IEC 62899-302-4

Edition 1.0 2024-08

INTERNATIONAL STANDARD

Printed electronics –
Part 302-4: Equipment – Inkjet – Medium for inkjet printing dot placement evaluation

IEC 62899-302-4:2024(en)

IEC Secretariat
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC
The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications
The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform
The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, …). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished
Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc
If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch
Discover our powerful search engine and read freely all the publications previews, graphical symbols and the glossary. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org
The world's leading online dictionary on electrotechnology, containing more than 22 500 terminological entries in English and French, with equivalent terms in 25 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online

IEC 62899-302-4

Edition 1.0 2024-08

INTERNATIONAL STANDARD

Printed electronics –
Part 302-4: Equipment – Inkjet – Medium for inkjet printing dot placement evaluation

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 19.080; 37.100.10

ISBN 978-2-8322-9495-6

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

PRINTED ELECTRONICS –

Part 302-4: Equipment – Inkjet – Medium for inkjet printing dot placement evaluation

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at https://patents.iec.ch. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 62899-302-4 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
119/496/FDIS	119/506/RVD

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

Until recently, inkjet technologies were used only for imaging printing (conventional “graphic printing”). However, recent developments of inkjet technologies, such as technologies for inkjet print-head, functional ink or print-head driving technologies, make it possible to extend their applications to printed electronics. For these applications, the accuracy requirement for inkjet drop placement tends to be higher than in graphic printing.

This document considers that “'inkjet print dot placement accuracy” is the key parameter to obtain an appropriate output that has adequate print quality. In order to evaluate the inkjet printing system, inkjet print dot placement accuracy is measured. For that purpose, an appropriate medium is used, since the “accuracy” of the printed position is only secured by using an appropriate medium that shows actual dot placement. This document describes what kinds of parameters of an appropriate medium are useful to obtain actual accuracy of dot placement evaluation for printed electronics.

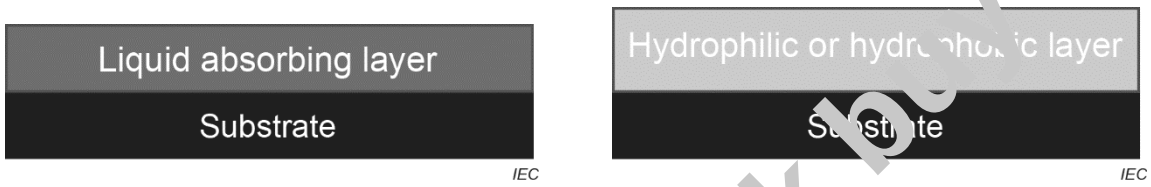
PRINTED ELECTRONICS –

Part 302-4: Equipment – Inkjet – Medium for inkjet printing dot placement evaluation

1 Scope

This part of IEC 62899 provides measurement methods and specifications for a medium to measure actual inkjet dot placement for printed electronics applications.

NOTE For this document, a medium is a substrate with (a) certain functional layer(s) to facilitate the ink printing process (or step). These functional layers are either (a) a liquid absorbing layer or (b) a hydrophilic or hydrophobic layer as shown in Figure 1.



a) Medium with a liquid absorbing layer **b) Medium with a hydrophilic or hydrophobic layer**

NOTE These figures are examples, and do not show all the required layers of a medium.

Figure 1 – Examples of a medium for actual dot placement

2 Normative reference

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 216, *Writing paper and certain classes of printed matter – Trimmed sizes – A and B series, and indication of machine direction*

ISO 534, *Paper and board – Determination of thickness, density and specific volume*

ISO 4287, *Geometrical Product Specifications (GPS) – Surface texture: Profile method – Terms, definitions and surface texture parameters*

ISO 8226-1, *Paper and board – Measurement of hygroexpansivity – Part 1: Hygroexpansivity up to a maximum relative humidity of 68 %*

ISO 8226- 2, *Paper and board – Measurement of hygroexpansivity – Part 2: Hygroexpansivity up to a maximum relative humidity of 86 %*

ISO 9513, *Metallic materials – Calibration of extensometer systems used in uniaxial testing*

ISO 11359-2, *Plastics – Thermomechanical analysis (TMA) – Part 2: Determination of coefficient of linear thermal expansion and glass transition temperature*