



IPC-4202C

# Specification for Flexible Base Dielectrics for Use in Flexible Printed Boards

Developed by the Flexible Circuits Base Materials Subcommittee (D-13)  
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Users of this publication are encouraged to participate in the  
development of future revisions.

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# Specification for Flexible Base Dielectrics for Use in Flexible Printed Boards

## 1 SCOPE

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

**1.1 Nomenclature Designation System** The system described in 1.1.1 through 1.1.2.4 identifies flexible base dielectrics.

**1.1.1 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 base dielectric, indicating base material type and method of reinforcement.

Example of nonspecific designation: **IPC-4202/1**, Where “1” refers to the specification sheet detailing unsupported polyimide flexible base dielectrics.

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

**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 printed board manufacturers (see 6.1). The specific designation should not be used by designers on master drawings to indicate their material selection. Master drawings **shall** indicate the material design 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.

Example of specific designation:

**IPC-4202/1 – E1E2**

Where:

**IPC-4202/1** – Nonspecific Designation (see 1.1.1), for unsupported polyimide flexible base dielectrics.

**E** – Base Dielectric Material Type Designation (see 1.1.2.1), specifying polyimide.

**1** – Reinforcement Method Designation (see 1.1.2.2), specifying nonreinforced.

**E** – Reinforcement Type Designation (see 1.1.2.3), specifying nonreinforced film.

**2** – Base Dielectric Material Thickness Designation (see 1.1.2.4), specifying 50  $\mu\text{m}$  [1970  $\mu\text{in}$ ] thickness.

### 1.1.2.1 Base Dielectric Material Type

The type of dielectric material **shall** be designated per Table 1-1.

**Table 1-1 Base Dielectric Type Designation**

Designation	Base Dielectric Type
A	Polyvinyl fluoride (PVF)
B	Polyethylene Terephthalate Polyester (PET)
C	Fluorinated Ethylene-Propylene Copolymer (FEP)
D	Polytetrafluoroethylene (PTFE)
E	Polyimide
F	Aramid
G	Polyamide-imide
H	Epoxy
J	Polyetherimide
K	Polysulfone
L	Polyethylene Naphthalate (PEN)
M	Thermotropic Liquid Crystal Polymer

**1.1.2.2 Reinforcement Method** The reinforcement method **shall** be designated per Table 1-2.

**Table 1-2 Reinforcement Method Designation**

Designation	Reinforcement Method
1	Nonreinforced
2	Nonwoven reinforcement
3	Woven reinforcement
4	Combination woven and nonwoven reinforcement

**1.1.2.3 Reinforcement Type** The reinforcement type **shall** be designated per Table 1-3.

**Table 1-3 Reinforcement Type Designation**

Designation	Reinforcement Type
A	Glass
B	Polyester
C	Aramid
D	Cellulose
E	Film (nonreinforced)

**Note:** Combinations will use two letters separated by slash.

**1.1.2.4 Base Dielectric Material Thickness** The base material thickness **shall** be designated per Table 1-4.

**Table 1-4 Nominal Dielectric Thickness Designation**

Designator	Thickness <sup>1</sup>
1	25 µm [980 µin]
2	50 µm [1970 µin]
3	75 µm [2950 µin]
4	100 µm [3940 µin]
5	125 µm [4920 µin]
A	2.5 µm [100 µin]
B	5 µm [200 µin]
C	7.5 µm [300 µin]
D	10 µm [390 µin]
E	12.5 µm [490 µin]
F	15 µm [590 µin]
H	18 µm [710 µin]
J	20 µm [790 µin]
K	23 µm [910 µin]
L	38 µm [1500 µin]
X	Specified on purchase order Thicker or Thinner

<sup>1</sup> See 3.5.4.