



BSI Standards Publication

## Printed electronics

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Part 202: Materials — Conductive ink

## National foreword

This British Standard is the UK implementation of IEC 62899-202:2023. It supersedes BS IEC 62899-202:2016, which is withdrawn.

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 committee manager.

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# IEC 62899-202

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# INTERNATIONAL STANDARD

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**Printed electronics –  
Part 202: Materials – Conductive ink**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**PRINTED ELECTRONICS –****Part 202: Materials – Conductive ink****FOREWORD**

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IEC 62899-2-1 has been prepared by IEC technical committee 119: Printed electronics. It is an International Standard.

This second edition cancels and replaces the first edition published in 2016. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) definitions of conductive material, conductive ink and conductive layer have been revised;
- b) a summary of test methods is added;
- c) mechanical tests for conductive layer are added.

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

Draft	Report on voting
119/423/FDIS	119/428/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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://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](http://webstore.iec.ch) in the data related to the specific document. At this date, the document will be

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- withdrawn,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

## INTRODUCTION

Printed electronics is a technology that spans the printing and electrical/electronic area, and it provides a variety of products. Since participants in this industry come from different areas, their backgrounds and customs can be barriers to smooth communication and transactions in the supply chain. The printed electronics industry continues to grow, but many barriers still remain. Particularly, the lack of standardised terms and evaluation methods is one of the major factors that inhibit smooth communication.

This document focuses on measurement and evaluation methods for conductive inks and provides tools to promote the smooth communication within the supply chain.

This document specifies the basic items to be communicated and their measurement or evaluation methods. This document includes the measurement methods for the basic properties of inks and electrical conductivity, which is obtained by the post treatment of inks. Additionally, storage methods, packaging and marking, and transportation conditions are also included.

This document is part of the IEC 62899-202 series and similar documents are available for other materials used in printed electronics.

The IEC 62899-20x series consists of the following parts:

- IEC 62899-201: Materials – Substrates
- IEC 62899-202: Materials – Conductive ink
- IEC 62899-203: Materials – Semiconductor ink
- IEC 62899-204: Materials – Insulator ink

Furthermore, sectional specifications, blank detail specifications, and detail specifications of each material will follow these parts.



## PRINTED ELECTRONICS –

### Part 202: Materials – Conductive ink

#### 1 Scope

This part of IEC 62899 defines the terms and specifies the standard test methods for characterization and evaluation of conductive inks.

This document also provides measurement methods for evaluating the properties of conductive layers made both from an additive process using conductive inks and from a subtractive process used 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.

IEC 62899-202-3, *Printed electronics – Part 202-3: Materials – Conductive ink – Measurement of sheet resistance of conductive films – Contactless method*

IEC 62899-202-5, *Printed electronics – Part 202-5: Materials – Conductive ink – Mechanical bending test of a printed conductive layer on an insulating substrate*

ISO 5-2, *Photography and graphic technology – Density measurements – Part 2: Geometric conditions for transmittance density*

ISO 5-3, *Photography and graphic technology – Density measurements – Part 3: Spectral conditions*

ISO 124, *Latex, rubber – Determination of total solids content*

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

ISO 304, *Surface active agents – Determination of surface tension by drawing up liquid films*

ISO 489:2022, *Plastics – Determination of refractive index*

ISO 758, *Liquid chemical products for industrial use – Determination of density at 20 degrees C*

ISO 1183-1, *Plastics – Methods for determining the density of non-cellular plastics – Part 1: Immersion method, liquid pycnometer method and titration method*

ISO 2409:2020, *Paints and varnishes – Cross-cut test*

ISO 2471, *Paper and board – Determination of opacity (paper backing) – Diffuse reflectance method*