IEC 62899-202-5

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INTERNATIONAL STANDARD

colour inside

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

IEC 62899-202-5:2018(en)

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FOREWORD

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International Standard IEC 62899-202-5 has been prepared by IEC technical committee 119: Printed Electronics.

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

FDIS	Report on voting
119/227/FDIS	119/235/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.

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 "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- withdrawn,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.

A bilingual version of this publication may be issued at a later date.

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INTRODUCTION

The printing process is a highly promising technology for the fabrication of flexible devices. In particular, a printed conductive layer on an insulating substrate will be widely employed as an electrode or as an interconnect for flexible devices. It will be dealt with and commercialized as a type of composite material in which the conductive layer is formed on the substrate as a conductor.

For a conductive film, the electrical property under mechanical deformation is very important because it is highly sensitive to mechanical stress and degrades well before the mechanical fracture. Therefore, a method for evaluating the conductivity of film materials provided by suppliers, sometimes including an *in situ* measurement system, is required in the industry as these are the basic materials which will be used in printed devices. Although some bending tests already exist, it is necessary to consider the unique characteristics of the printed films that are fabricated on a polymer substrate, which is weak under high temperature. These films are operated under severe mechanical deformations, unlike the conventional Si- or glass-based conductive films.

In this document, a mechanical bending test is described to evaluate the electrical property of a printed conductive layer on a substrate under repeated mechanical deformations. This sliding plate test method can be available for practical application in the industry by enabling the long-term reliability testing of printed film.

PRINTED ELECTRONICS –

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1 Scope

This International Standard specifies a mechanical bending test for evaluating the electrical properties of a printed conductive layer on an insulating substrate under repeated mechanical deformation.

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 62899-202:2016, *Printed electronics – Part 202: Materials – Conductive ink*

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
conductive material
ingredient of a printing or coating material, which itself is electrically conductive or becomes electrically conductive by post treatment such as heating

[SOURCE: IEC-62899-202:2016, 3.1]

3.2
conductive ink
fluid in which one or more small molecules, polymers, or particles are dissolved or dispersed, and which becomes an electrically conductive layer by post treatment such as heating

[SOURCE: IEC-62899-202:2016, 3.2]

3.3
conductive layer
film-like electrically conductive body made of conductive ink, which is printed or coated on a substrate, followed as necessary by post treatment such as heating

[SOURCE: IEC-62899-202:2016, 3.3]