



# IPC-TM-650 TEST METHODS MANUAL

**1 Scope** This test method is used to determine the mechanical forces required to mate connectors before and after the connectors are subjected to various environmental stresses.

**2 Applicable Documents** None

## 3 Test Specimen

**3.1** One piece connector (plug and receptacle), complete with all applicable guide, keying, and engaging hardware or a carot edge receptacle

**3.2** Two piece connector (header and receptacle or plug and receptacle), complete with all applicable guide, keying, and engaging hardware and appropriate flat cable

**3.3** Unless otherwise specified in the individual connector specification, the test samples (or engaging hardware) shall not be lubricated or otherwise coated prior to the test.

## 4 Apparatus

**4.1** Test blade as shown in Figure 1, to simulate a mating PWB of maximum thickness for card edge (one-piece) connector

**4.2** Mating connector to test for mating and unmating force of two piece connectors

**4.3** Force gauges of applicable range

**4.4** Clamps, jaws, or other means to hold the receptacle and header or receptacle and plug

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**4.5** Automatic or semi-automatic tester to mate and unmate the connector at the specified rate.

*Note:* While manual cycling of the connectors is permitted, proper alignment and orientation is most readily maintained in a mechanical device specifically designed for this test.

## 5 Procedure

**5.1** The samples shall be mounted in the tester and carefully aligned.

**5.2 Mating Force** The samples shall be brought to a position where mechanical mating begins and the force gauge is at zero indication. The samples shall then be fully mated and the force required for mating shall be recorded.

**5.3 Unmating Force** Once the mechanical mating is complete and the force gage is at zero indication, the samples shall be separated and the force required for separation shall be recorded.

**5.4** At the intervals specified in the individual connector specification, inspections or tests may be performed.

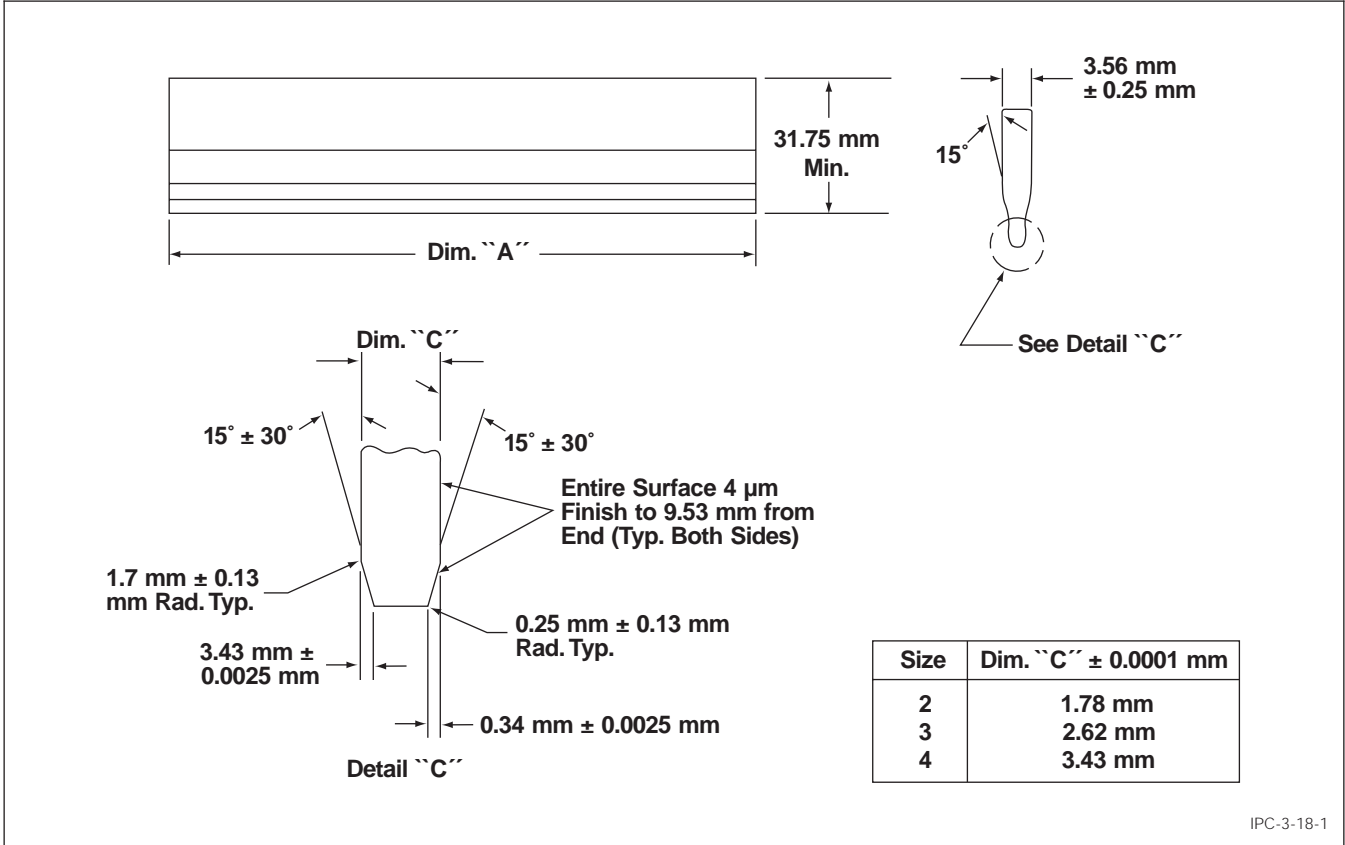
**5.5** During the final cycle, the force required for both mating and unmating shall again be recorded.

## 6 Notes

**6.1** Acceptance criteria shall be established in terms of the maximum allowable total mating force and the minimum allowable total separation force during the test.

**6.2** The information in this test method is intended to parallel the test method described in EIA-RS-364/TP-13.

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Figure 1 One-Piece Edge Connector Mechanical Gauges