

MILITARY SPECIFICATION

CONNECTORS, PLUG AND RECEPTACLE, ELECTRIC,  
RECTANGULAR, HIGH DENSITY; POLARIZED CENTER JACKSCREW,  
GENERAL SPECIFICATION FOR

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

1. SCOPE

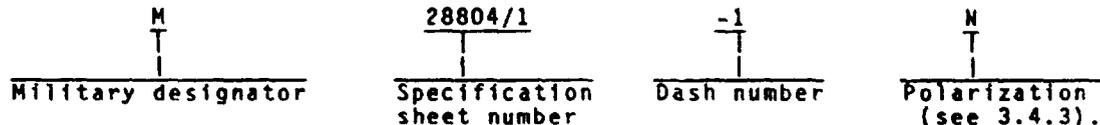
1.1 Scope. This specification covers rectangular electrical connectors, with size 22, nonremovable, solder type contacts, and rear removable crimp type contacts, environment resistant and nonenvironment, intended for use in electronic and electrical equipment (see 6.1).

1.2 Classification.

1.2.1 Classes:

- G - General purpose, nonmagnetic, high density, size 22, rear release, crimp removable contacts.
- P - Environment resisting, potting type, nonmagnetic, high density, size 22, rear release, crimp removable contacts.
- E - Environment resisting, nonmagnetic, high density, size 22, rear release, crimp removable contacts.
- S - Solder termination, general purpose, high density, nonremovable, size 22 contacts.
- SE - Solder termination, interfacial seal, high density, nonremovable, size 22 contacts.

1.2.2 Part or Identifying Number (PIN). The PIN shall consist of the letter "M", the basic number of the specification sheet, an assigned dash number, and a polarization letter (see 3.1), as shown in the following example:



2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 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.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Defense Electronics Supply Center, ATTN DESC-EMT, 1507 Wilmington Pike, Dayton, OH 45444-5284, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or letter.

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SPECIFICATIONS

FEDERAL

QQ-M-290 - Nickel Plating (Electrodeposited).

MILITARY

MIL-H-5606 - Hydraulic Fluid, Petroleum Base; Aircraft, Missile, and Ordnance.  
MIL-I-17214 - Indicator, Permeability; Low-Mu (Go-No-Go).  
MIL-C-22520 - Crimping Tools, Terminal, Hand, Wire Termination for Wire Barrel  
Sizes 20 Through 28.  
MIL-W-22759 - Wire, Electric, Fluoropolymer-Insulated, Copper or Copper Alloy.  
MIL-L-23699 - Lubricating Oil, Aircraft Turbine Engines, Synthetic Base.  
MIL-M-24519 - Molding Plastics, Polyester Thermoplastic.  
MIL-G-45204 - Gold Plating, Electrodeposited.  
MIL-P-46161 - Plastic Molding Material, Polyterephthalate Thermoplastic, Glass  
Fiber Reinforced.  
MIL-C-55330 - Connectors, Electrical and Fiber optic, Packaging of.  
MIL-W-81381 - Wire, Electric, Polyimide-Insulated, Copper or Copper Alloy.  
MIL-P-81728 - Plating, Tin Lead (Electrodeposited).  
MIL-I-81969 - Installing and Removal Tools Connector Electrical Contact  
General Specification For.

(See supplement 1 for list of associated specification sheets and military standards).

STANDARDS

MILITARY

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.  
MIL-STD-202 - Test Methods for Electronic and Electrical Component Parts.  
MIL-STD-454 - Standard General Requirements for Electronic Equipment.  
MIL-STD-1285 - Marking of Electrical and Electronic Parts.  
MIL-STD-1344 - Test Methods for Electrical Connectors.  
MIL-STD-1632 - Insert Arrangements for MIL-C-28804 High Density Rectangular  
Electric Connectors.  
MIL-STD-45662 - Calibration System Requirements.  
MS3197 - Gage Pin for Socket Contact Engagement Test.  
MS27488 - Plug, Sealing, Electric Connector.

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2 Non-Government publications. The following documents 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 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 document cited in the solicitation (see 6.2).

ELECTRONIC INDUSTRIES ASSOCIATION (EIA)

EIA-364-11-1987 - Test Procedure No.11, Resistance to Solvents, Test Procedure for Electrical Connectors.

EIA-364-56-1987 - Test Procedure No. 56, Resistance to Soldering Heat, Test Procedure for Electrical Connectors.

(Application for copies should be addressed to the Electronic Industry Association, Engineering Department, 1722 Eye Street N.W., Washington, DC 20006.)

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for related associated detail specifications, specification sheets or MS standards), 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 requirements of this specification and the specification sheet, the latter shall govern.

3.2 Qualification. Connector assemblies or removable crimp contacts furnished under this specification shall be products which are authorized by the qualifying activity for listing on the applicable qualified products list at the time of award of contract (see 4.5 and 6.3).

3.3 Materials. Materials shall be as specified herein. However, when a definite material is not specified, a material shall be used which will enable the connectors to meet the performance requirements of this specification. Acceptance or approval of any constituent material shall not be construed as a guaranty of acceptance of the finished product.

3.3.1 Dissimilar metals. When dissimilar metals are employed in intimate contact with each other, protection against electrolytic corrosion shall be provided as specified in requirement 16 of MIL-STD-454.

3.3.2 Nonmagnetic materials. All parts used in connectors shall be made from materials which are classed as nonmagnetic (see 3.5.1).

3.3.3 Contact materials. Contacts shall be made of suitably conductive copper based alloys and shall not contain greater than 3.5 percent lead content. All contacts shall be suitably protected from corrosion. When contacts are in-process plated in strip form, the absence of plating in the separation area is acceptable, provided the area is nonfunctional and any corrosion products formed as a result of salt spray testing (see 4.7.16) does not appear in contact mating or termination area.

3.3.3.1 Contact plating (classes G, P, and E). Contacts shall be gold-plated in accordance with MIL-G-45204, type 11, grade B or C, class 1 over a suitable underplating (underplating shall have no silver content), except that the accessory (hood) on socket contacts shall be suitably protected from corrosion.

3.3.3.2 Contact finish (classes S and SE). The contact finish on the bodies shall be gold applied either overall (see 3.3.3.2.1) or localized (see 3.3.3.2.2).

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3.3.3.2.1 Overall finish. Contacts shall be gold plated in accordance with MIL-G-45204, type II, grade B or C, class 1.

3.3.3.2.2 Localized finish. Contact bodies shall be overall nickel plated in accordance with QQ-N-290, except plating thickness shall be 50 to 150 microinches thick.

3.3.3.2.2.1 Contact mating area. The contact mating area as shown on figure 1 shall be gold plated in accordance with MIL-G-45204, type II, grade B or C, class 1 (see 3.3.3.2.2).

3.3.3.2.2.2 Printed wiring tails. Contact wiring tails shall be tin-lead plated in accordance with MIL-P-81728. Solder dipping is permitted, providing it meets the procedures and requirements of MIL-STD-202, method 208.

3.3.4 Dielectric materials.

3.3.4.1 Insert. Insert materials shall be thermoplastic polyester in accordance with MIL-M-24519, type GPT-30F, 30 percent glass filled in accordance with MIL-P-46161, grade B, class 3, or as otherwise specified (see 3.1)

3.3.4.2 Grommets and interfacial seals. Materials shall be high grade dielectric having hardness, electrical, and mechanical characteristics suitable for the purpose intended.

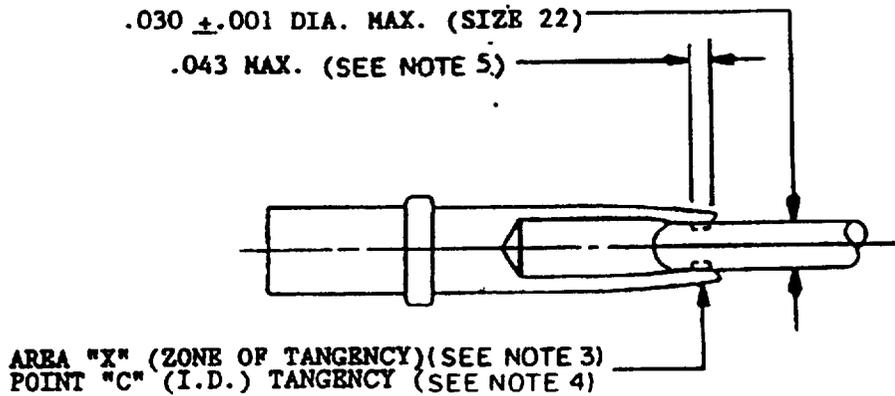
3.3.5 Polarizing and engaging hardware. Polarizing and engaging hardware shall be of high grade corrosion resistant material or a material treated to resist corrosion which allows the complete connector assembly to meet the requirements of this specification.

3.4 Design, construction, and physical dimensions. Connectors shall be of the design, construction, and physical dimensions specified (see 3.1). Connectors shall be designed so that neither the pins nor the sockets will be damaged during normal mating of counterpart connectors.

3.4.1 Contact design. Contacts shall be as specified on the individual specification sheet (see 3.1).

3.4.1.1 Printed wiring tails (solder contacts). Printed wiring tails (solder contacts) shall be nonremovable from the insert and shall have solder post terminals as specified (see 3.1).

3.4.1.2 Removable contacts. Removable contacts shall be in accordance with MIL-C-28804/9 and MIL-C-28804/10. The inserts shall be designed to provide positive individual contact retention, and individual contact release from the wire side of the connector, using an M81969/01-04 tool or equivalent that meets the requirements of MIL-I-81969. The insert design shall permit individual insertion and extraction of contacts without use of a retention ring, or removal of the insert or sealing members. The individual contact retention members shall be surrounded by rigid dielectric material, configured so as to limit their flexure during contact insertion and removal as required to prevent overstepping. Insertion and extraction shall be possible with a full complement of maximum outside diameter (OD) wire (see table I). Crimp barrels shall be designed to be crimped by a tool conforming to MIL-C-22520/2. Locators shall be as specified (see 3.1). For indirect shipment, connectors may be ordered without contacts (see 6.2).



Inches	mm
.001	0.03
.030	0.76
.043	1.09

SOCKET CONTACT WITH INTEGRAL PRESSURE MEMBER ONLY

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Localized finish: Apply gold to the inside and outside diameter of the contact in area "X". Measure gold thickness on outside diameter of the contact at point "C".
4. On socket contacts with integral pressure members, area "X" (zone tangency) extends from the tip of the contact to .020 inch beyond the point of tangency, point "C" on the outside diameter of the contact.
5. Point at which a square-ended pin of the same basic diameter as the mating contact first engages the socket contact spring.

FIGURE 1. Contact mating area.

TABLE I. Wire sizes and diameters.

Wire size (AWG)	Finished wire OD (inch)	
	Minimum	Maximum
26, 24, 22	.030	.054

**3.4.2 Insert design and construction.** Inserts shall be designed with suitable sections and radii such that they will not readily chip, crack, or break in assembly or in normal service. Inserts shall be molded or bonded one-piece construction, and shall not be hollowed out for weight saving purposes. Pin entry openings on socket insert faces shall be as small as practicable. Socket inserts shall provide adequate protection against a pin contacting a socket before the mating pair of connectors has been polarized. The contact retaining system shall be free of foreign material, adhesive, or any obstruction that would prevent smooth contact insertion and positive retention.

**3.4.2.1 Insert arrangement.** The insert arrangement shall be as indicated in MIL-STD-1632.

**3.4.2.2 Contact alignment and stability.** With all contacts in place, the alignment of pin and socket contacts shall always permit engagement irrespective of buildup of allowable tolerances on hole locations, distortion of contacts due to crimping, and insert location in the shell.

**3.4.3 Polarization.** Polarization shall be accomplished by hex keys (see figure 2) and shall be as specified (see 3.1). Polarization shall be accomplished before engagement of pins and sockets.

**3.4.4 Interchangeability.** All connectors having the same PIN shall be completely interchangeable with each other with respect to installation (physical) and performance (function) as specified herein. Solder and crimp contact connectors shall be intermateable (see 3.1).

**3.4.5 Sealing plugs (class E only).** Insulated plugs shall be provided for sealing spare contact holes. The plugs shall be in accordance with MS27488. For indirect shipment, connectors may be ordered without sealing plugs (see 6.2).

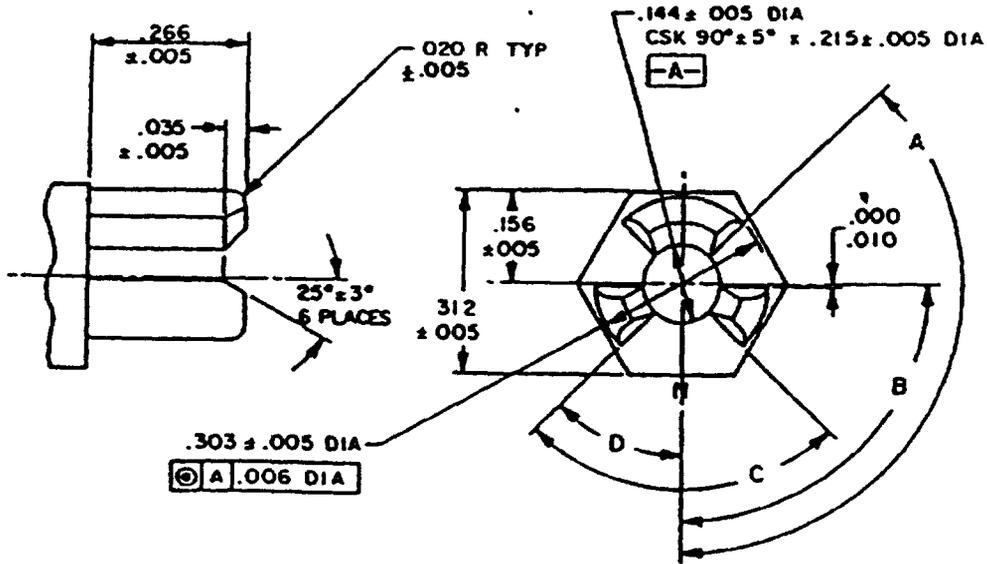
**3.4.6 Interfacial seal.** For classes E and P, a resilient interfacial seal shall be bonded to the pin insert; for class SE, the seal shall not be bonded.

**3.5 Performance.** Connectors shall be designed to meet the performance requirements specified herein.

**3.5.1 Magnetic permeability.** When measured as specified in 4.7.2, the relative permeability of connectors shall not exceed 2 mu.

**3.5.2 Maintenance aging (crimp contact connectors only).** After testing as specified in 4.7.3, all crimp-contact connectors shall be capable of conforming to the requirements of 3.5.3 and 3.5.4.

**3.5.3 Contact insertion and removal force.** When tested as specified in 4.7.4, the axial forces required to insert and remove removable contacts shall conform with the applicable requirements of table II.



POLARIZATION	A+0 30"	B+0 30"	C+0 30"	D+0 30"
N, V, W	135	90	90	45
X, Y, Z	137 30"	90	85	42 30"

Polarization key

Inches	mm	Inches	mm
.005	0.13	.156	3.96
.010	0.25	.215	5.46
.020	0.51	.266	6.76
.035	0.89	.303	7.70
.144	3.66	.312	7.92

NOTES:

1. Dimensions are in inches
2. Metric equivalents are given for general information only.
3. To polarize connector, the boss is mounted in the insert with largest opening adjacent to the desired position ("N" polarization shown).

FIGURE 2. Polarization key.

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TABLE II. Contact insertion and removal forces.

	Maximum force (pounds)	
	Class	
	G and P	E
Insertion	3	15
Removal	4	15

3.5.4 Mating and unmating force. When tested as specified in 4.7.5, the force for mating and unmating of counterpart connectors shall meet the requirements of table III. When connectors are mated to the torque values of table III, the maximum allowable dimension between flanges shall be .320 inch. The connectors used for this test shall have the complete complement of contacts.

TABLE III. Mating and unmating force.

Shell size	Inch-pounds maximum
8	.5
10	1.13
12	2.75
14	3.25
16	4.00
18	7.00

3.5.5 Contact retention. When tested as specified in 4.7.6, the axial displacement of the contacts shall not exceed .012 inch while under load. For classes G, E, and P, contacts shall be retained in their inserts.

3.5.6 Dielectric withstanding voltage. When tested as specified in 4.7.7, unmated connectors shall show no evidence of breakdown or flashover. Corona shall not be considered as breakdown.

3.5.7 Insulation resistance. When tested as specified in 4.7.8, the insulation resistance of mated and unmated connectors shall conform to the requirements of table IV (see 3.1).

TABLE IV. Insulation resistance.

Class	Moisture conditioned samples (see 4.7.12)		All other samples
	After step 6	After 24 hours of conditioning	
	Megohms (min)	Megohms (min)	Megohms (min)
Unmated G, S, and SE	1	1,000	5,000
Mated E and P	1	100	5,000

3.5.8 Contact resistance. When tested as specified in 4.7.9, contact resistance for mated pairs of pin and socket contacts shall be as specified in table V (see 3.1).

TABLE V. Contact resistance.

Wire size	Test current	Classes G, E, and P		Classes S and SE	
		After salt spray	All others	After salt spray	All others
	<u>Amperes</u>	<u>mV (max)</u>	<u>mV (max)</u>	<u>mV (max)</u>	<u>mV (max)</u>
26	2.0	70	60	35	25
22	5.0	70	60	35	25

3.5.9 Contact engagement and separation force. When tested as specified in 4.7.10, socket contacts shall conform to the forces specified in table VI.

TABLE VI. Contact engagement and separation force.

Maximum individual engagement force (oz) using maximum test pin	Maximum average engagement force (oz) using maximum diameter test pin	Minimum separation force (oz) using minimum diameter test pin
12.0	9.5	0.7

3.5.10 Thermal shock. When subjected to the temperature extremes of table VII in accordance with 4.7.11, there shall be no damage detrimental to the operation of the connector.

TABLE VII. Temperature extremes.

Extremes	°C
Low	+0
	-55 -3
High	+3
	+125 -0

3.5.11 Humidity. When tested as specified in 4.7.12, connectors shall meet the requirements of dielectric withstanding voltage (see 3.5.6) and insulation resistance (see 3.5.7).

3.5.12 Vibration. When tested as specified in 4.7.13, mated connectors shall not be damaged and there shall be no loosening of parts due to vibration. Counterpart connectors shall be retained in engagement and there shall be no interruption of electrical continuity or current flow longer than 1 microsecond.

**3.5.13 Shock (specified pulse).** When tested as specified in 4.7.14, mated connectors shall not be damaged and there shall be no loosening of parts, nor shall there be an interruption of electrical continuity or current flow longer than 1 microsecond during the exposure to mechanical shock.

**3.5.14 Durability.** When tested as specified in 4.7.15, counterpart connectors shall show no mechanical or electrical defects detrimental to the operation of the connector as specified for mating and unmating forces (see 3.5.4) and contact engagement and separation forces (see 3.5.9) after 500 cycles of mating and unmating.

**3.5.15 Salt spray (corrosion).** When tested as specified in 4.7.16, mated connectors shall show no exposure of base metal due to corrosion which will affect performance as specified for mating and unmating forces (see 3.5.4) and contact resistance (see 3.5.8).

**3.5.16 Oversize pin exclusion.** When tested as specified in 4.7.17, socket contacts shall exclude the entry of a test pin .036 inch diameter. After testing, the contacts shall meet the requirements for contact resistance (see 3.5.8).

**3.5.17 Probe damage.** When tested as specified in 4.7.18, socket contacts shall meet the requirements of the contact engagement and separation force (see 3.5.9) and shall show no evidence of visible damage.

**3.5.18 Fluid immersion.** When tested as specified in 4.7.19, unmated connectors shall meet the requirements of mating and unmating force (see 3.5.4).

**3.5.19 Crimp contact deformation.** When tested as specified in 4.7.20, crimped contacts shall conform to the requirements of this specification (see 3.5.19.1 and 3.5.19.2).

**3.5.19.1 Deformation of crimped barrel.** The out-of-roundness of the crimped barrel shall not exceed the maximum diameter specified by more than .006 inch.

**3.5.19.2 Axial deformation.** The axial bending of the crimped contact shall not exceed .015 inch, which includes the maximum total indicator readings permitted the contact during its manufacture.

**3.5.20 Contact pin strength.** When tested as specified in 4.7.21, the pin strength for crimp type pin contacts shall be such that a load moment of .32 inch-pound will not produce a permanent set in excess of .005 inch.

**3.5.21 Crimp tensile strength.** When tested as specified in 4.7.22, the tensile strength of crimp joints for individual contacts shall conform to the requirements of table VIII.

TABLE VIII. Crimp tensile strength.

Wire size (AWG)	Tensile strength (lbs minimum)
26	5
22	12

**3.5.22 Altitude immersion (classes P and E).** When tested as specified in 4.7.23 the mated connector shall meet a minimum insulation resistance of 1,000 megohms and the requirements of dielectric withstanding voltage as specified in 4.7.7. The use of epoxy or potting material is permissible when the methods are approved by the qualifying activity.

**3.5.23 Resistance to soldering heat.** When tested in accordance with 4.7.24, the connectors shall be visually inspected and shall show no evidence of distortion or physical damage and shall meet the contact retention requirements of 3.5.5 and dimensional requirements of 3.4.

**3.5.24 Resistance to solvents.** When tested in accordance with 4.7.25, the connectors shall be visually inspected and shall show no evidence of cracking, crazing, discoloration, distortion, or bleeding out of any foreign matter from the material. Pitting shall not be allowed. The marking and color coding shall be legible.

**3.5.25 Solderability (printed wiring tails only).** Solderable, nonremovable, printed wiring tails shall withstand the test specified in 4.7.26.

**3.5.26 Marking.** Each connector shall be legibly and permanently marked on the shell in accordance with MIL-STD-1285. The PIN to be marked on the connector shell shall be as specified (see 3.1).

**3.5.26.1 Insert marking.** The contact identification and arrangement shall be as specified (see 3.1). Letters or numerals shall be raised and clearly legible or shall appear in legible contrasting colors. Positioning and arrangement of the numerals shall be such as to avoid confusion between contacts. Markings shown in MIL-STD-1632 are for the pin insert front and socket rear. Socket face and pin rear are opposite.

**3.5.27 Workmanship.** Connectors and accessories shall meet all design dimensions and intermateability requirements of this specification. Loose contacts, poor molding fabrication, damaged or improperly assembled contacts, peeling, or chipping of plating or finish, galling of mated parts, nicks and burrs of metal parts and post-molding warpage shall be considered adequate basis for rejection of items of quality inferior for the purpose intended.

#### 4. QUALITY ASSURANCE PROVISIONS

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

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

**4.1.2 Test equipment and inspection facilities.** Test and measuring equipment and inspection facilities of sufficient accuracy, quality, and quantity to permit performance of the required inspection shall be established and maintained by the contractor. The establishment and maintenance of a calibration system to control the accuracy of the measuring and test equipment shall be in accordance with MIL-STD-45662.

**4.1.3 Assembly plants.** Assembly plants shall be listed on or approved for listing on the applicable qualified products list. The qualified connector manufacturer shall certify that the assembly plant is approved for the distribution of the manufacturer's parts. The assembly plant shall use only piece parts supplied by the qualified connector manufacturer. No testing other than visual examination is required of certified piece parts obtained from the qualified connector manufacturer, except when there is cause for rejection. All assemblies produced at the assembly plant shall be subjected to examination of product to assure that the assembly process conforms with that established at the qualified manufacturing plant. Quality control requirements, including Government inspection surveillance, shall be the same as required for the qualified connector manufacturer.

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

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

**4.3 Materials inspection.** Material inspection shall consist of certification supported by verifying data that the materials, as specified herein and on the specification sheet (see 3.1), used in the fabricating the connectors, are in accordance with the applicable referenced inspections or requirements prior to such fabrication.

**4.4 Inspection conditions.** Unless otherwise specified, all inspections shall be performed in accordance with the test conditions specified in the "GENERAL REQUIREMENTS" of MIL-STD-1344 and MIL-STD-202.

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

**4.5.1 Sample size and inspection routine.**

**4.5.1.1 Connectors.** A minimum of six completely assembled plugs and receptacles, with crimp terminations or nine completely assembled plugs and receptacles with solder terminations with the insert arrangement of the largest size connector for which qualification is desired shall be subjected to the examinations and tests in the sequence shown in table IX. If both classes E and S or SE connectors are being qualified at the same time, a minimum of three completely assembled plugs and receptacles of class E and a minimum of six completely assembled plugs and receptacles of class S or SE with the insert arrangement of the largest size connector shall be inspected. The connectors shall have their full complement of contacts. The minimum number of contact cavities or contacts shown in table X shall be inspected. Additional samples may be required to provide the contact cavities or contacts as specified in table X. Half of the connectors shall be wired with the maximum size wire (size 22) and the remainder shall be wired with the minimum size wire (size 26). The samples subjected to qualification testing shall be provided with counterpart connectors for those tests requiring mating assemblies. The counterpart connectors provided for this purpose shall be new, previously qualified connectors or new connectors submitted for qualification testing. Suppliers not producing mating connectors shall submit substantiating certification data that tests were performed with qualified counterpart connectors. The samples shall be representative of the manufacturer's production. Connectors shall be wired with approximately 2 feet of M22759/11-22 wire conforming to MIL-W-22759/11 for maximum size wire and M81381/7, /8, /9, or /10-26 wire conforming to MIL-W-81381/7, /8, /9 or /10 for minimum size wire. Termination of wires to crimp contacts shall be accomplished using a MIL-C-22520/2 crimping tool. Classes S and SE connectors may be wired with flexible printed wiring rated at the minimum test current in table V.

TABLE IX. Qualification and periodic inspection (connectors).

Inspection	Requirement paragraph	Method paragraph	Test samples										
			1	2	3	4	5	6 2/	7	8	9		
Inspection of product	3.1, 3.3, 3.4, 3.5.26, and 3.5.27.	4.7.1	X	X	X	X	X	X	X	X	X	X	X
Magnetic permeability <u>1/</u>	3.5.1	4.7.2			X	X							
Maintenance aging (crimp contact connectors only)	3.5.2	4.7.3	X		X								
Contact insertion and removal force	3.5.3	4.7.4	X		X								
Mating and unmating force	3.5.4	4.7.5	X		X								
Contact retention	3.5.5	4.7.6	X	X	X	X							
Dielectric withstanding voltage <u>1/</u>													
At sea level	3.5.6	4.7.7.1	X	X	X	X	X						
At altitude	3.5.6	4.7.7.2	X	X	X	X	X						
Insulation resistance <u>1/</u>	3.5.7	4.7.8	X	X	X	X	X						
Contact resistance <u>2/</u>	3.5.8	4.7.9	X	X	X	X							
Contact engagement and separation force <u>2/</u>	3.5.9	4.7.10	X	X	X	X	X						
Mating and unmating force	3.5.4	4.7.5	X	X	X	X	X						
Thermal shock	3.5.10	4.7.11	X	X	X	X	X						
Humidity	3.5.11	4.7.12	X	X	X	X	X						
Dielectric withstanding voltage	3.5.6	4.7.7	X	X	X	X	X						
Insulation resistance	3.5.7	4.7.8	X	X	X	X	X						
Vibration	3.5.12	4.7.13	X	X	X	X	X						
Shock (specified pulse)	3.5.13	4.7.14	X	X	X	X	X						
Durability	3.5.14	4.7.15	X	X	X	X	X						
Mating and unmating force	3.5.4	4.7.5	X	X	X	X	X						
Contact engagement and separation force	3.5.9	4.7.10	X	X	X	X	X						
Altitude immersion	3.5.22	4.7.23	X	X	X	X	X						
Salt spray (corrosion)	3.5.15	4.7.16	X	X	X	X	X						
Mating and unmating force	3.5.4	4.7.5	X	X	X	X	X						
Contact resistance	3.5.8	4.7.9	X	X	X	X	X						
Contact retention	3.5.5	4.7.6	X	X	X	X							
Oversize pin exclusion <u>2/</u>	3.5.16	4.7.17	X	X	X	X							
Contact resistance <u>2/</u>	3.5.8	4.7.9	X	X	X	X							
Probe damage <u>2/</u>	3.5.17	4.7.18	X	X	X	X							
Contact engagement and separation force <u>2/</u>	3.5.9	4.7.10	X	X	X	X							
Fluid immersion <u>1/</u>	3.5.18	4.7.19	X	X	X	X	X						
Mating and unmating force <u>1/</u>	3.5.4	4.7.5	X	X	X	X	X						
Crimp contact deformation <u>1/</u> <u>2/</u>	3.5.19	4.7.20						X					
Contact pin strength <u>1/</u> <u>2/</u>	3.5.20	4.7.21						X					
Crimp tensile strength <u>1/</u> <u>2/</u>	3.5.21	4.7.22						X					
Inspection of product <u>1/</u> <u>2/</u>	3.1, 3.3, 3.4, 3.5.26, and 3.5.27.	4.7.1	X	X	X	X	X	X					
Resistance to solder heat <u>1/</u> <u>3/</u>	3.5.23	4.7.24							X	X	X		
Contact retention <u>1/</u> <u>3/</u>	3.5.5	4.7.6							X	X	X		
Resistance to solvents <u>1/</u> <u>3/</u>	3.5.24	4.7.25							X	X	X		
Solderability (printed wiring tails only)	3.5.25	4.7.26							X	X	X		
Inspection of product <u>1/</u> <u>3/</u>	3.1, 3.3, 3.4, 3.5.26, and 3.5.27.	4.7.1							X	X	X		

1/ Not applicable for retention of qualification.

2/ When using previously qualified crimp contacts these tests are not required.

3/ Connectors with printed wiring tails only.

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**4.5.1.1.1 Qualification of similar classes.** Qualification of class E connectors shall also qualify classes G and P.

**4.5.1.2 Contacts (crimp-removable only).** A minimum quantity of contacts as listed in table X shall be inspected. Half of the contacts shall be wired with maximum size wire, and the remainder shall be wired with minimum size wire as specified in 4.5.1.1. The samples shall be subjected to the qualification testing shown in table XI and shall be provided with connectors for those tests requiring connectors or mating connector assemblies. The connectors provided for this purpose shall be previously qualified connectors. Suppliers not producing connectors shall submit substantiating certification data that tests were performed with qualified connectors. The samples shall be produced with equipment and procedures used in production.

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

**4.5.3 Retention of qualification.** To retain qualification, the contractor shall forward a report at 12-month intervals to the qualifying activity. The qualifying activity shall establish the initial reporting date. The report shall consist of:

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

Failure to submit either report within 60 days after the end of each reporting period may result in loss of qualification for the product. In addition, the contractor shall immediately notify the qualifying activity that the inspection data indicates failure of the qualified product to meet the requirements of this specification.

In the event that no production occurred during the reporting period, a report shall be submitted certifying that the company still has the capabilities and facilities necessary to produce the item. If during two consecutive reporting periods, there has been no production, the manufacturer may be required, at the discretion of the qualifying activity, to submit the products (a representative product of each connector) to testing in accordance with the qualification inspection requirements.

TABLE X. Samples for qualification and periodic inspection.

Contacts (minimum)	
Qualification	Retention of qualification
Classes G, E, and P	All classes
300	100

TABLE XI. Qualification and periodic inspection (crimp removable contacts only).

Inspection	Requirement paragraph	Method paragraph
Inspection of product	3.1, 3.3, 3.4, 3.5.26, and 3.5.27	4.7.1
Maintenance aging (crimp contact connectors only)	3.5.2	4.7.3
Contact insertion and removal force	3.5.3	4.7.4
Mating and unmating force	3.5.4	4.7.5
Contact resistance	3.5.8	4.7.9
Contact engagement and separation force	3.5.9	4.7.10
Thermal shock	3.5.10	4.7.11
Vibration	3.5.12	4.7.13
Shock (specified pulse)	3.5.13	4.7.14
Durability	3.5.14	4.7.15
Mating and unmating force	3.5.4	4.7.5
Contact engagement and separation force	3.5.9	4.7.10
Oversize pin exclusion	3.5.16	4.7.17
Probe damage	3.5.17	4.7.18
Contact engagement and separation force	3.5.9	4.7.10
Crimp contact deformation	3.5.19	4.7.20
Contact pin strength	3.5.20	4.7.21
Crimp tensile strength	3.5.21	4.7.22
Inspection of product	3.1, 3.3, 3.4, 3.5.26, and 3.5.27	4.7.1

#### 4.6 Quality conformance inspection.

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

4.6.1.1 Inspection lot. An inspection lot shall consist of all connectors or removable crimp contacts, as applicable, covered by a single specification sheet, produced under essentially the same conditions, and offered for inspection at one time.

4.6.1.2 Group A inspection. Group A inspection shall consist of the inspections specified in table XII for connectors and table XIII for contacts, in the order shown.

4.6.1.2.1 Sampling plan. Statistical sampling and inspection shall be in accordance with MIL-STD-105 for general inspection level II. The acceptable quality level (AQL) shall be 1.0 percent for major defects and 4.0 percent for minor defects.

4.6.1.2.2 Rejected lots. If an inspection lot is rejected, the supplier shall withdraw the lot, rework it to correct the defects, or screen out the defective units, as applicable, and reinspect. Such lots shall be kept separate from new lots, and shall be clearly identified as reinspected lots. Rejected lots shall be reinspected using tightened inspection.

TABLE XII. Group A inspection (connectors).

Inspection	Requirement paragraph	Method paragraph
Inspection of product	3.1, .3.3, 3.4, 3.5.26, and 3.5.27	4.7.1
Dielectric withstanding voltage (at sea level)-	3.5.6	4.7.7
Insulation resistance	3.5.7	4.7.8

TABLE XIII. Group A inspection (contacts).

Inspection	Requirement paragraph	Method paragraph
Inspection of product	3.1, .3.3, 3.4, 3.5.26, and 3.5.27	4.7.1
Contact engagement and separation force	3.5.9	4.7.10

4.6.1.2.3 Disposition of sample units. Sample units which have been subjected to the group A inspection may be delivered on the contract.

4.6.2 Periodic inspection. Periodic inspection shall consist of the inspections specified in table IX for connectors and in table XI for contacts. Except where the results of these inspections show noncompliance with the applicable requirements (see 4.6.2.5), delivery of products which have passed group A shall not be delayed pending the results of these periodic inspections.

4.6.2.1 Sampling plan (connectors). Sample connectors consisting of two mated pairs of each of the size of the types and termination and each of the sizes of the types containing contacts for which periodic inspection is desired shall be selected every 24 months. Upon passing this inspection two consecutive times, the supplier may select sample connectors every 36 months. If production of a particular PIN is not current, the periodic inspection tests shall take place at the time production is resumed. The testing shall revert to the original schedule which is applied to a newly qualified product. If periodic inspection on both classes G and S is desired, one completely assembled plug and receptacle of each class shall be subjected to the examinations and tests in lieu of two of a single class.

4.6.2.2 Sampling plan (contacts). The minimum quantity of contacts listed in table X shall be inspected every 24 months. Upon passing this inspection two consecutive times, the supplier may select sample connectors every 36 months. If production of a particular PIN is not current, the periodic inspection tests shall take place at the time production is resumed. The testing shall revert to the original schedule which is applied to a newly qualified product.

**4.6.2.3 Failures.** If any sample units fail to pass periodic inspection, the entire sample shall be considered to have failed.

**4.6.2.4 Disposition of sample units.** Sample units which have been subjected to the periodic inspection shall not be delivered on the contract.

**4.6.2.5 Noncompliance.** If a sample fails to pass periodic inspection, the manufacturer shall 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, processes, etc., and which are considered subject to the same failures. Normal inspection shall be discontinued until corrective action, acceptable to the Government, has been taken. After the corrective action has been taken, periodic inspection shall be repeated on new samples. Group A inspection may be reinstated; however, final acceptance shall be withheld until the periodic inspection has shown that the corrective action was successful. In the event of failure after reinspection, information concerning the failure and corrective action taken shall be furnished to the qualifying activity.

**4.6.3 Inspection of packaging.** The sampling and inspection of the preservation, packing, and container marking shall be in accordance with the requirements of MIL-C-55330.

#### **4.7 Methods of inspection.**

**4.7.1 Inspection of product.** Connectors and associated hardware shall be examined to verify that the design, construction, physical dimensions, marking, and workmanship are in accordance with the applicable requirements (see 3.1, 3.3, 3.4, 3.5.26, and 3.5.27).

**4.7.1.1 Final inspection of product.** Final examination of crimp contacts shall include a thorough examination to insure that identification markings are legible, the contact is free from mechanical defects, there are no cracks around the crimp area, and the contacts meet the physical requirements specified herein. Examination shall be made with a device having magnification power of approximately 3 diameters.

**4.7.2 Magnetic permeability (see 3.5.1).** Permeability shall be measured on classes G, E, and P connectors with an instrument conforming to MIL-I-17214. The connectors may be wired or unwired but shall not be carrying current.

**4.7.3 Maintenance aging (crimp contact connectors only) (see 3.5.2).** Maintenance aging shall be conducted in accordance with method 2002 of MIL-STD-1344. The following details shall apply:

- a. M81969/01-4 or equivalent tool shall be used.
- b. Installation requirements (see 4.5.1.1).
- c. Initial requirements: All contacts shall be removed and reinserted once. Connectors shall be mated and unmated once and force values recorded as specified in 4.7.5.
- d. Following the test, contact insertion and removal (see 4.7.4) and mating and unmating force (see 4.7.5) shall be performed.

**4.7.4 Contact insertion and removal force (see 3.5.3).** Contact insertion and removal force shall be conducted in accordance with method 2012 of MIL-STD-1344. The following details shall apply

- a. Wire (see 4.5.1.1).
- b. Forces: As specified in 3.5.3.

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4.7.5 Mating and unmating force (see 3.5.4). Mating and unmating forces shall be measured in accordance with method 2013 of MIL-STD-1344. The following details shall apply:

- a. Special mounting means: Normal mounting.
- b. Wire (see 4.5.1.1).
- c. Applicable hardware: Complete connector assembly.
- d. Force or torque requirement (see 3.5.4).
- e. Rate of mating and unmating: Maximum of 10 seconds per operation.
- f. Mating parameters: When coupling pins lock.

4.7.6 Contact retention (see 3.5.5). Contact retention shall be measured in accordance with method 2007 of MIL-STD-1344. The following details shall apply:

- a. Number of samples (see 4.5.1.1).
- b. Removal of wires: Not applicable.
- c. Applied axial force: 10 pounds minimum.
- d. Maximum displacement: .012 inch.
- e. Axial direction: Force applied to mating end of contacts.

4.7.7 Dielectric withstanding voltage (see 3.1 and 3.5.6).

4.7.7.1 Sea level. Unmated connectors shall be tested in accordance with method 3001 of MIL-STD-1344. The applicable test voltage in table XIV shall be applied between all adjacent contacts and between the center hardware and each adjacent contact. For group A inspection, voltage may be applied for a minimum of 10 seconds.

TABLE XIV. Test voltage (rms 60 Hz ac volts). 1/

Altitude (feet)	Moisture conditioned (see 4.7.12) samples	All other samples
Sea level	500	1200
70,000	---	375

1/ These are not working voltages.

4.7.7.2 Altitude. Unmated connectors shall be tested as specified in 4.7.7.1, with altitude pressure of 35.5 torr, at the simulated altitude of 70,000 feet. Voltage shall be applied for 5 seconds. All other requirements are stated in 4.7.7.1.

4.7.8 Insulation resistance (see 3.5.7). Connectors shall be tested in accordance with method 3003 of MIL-STD-1344. The points for resistance measurements shall be:

- a. Between 50 percent of adjacent contacts but not less than four pairs.
- b. Between 50 percent of adjacent contacts and the center hardware but not less than four pairs.
- c. The contacts selected shall be those having the closest spacing between measuring points.

4.7.9 Contact resistance (see 3.5.8). Contact resistance shall be measured in accordance with method 3004 of MIL-STD-1344 on each mated pair of contacts.

4.7.10 Contact engagement and separation force (see 3.5.9). Sockets shall be mounted in a suitable position or fixture for applying gradually increasing loads for the engagement and separation of test pins from the sockets. Maximum and minimum test pins shall be in accordance with MS3197. Insertion of test pins shall be to a depth of .140 inch minimum when measured from the front of the socket contact. The test pin shall not bottom in the socket. This test shall be performed in the following sequence:

- a. Insert and separate a maximum diameter pin in and from each socket contact, then insert and remove a minimum diameter pin in the same sockets. During separation of the minimum diameter test pin, the minimum separation force shall conform to 3.5.9.
- b. Insert and separate a maximum diameter pin in and from each socket contact three times. During the third cycle, the engagement shall conform to 3.5.9.

4.7.11 Thermal shock (see 3.5.10). Unmated connectors shall be tested in accordance with method 1003 of MIL-STD-1344. Test condition letter shall be A1 except the minimum temperature shall be -55°C, +0°C, -3°C. Following the last cycle, the connectors shall be returned to room temperature for inspection and further testing.

4.7.12 Humidity (see 3.5.11). Fully wired connectors shall be subjected to a humidity test in accordance with method 1002 of MIL-STD-1344, type II, and the following exceptions and details:

- a. Omit step 7.
- b. Upon completion of step 6 of the final cycle, connectors shall be removed from the chamber and surface moisture removed from the insulators.
- c. Immediately following removal of surface moisture, dielectric withstanding voltage (see 4.7.7) and insulation resistance (see 4.7.8) shall be measured.
- d. After the 24-hour conditioning period, the insulation resistance (see 4.7.8) shall be measured again.

4.7.13 Vibration (see 3.5.12). Mated connectors shall be tested in accordance with method 2005 of MIL-STD-1344, test condition IV. All contacts shall be wired in series. For size 26 wire, a strain relief clamp may be mounted directly on the connector.

4.7.14 Shock (specified pulse) (see 3.5.13). Mated connectors shall be subjected to method 2004 of MIL-STD-1344, test condition G. One shock shall be applied in each direction of the three major axes of the connectors. Receptacles shall be mounted similar to the mounting of 4.7.13. Plugs shall be engaged with the receptacles and shall not be held by any locking means. All contacts shall be wired in series with a minimum of 100 milliamperes of current allowed to flow and the wire bundles or cables shall be clamped to structures that move with the connectors. A minimum of 8 inches of wire or cable shall be unsupported behind the rear of the receptacle and 4 1/2 inches of wire or cable shall be unsupported behind the rear of the plug. A suitable instrument shall be used to indicate any discontinuity or interruption of current flow.

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4.7.15 Durability (see 3.5.14). Connectors shall be tested in accordance with method 2016 of MIL-STD-1344. The following details shall apply:

- a. Counterpart connectors shall be mated and unmated 500 times at a rate of 200  $\pm$ 100 cycles per hour in a manner to simulate actual service.
- b. After 500 cycles, the mated connectors shall be subjected to salt spray (see 4.7.16).

4.7.16 Salt spray (corrosion) (see 3.5.15). Mated connectors shall be subjected to salt spray in accordance with method 1001 of MIL-STD-1344. The following detail and exception shall apply:

- a. Test condition B.
- b. Measurements after test: Contact resistance (see 4.7.9) and mating and unmating force (see 4.7.5) shall be measured.

4.7.17 Oversize pin exclusion (see 3.5.16). A hardened steel oversize pin, as specified in 3.5.16, shall be placed in a position centered and parallel to the axis of the socket contact. A 12 ounce axial force shall then be applied tending to force the test pin into the socket contact. After completion of the test, contact resistance (see 4.6.9) shall be measured on 20 percent or a minimum of four socket contacts in each connector.

4.7.18 Probe damage (see 3.5.17). Socket contacts shall be tested in accordance with method 2006 of MIL-STD-1344. The following details shall apply:

- a. Number and size of samples: 20 percent of the contacts or a minimum of four contacts.
- b. Probe damage tool shall be inserted into the contact to a depth of .160  $\pm$ .020.
- c. The diameter of the handle (.190) is not applicable.
- d. The tolerance on the inch-pounds shall be 10 percent in lieu of the values specified in MIL-STD-1344.
- e. After testing, contact engagement and separation force (see 3.5.9) shall be measured.

4.7.19 Fluid immersion (see 3.5.18). Unmated connectors shall be immersed fully in the fluids specified below for the required periods. At least one connector shall be immersed in each fluid. After removal from the fluid, each connector shall remain for 1 hour in free air at room conditions. Subsequent testing shall be performed on connectors mated with the same mating connectors used previously in the test. The connectors shall be mated by hand. Following mating, connectors shall be cleaned in a suitable solvent to remove the hydraulic fluid and lubrication oil.

- a. Hydraulic fluid conforming to MIL-H-5606 for 20 hours.
- b. Lubricating oil conforming to MIL-L-23699 for 20 hours.

4.7.20 Crimp contact deformation (see 3.5.19). Contacts shall be tested in accordance with method 2001 of MIL-STD-1344. The test shall be performed on at least 40 contact pairs, selected so that 20 pairs having the maximum wire size and 20 pairs having the minimum wire size are tested.

4.7.21 Contact pin strength (see 3.5.20). Unless otherwise specified (see 3.1), removable contacts shall be mounted in a suitable fixture and a load applied to the pin as shown in figure 3. The rate of travel of the testing machine shall not exceed 1 inch per minute, and the load shall be maintained for 1 minute. The permanent set shall be the difference between the initial and final position of the point of load application, after load removal. The test shall be performed on at least 40 contacts.

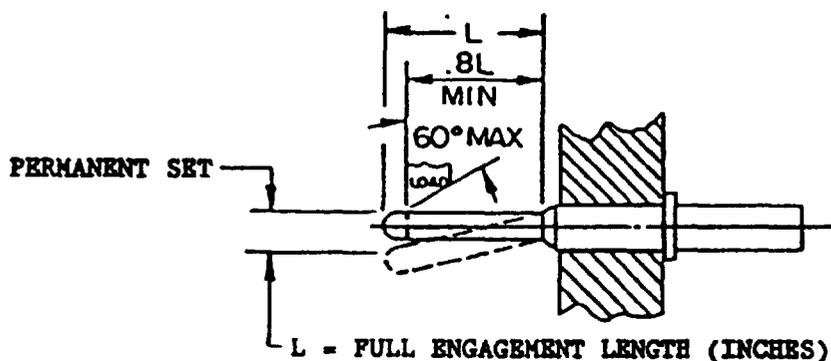


FIGURE 3. Contact pin strength.

4.7.22 Crimp tensile strength (see 3.5.21). Crimp contacts shall be tested in accordance with method 2003 of MIL-STD-1344. Contacts shall be crimped using a tool specified in MIL-C-22520/2. The test shall be performed on at least 40 contact pairs. These shall be selected so that 20 pairs have the maximum wire size and 20 pairs have the minimum wire size.

4.7.23 Altitude immersion (classes P, and E) (see 3.5.22). Mated connectors shall be tested in accordance with method 1004 of MIL-STD-1344. The following details shall apply:

- a. All wire ends shall be located within the chamber and exposed to the chamber atmosphere but not submerged or sealed.
- b. At the end of the third cycle, while the connectors are still submerged in the solution, the insulation resistance shall be measured as specified in 4.7.8 and the dielectric withstanding voltage test shall be performed as specified in 4.7.7.

4.7.24 Resistance to soldering heat (see 3.5.23). All connectors with solder terminations shall be tested in accordance with EIA-364-56. The connectors shall be tested in accordance with procedure 3 or 4 as specified (see 3.1). If no procedure is specified, connectors shall be tested in accordance with procedure 3.

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4.7.25 Resistance to solvents (see 3.5.24). Connectors shall be tested in accordance with EIA-364-11. The solvents shall be class 1. The connectors tested shall be fully assembled by the normal assembly operation.

4.7.26 Solderability (printed wiring tails only) (see 3.5.25). Solderable, nonremovable printed wiring tails shall be tested in accordance with method 208 of MIL-STD-202, (type R or RMA flux may be used).

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-C-55330.

6. NOTES

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

6.1 Intended use. Connectors and contacts covered by this specification are intended ~~for use in~~ airborne, ground support, and shipboard electrical and electronic equipment where presence of residual magnetism must be held to very low levels to avoid interference with nearby sensitive instrumentation.

- a. Class G connectors are intended for use in nonenvironment resisting applications where the operating temperature range of  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$  is experienced. Crimp contact connectors have the additional advantage of possessing rear removable crimp type contacts.
- b. Class P connectors are intended for environmental resisting applications where sealing around wires is accomplished by potting.
- c. Class E connectors are intended for environmental resisting applications. Provisions are made for sealing around wire at rear of connectors. Crimp contact connectors have the advantage of possessing rear release crimp type contacts.
- d. Class S connectors are supplied with nonremovable solder post terminations. This connector is intended for use with flexible printed circuits conforming to the pin pattern and thread inserts are provided for securing printed circuit to rear of connector.
- e. Class SE connectors are supplied with nonremovable solder post terminations and interfacial seal. They are for use with the same circuitry as the class S connectors.
- f. All classes of connectors are for use in applications wherein presence of residual magnetism must be held to very low levels to avoid interference with nearby sensitive instrumentation.

6.2 Acquisition requirements. Acquisition documents must specify the following.

- a. Title, number, and date of this specification.
- b. Title, number, and date of the applicable specification sheet and the complete PIN (see 3.1 and 1.2).
- c. Whether contacts and sealing plugs are included. For indirect shipment only (see 3.4.1.2 and 3.4.5).
- d. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1 and 2.2).

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are at the time of award of contract, qualified for inclusion in Qualified Products List QPL No. 28804 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 purchase orders for the products covered by this specification. The activity responsible for the Qualified Products List is Space and Naval Warfare Command, (SPAWAR 003-121), Department of the Navy, Washington, D.C. 20363, however, information pertaining to qualification of products may be obtained from the Defense Electronics Supply Center (DESC-E), Engineering Standardization Directorate, Dayton, Ohio 45444.

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#### 6.6 Definitions.

6.6.1 Overall finish. A finish having a specified minimum thickness applied over the entire surface area (such as, barrel plating techniques or other nonobjective plating techniques, and so forth).

6.6.2 Localized finish. A finish having a specified minimum thickness applied to a definite area, (such as, clad, inlay, welded dot, selective plating techniques, and so forth).

6.7 Part or Identifying Number (PIN). The PIN will be structured in accordance with 1.2.2.

#### 6.8 Subject term (key word) listing.

Contacts  
Crimp  
Current  
Dielectric  
Finish  
Heat  
Humidity  
Inspection  
Insulation displacement  
Magnetic permeability  
Materials  
Mating force  
Qualification  
Sampling  
Socket  
Solderability

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

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CONCLUDING MATERIAL

Custodians:  
Army - CR  
Navy - EC  
Air Force - 85

Preparing activity:  
Navy - EC

Agent:  
DLA - ES

(Project 5935-3763)

Review activities:  
Army - AT, MI  
Navy - AS  
Air Force - 99  
DLA - ES

User activities:  
Army - AM, AR, ME  
Navy - MC