

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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





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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

FOREWORD

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

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

FDIS	Report on voting
34A/2008/FDIS	34A/2015/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.

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- withdrawn,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.

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.

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

1 Scope

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

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 can also be used.

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

The long-term projection is based on the exponential-fit-function procedure of IES TM-21-11 (TM-21), and gives an alternative border function procedure in the case where the exponential-fit-function of IES TM-21-11 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-80-08¹, *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*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62504 and the following 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>

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*.