IEC 63013

Edition 1.1 2021-10
CONSOLIDATED VERSION

INTERNATIONAL STANDARD

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LED packages – Long-term luminous and radiant flux maintenance projection

LED encapsulées – Projection à long terme concernant la conservation du flux lumineux et du flux énergétique

IEC 63013:2017-06+AMD1:2021-10 CSV(en-fr)

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LED PACKAGES – LONG-TERM LUMINOUS AND RADIANT FLUX MAINTENANCE PROJECTION

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IEC 63013 edition 1.1 contains the first edition (2017-06) [documents 34A/2008/FDIS and 34A/2015/RVD] and its amendment 1 (2021-10) [documents 34A/2233(F)/CDV and 34A/2253/RVC].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.

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International Standard IEC 63013 has been prepared by subcommittee 34A: Lamps, of IEC technical committee 34: Lamps and related equipment.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of the base publication and its amendment will remain unchanged until the stability date indicated on the IEC web site under webstore.iec.ch in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
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INTRODUCTION

One of the benefits of LED lighting is their long lifetime compared to that of many other light source technologies.

However, there is currently no international standard for predicting the long-term luminous flux maintenance of LED packages. This document is intended to close this gap by specifying methods for the long-term luminous flux maintenance projection.

This document is the result of the discussions led by a special expert group within IEC technical committee 34 on this topic.

This expert group had collected a set of luminous flux maintenance measurements of 39 LED package types, each tested at three different temperatures.

Various projection methods were analysed based on this set of test data.

Regarding the selection of models, there was a controversial discussion among the experts and no unanimous agreement could be found.

It was concluded at the meeting in Berlin on 21 January 2014 to choose the TM-21 method as the starting point of the analysis and to have the border function as an alternative in case the TM-21 method was not applicable. It was further concluded that the Arrhenius temperature acceleration should be included in an informative annex.

At the meeting on 26 January 2015 in Washington some further editorial improvements were made and it was agreed to submit this document to IEC as a new project with a view to developing a full international standard.

This new project was approved and all comments received during the enquiry stage were discussed by the project team and resolved. This document incorporates the changes agreed by the project team.

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LED PACKAGES – LONG-TERM LUMINOUS AND RADIANT FLUX MAINTENANCE PROJECTION

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1 Scope

This document is applicable to LED packages for general lighting services and LED packages for horticultural lighting.

It specifies procedures and conditions for measuring the luminous flux maintenance of LED packages. It also provides the procedures and conditions (criteria) of projecting the long-term luminous flux maintenance based on limited luminous flux maintenance test data collected. Within the context of this document, wherever luminous flux measurement data is specified, radiant flux measurement data and photon flux measurement data can also be used.

These projection methods employ data collected as per ~~ANSI/IES LM-80-15~~ ANSI/IES LM-80-20 (LM-80).

The long-term projection is based on the exponential-fit-function procedure of ~~IES TM-21-11~~ ANSI/IES TM-21-19 (TM-21) and gives an alternative border function procedure in the case where the exponential-fit-function of ~~IES TM-21-11~~ ANSI/IES TM-21-19 is not applicable.

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 62504, *General lighting – Light emitting diode (LED) products and related equipment – Terms and definitions*

~~IES TM-21-11, *Projecting Long Term Lumen Maintenance of LED Light Sources*~~

~~IES LM-80-08 [1], *IES Approved Method for Measuring Lumen Maintenance of LED Light Sources*~~

~~ANSI/IES LM-80-15, *IES Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays and Modules*~~

ANSI/IES TM-21-19 [2], *Technical Memorandum: Projecting Long Term Lumen, Photon, and Radiant Flux Maintenance of LED Light Sources*

ANSI/IES LM-80-20, *Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays, and Modules*

~~[1] Withdrawn. This edition was replaced in 2015 by IES LM-80-15, *IES Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays and Modules*.~~

[2] A revision of ANSI/IES TM-21-19, and a new ANSI approved IES calculation tool are under preparation by the Illuminating Engineering Society. Publication of ANSI/IES TM-21-21 and the ANSI/IES TM-21-21 Calculator are expected prior to 2021-12-31.