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Part 550-1: Quality assessment – Framework document on durability testing – Mechanical and thermal testing

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FOREWORD

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IEC TR 62899-550-1 has been prepared by IEC technical committee 119: Printed Electronics. It is a Technical Report.

The text of this Technical Report is based on the following documents:

Draft	Report on voting
119/384/DTR	119/388/RVDTR

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 Technical Report 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. The main document types developed by IEC are described in greater detail at 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 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- withdrawn,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

The purpose of this document is to describe a framework for evaluating the mechanical and thermal durability of printed and/or flexible electronics components and products.

Durability testing helps to improve the product and create greater revenue through customer satisfaction and retention, since it provides the means to identify and ensure a robust product. Therefore, the standardization and sharing of a consistent method for durability test is an effective way to facilitate the commoditization and raise the confidence and performance bar of the relevant industry.

IEC TC 119 has previously published several documents relating to the durability of flexible electronics components and products. Examples include IEC 62899-201, IEC 62899-501-1, IEC 62899-502-1, and IEC 62899-505. Although they cover a variety of flexible components and products, there are many similarities in methods and procedures for durability testing. More documents will continue to be published in this way. Hence, a general framework is necessary to ensure solid consistency in the test methods and procedures of printed and/or flexible electronics. Specifying the consistent methods for durability testing will help users, including businesses, developers, vendors, and end users, to select a suitable method for durability test and make consistent test procedures for printed electronics.

Among various durability tests, mechanical and thermal tests are the most common for printed and/or flexible electronics components and products, since these devices are capable of undergoing deformation under various mechanical and environmental conditions. The functional properties will be unaffected by the serious mechanical and environmental changes. Thus, this document, which is the first framework document for durability testing, addresses mechanical and thermal durability tests. Further, the types of testing and test method will be continuously updated and extended to push the growth of the printed electronics industry.

For consistency of the framework, the IEC 62899 series is preferentially referred to for mechanical and thermal tests. For example, the bending test methods and procedures are made with reference to IEC 62899-201, IEC 62899-501-1, and IEC 62899-502-1. In the case of thermal testing, the methods and procedures are prepared based on IEC 62899-505, whereas the temperature and humidity conditions refer to IEC 60721-3-7, which includes the environmental parameters for portable use.

This framework is intended to assist in making documents relating to the mechanical and thermal durability of printed and/or flexible electronics components and products consistent.

For a general applicability of this framework, other durability tests such as humidity, altitude and radiation will be considered.

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1 Scope

This part of IEC 62899, which is a Technical Report, provides a framework for evaluating the mechanical and thermal durability of printed and/or flexible electronics components and products. This includes the bending test, torsion test, stretching test, steady heat test as well as the thermal cycle test. These are typical conditions that are easily encountered in daily life for printed and/or flexible electronics components and products.

This document gives guidance for use for technical committees in the preparation of consistent standards relating to the quality assessment of printed and/or flexible electronics components and products. Consistent standards for durability testing will help users, including businesses, developers, vendors, and end users to select suitable methods for durability testing and make consistent test procedures for printed electronics.

2 Normative references

There are no normative references in this document.