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REDLINE VERSION

INTERNATIONAL STANDARD

colour inside

Printed electronics –
Part 202: Materials – Conductive ink

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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PRINTED ELECTRONICS –

Part 202: Materials – Conductive ink

FOREWORD

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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 62899-202:2016. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

IEC 62899-202 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:

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IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

~~The IEC 62899-20x series relates mainly to evaluation methods for materials of printed electronics. The series also include storage methods, packaging and marking, and transportation conditions.~~

~~The IEC 62899-20x series is divided into parts for each material. Each part is prepared as a generic specification containing fundamental information for the area of printed electronics.~~

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[1]

IEC 62899-204: Materials – Insulator ink

~~(Subsequent parts will be prepared for other materials.)~~

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

~~This part of IEC 62899 is prepared for conductive materials used in printed electronics and contains the test conditions, the evaluation methods and the storage conditions.~~

[1] ~~Under consideration.~~

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 International Standard is applicable to conductive inks and conductive layer that are made from 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:~~1999~~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*

ISO 2555, *Plastics – Resins in the liquid state or as emulsions or dispersions – Determination of apparent viscosity ~~by the Brookfield Test~~ using a single cylinder type rotational viscometer method*

ISO 2592, *Petroleum and related products – Determination of flash and fire points – Cleveland open cup method*

ISO 2719, *Determination of flash point – Pensky-Martens closed cup method*

ISO 2811-1, *Paints and varnishes – Determination of density – Part 1: Pycnometer method*

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Part 202: Materials – Conductive ink

IEC 62899-202:2023-05(en)

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