IPC-4202A-2010

Flexible Base Dielectrics for Use in Flexible Printed Circuitry

Developed by the Flexible Circuits Base Materials Subcommittee (D-13) of the Flexible Circuits Committee (D-10) of IPC

Supersedes:
IPC-4202 - May 2002
IPC-FC-231C with
Amendment 1 - October 1995
IPC-FC-231C - April 1992
IPC-FC-231B - February 1986
IPC-FC-231A
IPC-FC-231

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

Contact:

IPC
3000 Lakeside Drive, Suite 309S
Bannockburn, Illinois
60015-1249
Tel 847 615.7100
Fax 847 615.7105

Table of Contents

Tables

Flexible Base Dielectrics for Use in Flexible Printed Circuitry

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 circuitry and flexible flat cable. This specification supersedes IPC-4202 which, in turn superseded IPC-FC-231C and the requirements herein meet or exceed the requirements for Class 3 in this superseded document. Note that conformance to Class 3 met or exceeded conformance to Classes 1 and 2. IPC-4202 no longer utilizes the 3-class system.

1.1 Classification 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 **fabricators** (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 non-reinforced.*

E – *Reinforcement Type Designation (see 1.1.2.3), specifying non-reinforced.*

2 – *Base Dielectric Material Thickness Designation (see 1.1.2.4), specifying 50 µm [1970 µin] 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	Polyvinylfluoride (PVF)
B	Polyethylene Terephthalate Polyester (PET)
C	Fluorinated Ethylene-Propylene Copolymer (FEP)
D	Polytetrafluorethylene (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	Non-reinforced
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 (non-reinforced)

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.