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IEC 62899-502-1

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# INTERNATIONAL STANDARD



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**Printed electronics –  
Part 502-1: Quality assessment – Organic light emitting diode (OLED) elements –  
Mechanical stress testing of OLED elements formed on flexible substrates**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

### PRINTED ELECTRONICS –

#### **Part 502-1: Quality assessment – Organic light emitting diode (OLED) elements – Mechanical stress testing of OLED elements formed on flexible substrates**

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International Standard IEC 62899-502-1 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
119/138/FDIS	119/148/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- withdrawn,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
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## INTRODUCTION

In contrast to existing lighting tiles formed on heavy and rigid substrates, printed flexible organic light emitting diodes (OLED) are expected to be thin and light-weight, and to be used as flexible lighting elements for emerging applications such as newly designed lighting for, architecture, automobile, aircraft and so on.

It is highly beneficial to standardize quality assessment methods of printed flexible OLED elements for both manufacturers and users at an early stage of the growing market for the devices. In addition, the standardization helps to settle the contents for the technological development. The standardization of testing conditions for mechanical stress is very much expected to evaluate the printed flexible OLED elements and to accelerate the expansion of the printed electronics (PE) market opportunities for flexible device applications.

This document defines testing conditions for mechanical stress, in the form of curving, rolling, and/or folding on printed flexible OLED elements. The mechanical stresses for the test are applied as specific forms under defined conditions, which depend on the specific applications including rigidly fixed lighting for the printed flexible OLED elements. This document also defines coexisting environmental conditions such as temperature, humidity and air pressure. This document includes evaluation methods of optical and electrical properties for the performance change induced by the stress test on the printed flexible OLED elements.

## PRINTED ELECTRONICS –

### **Part 502-1: Quality assessment – Organic light emitting diode (OLED) elements – Mechanical stress testing of OLED elements formed on flexible substrates**

#### **1 Scope**

This part of IEC 62899 specifies the quality assessment methods, especially the mechanical stress test methods, for reliability assessment.

This document is applicable to flexible OLED elements formed on flexible substrates by printed electronics technology *excluding those OLED products, which are intended to be used for lighting purposes.*

#### **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 62715-6-1, *Flexible display devices – Part 6-1: Mechanical stress test methods*

IEC 62341-5:2009, *Organic light emitting diode (OLED) displays – Part 5: Environmental testing methods*

IEC 62341-6-1, *Organic light emitting diode (OLED) displays – Part 6-1: Measuring methods of optical and electro-optical parameters*

IEC 62595-2-1:2016, *Display lighting unit – Part 2-1: Electro-optical measurement methods of LED backlight unit*

IEC 62922, *Organic light emitting diode (OLED) panels for general lighting – Performance requirements*