>	3.6	4.6.3
Connector durability <u>1/</u>	3.7	4.6.4
Solderability <u>2/</u>	3.8	4.6.5
Resistance to soldering heat <u>2/</u>	3.9	4.6.6
Resistance to solvents <u>2/</u>	3.10	4.6.7
Terminal strength <u>2/</u>	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 <u>3/</u>	3.18	4.6.15
Salt spray <u>3/</u>	3.19	4.6.16
Power dissipation	3.20	4.6.17
Endurance	3.21	4.6.18
Overload <u>3/</u>	3.22	4.6.19
Pressurization <u>3/</u>	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).

4.4.3 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.

4.4.4 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 part number, produced under essentially the same conditions, and offered for inspection at one time.

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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 3.4.8 incl., 3.24 and 3.25	4.6.1
VSWR	3.13	4.6.10
Thermal shock <u>1/</u>	3.14	4.6.11
Burn-in <u>1/</u>	3.12	4.6.9

1/ For screened units only.

4.5.1.2.1 Sampling plan. All units shall be subjected to group A inspection. No failures are permitted. If one or more sample units fail, the sample 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.

4.5.2 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.

4.5.2.1 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.

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TABLE III. Group B inspection.

Inspection	Requirement paragraph	Test method paragraph
Force to engage/disengage <u>1/</u>	3.5	4.6.2
Coupling proof torque <u>1/</u>	3.6	3.6.3
Connector durability <u>1/</u>	3.7	4.6.4
Solderability <u>2/</u>	3.8	4.6.5
Resistance to soldering heat <u>2/</u>	3.9	4.6.6
Resistance to solvents <u>2/</u>	3.10	4.6.7
Terminals strength <u>2/</u>	3.11	4.6.8
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 <u>3/</u>	3.18	4.6.15
Salt spray <u>3/</u>	3.19	4.6.16
Power dissipation	3.20	4.6.17
Endurance	3.21	4.6.18
Overload <u>3/</u>	3.22	4.6.19
Pressurization <u>3/</u>	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 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 failures after reinspection, information concerning the failure and corrective action taken shall be furnished to the cognizant inspection activity and the qualifying activity.

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4.6 Methods of inspection. ^{3/}

4.6.1 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).

4.6.2 Force to engage/disengage (see 3.5).

4.6.2.1 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 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. Its spring members when applicable shall be heat treated beryllium copper.

4.6.2.2 Push-on connector types. 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.

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.

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 or tools shall not be used for cleaning.

4.6.5 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.

4.6.6 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 1/16 +1/32, -0 inch from the body.
- c. Test condition A.
- d. Cooling time - stabilize to +25°C.

^{3/} 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 method described herein are proven methods and shall be the referee method in case of dispute.

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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 detail shall apply:

All portions of the dummy loads shall be brushed.

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 for 1.5 pounds.

4.6.9 Burn-in (screened only) (see 3.1). 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.

4.6.10 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 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.

4.6.11 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.

4.6.12 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.

4.6.12.1 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 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 mounting receptacle.
- c. Test and measurements after vibration - VSWR shall be measured as specified in 4.7.10.

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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 4.7.10.

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 receptacle.
- b. Test condition letter - I.
- c. Measurements after test - VSWR shall be measured as specified in 4.7.10.

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 in 4.7.10.

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 4.7.10.
- 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 4.7.10.

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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 4.7.10 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.

4.6.19 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 4.7.10.

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 personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. 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 strip lines.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1),
- c. Title, number and date of the applicable specification sheet.
- d. Packaging requirements (see 5.1).
- e. The complete PIN of the dummy load ordered.

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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 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. Information pertaining to qualification of products may be obtained from the Defense Supply Center Columbus, ATTN: DSCC-VQE, 3990 East Broad Street, Columbus, Ohio 43216-5000.

6.4. References to superseded specifications. All the requirements of MIL-PRF-39030C are interchangeable with those of MIL-D-39030B, therefore, previously existing documents (OEM drawings, etc.) referencing MIL-PRF-39012 or MIL-PRF-55339 need not be changed.

6.5 Part or Identifying Number (PIN). The PIN consists of the letter "M" followed by the basic number of the specification sheet, an assigned dash number (see 3.1) and the letter N or S where N indicates a nonscreened production item and S indicates a screened production item:

	M39030/1-	01	N	or	S
Military designator and specification sheet no. _____					
Dash number designation on specification sheet _____					
Nonscreened _____					
Screened _____					

6.6 Subject Term (key word) Listing.

- Coaxial
- Stripline
- Interface
- Voltage Standing Wave Ratio (VSWR)

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

6.8 Guidance documentation. Based on past experience, the following materials have been used in the fabrication of dummy loads in order for them to meet the performance requirements of this specification;

- a. Brass in accordance with ASTM B16, B36 and B121.
- b. Copper alloy in accordance with ASTM B124 and B152.
- c. Nickel in accordance with ASTN B607, B656, B733, SAE AMS 2404, 2405 and 2433.
- d. Copper-beryllium in accordance with ASTM B194, B196 and B197.
- e. Corrosion-resisting steel in accordance with ASTM A582 and QQ-S-763.
- f. Aluminum alloy in accordance with QQ-A-225/3, QQ-A-250/11, ASTM B26/26M, B85, B108, B221 and B241.
- g. Plastic in accordance with ASTM D1457 and D2116.
- h. Gold in accordance with MIL-G-45204.

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CONCLUDING MATERIAL

Custodians:

Army - CR
Navy - EC
Air Force - 85

Preparing activity:
DLA - CC

(Project 5985-1073)

Review activities:

Army - MI, AV
Navy - AS, MC, OS, SH
Air Force - 17, 19, 99

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APPENDIX

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. Alternate groupings may be offered by manufacturers for consideration by the qualifying activity.

TABLE IV. Grouping for qualification.

Group number	Qualifying part number	Part number 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, 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

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-PRF-39030C	2. DOCUMENT DATE (YYMMDD)
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3. DOCUMENT TITLE: DUMMY LOADS, ELECTRICAL, COAXIAL AND STRIPLINE, GENERAL SPECIFICATION FOR

4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME (Last, First, Middle initial)	b. ORGANIZATION	
c. ADDRESS (Include Zip Code)	d. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON (If applicable)	7. DATE SUBMITTED (YYMMDD)

8. PREPARING ACTIVITY

a. NAME Ron Gary	b. TELEPHONE (Include Area Code) (1) Commercial (614) 692-0568 (2) AUTOVON 850-0568	
c. ADDRESS (Include Zip Code) DSCC-VAI 3990 East Broad Street Columbus, Ohio 43216-5000	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340	

DD Form 1426, OCT 89 Previous editions are obsolete 198/290