

TECHNICAL REPORT

Printed electronics –
Part 303-2: Equipment – Sheet to sheet printing – Mechanical dimensions

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

PRINTED ELECTRONICS –

**Part 303-2: Equipment – Sheet-to-sheet printing –
Mechanical dimensions**

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IEC TR 62899-303-2 has been prepared by IEC technical committee 119: Printed Electronics. It is a Technical Report.

The text of this Technical Report is based on the following documents:

Draft	Report on voting
119/504/DTR	119/513/RVDTR

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 Technical Report 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- withdrawn, or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.

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INTRODUCTION

The field of printed electronics represents an exciting frontier in modern technology, having recently progressed from experimental stages to actual commercial production. This advancement underscores the need for scalable industrial equipment to manufacture a large volume of products efficiently.

Unlike traditional electronic products, the nascent world of printed electronics lacks universally accepted standards for the mechanical dimensions of the final products or devices. This absence presents a unique challenge in an industry with a rich history of over 1 000 years, where 'printing' commonly refers to 'image printing' or simply 'print.'

Historically, international standards have been instrumental in shaping the printing industry. These standards, defining aspects like paper size and the input and output dimensions of the printing process, have streamlined production and mitigated complications arising from unknown or variable sizes.

Embracing this established tradition of standardization, IEC TC 119 is initiating a document to delineate standard mechanical dimensions for input and output from printed electronics equipment. The intention behind this standardization is to provide a cohesive framework, enhancing interoperability and efficiency, mirroring the success achieved in traditional printing processes. This initiative marks a significant step towards integrating printed electronics into the broader landscape of industrial production.

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PRINTED ELECTRONICS –

Part 303-2: Equipment – Sheet-to-sheet printing – Mechanical dimensions

1 Scope

This part of IEC 62899, which is a Technical Report, lays down the framework for defining standard mechanical dimensions of equipment utilized in the field of printed electronics. While primarily focused on substrate-based printing equipment, the guidelines and standards established in this document also maintain flexibility for application to transient printing equipment. Through this inclusivity, the document seeks to cover a broad spectrum of the industry, ensuring uniformity and adaptability across various printing technologies in the printed electronics domain.

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 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 S2S

sheet-to-sheet

printing operation that demands the sequential feed-in of the substrate, aligning each sheet accurately for the subsequent steps in the process

Note 1 to entry: The substrate is also called wafer in semiconductor industry.

Note 2 to entry: See also IEC 62899-101:2019 [4], 3.123.

3.2 alignment mark

specific mark or indicator used within the fabrication process to dictate the exact positioning for alignment, to guide and ensure the correct alignment of various components or layers during production, thereby maintaining precision and consistency throughout the manufacturing stage

3.3 trigger mark

designated mark or sign that serves as an indication of where the printing process is required to begin or initiate

Note 1 to entry: This mark plays a critical role in the sequence of operations, ensuring that the printing commences at the correct point, thereby maintaining the alignment and consistency of the entire process.

3.4 shuttle

<printed electronics> device or mechanism that moves back and forth between two or more fixed points, often used to transfer or guide materials within a system or process

Note 1 to entry: The shuttle's function and design can vary significantly depending on its application, such as in printing, manufacturing, or transportation systems.

Note 2 to entry: Specific parameters or characteristics related to the shuttle might possibly be defined based on its application within the particular standard.

4 Mechanical dimensions

4.1 General

The specified conditions for measuring the mechanical dimensions will be consistent and adhere to the following parameters:

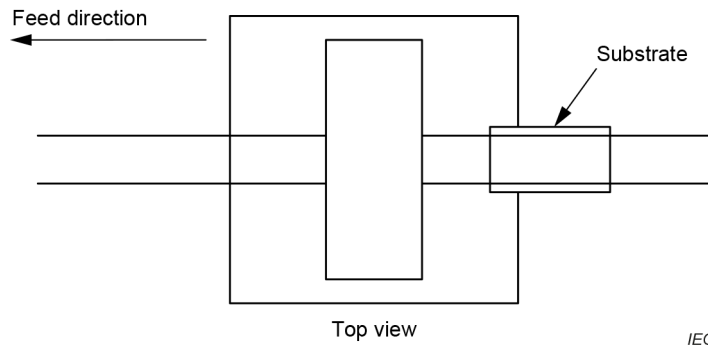
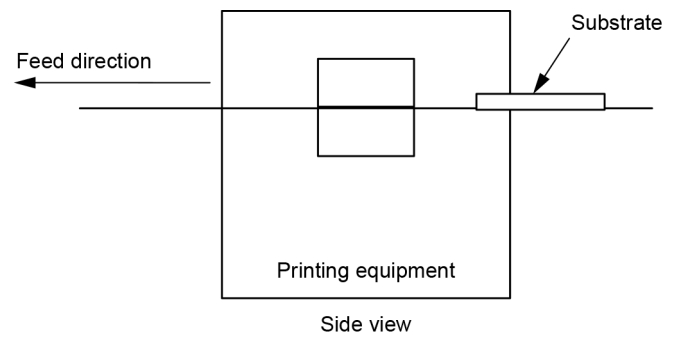
- room temperature;
- room humidity.

These measuring conditions will be accurately reported, as they play a crucial role in the precision and reliability of the measurements.

4.2 Overview of printing equipment for printed electronics

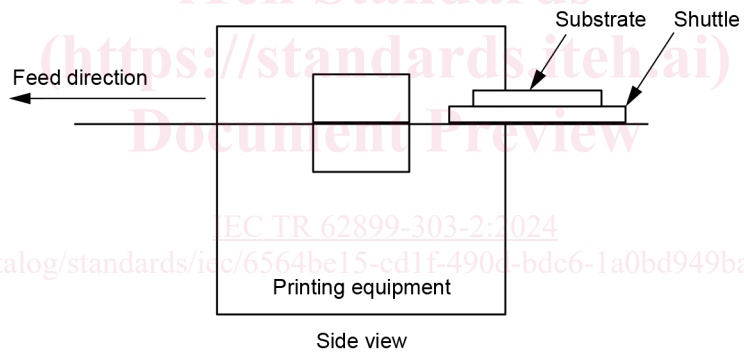
The printing systems designed for printed electronics can be broadly classified into two main categories, as shown in Figure 1:

- S2S printing system (feed substrate only): This system solely focuses on the feed-in of the substrate without any additional functionalities.
- S2S printing system with shuttles: This system includes shuttles, providing enhanced functionalities in the printing process by conveying substrate(s) on a shuttle that carries them.

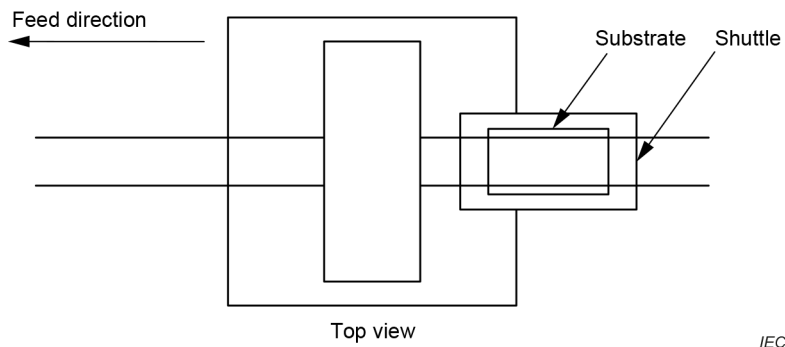


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a) Examples of an S2S printing system with substrate feed only



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b) Examples of a S2S printing system with shuttles

Figure 1 – Overview of S2S printing system