The Principles of Standardization

In May 1995 the IPC’s Technical Activities Executive Committee (TAEC) 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.

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IPC Position Statement on Specification Revision Change

It is the position of IPC’s Technical Activities Executive Committee 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 publication 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

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Your purchase of this document contributes to the ongoing development of new and updated industry standards and publications. 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 and publications 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, type sets and circulates document drafts, and follows all necessary procedures to qualify for ANSI approval.

IPC’s membership dues have been kept low to allow as many companies as possible to participate. Therefore, the standards and publications revenue is necessary to complement dues revenue. The price schedule offers a 50% discount to IPC members. If your company buys IPC standards and publications, 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 847/597-2872.

Thank you for your continued support.
Flexible Metal-Clad Dielectrics for Use in Fabrication of Flexible Printed Circuitry

Replace Section 1.1.2 with the following:

1.1.2 Specific Designation  The specific designation should be in the form shown in the following example, and is intended for use on material purchase orders by fabricators (see 6.1). The specific designation should not be used by designers on master drawings to indicate their material selection, as the designation is lengthy and requires fabricator level knowledge in making the detailed selections.

NOTE: The alpha character “Z” replaces and is entirely equivalent to the alpha character “O” (ref: Table 1-5) in the original release (prior revision) of this IPC standard. This interchange of characters within the designation will help alleviate confusion from using both the alpha character “O” and the digit “0” from the original release of this IPC standard. Legacy designs that utilize a designation and material description from the original release of this IPC standard [alpha character “O” (from Table 1-5)] may continue to be used. Supplier material certifications will reflect the current IPC standard’s revision, and accordingly, the alpha character “Z” in the designation.

Example of specific designation:

IPC-4204/I – E1E2M2/2 CU-W7-1P/1P

Where:

IPC-4204/I = Nonspecific Designation (see 1.1.1) specifying copper-clad dielectric with acrylic adhesive
E = Base Dielectric Type Designation (see 1.1.2.1) specifying polyimide
1 = Reinforcement Method Designation (see 1.1.2.2) specifying non-reinforced
E = Reinforcement Type Designation (see 1.1.2.3) specifying non-reinforced film
2 = Base Dielectric Thickness Designation (see 1.1.2.4) specifying 50microns [0.002 in]
M = Adhesive Type Designation (see 1.1.2.5) specifying acrylic adhesive
2/2 = Adhesive Thickness Designation (see 1.1.2.6) specifying 50 micron both sides (Not used for adhesiveless product)
CU-W7-1P/1P = Metal Cladding Designation (see 1.1.2.7) specifying wrought rolled annealed copper, 35 microns both sides with no treatment

Replace Section 2.1 with the following:

2.1 IPC1

IPC-T-50  Terms and Definitions for Interconnecting and Packaging Electronic Circuits
IPC-TM-650  Test Methods Manual2

2.1.13 Inspection for Inclusions and Voids in Flexible Printed Wiring Materials
2.2.4 Dimensional Stability, Flexible Dielectric Materials
2.3.2 Chemical Resistance of Printed Wiring Materials
2.4.3 Flexural Endurance
2.4.13 Solder Float
2.4.15 Surface Finish, Metal Foils
2.4.16 Initiation Tear Strength, Flexible Insulating Materials
2.4.17.1 Propagation Tear Strength, Flexible Insulating Materials
2.4.19 Tensile Strength and Elongation, Flexible Printed Wiring Materials
2.5.5.3 Permittivity (Dielectric Constant) and Loss Tangent (Dissipation Factor) of Materials (Two Fluid Cell Method)
2.5.5.5 Stripline Test for Permittivity and Loss Tangent (Dielectric Constant and Dissipation Factor) at X-Band
2.5.5.9 Permittivity and Loss Tangent, Parallel Plate, 1 MHz to 1.5 GHz
2.5.17 Volume and Surface Resistivity of Printed Wiring Materials
2.6.1 Fungus Resistance, Printed Wiring Material
2.6.2 Moisture Absorption, Flexible Printed Wiring
2.6.18 Low Temperature Flexibility
2.6.21 Service Temperature of Metal-Clad Flexible Laminated, Cover Material and Adhesive Bonding Films

**IPC-4202** Flexible Base Dielectrics for Use in Flexible Printed Circuitry
**IPC-4203** Cover and Bonding Material for Flexible Printed Circuitry
**IPC-4562** Metal Foil for Printed Board Applications
**IPC-9191** General Requirements for Implementation of Statistical Process Control

*Replace Section 2.5 with the following:*

**2.5 ISO**

ISO 10012-1 Quality Assurance Requirements For Measuring Equipment - Part 1: Metrological Confirmation System For Measuring Equipment

ISO 17025 General Requirements for the Competence of Testing and Calibration Laboratories

*Replace Section 3.5.2 with the following:*

**3.5.2 Wrinkles, Creases, Streaks and Scratches** Scratches are not permitted where any part of the defect is \( \geq 20\% \) of the nominal foil thickness (i.e., 3.4 µm [134 µin] for 17 µm [669 µin] metal) or have more than five occurrences per 300 mm x 300 mm [11.8 in x 11.8 in]. Any scratch with a depth > 5% of the nominal foil thickness shall not be counted, regardless of length. The maximum allowable scratch length is 100 mm [3.937 in] for any scratch with a depth \( \geq 5\% \) and < 20% of the nominal foil thickness. Any wrinkles and creases are AABUS. The allowable depth, width and quantity of wrinkles and creases and the allowable height, width and quantity of streaks shall be AABUS. After etching of the metal cladding, the adhesive layer shall be free of streaks, scratches, voids, gel particles, or contamination, AABUS.

*Replace Section 3.9 with the following:*

**3.9 Electrical Requirements** As values may change with construction, environmental and operating frequency variations, it is recommended that the material supplier be contacted to verify the electrical properties.