BS IEC 62899-301-2:2017

BSI Standards Publication

Printed electronics

Part 301-2: Equipment - Contact printing - Rigid master - Measurement method of plate master pattern dimension

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The UK participation in its preparation was entrusted to Technical Committee AMT/9, Printed Electronics.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Part 301-2: Equipment – Contact printing – Rigid master – Measurement method of plate master pattern dimension

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PRINTED ELECTRONICS –

Part 301-2: Equipment – Contact printing – Rigid master – Measurement method of plate master pattern dimension

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International Standard IEC 62903-2 has been prepared by IEC technical committee TC119: Printed electronics.

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

FDIS	Report on voting
119/178/FDIS	119/187/RVD

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

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

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- withdrawn,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

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INTRODUCTION

When dissecting the term "printed electronics", it can be easily understood that this industry involves electronic devices and products that are made using some fashion of printing technique. Printing methods have been widely used in textile and paper type substrates for centuries. In the past, the advent of mass producible printouts has brought huge impacts on how knowledge is stored, transferred and reproduced. At this stage of technological development, printing on either rigid or flexible substrates is considered to supplement or replace traditional electronic device manufacturing processes. The difference between media printing and printed electronics stems from the fact that media print is used to convey information for human to process using eyes while printed electronics requires machine to process electronic information; the level of required resolution and functionality make the differences. Some of the widely used functional materials for printed electronics are, but not limited to nano- or micro-size metal particles, semiconductive polymers, and dielectric materials. Due to the available and required readout resolution, small feature size below 20 μm needs to be printed. Layer thickness and registration accuracy of printed products are closely related to quality control of electronic devices, and ink materials require a high level of quality. Overall, printing tolerance is much smaller in printed electronics.

There are mainly two categories in printing process for the printed electronics. One is a non-contact printing process such as inkjet printing and electrostatic discharge (ESD) printing process. The other is a contact printing process such as gravure printing, gravure offset printing, reverse offset printing and screen printing. This document provides a proposal for measuring and assessing the printing master, therefore the scope is limited to the printing process using the printing master.

The quality of the printing master is important because the ink is transferred from the printing master to the substrate directly in these processes and it means that the quality of the results of the printed circuit depends on the quality of the printing master. For a mass production of the printed electronic devices, many companies such as device manufacturers, printing master manufacturers and printing master manufacturing equipment vendors are related to manufacturing and they need to use the printing master and the standardized measurement and assessment methods.

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PRINTED ELECTRONICS –

Part 301-2: Equipment – Contact printing – Rigid master – Measurement method of plate master pattern dimension

1 Scope

This part of IEC 62899 defines measurement terms and methods related to the critical dimension of features and the registration accuracy of features on rigid plate masters.

General critical dimensions are defined to evaluate the shape accuracy of features on the plate master. To evaluate the registration accuracy of features on the plate master, the specification for the registration mark for the plate master is specified. Then, common metrology procedures to measure the critical dimensions and the registration accuracy of the plate master are established for device manufacturers, printing master manufacturers and printing master manufacturing equipment vendors. The measurement terms which are measured by agreement between the user and the supplier are measured using the measurement methods given in this document.

2 Normative references

There are no normative references in this document.

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
plate master
device that carries the image to be printed

Note 1 to entry: The image on the plate may be raised above the surface (relief) or may be carved into the surface.

3.2
machine direction
MD
direction in which the stock flows

3.3
CD
cross direction
direction at right angles to the machine direction of a substrate

3.4
pattern edge detection method
method for determining the edge position of a given pattern by a computer algorithm

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