



ASSOCIATION CONNECTING
ELECTRONICS INDUSTRIES

IPC-6012A

Qualification and Performance Specification for Rigid Printed Boards

Amendment 1

IPC-6012A

A standard developed by IPC

July 2000
Amendment 1

2215 Sanders Road, Northbrook, IL 60062-6135
Tel. 847.509.9700 Fax 847.509.9798
www.ipc.org

The Principles of Standardization

In May 1995 the IPC's Technical Activities Executive Committee adopted Principles of Standardization as a guiding principle of IPC's standardization efforts.

Standards Should:

- Show relationship to Design for Manufacturability (DFM) and Design for the Environment (DFE)
- Minimize time to market
- Contain simple (simplified) language
- Just include spec information
- Focus on end product performance
- Include a feedback system on use and problems for future improvement

Standards Should Not:

- Inhibit innovation
- Increase time-to-market
- Keep people out
- Increase cycle time
- Tell you how to make something
- Contain anything that cannot be defended with data

Notice

IPC Standards and Publications are designed to serve the public interest through eliminating misunderstandings between manufacturers and purchasers, facilitating interchangeability and improvement of products, and assisting the purchaser in selecting and obtaining with minimum delay the proper product for his particular need. Existence of such Standards and Publications shall not in any respect preclude any member or nonmember of IPC from manufacturing or selling products not conforming to such Standards and Publication, nor shall the existence of such Standards and Publications preclude their voluntary use by those other than IPC members, whether the standard is to be used either domestically or internationally.

Recommended Standards and Publications are adopted by IPC without regard to whether their adoption may involve patents on articles, materials, or processes. By such action, IPC does not assume any liability to any patent owner, nor do they assume any obligation whatever to parties adopting the Recommended Standard or Publication. Users are also wholly responsible for protecting themselves against all claims of liabilities for patent infringement.

IPC Position Statement on Specification Revision Change

It is the position of IPC's Technical Activities Executive Committee (TAEC) that the use and implementation of IPC publications is voluntary and is part of a relationship entered into by customer and supplier. When an IPC standard/guideline is updated and a new revision is published, it is the opinion of the TAEC that the use of the new revision as part of an existing relationship is not automatic unless required by the contract. The TAEC recommends the use of the latest revision.
Adopted October 6, 1998

Why is there a charge for this standard?

Your purchase of this document contributes to the ongoing development of new and updated industry standards. Standards allow manufacturers, customers, and suppliers to understand one another better. Standards allow manufacturers greater efficiencies when they can set up their processes to meet industry standards, allowing them to offer their customers lower costs.

IPC spends hundreds of thousands of dollars annually to support IPC's volunteers in the standards development process. There are many rounds of drafts sent out for review and the committees spend hundreds of hours in review and development. IPC's staff attends and participates in committee activities, typesets and circulates document drafts, and follows all necessary procedures to qualify for ANSI approval.

IPC's membership dues have been kept low in order to allow as many companies as possible to participate. Therefore, the standards revenue is necessary to complement dues revenue. The price schedule offers a 50% discount to IPC members. If your company buys IPC standards, why not take advantage of this and the many other benefits of IPC membership as well? For more information on membership in IPC, please visit www.ipc.org or call 847/790-5372.

Thank you for your continued support.

Qualification and Performance Specification for Rigid Printed Boards Amendment 1

Foreword First paragraph, first sentence, replace with “This specification is intended to provide information on the detailed performance criteria of rigid printed boards. It supercedes both IPC-6012 and IPC-RB-276 and was developed as a revision to those documents.”

Para 2.1 Remove references to IPC Master Drawings IPC-100104 through IPC-100106.

Para 2.1 Replace reference to **IPC-MF-150** Metal Foil for Printed Wiring Applications with **IPC-4562** Metal Foil for Printed Wiring Applications.

Para 3.2.4 Replace first sentence with “Copper foil **shall** be in accordance with IPC-4562.”

Replace Para 3.2.6.2 as follows:

3.2.6.2 Additive Copper Depositions Additive/electroless copper platings applied as the main conductor metal **shall** meet the requirements of this specification.

Add new Para 3.2.6.8 as follows:

3.2.6.8 Electrodeposited Copper When specified, electrodeposited copper platings **shall** meet the following criteria. Frequency of testing shall be determined by the manufacturer to ensure compliance.

- a) When tested as specified in IPC-TM-650, Method 2.3.15, the purity of copper **shall** be no less than 99.50% for either pyrophosphate or acid copper.
- b) When tested as specified in IPC-TM-650, Method 2.4.18.1, at ambient temperature using 50 -100 µm [0.0020in - 0.003937in] thick samples, the tensile strength **shall** be no less than 36,000 PSI [248 MPa] and the elongation **shall** be no less than 12%.

Replace Para 3.6.2 as follows:

3.6.2 Requirements for Microsectioned Coupons or Production Boards When examined in microsection, the test coupons or production boards **shall** meet the requirements of Table 3-6 and paragraphs 3.6.2.1 through 3.6.2.16.

Para 3.7.1 First sentence should read as “When specified, metal core printed boards which have clearance...”

Para 3.9 First sentence should read “When tested as specified in Table 4-3 or Table 4-4, the printed boards **shall** meet the electrical requirements detailed in the following paragraphs.”

Para 3.9.4 First paragraph, fifth sentence should read “Insulation resistance requirements in the as-received condition are detailed in section 3.11.9.”

Replace Para 3.12 as follows:

3.12 Repair Repair of bare boards **shall** be as agreed upon between the user and supplier for each set of procurement documentation. (See IPC-7721)

Para 4.1.2 Remove references to Type 4 through Type 6 Master Drawings IPC-100104 to IPC-100106.

Para 5.2 Sentence should read “This specification supercedes and replaces IPC-RB-276 in the performance and requirements section and IPC-6012.”

Appendix A Adjust performance requirements for Wicking to read:

Wicking	125 µm [0.00492 in] max	100 µm [0.00393 in] max.	80 µm [0.00315 in] max.	3.6.2.1, Tab. 3-6
---------	-------------------------------	--------------------------------	-------------------------------	-------------------------

Replace Table 3-1 as follows:

Table 3-1 Metal Core Substrate

Material	Specification	Alloy
Aluminum	QQ-A-250	As specified
Steel	QQ-S-635	As specified
Copper	ASTM-B-152 or IPC-4562	As specified
Copper-Invar-Copper	IPC-CF-152	As specified
Copper-Moly-Copper	IPC-CF-152	As specified
Other	As specified	

Replace Table 3-7 as follows:

Table 3-7 Internal Layer Foil Thickness After Processing

Copper Foil			Minimum
Designator	Weight	Starting Thickness	
E	1/8 oz	5 μm [0.00020 in]	3.5 μm [0.00014 in]
Q	1/4 oz	9 μm [0.00035 in]	6.0 μm [0.00024 in]
T	3/8 oz	12 μm [0.00047 in]	8.0 μm [0.00031 in]
H	1/2 oz	17 μm [0.00067 in]	12.0 μm [0.00047 in]
1	1 oz	35 μm [0.00138 in]	25.0 μm [0.00098 in]
2	2 oz	70 μm [0.00276 in]	56.0 μm [0.00220 in]
3	3 oz	105 μm [0.00413 in]	91.0 μm [0.00358 in]
4	4 oz	140 μm [0.00551 in]	122.0 μm [0.00480 in]
Above 4 oz			13 μm [0.00051 in] below minimum thickness listed for that foil thickness in IPC-4562



ASSOCIATION CONNECTING
ELECTRONICS INDUSTRIES

2215 Sanders Road, Northbrook, IL 60062-6135
Tel. 847.509.9700 Fax 847.509.9798
www.ipc.org