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INTERNATIONAL STANDARD

Printed electronics -
Part 402-8: Printability - Measurement of qualities - Shape pattern dimension

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Printed electronics - Part 402-8: Printability - Measurement of qualities - Shape pattern dimension

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IEC 62899-402-8 has been prepared by IEC technical committee 119: Printed Electronics. It is an International Standard.

The text of this International Standard is based on the following documents:

Draft	Report on voting
119/532/CDV	119/563A/RVC

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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 document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,

– withdrawn, or

– revised.

INTRODUCTION

This document specifies the measurement of dimensions of the shape patterns in printed electronics. The shape patterns include various patterns with shapes such as circle, ellipse, square, rectangle, etc., as well as a combination of two or more of these, which are commonly used as parts of printed electronics devices. Various shape patterns constitute printed electronics devices, and consequently, the printability of patterns including dimension, gain, loss and distortion affects device performance. Therefore, it is important to measure the dimensions of shape patterns from the viewpoint of printability.

Some parts of pattern measurement have been specified for line pattern width, edge, and voids in IEC 62899-402-1, IEC 62899-402-2, and IEC 62899-402-3, respectively. The IEC 62899-403 series includes basic patterns for evaluation of printing machine, basic patterns for plating, etc., and moreover, IEC 62899-301-2 deals with the measurement of plate master pattern dimension. However, there is no standard for the measurement of printed patterns with general shapes. Therefore, this document is used to measure the dimensions of printed patterns as the result of the pattern design of the IEC 62899-403 series and plate patterns of IEC 62899-301-2 as well as to compare the dimensions of printed patterns with the pattern design for evaluating the printability.

This document includes two methods for the measurement of dimensions of the shape patterns: The first one is to simply specify the dimension of the shape and compare with the original design, and the second one is to specify the dimension as well as to quantify the related attributes such as variation of dimension. For more accurate measurement of dimensions of the shape patterns, it is recommended to apply the second method which requires the proper software to recognize the boundaries or edges differentiating the pattern area from the non-pattern area of the captured image as well as to identify the two-dimensional coordinates of pixels that constitute the image. This document does not specify the software to recognize the edge nor the edge detection algorithm. Depending on the user's concern and purpose, the first method or the second method can be used, or both.

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

1 Scope

This part of IEC 62899 specifies the measurement methods of the dimensions of the shape patterns in printed electronics. These printed patterns 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 vertical variance in IEC TR 62899-402-4 in printed electronics.

NOTE The measurement methods of dimensions of the shape patterns considering three-dimensional characteristics can be developed later after the measurement methods for vertical variance are established.

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 187, *Paper, board and pulps - Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples*

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 terminology databases for use in standardization at the following addresses:

– IEC Electropedia: available at https://www.electropedia.org/
– ISO Online browsing platform: available at https://www.iso.org/obp

3.1
shape pattern
two-dimensional pattern figure with various shapes

3.2
basic shape pattern
pattern with shapes of circle and rectangle as well as line pattern

3.3
shape pattern dimension
two-dimensional dimension of shape pattern

3.4
reference side
line that best fits each edge of a rectangle

3.5
reference length line
vertical reference side of a rectangle

3.6
reference width line
horizontal reference side of a rectangle