

INTERNATIONAL STANDARD



**Printed electronics –
Part 402-1: Printability – Measurement of qualities – Pattern width**



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

PRINTED ELECTRONICS –

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Pattern width**

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International Standard IEC 62899-402-1 has been prepared by IEC technical committee 119: Printed electronics.

The text of this standard is based on the following documents:

FDIS	Report on voting
119/133/FDIS	119/143/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62899 series, published under the general title *Printed electronics*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

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INTRODUCTION

This document contains fundamental information on the measurement of printed pattern width in printed electronics. This document includes measurement procedures as well as definitions of pattern width and related attributes such as variation properties of width, which are quite different from those in graphic art printing or the etching process. For example, in graphic art printing, the pattern width is generally more than several millimetres and the variation of width is relatively small and negligible. However, in printed electronics, the printed line patterns, through printing processes such as inkjet, gravure, flexography, etc., can have very narrow width of under several tens of micrometres, and the variation of pattern width can be large due to rough edges, which is hardly observed in the etching process. Therefore, it is difficult to define the line width exactly. The accurate information about pattern width can be very important for control and management of printability in the printing process and this can strongly affect the reliability and performance of printed electronics devices made of several sets of patterns.

This document excludes the standardization of the measurement system. It specifies the properties related to the width of the printed patterns obtained from the optical measurement system.

It is useful to use appropriate software that is capable of image processing, including image conversion, edge detection, calculation of the edge variation, etc., and should include information on the edge detection methods used.

PRINTED ELECTRONICS –

Part 402-1: Printability – Measurement of qualities – Pattern width

1 Scope

This part of IEC 62899 specifies the measurement methods of the widths of the printed patterns in printed electronics. These printed pattern widths are treated as two-dimensional on a substrate. When the patterns are definitely affected by three-dimensional configurations, these are specified in measurement methods for thickness in printed electronics.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 291, *Plastics – Standard atmospheres for conditioning and testing*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

stroke width

distance from edge to edge along a line normal to the vertical line of the captured image in the region of interest (ROI)

3.2

pattern width

distance from one edge to the other edge along a line normal to the pattern center line

3.3

pattern center line

approximate center line of two edges obtained from the centers of the stroke widths

3.4

mean pattern width

mean value of the pattern width

3.5

minimum pattern width

minimum value of the pattern width