UL 796

STANDARD FOR SAFETY

Printed Wiring Boards

UL Standard for Safety for Printed Wiring Boards, UL 796

Twelfth Edition, Dated October 13, 2020

SUMMARY OF TOPICS:

This revision of ANSI/UL 796 dated August 4, 2021 includes the following changes in requirements:

- ***Update UL/ANSI CEM-3 and FR-4 Types and Editorial Correction; Table 9.1***
- ***Clarification of Test Pattern Requirements; Figure 10.1, 10.10.1, 10.11.1, 17.5.4 and 17.5.5***
- ***Addition of Reference to 13.1.6 in 13.2 Permanent Coatings Program; 13.2.1***
- ***Addition of Non-Plated via Hole Reference to Notes for Figure 14.1***
- ***Addition of Reference to Flammability Only PWBs; 16.2.1 and 17.8.1***
- ***Clarification of HDI Test Program; Table 19.1***
- ***Addition of Reference to Ceramic Base Material Exception 9.1.3; 20.1.2***
- ***Addition of Reference to Annex A Sample Construction Examples; 23.2***
- ***Clarification of Optional Use of Release Agent and Clips; 25.2.4***
- ***Clarification of Foil Thickness Measurements by Microsection; 25.4.1***
- ***Clarification of Tolerances on Conditioning Parameters; 27.3.2, 28.3(title), 28.3.1, 28.3.2, 30.2, 35.2.4 and 35.2.6***
- ***Clarification of HDI Bond Strength, Delamination and Blistering Testing; 34.3.1***
- ***Editorial Updates; 2.4, 25.1.2, 27.2.3, 27.3.2 and 27.3.3***

Text that has been changed in any manner or impacted by UL's electronic publishing system is marked with a vertical line in the margin.

The new and revised requirements are substantially in accordance with Proposal(s) on this subject dated June 4, 2021.

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UL 796

Standard for Printed Wiring Boards

Fifth Edition – May, 1980
Sixth Edition – November, 1984
Seventh Edition – November, 1993
Eighth Edition – October, 1999
Ninth Edition – April, 2006
Tenth Edition – October, 2010
Eleventh Edition – May, 2016

Twelfth Edition

October 13, 2020

This ANSI/UL Standard for Safety consists of the Twelfth Edition including revisions through August 4, 2021.

The most recent designation of ANSI/UL 796 as an American National Standard (ANSI) occurred on August 4, 2021. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, and Title Page. Any other portions of this ANSI/UL standard that were not processed in accordance with ANSI/UL requirements are noted at the beginning of the impacted sections.

The Department of Defense (DoD) has adopted UL 796 on January 20, 1995. The publication of revised pages or a new edition of this Standard will not invalidate the DoD adoption.

Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at https://csds.ul.com.

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INTRODUCTION

1 Scope

1.1 These requirements apply to rigid printed wiring boards and flexible printed wiring board for use as components in devices or appliances. Compliance with these requirements does not indicate that the product is acceptable for use as a component of an end product without further investigation.

1.2 The flexible printed wiring boards covered by these requirements consist of conductors affixed to insulating base film, with or without a cover-lay film, with midboard connections.

1.3 These requirements do not cover flexible printed wiring boards of laminated-film construction in which the conductors are parallel to each other and are completely covered by the base film with only point-to-point end connections.

1.4 Flexible material constructions and multilayer rigid flex composite interconnect constructions with and without stiffener and adhesive materials shall be investigated in accordance with the Standard for Flexible Materials Interconnect Constructions, UL 796F.

2 Glossary

2.1 For the purpose of this Standard the following definitions apply.

2.2 ADDITIVE PROCESS – A selective or non-selective process used to deposit a pattern of conductor material(s) on clad or unclad base material.

2.3 ADHESIVE – A substance such as glue or cement used to join, bond, or fasten materials or objects together.

2.4 AS RECEIVED – Samples in an unconditioned state, prior to being subject to conditioning, or without a history of conditioning.

2.5 BASE MATERIAL – An organic or inorganic material used to support a pattern of conductor material. The base material may be rigid or flexible.

2.6 BASE MATERIAL THICKNESS – The thickness of the base dielectric material excluding conductive foil or material deposited on the surface of the base material. If an adhesive is used to adhere the conductor material to the base material, the adhesive thickness and application surfaces (base material sides) is indicated separately.

2.7 BLIND VIA – A via extending to only one surface of the board construction.

2.8 BLISTERING – Localized area of delamination. See 2.45, Delamination.

2.9 BONDING LAYER – An adhesive layer used to bond discrete layers of multilayer board constructions. Also known as Prepreg.

2.10 BUILD-UP THICKNESS – Overall thickness of a combination of materials. Unless otherwise indicated, the build-up thickness will refer to the overall thickness of a board construction where no internal or external conductor material resides.

2.11 BUILT-UP MULTILAYER (BUM) – Multiple layers of HDI materials.