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IPC-4761

Design Guide for Protection of Printed Board Via Structures

Developed by the Via Protection Task Group (D-33d)
of the Rigid Printed Board Committee (D-30) of IPC

Users of this publication are encouraged to participate in the development of future revisions.

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1 SCOPE

The protection of through vias within Printed Wiring Boards (PWB) has evolved from limited use to common practice. Technology has evolved where via fabrication techniques and protection methodologies need to be defined to allow current designs to be manufacturable at an acceptable yield and cost. Numerous techniques and objectives exist, and will be discussed in this document. This document is the product of the IPC D-33d Via Protection Task Group and has been developed to provide guidance for the designer and fabricator on how via protection should be approached as well as guidance on how via protection should be specified in procurement documentation.

1.1 Purpose This guideline provides PWB designers, fabricators and/or users with information on existing methods for the protection of vias on printed boards. In addition to detailing some of the advantages of via protection, production and material issues are given to aid the user in evaluating the benefits and concerns for each type of protection.

1.2 Terms and Definitions The definition of all terms used herein **shall** be as specified in IPC-T-50 and as defined below.

Bumped Via Protection – Via protection where the hole plugging or fill material protrudes above the surface of the hole interface producing a convex shape. See Figure 1-1.

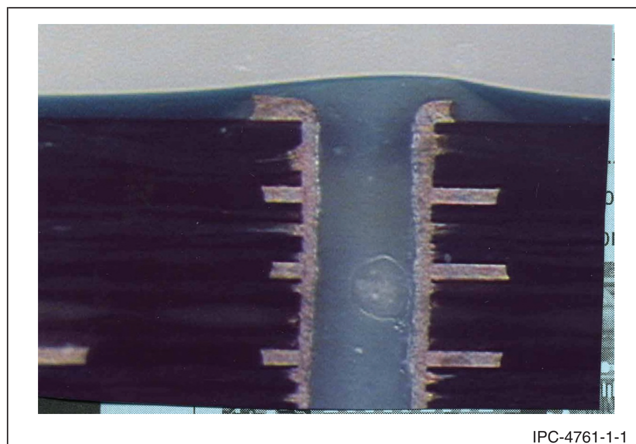

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Figure 1-1 Bumped Via Protection Material

Dimpled Via Protection – Via protection where the hole plugging or fill material recedes below the hole interface producing a concave shape. See Figure 1-2.

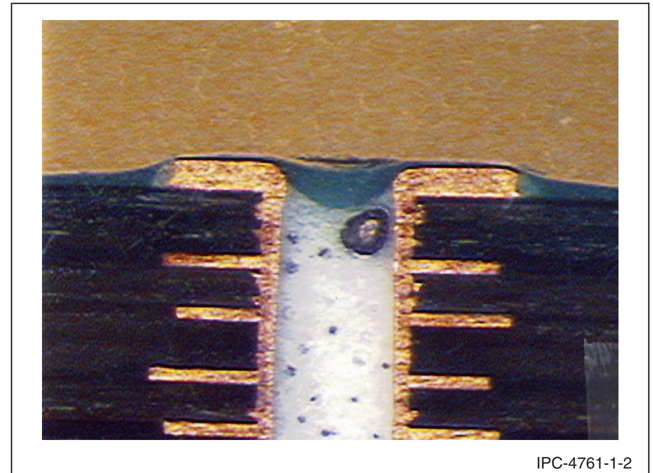

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Figure 1-2 Dimpled Via Protection Material

Planarized Via Protection – Via protection where the excess hole plugging or fill material protruding above the hole interface has been removed by a process to produce a coplanar surface. See Figure 1-3.

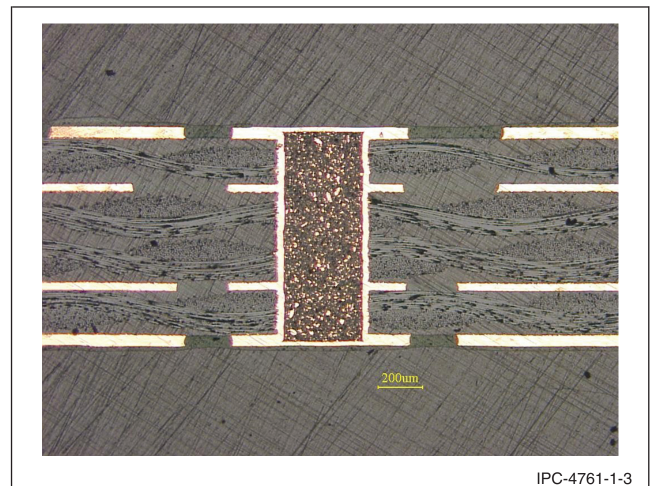

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Figure 1-3 Planarized and Capped Via Protection Material

2 APPLICABLE DOCUMENTS

2.1 IPC[1]

IPC-T-50 Terms and Definitions for Interconnecting and Packaging Electronic Circuits

IPC-A-600 Acceptability of Printed Boards

IPC-SM-840 Qualification and Performance of Permanent Solder Mask

[1] www.ipc.org