SLOVENSKI STANDARD
SIST EN 62717:2017/A2:2019

01-junij-2019

LED-moduli za splošno razsvetljavo - Tehnične zahteve - Dopolnilo A2 (IEC 62717:2014/A2:2019)

LED modules for general lighting - Performance requirements (IEC 62717:2014/A2:2019)

LED-Module für die Allgemeinbeleuchtung - Anforderungen an die Arbeitsweise (IEC 62717:2014/A2:2019)

Modules de LED pour éclairage général - Exigences de performance (IEC 62717:2014/A2:2019)

Ta slovenski standard je istoveten z: **EN 62717:2017/A2:2019**

ICS:

29.140.50	Instalacijski sistemi za razsvetljavo	Lighting installation systems

SIST EN 62717:2017/A2:2019 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62717:2017/A2

April 2019

ICS 29.140.99

English Version

LED modules for general lighting - Performance requirements (IEC 62717:2014/A2:2019)

Modules de LED pour éclairage général - Exigences de performance
(IEC 62717:2014/A2:2019)

LED-Module für die Allgemeinbeleuchtung - Anforderungen an die Arbeitsweise
(IEC 62717:2014/A2:2019)

This amendment A2 modifies the European Standard EN 62717:2017; it was approved by CENELEC on 2019-02-28. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This amendment exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

The text of document 34A/2121/FDIS, future IEC 62717/A2, prepared by SC 34A "Lamps" of IEC/TC 34 "Lamps and related equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62717:2017/A2:2019.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2019-11-28
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-02-28

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For the relationship with EU Directive(s), see informative Annexes ZZ included in EN 62717:2017.

Endorsement notice

The text of the International Standard IEC 62717:2014/A2:2019 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 62722-1:2014	NOTE	Harmonized as EN 62722-1:2016

Replace the Annex ZA of 62717:2017 by the following one:

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60050-845	1987	International Electrotechnical Vocabulary. Lighting	-	-
IEC 60068-2-14	-	Environmental testing - Part 2-14: Tests - Test N: Change of temperature	EN 60068-2-14	2009
IEC 60068-3-5	2001	Environmental testing -- Part 3-5: Supporting documentation and guidance - Confirmation of the performance of temperature chambers	EN 60068-3-5	2002
IEC 60081	-	Double-capped fluorescent lamps - Performance specifications	EN 60081	1998
			A1	2002
			A2	2003
			A3	2005
			A4	2010
			A5	2013
			A6	2017
			A11	2018
IEC 61000-3-2	2005	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)	-	-
+ A1	2008			
+ A2	2009			

IEC 61000-4-7	-	Electromagnetic compatibility (EMC) - Part 4-7: Testing and measurement techniques - General guide on harmonics and interharmonics measurements and instrumentation, for power supply systems and equipment connected thereto	EN 61000-4-7	2002
			A1	2009
IEC 61347-2-13	-	Lamp controlgear - Part 2-13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules	EN 61347-2-13	2014
			A1	2017
IEC 62031	2008	LED modules for general lighting - Safety specifications	EN 62031	2008
IEC 62504	-	General lighting - Light emitting diode (LED) products and related equipment - Terms and definitions	EN 62504	2014
			A1	2018
IEC/TR 61341	-	Method of measurement of centre beam intensity and beam angle(s) of reflector lamps	EN 61341	2011
ANSI/IES LM-80-15	-	Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays and Modules	-	-
CIE 13.3	1995	Method of measurement and specifying colour rendering properties of light sources	-	-
CIE 177	2007	Colour rendering of white LED light sources	-	-
CIE S 025/E	2015	Test Method for LED Lamps, LED Luminaires and LED Modules	-	-

IEC 62717

Edition 1.0 2019-01

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

AMENDMENT 2
AMENDEMENT 2

LED modules for general lighting – Performance requirements

Modules de LED pour éclairage général – Exigences de performance

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 29.140.99

ISBN 978-2-8322-6406-5

FOREWORD

This amendment has been prepared by subcommittee 34A: Lamps, of IEC technical committee 34: Lamps and related equipment.

The text of this amendment is based on the following documents:

FDIS	Report on voting
34A/2121/FDIS	34A/2127/RVD

Full information on the voting for the approval of this amendment can be found in the report on voting indicated in the above table.

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

2 Normative references

Delete the reference to CIE 121:1996 and the reference to IES LM-80, added by Amendment 1.:

Add the following new references:

CIE S 025/E:2015, *Test Method for LED Lamps, LED Luminaires and LED Modules*

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

3 Terms and definitions

Replace terminological entries 3.5, 3.7, 3.11, 3.12 and 3.13 with the following new entries:

3.5
flux degraded LED product
operating LED product that emits an amount of luminous flux less than the luminous flux relating to the required luminous flux maintenance factor x

Note 1 to entry: For illustration of gradual depreciation mode, causing a flux degraded product, see Figure C.1.

Note 2 to entry: In general, LED products include LED lamps, LED modules and LED luminaires although this term can be used with any LED based lighting product.

3.7
median useful life
L_x
<of LED modules> length of operating time during which a total of 50 % (B_{50}) of a population of operating LED modules of the same type have flux degraded to the luminous flux maintenance factor x

Note 1 to entry: The median useful life includes operating LED modules only.

Note 2 to entry: By convention, the expression “life of LED modules” without any modifiers is understood to mean the median useful life.

3.11
combined failure value
CFV
percentage of LED modules or LED luminaires having either flux degraded or abruptly failed at median useful life L_x

Note 1 to entry: CFV = 50 % + 0,5 × AFV.

EXAMPLE Given AFV = 15 %, then CFV = 50 % + 0,5 × 15 % = 57,5 %

Note 2 to entry: This note applies to the French language only.

3.12
combined life
M_xF_y
<of LED lamps> length of time during which y % (F_y) of a population of initially operating LED lamps of the same type have either flux degraded to the luminous flux maintenance factor x or abruptly failed

Note 1 to entry: The combined life (of LED lamps) includes operating and non-operating LED lamps.

3.13
median combined life
M_x
<of LED lamps> length of time during which 50 % (F_{50}) of a population of initially operating LED lamps of the same type have either flux degraded or abruptly failed

Note 1 to entry: The median combined life (of LED lamps) includes operating and non-operating LED lamps.

Add, at the end of Clause 3, the following new terminological entry:

3.22
useful life
L_xB_y
<of LED modules> length of time until at maximum a percentage y of a population of operating LED modules of the same type have degraded to the luminous flux maintenance factor x

Note 1 to entry: The useful life includes operating LED modules only.

Note 2 to entry: Typically median useful life values L_x are provided (see definition 3.7).

4 Marking

4.1 Mandatory marking

Table 1

Replace item c) and item m) as follows:

c) Rated median useful life L_x (h) and the related luminous flux maintenance x [6]	–	x	x
m) void	–	–	–

Add, after table footnote 5 the following new table footnote 6:

6 The rated useful life L_xB_y (in hours) and the associated luminous flux maintenance factor x and percentage y can optionally be on the product datasheets, leaflets or website.

4.2 Additional marking

Replace, in the first and second paragraphs, "estimated life time" with "median useful life".

Table 2

Replace the existing title with the following new title:

Table 2 – LED module median useful life information

*Replace, in the first column, second row, "*Rated life time (h)*" with "*Median useful life L_x (h)", *as follows*:

Median useful life L_x (h)	XX XXX [a]	XX XXX [a]	XX XXX [a]

6 Test conditions

6.1 General test conditions

Replace the fourth paragraph with the following new paragraph:

Testing duration is 25 % of rated median useful life with a maximum of 6 000 h.

In the fifth paragraph, added by Amendment 1, replace "IES LM-80" with "ANSI/IES LM-80-15".

8 Light output

8.3 Luminous efficacy

Delete the content of Subclause 8.3 and replace with "Void".

9 Chromaticity coordinates, correlated colour temperature (CCT) and colour rendering

9.3 Color rendering index (CRI)

Replace the existing text with the following new text:

The initial colour rendering index (CRI) of a LED module is measured.

Compliance:

For all tested LED modules in a sample the measured CRI shall not be lower than 3 points from the rated CRI (see Table 1).

10 LED module life

10.2 Lumen maintenance

Replace Subclause 10.2 including its title, with the following new subclause:

10.2 Luminous flux maintenance

The rated luminous flux maintenance factor may vary depending on the application of the LED module. Dedicated information on the chosen percentage should be provided by the manufacturer.

NOTE 1 As the typical life of a LED module is (very) long, it is within the scope of this standard regarded impractical and time consuming to measure the actual luminous flux reduction over life (e.g. L_{70}). For that reason this standard relies on test results to determine the expected lumen maintenance code of any LED module.

NOTE 2 The actual luminous flux maintenance of LED modules can differ considerably per type and per manufacturer. It is not possible to express the luminous flux maintenance of all LEDs in simple mathematical relations. A fast initial decrease in luminous flux does not automatically imply that a particular LED will not make its rated life.

NOTE 3 Other methods providing more advanced insight in luminous flux depreciation over LED module life are under consideration.

This standard has opted for "lumen maintenance codes" (see Figure 2) that cover the initial decrease in luminous flux until an operational time as stated in 6.1. There are three codes which define luminous flux maintenance in percent of the initial luminous flux (see Table 6).

Table 6 – Lumen maintenance code at an operational time as stated in 6.1

Luminous flux maintenance %	Code
≥ 90	9
≥ 80	8
≥ 70	7

The initial luminous flux shall be measured. The measurement is repeated at an operational time as stated in 6.1. The initial luminous flux value is normalized to 100 %; it is used as the first data point for determining LED module life. The measured luminous flux value at an operational time as stated in 6.1 shall be expressed as maintained value (= percentage of the initial value).

It is recommended to measure the luminous flux at 1 000 h intervals (expressed as a percentage of the initial value) for a total equal to an operational time as stated in 6.1.

NOTE 4 This will give an additional insight as to the reliability of the measured values, but assigning a code does not imply a prediction of achievable life time. LED modules with a higher code could be better or worse than LED modules with a lower code.

For marking of the luminous flux maintenance factor x and the lumen maintenance codes, see Table 1.