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Requirements for Printed Electronics Base Materials (Substrates)

Developed by the Printed Electronics Base Material/Substrates
Subcommittee (D-62) of the Printed Electronics Committee (D-60)
of IPC

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

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Requirements for Printed Electronics Base Materials (Substrates)

1 SCOPE

1.1 Statement of Scope This standard establishes the classification system, the qualification and quality conformance requirements for printed electronics base materials (substrates).

The standard defines the base material only and should not be used for substrates that have been post processed and comprise defined features or structures e.g., conductive traces.

1.2 Purpose The purpose is to provide practitioners of printed electronics based products with the necessary technical structure to design and manufacture product meeting conformance to industry determined metrics.

1.3 Classification System The system described in 1.3.1 through 1.3.2.5 identifies printed electronics base materials.

1.3.1 Nonspecific Designation A nonspecific designation is intended for use by designers on master drawings to designate their base material choice. At the end of this standard is a series of base material specification sheets identified by specification sheet numbers. Each sheet outlines engineering and performance data for a printed electronics base material, indicating base material family classification e.g., ceramic, metal, organic or glass. The designer should select the appropriate base material specification sheet as required to meet the operational specifications of their application e.g., consumer, automotive, aerospace.

Example of nonspecific designation: IPC-4921/1, Where “1” refers to the specification sheet detailing unsupported polyethylene terephthalate base material.

If further material specification details (such as thickness) are required, they should be highlighted in cross sectional views or notes on the master drawing.

1.3.2 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 Section 6). The specific designation should not be used by designers on master drawings to indicate their material selection. Designers **shall** specify on master drawings their material selection, as the specific designation is lengthy and requires fabricator level knowledge in making the detailed selections.

Example of specific designation:

IPC-4921/1 – OR7/1/F/7

Where:

IPC-4921/1 – Nonspecific Designation (see 1.3.1), for unsupported polyester base material.

OR7 – Base Material Type Designation (see 1.3.2.2), specifying polyethylene terephthalate.

1 – Base Structure Designation (see 1.3.2.3), specifying film.

F – Reinforcement Type Designation (see 1.3.2.4), specifying non-reinforced.

7 – Base Material Thickness Designation (see 1.3.2.5), specifying thickness ≥ 0.250 mm.

1.3.2.1 Base Material Family The family of the printed electronics base material **shall** be designated per Table 1-1.

Table 1-1 Base Material Family Designation

Designation	Family
C	Ceramic
M	Metal
OR	Organic
G	Glass
O	Other