



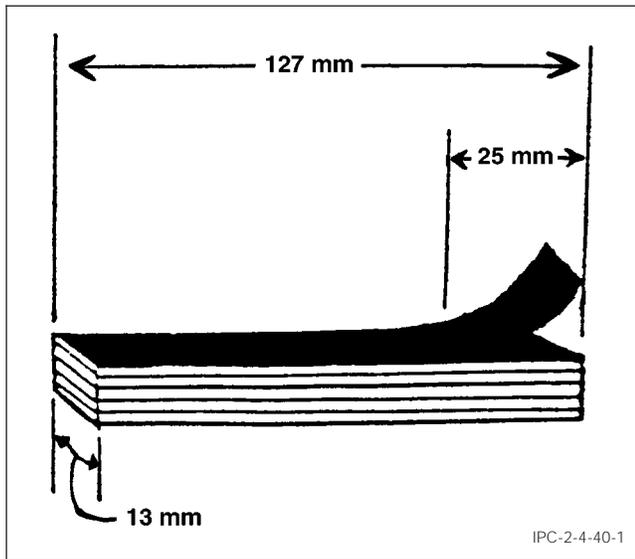
# IPC-TM-650 TEST METHODS MANUAL

Number <b>2.4.40</b>	
Subject <b>Inner Layer Bond Strength of Multilayer Printed Circuit Boards</b>	
Date <b>10/87</b>	Revision
Originating Task Group <b>N/A</b>	

**1 Scope** This method is used to determine the inner layer bond strength of either a metal conductor or an individual dielectric.

**2 Applicable Documents** None

**3 Test Specimen** Laminate dielectric with or without copper foil, prepared in accordance with Figure 1.



**Figure 1 Laminate Dielectric**

## 4 Equipment/Apparatus

**4.1** Unite-O-Matic tensile tester Model #FM 10 or equivalent

**4.2** Scalpel

## 5 Procedure

**5.1 Preparation for Testing** During layup of the test specimen panel, place "TEDLAR" (or other suitable material)

release sheets that will disallow lamination at one end of each specimen, providing a 13 mm x 25 mm non-bonded tab. The tabs can then be used as gripping areas to perform bond strength testing. One can then evaluate the laminate-to-laminate bonds and the laminate-to-copper foil bond throughout the finished panel thickness.

**5.1.1** Place an equal number of release sheets on the outer surface of the layup, covering all surfaces, except where internal release sheets have been placed. This is essential to provide proper and uniform lamination pressure.

**5.1.2** After lamination and cure, cut the panel into 25 mm strips, as shown in Figure 1, and remove internal release sheets.

**5.1.3** If steps 5.1.1 and 5.1.2 are not used, it will be necessary to chemically or thermally remove resins from the outer 25 mm, in order to provide a tab to initiate testing.

**5.2** After cutting the samples to the designated size and lifting the 25 mm strip for testing, the layer to be tested shall be fastened into the clamping device of the tensile tester, allowing the wire connecting the clamp to the tensile tester to pull the specimen vertically within  $\pm 5^\circ$  angle.

**5.3** The tester is then started. A force is applied in the vertical direction at a rate of 51 mm per minute until delamination (bond strength) is completed or the inner layer tears.

The minimum load is then recorded using the following formula:

Bond strength of the conductor width =

$$\frac{25\text{mm}}{\text{sample width}} \times \text{total load}$$