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**IPC-4204C**

# **Flexible Metal-Clad Dielectrics for Use in Fabrication of Flexible Printed Boards**

If a conflict occurs between the English language and translated versions of this document, the English version will take precedence.

Developed by the IPC-4204C D-13 Flex Materials Subcommittee of the D-10 Flexible Circuits General Committee of Global Electronics Association.

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# Flexible Metal-Clad Dielectrics for Use in Fabrication of Flexible Printed Boards

## 1 SCOPE

This standard establishes the classification system, the qualification and quality conformance requirements for flexible metal-clad dielectric materials to be used for the fabrication of flexible printed boards.

**1.1 Purpose** The purpose of this standard is to classify and characterize based materials for use in flex and rigid-flex boards for electronic applications. It is to be used for procurement and quality assurance activities.

**1.2 Classification System** The system described in 1.2.1 through 1.2.2.7 identifies flexible metal-clad dielectrics.

**1.2.1 Nonspecific Designation** A nonspecific designation is intended for use by *designers* on master drawings to designate their material choice. At the end of this standard is a series of material specification sheets identified by specification sheet numbers. Each sheet outlines engineering and performance data for a flexible metal-clad dielectrics, indicating base material type, adhesive type and method of reinforcement.

Example of nonspecific designation:

*IPC-4204/1*, where “1” refers to the specification sheet detailing copper-clad polyimide dielectric with acrylic adhesive. If further material specification details (such as dielectric, adhesive or copper thicknesses) are required, they should be high-lighted in cross sectional views or notes on the master drawing.

**1.2.2 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-4204/1 – E1E2M2/2 CU-W7-1P/1P**

Where:

*IPC-4204/1* – Nonspecific Designation (see 1.2.1) specifying copper-clad dielectric with acrylic adhesive

*E* – Base Dielectric Type Designation (see 1.2.2.1) specifying polyimide

*1* – Reinforcement Method Designation (see 1.2.2.2) specifying non-reinforced

*E* – Reinforcement Type Designation (see 1.2.2.3) specifying non-reinforced film

*2* – Base Dielectric Thickness Designation (see 1.2.2.4) specifying 50 $\mu$ m [1968  $\mu$ in]

*M* – Adhesive Type Designation (see 1.2.2.5) specifying acrylic adhesive

*2/2* – Adhesive Thickness Designation (see 1.2.2.6) specifying 50  $\mu$ m both sides (Not used for adhesiveless product)

*CU-W7-1P/1P* – Metal Cladding Designation (see 1.2.2.7) specifying wrought rolled annealed copper, 35  $\mu$ m both sides with no treatment

**1.2.2.1 Base Material Type** The type of dielectric material **shall** be specified per Table 1-1.