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Printed electronics –
Part 202-6: Materials – Conductive ink – Measurement method for resistance changes under high temperature and humidity – Printed conductive layer on a flexible substrate

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International Standard IEC 62899-202-6 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
119/323/FDIS	119/331/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- withdrawn,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.

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INTRODUCTION

The printing process is a highly promising technology for fabricating flexible devices due to its high conductivity and productivity. In particular, a printed conductive layer on a flexible substrate will be widely employed as an electrode or an interconnect for flexible devices. It will be dealt with and commercialized as a sort of composite material in which the conductive layer is formed on the substrate as a conductor.

For conductive films, silver/copper nanowires or metal mesh on flexible substrate are a key component for many recently developed electronic products, from smart phones to the keypads of appliances such as refrigerators and washing machines. Although the conventional material for transparent conductive films is indium tin oxide (ITO), transparent conductive films, enabled by printed electronics technologies, have arisen as a replacement. For application of conductive films, the electrical property under environmental conditions such as temperature, humidity, light, etc., is very important because it is highly sensitive to the environment because of oxidation, dissolution, melting, etc [1][1]. The conductive films should be stored on a shelf and should be environmentally stable during their operation in electronic devices. Therefore, a method and environment for transferring, storing, and processing the conductivity film are sometimes provided by the supplier and include environmental measurements for printed devices. Although some environmental conditions for testing already exist, the unique characteristics of the printed conductive films should be considered, because they are fabricated on a polymer substrate which is susceptible to temperature, humidity, light, etc., unlike the conventional ITO transparent conductive films.

In this document, an environment reliability test is proposed to evaluate the electrical property and resistance change of a printed conductive film on a flexible substrate.

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1 Numbers in square brackets refer to the Bibliography.

PRINTED ELECTRONICS –

Part 202-6: Materials – Conductive ink – Measurement method for resistance changes under high temperature and humidity – Printed conductive layer on a flexible substrate

1 Scope

This part of IEC 62899 provides a method of in-situ measurement for the resistance change of a conductive layer formed by printing methods on a flexible substrate under specified temperature and humidity conditions.

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 62899-201, *Printed electronics – Part 201: Materials – Substrates*

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

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