

IPC-4921A

2017 - May

Requirements for Printed Electronics Base Materials (Substrates)

An international standard developed by IPC

Association Connecting Electronics Industries



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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

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

Contact:

IPC
3000 Lakeside Drive, Suite 105N
Bannockburn, Illinois
60015-1249
Tel 847 615.7100
Fax 847 615.7105

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Printed Electronics Committee	Printed Electronics Base Material/Substrates Subcommittee	Technical Liaison of the IPC Board of Directors
Co-Chairs Neil Bolding MacDermid Enthone Electronics Solutions	Chair Scott E. Gordon DuPont Teijin Films	Bob Neves Microtek (Changzhou) Laboratories
Daniel Gamota Printovate Technologies, Inc.	Vice Chair Neil Bolding MacDermid Enthone Electronics Solutions	
Printed Electronics Base Material/Substrates Subcommittee		
Leonard Allison, Engineered Materials Systems, Inc.	Mahendra S.Gandhi, Northrop Grumman Aerospace Systems	Tom Rogers, Polyonics, Inc.
John Andresakis, Park Electrochemical Corp.	Ken Gann, Lab Tech	Haridoss Sarma, GO 2 Scout 4 R&T
Lance Auer, Raytheon Missile Systems	MaryAlice Gill, Jabil Circuit, Inc.	Joseph Schmidt, Raytheon Missile Systems
Sai Avuthu, Jabil Circuit, Inc.	Josh Goldberg, Taiyo America Inc.	Jeff Shubrooks, Raytheon Company
Anirban Basu	Scott E. Gordon, DuPont Teijin Films	Michael Slocum, Coast to Coast Circuits, Inc.
Andy Behr, Panasonic Industrial Devices Sales Company of America (PIDSA)	Mary K. Herndon, Raytheon Company	Richard C. Snogren, Bristlecone LLC
Todd Boedecker, GM Nameplate	Abbas Hosseinzadeh, Coast to Coast Circuits, Inc.	David Sommervold, The Bergquist Company/Henkel Electronic Materials LLC
Neil Bolding, MacDermid Enthone Electronics Solutions	Nizamidin Jappar, Kimoto Tech	Mamoru Takahashi, Asahi Glass Co., Ltd.
Alan Brown, Engineered Materials Systems, Inc.	Michael J. Jawitz, Orbital ATK	Brian J. Toleno, Microsoft Corporation
Alan M. Burk, ALMAX	Weifeng Liu, Flextronics International	Hector A. Valladares, Honeywell Aerospace
Antonio Caputo, Massachusetts Institute of Technology	Jason Marsh, Nextflex	Crystal Vanderpan, UL LLC
P. Marc Carter, SAIC	Daniel McCormick, NSWC Crane	Steve Vetter, NSWC Crane
Hikmat Chammas, Honeywell Inc. Air Transport Systems	Marty Medvetz, Chromaline Corporation	Michael Wagner, Butler Technologies, Inc.
John Crumpton, DuPont - RTP	Roger J. Miedico, Raytheon Company	Diane H. Williams, Corning Incorporated
Daniel Gamota, Printovate Technologies, Inc.	Dean A. Miner, 3M	Mobin Yahyazadehfar, DuPont Engineering Polymers
	Jeffrey Parker, Insulectro	
	Sujatha Ramanujan	
	German Rivera, Coast to Coast Circuits, Inc.	
	Cassandra Rocha, Boeing Company	

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Requirements for Printed Electronics Base Materials (Substrates)

1 SCOPE

This standard establishes the classification system, 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 postprocessed and comprise defined features or structures (e.g., conductive traces).

1.1 Purpose The purpose of this standard is to provide and define key characteristics and test methods used for procuring printed electronics base materials (substrates).

1.2 Classification System The system described in 1.2.1 through 1.2.2.5 identifies printed electronics base materials (substrates).

1.2.1 Designating Materials A materials 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 material specification sheets, which are identified by specification sheet numbers. Each specification sheet outlines engineering and performance data for a printed electronics base material type. The designer should select the appropriate base material specification sheet as required to meet the operational specifications of the end product application (e.g., consumer, automotive, aerospace, etc.).

An example base material designation would be IPC-4921/2, for which “/2” refers to the specification sheet detailing Polyester Naphthalate (PEN)/Biaxially Oriented Polyethylene Naphthalate (BOPEN).

If the designer requires further material specification details (e.g., thickness), the designer should highlight those details in cross-sectional views or notes on the master drawing.

If the designer is using a material which is not in one of the approved IPC-4921 specification sheets, the designer **shall** select the material type from 1.2.2.2. Users and suppliers should consider submitting new specification sheets for consideration in this standard (see 1.8).

1.2.2 Adding Details When Designating Materials Designers may add details to the procurement documentation for substrate materials.

The additional details designation **shall** follow this format:

Standard designation / Specification Sheet number or Base Material Type / Base Structure / Base Reinforcement Type / Base Material Thickness

Where:

- Standard designation is IPC-4921.
- Specification Sheet number is an approved IPC-4921 specification sheet.
- If no specification sheet exists, the designer **shall** select a Base Material Type designation from 1.2.2.2. If the material type is not included in 1.2.2.2, the designer **shall** create a designator for the material.
- Base Structure is selected from 1.2.2.3.
- Base Reinforcement Type is selected from 1.2.2.4.
- Base Material Thickness is selected from 1.2.2.5.

The following is an example of a detailed designation using an IPC-4921 Specification Sheet as the Base Material Type:

IPC-4921 / 2 / 2 / F / 7 would be PEN/BOPEN in sheet form, nonreinforced, with a thickness range of ≥ 0.250 mm to < 0.400 mm.

The following is an example of a detailed designation using a material which is not represented in an IPC-4921 specification sheet: