

INCH-POUND
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SUPERSEDING
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DETAIL SPECIFICATION

CONNECTORS, ELECTRICAL, FLAT CABLE, AND/OR PRINTED WIRING BOARD, NONENVIRONMENTAL GENERAL SPECIFICATION FOR

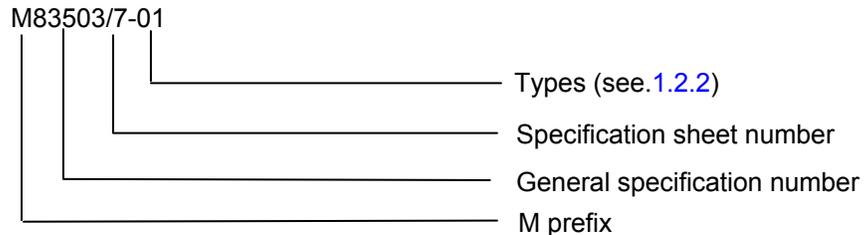
This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the requirements for multi-contact electrical connectors terminating flexible flat cable, and for mounting on printed wiring boards. It includes insulation displacement connectors (IDC), solder transition connectors, and header style connectors.

1.2 Classification. Connectors are of the following types, as specified herein.

1.2.1 Part or Identifying Number (PIN). The PIN consists of the letter "M", the basic specification number, a slash, specification sheet number, and an assigned dash number as shown in the following example:



1.2.2 Types. The connector type is determined by the number of contacts and the length of the terminating tails, as shown in individual specification sheets.

Comments, suggestions, or questions on this document should be addressed to: Commander, Defense Supply Center Columbus, Attn: VAI, P.O. Box 3990, Columbus, Ohio, 43218-3990 or emailed to RectangularConnector@dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <http://assist.daps.dla.mil>.

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2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 of this specification. This section does not include documents cited in other sections of this specification or recommended of 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 of documents cited in sections 3, 4, or 5 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 Standard for Federal Services

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-M-24519 - Molding Plastics and Molded Plastic Parts, Thermosetting
MIL-DTL-49055 - Cable, Electrical, (Flexible, Flat, Unshielded), (Round Conductor) General Specification for

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-202 - Tests Methods for Electronic and Electrical Component Parts
MIL-STD-889 - Dissimilar Metals
MIL-STD-1285 - Marking of Electrical and Electronic Parts

(Copies of these documents are available online at <http://assist.dla.mil/quicksearch/> or <http://assist.daps.dla.mil> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

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.

ASTM International

ASTM A240/A240M - Standard Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels
ASTM A582/A582M - Free-machining Stainless and Heat-resisting Steel Bars, Hot-rolled or Gold finished
ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar
ASTM A967 - Chemical Passivation Treatments for Stainless Steel Parts
ASTM B16/B16M - Rod, Bar, and Shapes for use in Screw Machines, Free Cutting Brass
ASTM B36/B36M - Brass Plate, Sheet, Strip, and Rolled Bar
ASTM B103/B103M - Standard Specification for Phosphor Bronze Plate, Sheet, Strip, and Rolled Bar
ASTM B122/B122M - Plate, Sheet, Strip and Rolled Bar, Copper-Nickel-Tin Alloy, Copper-Nickel-Zinc Alloy (Nickel Silver) and Copper Nickel Alloy

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- ASTM B139/B139M - Rod, Phosphor Bronze, Bar, and Shapes
- ASTM B159/B159M - Standard Specification for Phosphor Bronze Wire
- ASTM B194 - Plate, Copper Beryllium Alloy, Sheet, Strip, and Rolled Bar
- ASTM B196/B196M - Rod and Bar, Copper Beryllium Alloy
- ASTM B488 - Standard Specification for Electrodeposited Coatings of Gold for Engineering Uses
- ASTM B768 - Copper-Cobalt-Beryllium Alloy and Copper-Nickel-Beryllium Alloy Strip and Sheet
- ASTM D570 - Standard Test Method for Water Absorption of Plastics
- ASTM D4067 - Reinforced and Filled Polyphenylene Sulfide (PPS) Injection Molding and Extrusion Materials
- ASTM D5948 - Molding Compounds, Thermosetting
- ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi

(Copies of these documents are available from www.astm.org or ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, Pennsylvania, USA 19428-2959.)

ELECTRONIC INDUSTRY ALLIANCE (EIA)

- EIA-364 - Electrical Connector/Socket Test Procedures Including Environmental Classifications
- EIA-364-06 - Contact Resistance Test Procedure for Electrical Connectors
- EIA-364-13 - Mating and Unmating Forces Test Procedure for Electrical Connectors
- EIA-364-17 - Temperature Life with or without Electrical Load Test Procedure for Electrical Connectors and Sockets
- EIA-364-20 - Withstanding Voltage Test Procedure for Electrical Connectors, Sockets and Coaxial Contacts
- EIA-364-21 - Insulation Resistance Test Procedure for Electrical Connectors, Sockets, and Coaxial Contacts
- EIA-364-23 - Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets
- EIA-364-26 - Salt Spray Test Procedure for Electrical Connectors, Contacts and Sockets
- EIA-364-27 - Mechanical Shock (Specified Pulse) Test Procedure for Electrical Connectors
- EIA-364-28 - Vibration Test Procedure for Electrical Connectors and Sockets
- EIA-364-29 - Contact Retention Test Procedure for Electrical Connectors
- EIA-364-31 - Humidity Test Procedure for Electrical Connectors and Sockets
- EIA-364-32 - Thermal Shock (Temperature Cycling) Test Procedure for Electrical Connectors and Sockets
- EIA-364-41 - Cable Flexing Test Procedure for Electrical Connectors
- EIA-364-54 - Magnetic Permeability Test Procedure for Electrical Connectors, Contacts, and Sockets

(Copies of these documents are available online at <http://www.eia.org> or from the Electronic Industries Alliance, Technology Strategy & Standards Department, 2500 Wilson Boulevard, Arlington, VA 22201.)

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NATIONAL CONFERENCE OF STANDARDS LABORATORIES (NCSL)

NCSL-Z540.1 - Calibration Laboratories and Measuring and Test Equipment, General Requirements

(Copies of these documents are available online at <http://www.ncsli.org> or from the National Conference of Standards Laboratories (NCSL), 2995 Wilderness Place, Suite 107, Boulder, CO 80301-5404.)

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

SAE-AMS-QQ-N-290 - Nickel Plating (Electrodeposited)
SAE-AMS-QQ-P-35 - Passivation Treatments for Corrosion-Resistant Steel
SAE-AMS-P-81728 - Plating, Tin-Lead (Electrodeposited)
SAE-AS81021 - Copper-Beryllium Alloy, (Copper Alloy Numbers C17500 and C17510), Strip

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

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

ISO-10012-1 - Equipment, Metrological Confirmation Systems for Measuring

(Copies of these documents are available online at <http://www.iso.ch> or from the International Organization for Standardization American National Standards Institute, 11 West 42nd Street, 13th Floor, New York, NY 10036.)

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 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 sheet. In the event of any conflict between the requirements of this specification and the specification sheet, the latter shall govern.

3.2 Qualification. Connectors 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 4.2 and 6.3).

3.3 Materials. Example reference materials are identified herein. When an example reference material is not identified, a material shall be used which will enable the connectors to meet the performance requirements of this specification. Acceptance or approval of a constituent material shall not be construed as a guaranty of acceptance of the finished product.

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3.3.1 Reference materials, plating, and processes. The materials, plating and processes identified in this specification have been established to assure that connectors manufactured to this specification will properly interface to similar industry standard or government specified connectors without problems of electromechanical contamination to electrical and mechanical interfaces, or unacceptable or excessive interface surface wear. Manufacturers of connectors supplied to this specification are allowed to use alternate, recognized industry standard materials, plating, and processes from those specified in 3.3. The use of alternate materials, plating, or process must be coordinated with the qualifying activity as part of the qualification process, and must not result in inferior short or long term performance of reliability of connectors manufactured to this specification. Short or long term reliability problems resulting from the use of alternate materials, plating, or processes are the responsibility of the supplier.

3.3.1.1 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable 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.

3.3.1.2 Pure tin. The use of pure tin is prohibited (see 6.4). The maximum amount of pure tin is 97 percent and the alloy material shall inhibit the growth of tin whiskers.

3.3.2 Body and removable insulator, (when applicable). Unless otherwise specified, the body and removable insulator, (when applicable) shall be diallylphthalate in accordance with [ASTM D5948](#), type SIG-F (nylon glass filled, type I grade A); Polyester-Glass filled, type GPT-15F, GPT-20F, GPT-30F in accordance with [MIL-M-24519](#); Polyester Glass filled, or Polyphethylene Sulfide-glass filled, designation PPS000G40A43443 in accordance with [ASTM D4067](#) (see 3.1).

3.3.2.1 Hydrolytic stability. All nonmetallic material shall be hydrolytic reversion resistant in accordance with [ASTM D570](#).

3.3.3 Contacts. Contact material shall contain one or more of the following:

- a. Brass in accordance with [ASTM B16/B16M](#) or CA26000 in accordance with [ASTM B36/B36M](#).
- b. Copper alloy in accordance with [ASTM B103/B103M](#), [ASTM B122/B122M](#), [ASTM B139/B139M](#) or [ASTM B159/B159M](#).
- c. Beryllium copper in accordance with [ASTM B194](#) or [ASTM B196/B196M](#).

The contact materials shall meet the applicable requirements as specified herein and as specified in the individual specification sheets (see 3.1).

3.3.3.1 Electrical contact gold guidelines. Electrical contact gold plating shall be in accordance with [ASTM B488](#), type II, code C, class 1.27 (50 micro-inches) minimum thickness on the contact mating surface (see 3.1).

3.3.3.2 Contact underplate. All contact finishes shall have an underplate of nickel in accordance with [SAE-AMS-QQ-N-290](#) class II, 30 to 150 micro-inches (0.76 to 3.81 μm) thick. Silver shall not be used as an underplate (see 3.3.1).

NOTE: When contacts have been provided in strip form, the absence of plating in the area where the contact was removed from the strip is acceptable provided it is in a nonfunctional area and any corrosion formed as a result of salt spray testing does not creep into the contact mating area.

3.3.3.3 Overall finish. All parts of the contact shall be gold in accordance with [ASTM B488](#), type II, code C, class 1.27 (50 micro-inches minimum thickness see 3.1).

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3.3.3.3.1 Localized finish (selective plating). Selectively plated contacts must have a transition area between the Au and Sn-Pb of nickel to avoid overlap and resultant embrittlement.

3.3.3.3.1.1 Contact mating area. Contact mating area shall be gold in accordance with [ASTM B488](#), type II, code C, class 1.25 (50 micro-inches) minimum thickness (see [3.3.1](#)), over nickel 30 to 150 micro-inches (0.76 to 3.81 μm) thick (see [3.3.3.2](#)). Silver shall not be used as an underplate (see [3.1](#)).

3.3.3.3.1.2 Insulation displacement contact (IDC) - wire termination area. Shall be gold in accordance with [ASTM B488](#), type II, code C, class 1.27 (50 micro-inches, or [ASTM B488](#), type II, code C, class 0.25 10 micro-inches minimum thickness (see [3.3.3.2](#) for purity and hardness), or tin-lead in accordance with [SAE-AMS-P-81728](#), 100 micro-inches (2.54 μm) thick minimum (see [3.1](#)).

3.3.3.3.1.3 Termination area.

3.3.3.3.1.3.1 Solderless wrappost. Shall be gold in accordance with [ASTM B488](#), type II, code C, class 1.27 (50 micro-inches) minimum thickness (see [3.3.3.1](#)), or tin-lead in accordance with [SAE-AMS-P-81728](#), 100 micro-inches (2.54 μm) inch thick minimum (5 percent minimum lead) (see [3.1](#)).

3.3.3.3.1.3.2 Solder tail. Shall be gold in accordance with [ASTM B488](#), type II, code C, class 1.27 (50 micro-inches) minimum thickness (see [3.3.3.1](#)), or tin-lead in accordance with [SAE-AMS-P-81728](#), 100 micro-inches (2.54 μm) thick minimum (5 percent minimum lead) (see [3.1](#)).

3.3.3.3.1.4 Terminations intended for socket contact engagement. Shall be gold in accordance with [ASTM B488](#), type II, code C, class 1.27 (50 micro-inches) minimum thickness, (see [3.1](#) and [3.3.3.1](#)).

3.3.3.3.1.5 Nonfunctional areas. Any portion of the contact other than the contact or termination area shall be gold, tin/lead (50 to 95 percent minimum tin), or nickel plated 30 to 150 micro-inches (0.76 to 3.81 μm) thick (see [3.3.3.2](#)). Silver shall not be used as an underplate (see [3.3.3.1](#)).

3.3.4 Grommets and seals. Sealing materials shall be of a resilient dielectric material capable of meeting the performance requirements of this specification.

3.3.5 Dissimilar metals. Unless suitably protected against electrolytic corrosion, dissimilar metals shall not be employed in intimate contact with each other in connector or in mated pairs of connectors conforming to this specification. Dissimilar metals are defined in [MIL-STD-889](#).

3.3.6 Inserts. Insert material shall be of a suitable high grade dielectric material capable of meeting the performance requirements of this specification.

3.3.7 Hardware. Mounting and mating hardware shall be corrosion resistance steel in accordance with [ASTM A240/A240M](#), [ASTM A666](#) 300 series, or [ASTM A582/A582M](#). Corrosion resistance steel shall be passivated in accordance with [SAE-AMS-QQ-P-35](#) or [ASTM A967](#) (see [3.1](#)).

3.4 Design and construction. Connectors shall be of the design, physical dimensions, and construction specified to withstand the handling and maintenance expected in installation and normal service use and to comply with the requirements specified herein (see [3.1](#)).

3.4.1 Contacts. The contacts shall be designed to prevent damage to the active member if improperly mated. The contact shall incorporate a wiping action.

3.4.2 Inserts. Inserts shall be designed and constructed with proper sections and radii so that they will not chip, or break in assembly or in normal service. Insert shall be designed so as to positively retain contacts.

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3.4.2.1 Contact arrangements. Contact arrangements in inserts shall be as specified (see 3.1).

3.4.3 Interchangeability. The mated connectors and individual plugs and receptacles having the same PIN shall be directly and completely interchangeable with each other with respect to installation and performance, as specified herein, and the applicable specification sheet (see 3.1).

3.4.4 Polarization. The polarization of connectors shall be accomplished by a mechanical or visual method that precludes mating in more than one position. The polarization shall be accomplished prior to the electrical engagement of the contacts.

3.4.5 Cable tension relief. When applicable, the connectors shall incorporate suitable means for preventing the forces applied to the conductors from acting directly on the contacts (see 3.1).

3.4.6 Screw threads. Screw threads shall be in accordance with [FED-STD-H28](#).

3.5 Performance. The connectors shall be wired and mated, unless otherwise specified, when subjected to the applicable environments and tests specified.

3.5.1 Preconditioning. Mating connectors shall be preconditioned as specified in [4.6.3](#) before any performance testing.

3.5.2 Insulation resistance. When the unmated connectors are tested as specified in [4.6.4](#), the initial insulation resistance shall be greater than 5,000 megohms. Insulation resistance following exposure shall not be less than 1,000 megohms.

3.5.3 Withstanding voltage. When the connectors are tested as specified in [4.6.5](#), there shall be no evidence of breakdown, arcing, or damage.

3.5.4 Cable retention (flat-cable only). When connectors are tested as specified in [4.6.6](#), they shall withstand the minimum applied force without mechanical damage.

3.5.5 Vibration. When connectors are tested as specified in [4.6.7](#), there shall be no evidence of loosening of parts, cracks, or breaks, and no loss in continuity greater than 1 microsecond.

3.5.6 Low level contact resistance. When connectors are tested as specified in [4.6.8](#), the resistance shall not exceed 50 milliohms.

3.5.7 Salt spray (corrosion) (unmated). When connectors are tested as specified in [4.6.9](#), there shall not be sufficient corrosion to interfere with mating or unmating or cause exposure of base metal of plated parts. There shall be no evidence of deterioration that will affect their operation. After exposure, the connectors shall meet the requirements of withstanding voltage and contact resistance as specified in [3.5.3](#) and [3.5.10](#), respectively.

3.5.8 Contact retention (removable contacts only). When connectors are tested as specified in [4.6.10](#), there shall be no resulting damage to the contact, connector insert, housing, or contact retention system.

3.5.9 Connector-cable flexing (flat cable only). When connectors are tested as specified in [4.6.11](#), there shall be no discontinuity of 1 microsecond or greater during the test. Following the test, the requirements of withstanding voltage (sea level) specified in [3.5.3](#), shall be met and there shall be no flaws or damage.

3.5.10 Contact resistance. When connectors are tested as specified in [4.6.12](#), the resistance shall not exceed the value specified (see 3.1).

3.5.11 Temperature cycling. When connectors are tested as specified in [4.6.13](#), there shall be no

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evidence of cracking, crazing, or other physical damage. Discoloration of insulation or sealing material shall not constitute failure. The connectors shall be capable of being manually mated and unmated at extreme low temperature.

3.5.12 Shock (specified pulse). When connectors are tested as specified in 4.6.14, there shall be no evidence of loosening of parts, cracks or breaks and there shall be no loss of electrical continuity during the test greater than 1 microsecond.

3.5.13 Humidity. When the mated connectors are tested as specified in 4.6.15, there shall be no cracking or separation of the insulation. Following the test, the connectors shall meet the requirements of insulation resistance, withstanding voltage (sea level), and contact retention in 3.5.2, 3.5.3, and 3.5.8 respectively.

3.5.14 Mating and unmating forces. When connectors are tested as specified in 4.6.16, the force required to mate and unmated the connector pairs shall be 1.5 to 8 ounce-force times the number of contacts per connector, unless otherwise specified (see 3.1).

3.5.15 Durability. When mated and wired connectors are tested as specified in 4.6.17, there shall be no base metal exposure or damaged parts that will be detrimental to the electrical characteristics. After the test, the connectors shall meet the contact resistance requirements of 3.5.10.

3.5.16 Permeability (when applicable). When unmated connectors and connector assemblies with metal parts and mounting hardware are tested as specified in 4.6.18, the measurements shall be 2.0 μ , maximum.

3.5.17 Fungus resistance. When connectors are tested when specified in 4.6.21 materials used in the construction of these connectors shall be fungus inert when tested in accordance with ASTM G21.

3.5.18 Temperature life. When connectors are tested as specified in 4.6.19, they shall meet the insulation resistance and contact resistance requirements in 3.5.2 and 3.5.10, respectively.

3.5.19 Solderability. When tested in accordance with 4.6.20, the solder termination area shall meet the requirements of MIL-STD-202, method 208.

3.6 Marking. Connectors are to be marked in accordance with method I of MIL-STD-1285, and are to include the PIN (see 3.1), the manufacturer's name or code symbol, and date code. The marking shall remain legible after completion of the tests specified herein.

3.7 Workmanship. Connectors and accessories shall be processed in such a manner, as to be uniform in quality and shall be free from burrs, crazing, cracks, voids, pimples, chips, blisters, pinholes, sharp cutting degrees (except wire wrap posts), and other defects that will affect life, serviceability, or appearance.

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4. VERIFICATION

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

- a. Qualification inspection (see 4.3).
- b. Conformance inspection (see 4.4).
- c. Materials inspection (see 4.5 and table I).

4.2 Inspection conditions. Unless otherwise specified herein, all inspections shall be performed in accordance with the test conditions specified in EIA-364. Twenty percent minimum but not less than four contacts shall be installed in each connector to be tested. When a dimension is called out as a typical, a random 10 percent but not less than 5 readings shall be taken.

4.2.1 Test equipment and inspection facilities. Test and measuring equipment and inspection facilities of sufficient accuracy, qualify 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. NCSL-Z540.1 or ISO-10012-1 part 1) shall be required.

4.3 Qualification inspection. Qualification inspection shall be performed at a laboratory acceptable to the Government on sample units produced with equipment and procedures normally used in production (see 6.3). Use of alternate materials, plating, and processes shall be identified for inclusion in the product test documentation (see 3.3.1).

4.3.1 Sample size. Sample size shall be as specified in table II. Connectors with the greatest number of contact from each specification sheet, for which qualification is desired, shall be subjected to qualification testing (example: "2 samples" specifies 2 samples from each slash sheet being qualified). The connectors shall be assembled to uniform lengths of flat cable and printed wiring boards when applicable, and each connector shall be tested. The conductor size shall be as specified (see 3.1).

4.3.2 Inspection routine. The sample shall be subjected to the inspections specified in table II, in the order shown. All sample units shall be subjected to the inspection of group I. The sample shall then be divided as specified in table II for groups II through V inclusive.

4.3.3 Failures. Failure to pass any one of the tests in table II shall be cause for refusal to grant qualification. All failures shall be attributed to the cause for refusal to grant qualification. All failures shall be attributed to the connector unless data is provided showing failure is due to the cable or the test fixture.

4.3.4 Verification 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.

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

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4.3.6 Verification testing. Tests and test methods identified in this specification assure connector integrity within typical operating conditions and applications. Alternate commercial industry standard test methods are allowed, however when an alternate method is used, the alternate method must be coordinated with the qualifying activity prior to performance of the test. The tests methods describe herein are proven methods and shall be the referee method in cases of dispute.

4.4 Conformance inspection.

4.4.1 Inspection of product for delivery. Inspection of product for delivery shall consist of group A inspection. Except as specified in 4.4.1.2.1, delivery of products which have passed the group A inspection shall not be delayed pending the results of group B inspection.

4.4.1.1 Inspection lot. An inspection lot shall consist of all the mating plugs and receptacles as indicated in each specification sheet, produced under essentially the same conditions and offered for inspection at one time. When only the plug or receptacle is specified in the contract, the manufacturer shall supply the mating receptacle or plug for inspection purposes.

4.4.1.2 Group A inspection. Group A inspection shall consist of the examinations and tests specified in table III, and shall be made on the same set of sample units in the order shown. The sample units may be wired or unwired at the option of the contractor. If unwired samples are submitted, the test apparatus shall meet prior Government approval.

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

4.4.1.2.2 Rejected lots. If an inspection lot is rejected, the manufacturer may rework it to correct the defects, or screen out the defective units, and resubmit for re-inspection. Resubmitted lots shall be inspected using the sample size of the next higher lot size specified in table III. The lot(s) shall not be tendered for acceptance until the reason for the failure and corrective action taken is submitted to the inspection activity. Such lots shall be segregated from new lots and shall be clearly identified as re-inspected lots.

4.4.1.2.3 Disposition of sample units. If the lot is accepted, unwired samples may be delivered on the contract. The wired samples with removable contacts may be delivered on the contract provided the wired contacts are replaced with new contacts.

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TABLE I. Materials.

Component Material	Requirement paragraph	Applicable specifications
Body Insulator material	3.3.2	MIL-M-24519, ASTM D5948 and ASTM D4067
Beryllium copper	3.3.1.1, 3.3.1.2	ASTM B194, ASTM B196/B196M SAE-AS81021 (C17500), ASTM B768 (C17410)
Brass	3.3.3	ASTM B16/B16M ASTM B36/B36M (CA26000)
Copper alloy	3.3.3	ASTM B103/B103M, ASTM B122/B122M, ASTM B139/B139M and ASTM B159/B159M
Nickel (electroplate)	3.3.3.1, 3.3.3.2, and 3.3.3.3.1.2	SAE-AMS-QQ-N-290
Gold (electroplate)	3.3.3.1, 3.3.3.3.1, 3.3.3.3.1.2, 3.3.3.3.1.3.1, 3.3.3.3.1.3.2, and 3.3.3.3.1.4	ASTM B488
Steel (corrosion resistant)	3.3.7	ASTM A240/A240M, ASTM A666, ASTM A582/A582M

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TABLE II. Qualification inspection.

Inspection	Requirement paragraph	Method paragraph
<u>Subgroup I (samples from each slash sheet)</u>		
Visual and mechanical inspection	3.1, 3.3, 3.4, 3.6, and 3.7	4.6.2
Preconditioning	3.5.1	4.6.3
Insulation resistance	3.5.2	4.6.4
Withstanding voltage (sea Level)	3.5.3	4.6.5.1
Withstanding voltage (altitude)	3.5.3	4.6.5.2
Permeability (when applicable)	3.5.16	4.6.18
<u>Subgroup II (4 pair)</u>		
Low level contact resistance <u>1/</u>	3.5.6	4.6.8
Shock(specified pulse)	3.5.12	4.6.14
a. Visual inspection 10X magnification of solder joints and contacts for cracks or other degradation)		
Vibration:		
a. Visual inspection for loosening of parts, cracks, or breaks.	3.5.5	4.6.7
b. No loss in continuity greater than 1 microsecond		
Low level contact resistance	3.5.6	4.6.8
<u>Subgroup III (2 pair)</u>		
Contact resistance <u>1/</u>	3.5.10	4.6.12
Durability	3.5.15	4.6.17
Contact resistance	3.5.10	4.6.12
Temperature cycling:	3.5.11	4.6.13
a. Manually mate and unmate at low temps		
b. After temp cycling visual inspection for degradation)		
Humidity:	3.5.13	4.6.15
a. Withstanding voltage (sea level) (Immediately after humidity)	3.5.3	4.6.5.1
b. Insulation resistance (Within 1 to 2 hours after humidity)	3.5.2	4.6.4
c. Insulation resistance (24 hours after humidity)	3.5.2	4.6.4
d. Visual inspection for cracking or separation of the insulation	3.5.13	
Contact resistance ^{1/}	3.5.10	4.6.12
<u>Subgroup IV (2 pair)</u>		
Mating and unmating forces	3.5.14	4.6.16
Contact resistance ^{1/}	3.5.10	4.6.12
Temperature life	3.5.18	4.6.19
Insulation resistance	3.5.2	4.6.4
Contact resistance ^{1/}	3.5.10	4.6.12

See footnotes at end of documents

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TABLE II. Qualification inspection - Continued.

Inspection	Requirement paragraph	Method paragraph
<u>Subgroup V (2 sample units)</u>		
Contact resistance <u>1/</u>	3.5.10	4.6.12
Salt spray testing (corrosion) (unmated) <u>2/</u>	3.5.7	4.6.9
Withstanding voltage (sea level)	3.5.3	4.6.5.1
Contact resistance <u>1/</u>	3.5.10	4.6.12
<u>Subgroup VI (2 sample units)</u>		
Contact retention (removable contacts)	3.5.8	4.6.11
a. Visual inspection for flaws or damage		
<u>Subgroup VII <u>4/</u></u>		
Fungus	3.5.17	4.6.21
a. Visual inspection		
Withstanding voltage (sea level)	3.5.3	4.6.5.1
<u>Subgroup VIII (Solder tail terminations only) (2 sample units)</u>		
Solderability <u>2/</u>	3.5.19	4.6.20
<u>Subgroup IX (flat cable connectors only) (4 sample units)</u>		
Cable retention <u>3/</u>	3.5.4	4.6.6
Withstanding voltage (sea level)	3.5.3	4.6.5.1
<u>Subgroup X (IDC flat cable connectors only) (2 sample units)</u>		
Connector-cable flexing	3.5.9	4.6.12
a. Visual inspection for flaws or damage		
Withstanding voltage (sea level)	3.5.3	4.6.5.1

1/ If both contact resistance and low level circuit resistance are required, they shall be performed on different contact positions. In no instance shall they be performed on the same positions.

2/ These samples shall not be subject to any test in any other group.

3/ Four samples selected at random.

4/ Test specimens may be from completely fabricated parts, or sections or subassemblies cut from completely fabricated parts.

4.4.1.2.4 Production conditions. 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 2 consecutive reporting periods, there has been no production, the manufacturer may be required, at the discretion of the qualifying activity, to submit the products to testing in accordance with the qualifying inspection requirements.

TABLE III. Group A inspection.

Inspection	Requirement paragraph	Method paragraph
Visual and mechanical examination	3.1, 3.3, 3.4, 3.6, and 3.7	4.6.2
Insulation resistance	3.5.2	4.6.4
Withstanding voltage (sea level)	3.5.3	4.6.5.1

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TABLE IV. Lot and sample size.

Lot size	Sample size
1 to 50	5
51 to 90	7
91 to 150	11
151 to 280	13
281 to 500	16
501 to 1200	19
1201 to 3200	23
3201 to 10000	29
10001 and over	35

4.4.2 Group B inspection. Group B inspection shall consist of the tests specified in [table V](#), in the order shown, and shall be made on sample units which have been subjected to and have passed the group A inspection.

4.4.2.1 Sampling plan (Group B). Four connectors of each specification sheet shall be selected at random from production. These inspections shall be performed at least once each 6 months for each class but not more often than 3 months.

4.4.2.2 Preparation of sample units. All connector samples shall be assembled to uniform lengths of flat cable in accordance with [MIL-DTL-49055](#) or mounted to printed wiring boards. The conductor size or printed wiring board thickness shall be as specified in the individual specification sheets (see [3.1](#)).

4.4.2.3 Failures. No failures shall be allowed.

4.4.2.4 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 lots shall be separate from new lots, and shall be clearly identified as reinspected lots.

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

TABLE V. Group B inspection.

Inspection	Requirement paragraph	Method paragraph
<u>Subgroup I (2 samples)</u>		
Contact retention	3.5.8	4.6.10
Permeability (when applicable)	3.5.16	4.6.18
Insulation resistance	3.5.2	4.6.4
Contact resistance <u>1/</u>	3.5.10	4.6.12

1/ If both contact resistance and low level circuit resistance are required, they shall be performed on different contact positions. In no instance shall they be performed on the same positions.

4.4.3 Periodic inspection. Periodic inspection shall consist of group C. Except where the results of these inspections show noncompliance with the applicable requirements (see [6.3](#)), delivery of products which have passed groups A and B shall not be delayed pending the results of these periodic inspections.

4.4.3.1 Group C inspection. Group C inspection shall consist of the tests specified in [table VI](#), in the order shown. Group C inspection shall be made on sample units selected from inspection lots which have passed the groups A and B inspection.

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TABLE VI. Group C Inspection.

Inspection	Requirements paragraph	Method paragraph
<u>Subgroup I (4 pair)</u>		
Low level contact resistance	3.5.6	4.6.8
Shock (specified pulse):	3.5.12	4.6.14
a. Visual inspection 10X magnification of solder joints and contacts for cracks or other degradation)		
Vibration:	3.5.5	4.6.7
a. Visual inspection for loosening of parts, cracks, or breaks.		
b. No loss in continuity greater than 1 microsecond		
Low level contact resistance	3.5.6	4.6.8
<u>Subgroup II (2 pair)</u>		
Preconditioning	3.5.1	4.6.3
Mating and unmating forces	3.5.14	4.6.16
Durability	3.5.15	4.6.17
Contact resistance	3.5.10	4.6.12
<u>Subgroup III (2 pair)</u>		
Temperature cycling:	3.5.11	4.6.13
a. Manually mate and unmate at low temps		
b. After temp cycling visual inspection for degradation		
<u>Subgroup IV (2 pair)</u>		
Insulation resistance	3.5.10	4.6.12
Contact resistance	3.5.18	4.6.19
Temperature life	3.5.2	4.6.4
Insulation resistance	3.5.10	4.6.12
Contact resistance		
<u>Subgroup V (2 pair)</u>		
Withstanding voltage	3.5.3	4.6.5.1
Insulation resistance	3.5.2	4.6.4
Humidity:	3.5.13	4.6.15
a. Withstanding voltage (sea level) (Immediately after humidity)	3.5.3	4.6.5.1
b. Insulation resistance (Within 1 to 2 hours after humidity)	3.5.2	4.6.4
c. Insulation resistance (24 hours after humidity)	3.5.2	4.6.4
d. Visual inspection for cracking or separation of the insulation.		
Contact resistance	3.5.10	4.6.12
<u>Subgroup VI (IDC flat cable connectors only) (4 sample units)</u>		
Withstanding voltage (sea level)	3.5.3	4.6.5.1
Connector-cable flexing	3.5.9	4.6.11
a. Visual inspection for flaws or damage		
Withstanding voltage (sea level)	3.5.3	4.6.5.1
<u>Subgroup VII (Solder tail terminations only) (2 sample units)</u>		
Solderability	3.5.19	4.6.20

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4.4.3.2 Sampling plan (Group C). Sampling shall be in accordance with [table VI](#). For group C inspection, connectors with the greatest number of contacts from each specification sheet, of qualified connectors shall be selected at random from units produced within twelve months preceding initial reporting date, and every thirty-six months thereafter. The manufacturer when necessary for inspection purposes shall supply counterpart plugs or receptacles. The connectors shall be assembled to printed wiring boards or to uniform lengths of flat cable in accordance with [MIL-DTL-49055](#).

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

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

4.4.3.5 Noncompliance. If a sample fails to pass group C inspection, the manufacturer shall notify the qualifying activity and the 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 are manufactured 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 qualifying activity has been taken. After the corrective action has been taken group C inspection shall be repeated on additional sample units (all tests and examinations, or the test which the original sample failed, at the option of the qualifying activity). Groups A and B inspections may be reinstated; however, final acceptance and shipment shall be withheld until the group C inspection has shown that the corrective action was successful. In the event of failure after re-inspection, information concerning the failure shall be furnished to the inspection activity and the qualifying activity.

4.5 Materials inspection. Materials inspection shall consist of certification, supported by verifying data, that the materials specified in [table I](#), and on the specification sheets (see [3.1](#)) and used in fabricating the connectors are in accordance with the referenced specifications and requirements (see [3.5](#), [4.6.2](#), and [6.2](#)).

4.6 Methods of inspection.

4.6.1 Test methods. The following identified tests and test methods assure connector integrity within typical operating conditions and applications. Alternate commercial industry stand test methods are allowed. When an alternate method is used, the qualifying activity must be notified prior to performance of the tests. The test methods described herein are proven methods and shall be the referee method in cases of dispute.

4.6.2 Visual and mechanical inspection. Contacts and connectors shall be examined to ensure conformance with this specification and associated specification sheets. Continuous examination shall be performed to assure compliance with the following requirements:

- a. Specification sheets (see [3.1](#)).
- b. Materials (see [3.3](#), [3.3.1](#), and [4.5](#)).
- c. Design, construction and physical dimensions (see [3.4](#)).
- d. Marking (see [3.6](#)).
- e. Workmanship (see [3.7](#)).

4.6.3 Preconditioning (see [3.5.1](#)). Before any environmental tests are conducted, the connectors shall be coupled and uncoupled 3 times.

4.6.4 Insulation resistance (see [3.5.2](#)). The unmated connectors shall be tested in accordance with test procedure [EIA-364-21](#).

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4.6.5 Withstanding voltage (see [3.5.3](#)).

4.6.5.1 Sea level. The mated connectors shall be tested in accordance with test procedure [EIA-364-20](#) test condition I. The following details shall apply:

- a. Points of application: The test voltage shall be applied between two adjacent contacts and between the housing and the contacts nearest the housing, if the housing is conductive see [3.1](#).
- b. Duration of test voltage: 5 seconds, minimum.

4.6.5.2 At altitude. The connectors shall be tested in accordance with test procedure, [EIA-364-20](#) test condition IV. The following details shall apply:

- a. Special preparations or conditions: Mated connectors shall be placed in a vacuum chamber at a pressure of 33.0 millimeters of mercury (70,000 feet), maximum.
- b. Magnitude of test voltage: A test voltage shall be applied for one minute during the first five minutes at altitude and for one minute during the following thirty minutes while at altitude and after 30 minutes at altitude (see [3.1](#)).

4.6.6 Cable retention (flat cable only) (see [3.5.4](#)). The unmated wired connector with strain relief, when applicable, shall be mounted by normal mounting means and aligned with the test fixture. The following details shall apply:

- a. An axial force of 8 ounces (2.22 Newton's) per contact shall be applied.
- b. The force shall be applied 6 inches (152.4 mm) from the mating face of the connector to the cable and shall be pulled away from the connector in a direction that will put the maximum stress on the contact-cable interface.

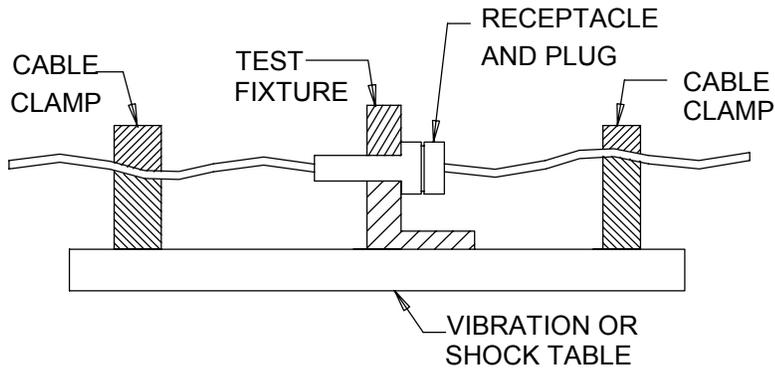
4.6.7 Vibration (see [3.5.5](#)). Mated connectors shall be tested in accordance with test procedure [EIA-364-28](#), test condition IV. The following details shall apply:

- a. Preparation: All contacts shall be wired in series.
- b. Applied current: 10 milliamperes.
- c. Fixture: See [figure 1](#).
- d. The cable shall be supported at a distance of 4 inches from the connector body.

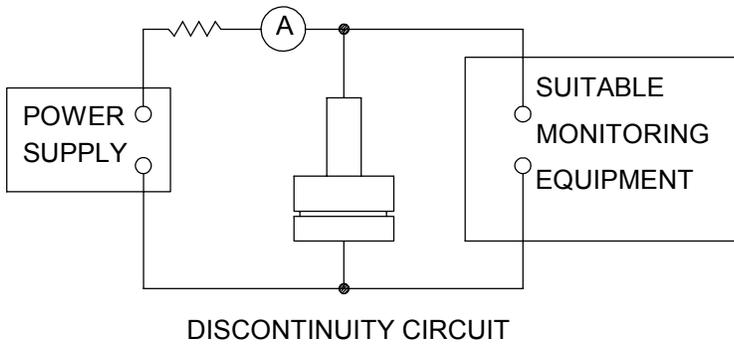
4.6.8 Low level contact resistance (see [3.5.6](#)). Connectors shall be tested in accordance with test procedure [EIA-364-23](#). The following details shall apply.

- a. Test samples shall consist of mated connector pairs. Unless otherwise specified, twenty percent, but not less than 9 contacts shall be tested. Contact test positions shall be evenly distributed in each row of multi-row connectors, at each end, and in the middle.
- b. Wire size when applicable shall be as specified in the detail specification sheets (see [3.1](#)).
- c. Environmental conditioning not required.
- d. When connectors are assembled to printed wiring boards, the voltage drop shall be taken at the terminations at the point of attachment to the board.

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MOUNTED FLAT CABLE PLUG AND RECEPTACLE CONNECTORS



DISCONTINUITY CIRCUIT

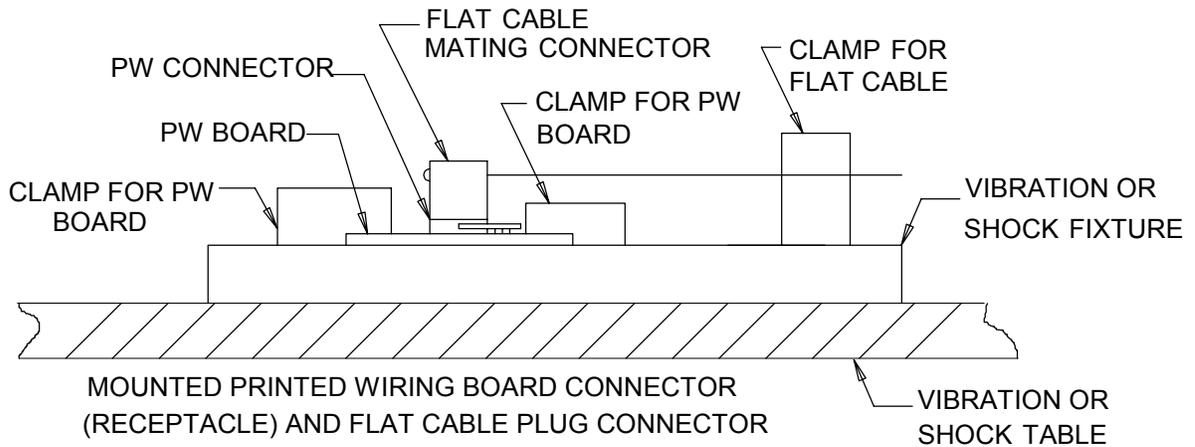


FIGURE 1. Vibration and shock fixtures.

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4.6.9 Salt spray (corrosion) (unmated) (see 3.5.7). Connectors shall be tested in accordance with test procedure [EIA-364-26](#), condition B. The following details shall apply.

- a. Connectors shall then be examined as specified in test procedure [EIA-364-26](#) for evidence of corrosion.
- b. Measurements after test: Withstanding voltage and low level contact resistance shall be measured as specified in [4.6.5](#) and [4.6.8](#) respectively.

4.6.10 Contact retention (removable contacts only) (see 3.5.8). Connectors shall be tested in accordance with test procedure [EIA-364-29](#). The following details shall apply:

- a. Axial direction: Shall be applied in both directions.
- b. Axial load: As specified in the detail specification sheets (see [3.1](#)).

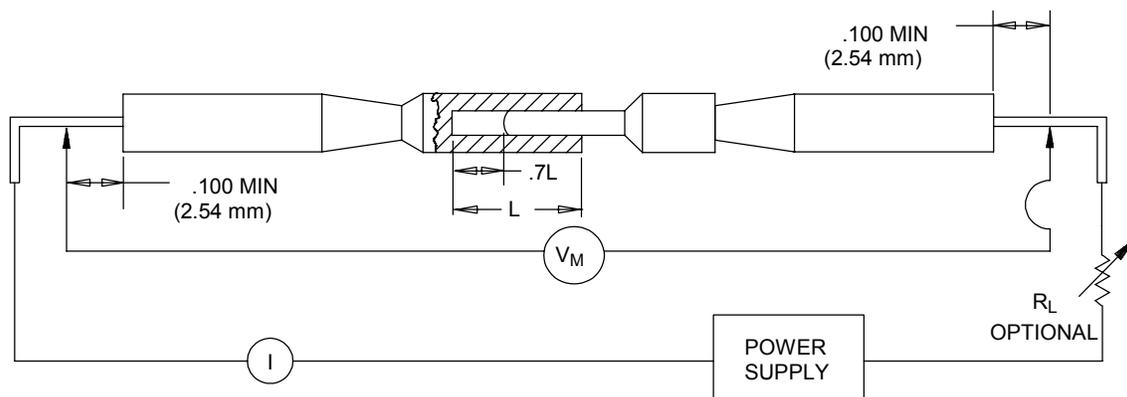
4.6.11 Connector-cable flexing (flat cable only) (see 3.5.9). Connectors shall be tested in accordance with test procedure [EIA-364-41](#), test condition II. The following details shall apply:

- a. Test procedure:
 - (1) The assembled wired connector shall be installed in fixture.
 - (2) Each cable shall be gripped 12 inches (305 mm) from the connector with an applied tension of 2 ± 1 pound per inch of cable width.
 - (3) Each cable shall be individually loaded.
 - (4) The cable or the connector shall be moved through an arc of 140 degrees ± 10 for 50 cycles.
 - (5) One complete cycle shall consist of the rotation of the cable or connector from the neutral position to 70 degrees ± 5 in both directions.
 - (6) The cycling rate shall be 10 ± 1 cycles per minute.
 - (7) A monitoring current of 10 ma shall be applied through the conductor of the test cables and the contacts of the connector in series.
- b. Suitable equipment shall be used to monitor the current flow and indicate a 1 microsecond or greater interruption of current flow.
- c. Measurements: A visual inspection shall be made to check for flaws or damage and the withstanding voltage shall be measured as specified in [4.6.5](#).

4.6.12 Contact resistance (see 3.5.10). The requirements specified in [3.5.10](#) shall be met when tested in accordance with test procedure [EIA-364-06](#). Wire length shall be 6 inches (15.24 cm). Twenty percent, but not less than 9 mated connector pairs shall be tested. The applicable test circuit shall be as shown on [figure 2](#), and contacts shall be fully mated (see [figure 2](#)). The following details shall apply.

- a. Wire size: As specified (see [3.1](#)).
- b. Preparation: Connectors mated.
- c. Test current: 1 ampere.
- d. When connectors are assembled to PWB, the voltage drop shall be taken at the point of attachment to the boards.
- e. Contact resistance shall be as specified in the specification sheets (see [3.1](#)).

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NOTES:

1. Voltage drop measurement connection points shall be permanent connections and may be protected by potting or equivalent means.
2. Total resistance equals the wire resistance plus the mated contact resistance.

FIGURE 2. Test circuit for measurement of contact resistance.

4.6.13 Temperature cycling (see 3.5.11). Connectors shall be tested in accordance with test procedure EIA-364-32, test condition I, 5 cycles. The following details shall apply:

- a. Test connectors: Wired and mated.
- b. A mated connector shall be weighed and the weight recorded.
- c. The dwell time shall be determined by test procedure EIA-364-32.
- d. Step 3 shall be 120°C.
- e. At the completion of the last cycle, the connectors shall be returned to room temperature and shall meet the contact resistance specified in 3.5.10.
- f. Connectors shall exhibit no visual evidence of physical degradation and shall pass succeeding tests of table II or table VI as applicable in sequence.

4.6.14 Shock (specified pulse) (see 3.5.12). The connectors shall be tested in accordance with test procedure EIA-364-27, condition H. The following details shall apply:

- a. Fixture: The test specimens shall be attached to the test fixture using their normal attaching means. The cables shall be rigidly supported at a distance of 4 inches from the connector body (see figure 1).
- b. Test specimens: Wired and mated; conductors shall be connected in series with a suitable monitoring circuit to detect any interruptions of current greater than 1 microsecond. Special mounting means may be utilized upon agreement between the manufacturer, customer and the government.
- c. Applied current: 10 milliamperes.
- d. The cable shall be supported at a distance of 4 inches (101.6 mm) from the connector body.
- e. Following completion of shocks on each axis, solder joints and contacts shall be examined at 10X magnification for signs of cracks or other degradation. The remainder of the connectors shall be inspected for damage and evidence of unusual wear.

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4.6.15 Humidity (see [3.5.13](#)). The plug and receptacles shall be tested in accordance with test procedure [EIA-364-31](#) method II, test condition B. The following details shall apply:

- a. Samples: The plugs and receptacles shall be mated and wired, unless otherwise specified (see [3.1](#)).
- b. Upon completion of step 6 of the final cycle, the connectors shall be removed from the chamber, unmated, and surface moisture shall be removed.
- c. The following tests shall be performed:
 - (1) Immediately following removal of surface moisture, the withstanding voltage test specified in [4.6.5.1](#) (sea level) shall be performed.
 - (2) Within 1 to 2 hours after removal of surface moisture, the insulation resistance test specified in [4.6.4](#) shall be performed.
 - (3) Contact retention shall be measured as specified in [4.6.10](#).
- d. After the 24-hour conditioning period, the insulation resistance specified in [3.5.2](#) shall again be measured.

4.6.16 Mating and unmating forces (see [3.5.14](#)). Mated connectors shall be tested in accordance with test procedure [EIA-364-13](#). The following details shall apply:

- a. Rate of mating and unmating: One to 10 inches (25.4 to 250 mm) per minute.

4.6.17 Durability (see [3.5.15](#)). The connector assemblies shall be subjected to 500 cycles of mating and unmating at a rate of 600 cycles per hour. Following the test, contact resistance shall be measured as specified in [4.6.12](#).

4.6.18 Permeability (when applicable) (see [3.5.16](#)). Unmated connectors and connector assemblies with metal parts and mounting hardware shall be tested in accordance with test procedure [EIA-364-54](#).

4.6.19 Temperature life (see [3.5.18](#)). The connectors shall be tested in accordance with test procedure [EIA-364-17](#). The following details and exceptions apply:

- a. Sample preparation: Mated and wired connectors.
- b. Test condition: Rated temperature (see [3.1](#) and [6.7.1](#)).
- c. Test time condition D.
- d. Measurements after test: Insulation resistance and contact resistance shall be measured as specified in [4.6.4](#) and [4.6.12](#), respectively.

4.6.20 Solderability (see [3.5.19](#)). The solder tail terminals shall be subject to the testing as specified in [MIL-STD-202](#), method 208. The following details shall apply:

- a. Test samples shall not be cleaned prior to soldering.
- b. Twenty percent, but not less than 7 leads of test specimens shall be tested.
- c. Examination at 10X magnification.

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4.6.21 Fungus resistance. There shall be no evidence of fungus growth on the external surfaces when tested as specified in 3.5.17. The following details shall apply:

- a. Test specimens may be from completely fabricated parts, or sections or subassemblies cut from completely fabricated parts.
- b. For visual evaluation three test samples shall be inoculated. If the two sides of a test sample are different, the test shall be conducted on three samples of each side, face up and face down.
- c. Using visual inspection, look for evidence of cracking, swelling, discoloration, blistering or other signs of deterioration in the test sample.
- d. Immediately after visual inspection perform the withstanding voltage test (sea level) as specified in 3.5.3.
- e. Each individual insulator body material used shall be tested; individual detail specification sheets do not need to be tested that utilize the same insulator body material.

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 material 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 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 which may be helpful, but is not mandatory.)

6.1 Intended use. The sockets covered by this specification are intended for use on a printed circuit board or mounting into a chassis. Terminals may be soldered to the printed circuit board unless otherwise noted (see 3.1). Only plug-in component leads with similar finishes to the mating socket contacts should be mated; reference MIL-HDBK-454, General Guidelines for Electronic Equipment.

6.1.1 Military-unique rationale. The connectors covered by this specification are military unique because they must be able to operate satisfactorily under high altitude (70,000 feet maximum), resist corrosion due to salt spray; and 30 g of shock without discontinuities. Commercial electronic connectors are not designed to withstand such extreme environmental conditions and would experience catastrophic failure.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number and date of the basic specification.
- b. Title, number and date of the applicable specification sheet, and the complete PIN (see 1.2.1 and 3.1).
- c. Level of preservation, packaging, and marking required (see section 5).
- d. Certificate of compliance covering materials, when required.

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6.3 Qualification. With respect to products requiring qualification, awards will be made only for products that, at the time of award, are qualified for inclusion in QPL No.83503 whether or not such products have actually been listed by that date. The attention of contractors is called to this requirement. In order to be eligible for contracts or orders for products covered by this specification, manufacturers should arrange for qualification testing of products they propose to offer the Federal Government. The activity responsible for the QPL is DSCC-VQ, which may be contacted at the Defense Supply Center Columbus, P.O. Box 3990, ATTN: DSCC-VQ, Columbus, Ohio 43218-3990 or emailed to <mailto:RectangularConnector@dla.mil>. Application procedures should conform to the "Provisions Governing Qualification" (see 6.3.1).

6.3.1 Provisions governing qualification. Copies of "Provisions Governing Qualification" may be obtained upon application to Standardization Document Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

6.4 Tin whisker growth. The use of pure tin may exhibit tin whisker growth problems (days to months to years) after manufacture. Tin whiskers can develop under typical operating conditions on any product that uses lead-free pure tin coatings. Conformal coatings applied over top of a whisker-prone surface will not prevent the formation of tin whiskers. Alloys of 3 percent lead have shown to inhibit the growth of tin whiskers.

6.5 Environmentally preferable material. Environmentally preferable materials should be used to the maximum extent possible that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs. Table XIII lists the Environmental Protection Agency (EPA) top seventeen hazardous materials targeted for major usage reduction. If any of these hazardous materials are required, it is recommended that it be used only when other materials cannot meet performance requirements.

TABLE XIII. EPA top seventeen hazardous materials.

Benzene	Dichloromethane	Tetrachloroethylene
Cadmium and compounds	Lead and compounds	Toluene
Carbon Tetrachloride	Mercury and compounds	1,1,1 - Trichloroethane
Chloroform	Methyl Ethyl compounds	Trichloroethylene
Chromium and compounds	Methyl Isobutyl Ketone	Xylenes
Cyanide and compounds	Nickel and compounds	

6.6 Subject term (key word) listing.

Beryllium
 Contacts
 Copper
 Gold
 Lead
 Nickel
 Polarization
 Tin

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6.7 Definition.

6.7.1 Rated temperature. Rated temperature is the maximum value of the temperature range and also the maximum hot spot temperature of the connector.

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.

CONCLUDING MATERIAL

Custodians:
Air Force - 11
DLA - CC

Preparing activity
DLA - CC

(Project 5935-4601-000)

Review activities:
Air Force - 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 <http://assist.daps.dla.mil>.