

REQUIREMENT 11

DETAILED REQUIREMENTS FOR CONNECTORS

11. General. This section describes detailed requirements for a DPA of commonly used connectors. These requirements supplement the general requirements in section 4. Examples of typical configuration sketches are included. When applicable, specification numbers or types are referenced to assist in identification. Pre-DPA tests such as functional tests, mating, and solderability tests, are assumed to have been satisfied by normal inspection and testing and are therefore not addressed.

11.1 Connectors, multipin, excluding contacts. Typical multipin connectors are shown on figure 11-1 and figure 11-2. Connectors are illustrated with contacts.

11.1.1 Methods.

11.1.1.1 External visual. Inspect each sample at 7X to 10X magnification for the following defects which may be considered risks:

- a. Item marking and identification compliance to applicable specification.
- b. Dimensional check against applicable specification.
- c. Foreign material contamination.
- d. Chips, cracks, or other defects in the inserts.
- e. Check hermetic connectors for inadequate glass wetting.
- f. Plating defects such as porosity, burrs, blow holes, cracks, peeling, and flaking.
- h. Clocking.
- i. Keys and keyways.
- j. Retainers (an otoscope or similar device may be used).
- k. Free running threads.
- l. Lubricants.

11.1.1.2 X-ray examination. Nondestructive internal examination is accomplished by X-ray to check for misaligned or missing parts, cracks, breaks, and other defects which are considered failure mechanisms.

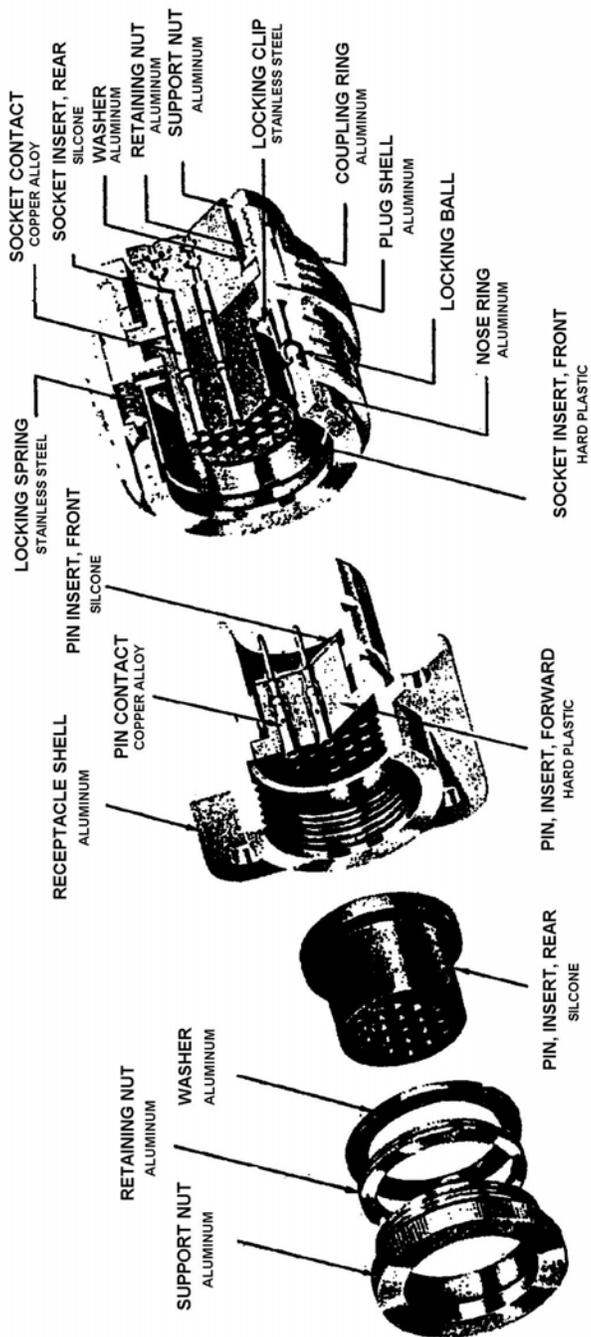


FIGURE 11-1. Typical multipin connector.

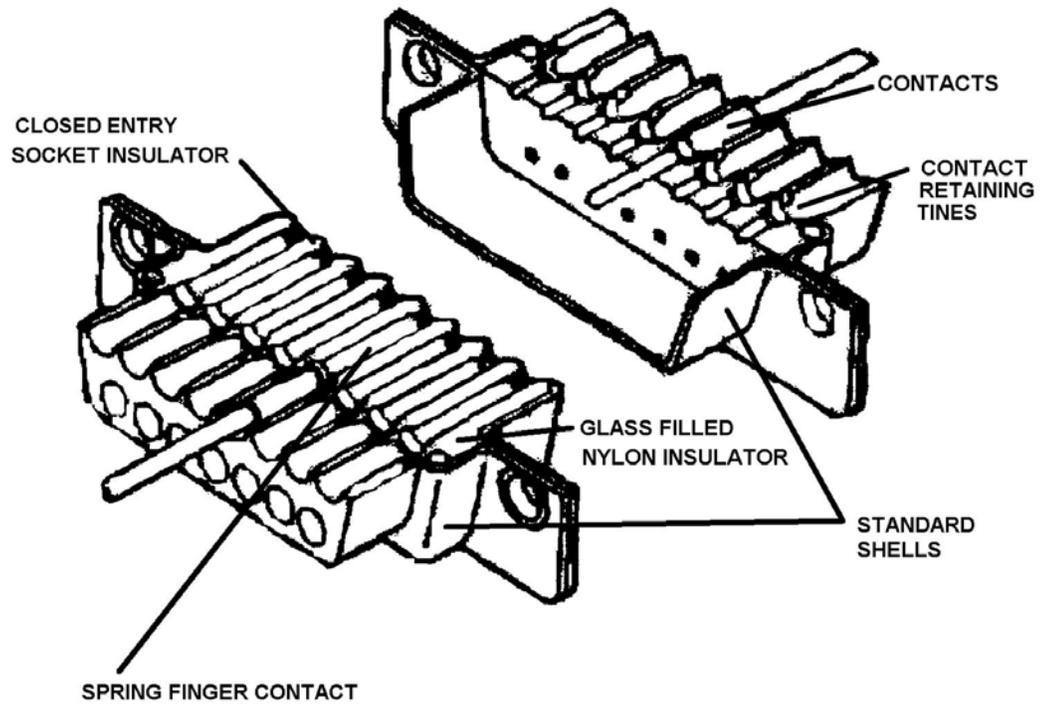


FIGURE 11-2. Typical rectangular multipin connectors.

11.1.1.3 Physical tests. The requirements of the controlling document and the following test shall apply.

- a. Each cavity shall be checked for insertion force.
- b. Each cavity shall be checked for contact retention.
- c. Plating thickness of the shell and other plated parts may be checked with a beta back-scatter instrument or sectioned and examined at 1000X magnification.
- d. Plating adhesion testing shall be performed on all samples. This test may induce minor cracks in the plating or base metal and shall not be considered defects, unless accompanied by flaking, blistering, or peeling.
- e. Test for insulator retention by applying a 100 psi or 25 pounds minimum force perpendicular to the insulator face. Any displacement visible to the eye is considered a failure.

11.2 Connectors, multipin, with contacts. All connector samples shall be subjected to the inspections and tests detailed in 11.1. In addition, they shall be tested in accordance with 11.2.1 and sectioned and inspected in accordance with 11.2.1.2. Figures 11-1 and 11-2 illustrate typical multipin connectors.

11.2.1 Methods.

11.2.1.1 Electrical test. Each connector sample shall meet the insulation resistance (IR) and Hi Pot requirements of the applicable specification.

11.2.1.2 Sectioning. Pot each connector sample in clear epoxy. Pull a vacuum on each sample during the potting procedure.

11.2.1.2.1 Fixed contact connectors. Cut each sample along the longitudinal axis on the center of the connector and one contact. Polish and examine both halves under 10X magnification to verify that:

- a. The insulator is formed and installed in accordance with the applicable specification.
- b. The elastomer and plastic members are not molded or conforming to each other.
- c. There is proper bonding between the shell and insert.

In addition, section and inspect at least one contact for required plating thickness at a suitable magnification.

11.2.1.2.2 Removable contact connectors. Samples may be examined as follows: Cut the connector through along the longitudinal axis on the center of the connector and a contact. Polish each half and perform the visual examination and contact plating inspection identified in 11.2.1.2.1. Then inspect the contact retention for proper installation and for possible broken or missing tangs.

11.2.1.3 SEM. Connector samples with known defects or suspected of containing defects shall be examined further with an SEM. The samples shall be scanned and photographed at sufficient magnification to obtain clear, sharp images of the suspect area. All SEM results are to be a permanent part of the DPA records.

MIL-STD-1580B

11.3 RF connectors. Typical RF connector is shown on figure 11-3.

11.3.1 Methods.

11.3.1.1 External examination. Examine each sample for the possible defects identified in 11.1.1.1 a, b, c, i, j, k, and l. In addition, conduct the following tests:

- a. Contact stress test. A maximum diameter test pin shall be inserted 100 times. The socket shall not show evidence of cracks at the bottom of the slots.
- b. Separating force test. Use a minimum diameter test pin.
- c. Axial contact retention.
- d. Rotational contact retention.
- e. Plating thickness of shell coupling shall comply to the applicable specification.
- f. Plating adhesion. See 11.1.1.3.d.

11.3.1.2 Internal examination. Pot the connector sample in clear epoxy. Pull a vacuum during the potting process. Whenever possible, connector pairs should be sectioned together. Cut along the longitudinal axis through the center of the connector(s) and the center pin. Inspect for:

- a. Integrity of the epoxy staking.
- b. Workmanship in areas such as brazed, soldered, and conductive epoxy joints, and the lock ring area.
- c. The mating surfaces of the ring, body, and coupling nut cannot be rounded, chamfered, or sloped.

11.4 Contacts. Test contact samples to the applicable specification requirements and the following.

11.4.1 Methods.

11.4.1.1 Visual examination. Test a random selection of one-half the contact sample for:

- a. Dimensional accuracy and marking.
- b. Plating adhesion. See 11.1.1.3d.
- c. Plating thickness. A beta back-scatter may be used, or pot the samples with a clear epoxy, section in half longitudinally, and measure at 1000X magnification.

11.4.1.2 Solder contacts. A minimum of four contacts shall be soldered with a length of wire 0.15 meters to 0.30 meters (6 to 12 inches) long, complying to MIL-W-81044 or MIL-DTL-81381. Inspect for proper wetting, solder flow, and general appearance.

11.4.1.3 Crimp contacts. Crimp a minimum of four contacts to the minimum allowable wire gauge, and two contacts to the maximum allowable wire gauge. Examine all crimps under 20X magnification for cracks or crazing of the plating or base metal. Four samples should then be tested for tensile strength in accordance with the applicable contact specification.

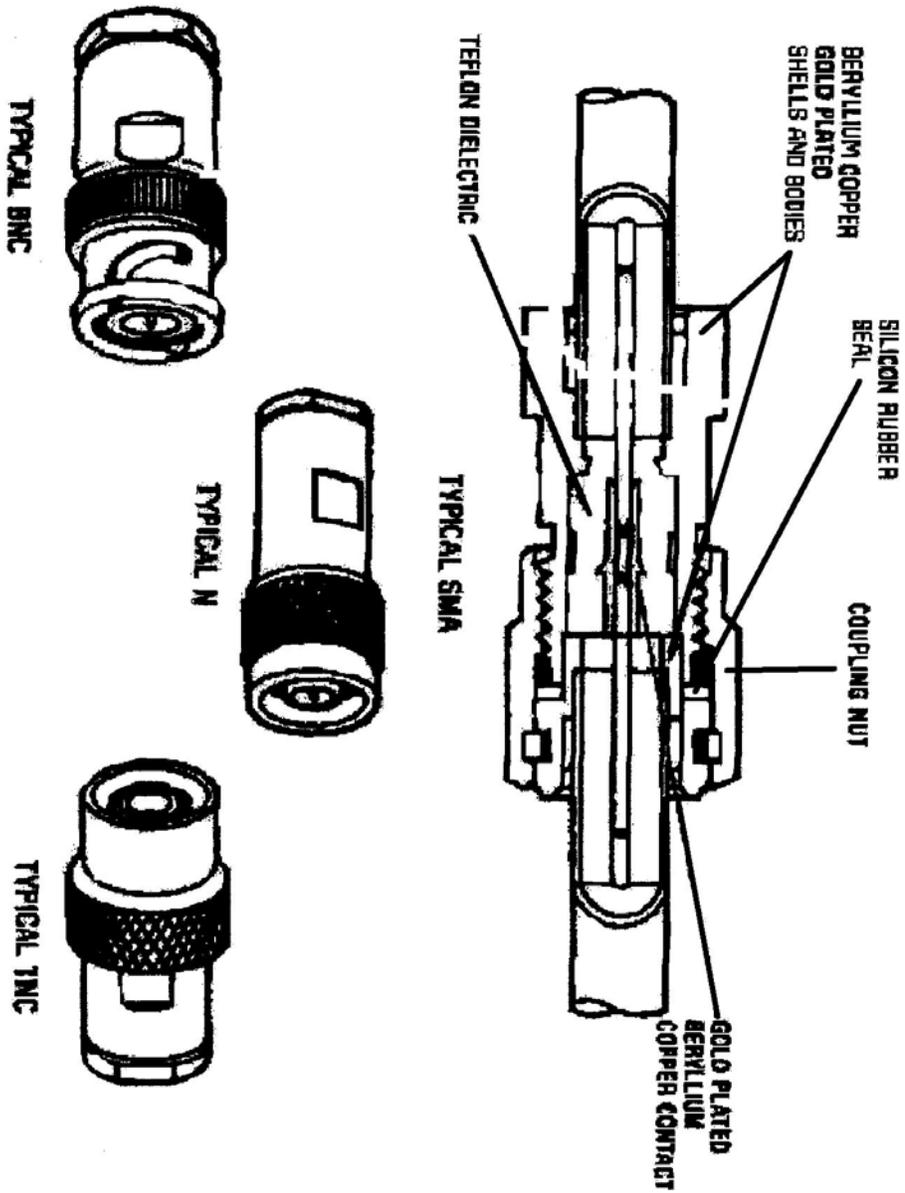


FIGURE 11-3. Typical RF connector.