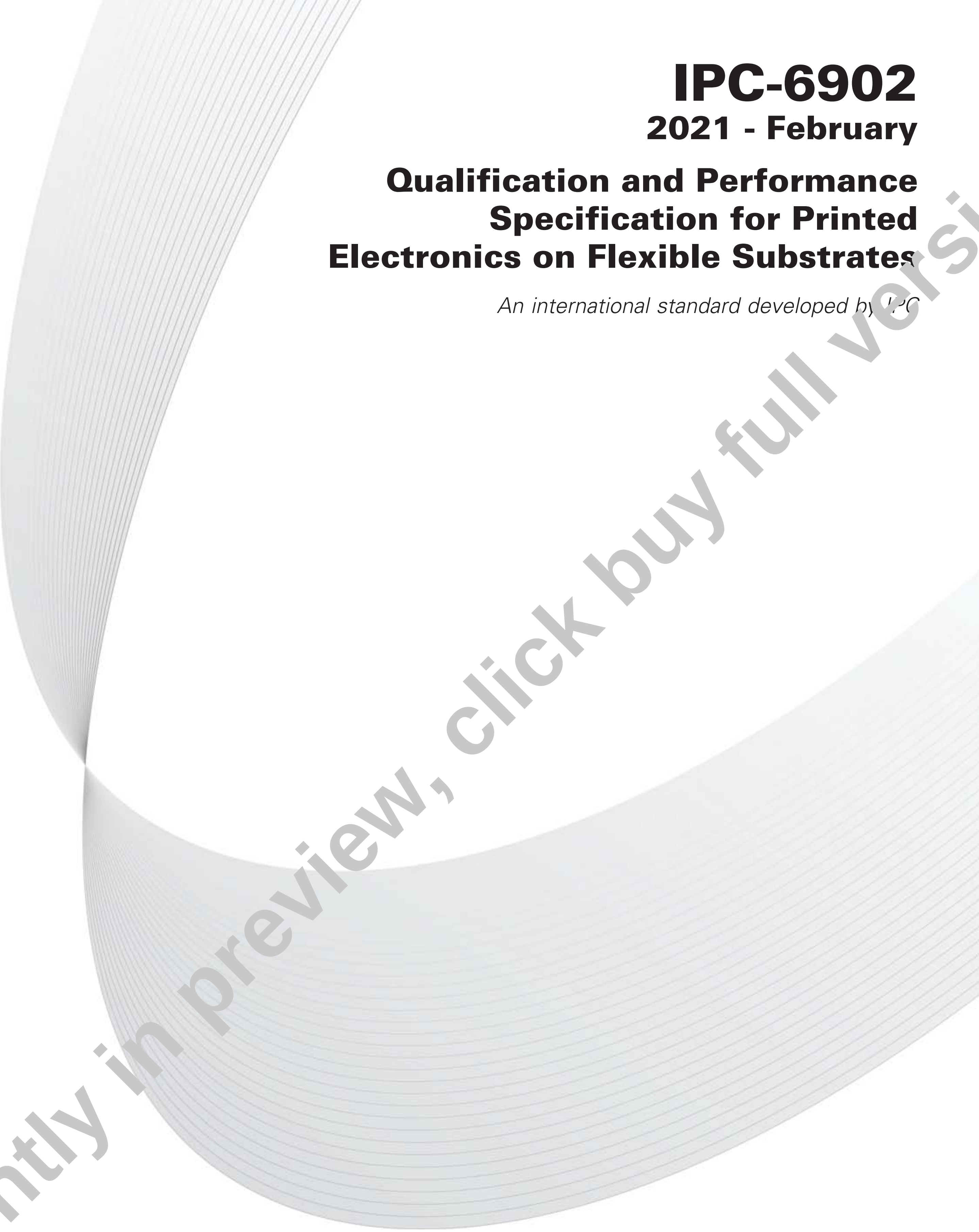

IPC-6902

2021 - February

Qualification and Performance Specification for Printed Electronics on Flexible Substrates

An international standard developed by IPC

BUILD ELECTRONICS BETTER

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- Show relationship to Design for Manufacturability (DFM) and Design for the Environment (DFE)
- Minimize time to market
- Contain simple (simplified) language
- Just include spec information
- Focus on end product performance
- Include a feedback system on use and problems for future improvement

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- Increase time-to-market
- Keep people out
- Increase cycle time
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IPC-6902

Qualification and Performance Specification for Printed Electronics on Flexible Substrates

Developed by the Printed Electronics Final Assembly Subcommittee (D-64) 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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Qualification and Performance Specification for Printed Electronics on Flexible Substrates

1 SCOPE

This standard establishes and defines the qualification and performance requirements for printed electronics and their forms of component mounting and interconnecting structures on flexible substrates. Flexible substrates, as pertain to this standard, are materials or devices which have some amount of flexibility or bendability but are not considered to be stretchable (e.g., fabrics, textiles, stretchable polymers, etc.). The substrate can be conductive, semiconductive or nonconductive.

1.1 Purpose The purpose of this specification is to provide requirements for qualification and performance of flexible printed electronics designed to IPC-2292.

1.2 Classification IPC standards recognize that electrical and electronic assemblies are subject to classifications by intended end-item use. Three general end-product classes have been established to reflect differences in manufacturability, complexity, functional performance requirements, and verification (inspection/test) frequency. It should be recognized that there may be overlaps of equipment between classes.

CLASS 1 General Electronic Products

Includes products suitable for applications where the major requirement is function of the completed assembly.

CLASS 2 Dedicated Service Electronic Products

Includes products where continued performance and extended life is required, and for which uninterrupted service is desired but not critical. Typically, the end-use environment would not cause failures.

CLASS 3 High Performance/Harsh Environment Electronic Products

Includes products where continued high performance or performance-on-demand is critical, equipment downtime cannot be tolerated, end-use environment may be uncommonly harsh, and the equipment must function when required, such as life support or other critical systems.

1.3 Measurement Units All dimensions and tolerances in this specification are expressed in hard SI (metric) units. Users of this specification are expected to use metric dimensions. All dimensions ≥ 1 mm will be expressed in millimeters. All dimensions < 1 mm will be expressed in micrometers.

1.4 Definition of Requirements The words **shall** or **shall not** are used in the text of this document wherever there is a requirement for materials, preparation, process control or acceptance.

The word ''should'' reflects recommendations and is used to reflect general industry practices and procedures for guidance only.

Line drawings and illustrations are depicted herein to assist in the interpretation of the written requirements of this Standard. The text takes precedence over the figures.

1.5 Process Control Requirements The primary goal of process control is to continually reduce variation in the processes, products, or services to provide products or processes meeting or exceeding User requirements. Process control tools such as IPC-9191, JEDEC JESD 557 or other User-approved system may be used as guidelines for implementing process control.

Manufacturers of Class 3 products **shall** develop and implement a documented process control system.

A documented process control system, if established, **shall** define process control and corrective action limits.

This may or may not be a statistical process control system. The use of ''statistical process control'' (SPC) is optional and should be based on factors such as design stability, lot size, production quantities, and the needs of the Manufacturer.