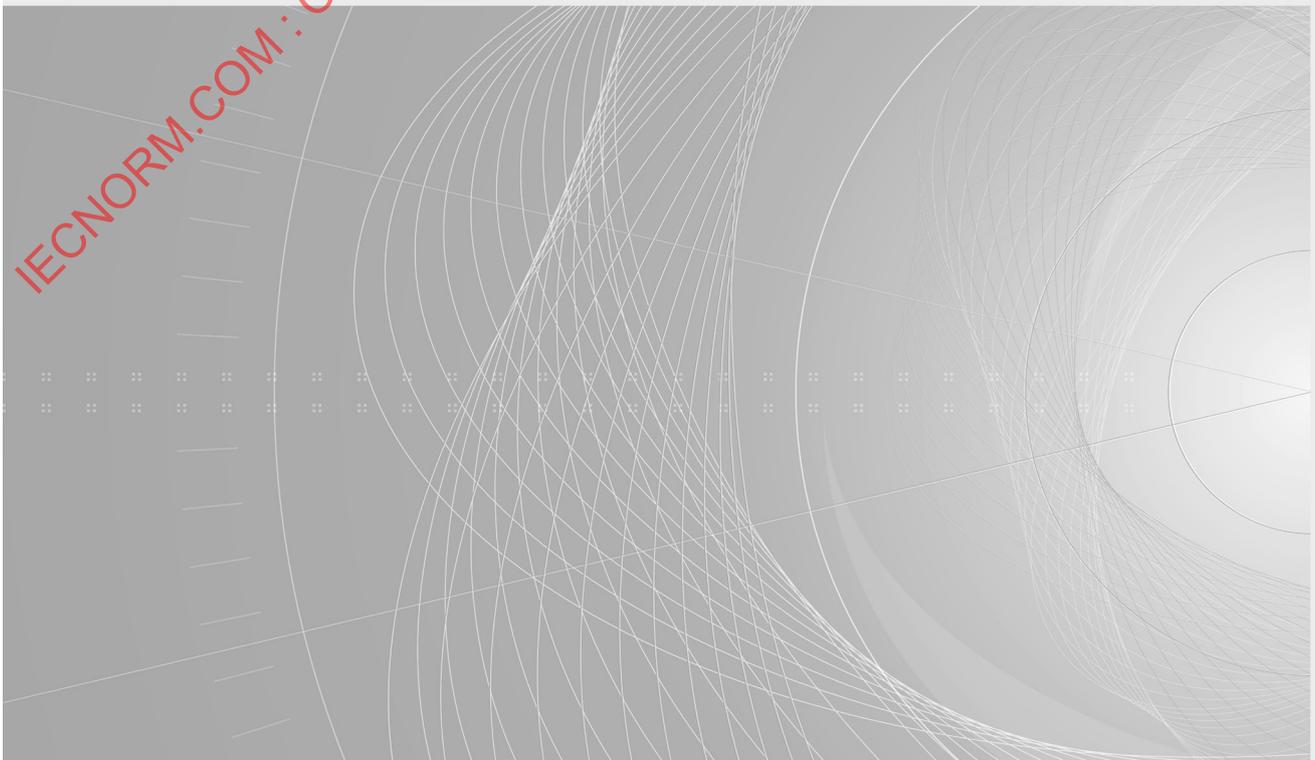


INTERNATIONAL STANDARD

**Organic light emitting diode (OLED) light sources for general lighting – Safety –
Part 2-3: Particular requirements – Flexible OLED tiles and panels**

IECNORM.COM : Click to view the full PDF of IEC 62868-2-3:2021+AMD1:2025 CSV





THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2025 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Secretariat
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, ...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch

Discover our powerful search engine and read freely all the publications previews, graphical symbols and the glossary. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 500 terminological entries in English and French, with equivalent terms in 25 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IECNORM.COM : Click to view the full PDF of IEC 60687-2:2021-HAMD1:2025 CSV



IEC 62868-2-3

Edition 1.1 2025-02
CONSOLIDATED VERSION

INTERNATIONAL STANDARD

**Organic light emitting diode (OLED) light sources for general lighting – Safety –
Part 2-3: Particular requirements – Flexible OLED tiles and panels**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 29.140.99

ISBN 978-2-8327-0279-6

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD	4
1 Scope	6
2 Normative references	6
3 Terms and definitions	6
4 General	7
4.1 General requirements	7
4.2 General test requirements	7
5 Marking	8
5.1 Contents and location	8
5.2 Durability and legibility of marking	8
6 Construction	8
6.1 General	8
6.2 Mechanical strength	8
6.2.1 Requirements	8
6.2.2 Vibration test	9
6.2.3 Strength and impact test	9
6.3 Internal short circuit	10
6.4 Wireways	10
6.5 Resistance to dust, solid objects and moisture	10
7 Mechanical hazard	11
8 Fault conditions	11
8.1 General	11
8.2 Overpower Overload condition	11
8.3 Input stability test	11
8.4 Overbending	11
8.5 Excess bending cycles	11
9 Insulation resistance and electric strength	12
9.1 General requirements	12
9.2 Insulation resistance	12
9.3 Electric strength	12
10 Thermal stress	12
11 Creepage distances and clearances	12
12 Resistance to heat and fire	12
12.1 Resistance to heat	12
12.2 Resistance to fire flame and ignition	12
13 Photobiological safety	12
14 Terminals	12
15 Information for luminaire design	12
16 Protection against accidental contact with live parts	13
17 Screws, current-carrying parts and connections	13
18 Resistance to corrosion	13
19 Provisions for protective earthing	13
Annex A (informative) Construction of flexible OLED tiles and panels	14
Annex B (normative) Classification of flexible OLED tiles and panels	15

Bibliography.....	16
Figure A.1 – Schematic diagram of glass flexible OLED tile for lighting.....	14
Figure A.2 – Schematic diagram of film flexible OLED panel for lighting.....	14
Table 1 – Additional marking.....	8
Table 2 – Mechanical attributes and measurement methods	9
Table B.1 – Flexible OLED classification.....	15

IECNORM.COM : Click to view the full PDF of IEC 62868-2-3:2021+AMD1:2025 CSV

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ORGANIC LIGHT EMITTING DIODE (OLED) LIGHT
SOURCES FOR GENERAL LIGHTING – SAFETY –****Part 2-3: Particular requirements – Flexible OLED tiles and panels**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization, comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at <https://patents.iec.ch>. IEC shall not be held responsible for identifying any or all such patent rights.

This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

IEC 62868-2-3 edition 1.1 contains the first edition (2021-10) [documents 34A/2254/FDIS and 34A/2261/RVD] and its amendment 1 (2025-02) [documents 34A/2424/FDIS and 34A/2434/RVD].

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.

IEC 62868-2-3 has been prepared by subcommittee 34A: Electric light sources, of IEC technical committee 34: Lighting. It is an International Standard.

The language used for the development of this International Standard 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/standardsdev/publications.

A list of all parts in the IEC 62868 series, published under the general title *Organic light emitting diode (OLED) light sources for general lighting – Safety*, can be found on the IEC website.

This International Standard is to be used in conjunction with IEC 62868-1:2020.

In this document, the following print type is used:

– *compliance statements: in italic type.*

The committee has decided that the contents of this document and its amendment 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, or
- revised.

IECNORM.COM : Click to view the full PDF of IEC 62868-2-3:2021+AMD1:2025 CSV

ORGANIC LIGHT EMITTING DIODE (OLED) LIGHT SOURCES FOR GENERAL LIGHTING – SAFETY –

Part 2-3: Particular requirements – Flexible OLED tiles and panels

1 Scope

This part of IEC 62868 specifies the safety requirements for flexible organic light emitting diode (OLED) tiles and panels for use on supplies up to 120 V ripple free DC for indoor and similar general lighting purposes and designed for being bent during the manufacturing process of curved luminaires.

NOTE The construction of flexible OLED tiles and panels is given in Annex A.

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 61747-40-1:2019, *Liquid crystal display devices – Part 40-1: Mechanical testing of display cover glass for mobile devices – Guidelines*

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

IEC 62715-6-3:2020, *Flexible display devices – Part 6-3: Mechanical test methods – Impact and hardness tests*

IEC 62868-1:2020, *Organic light emitting diode (OLED) light sources for general lighting – Safety – Part 1: General requirements and tests*
IEC 62868-1:2020/AMD1:2024

IEC TS 62972:2016, *General lighting – Organic light emitting diode (OLED) products and related equipment – Terms and definitions*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62504, IEC 62868-1 and IEC TS 62972 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>

3.1

flexible OLED

OLED that is mechanically bendable in one or more of the steps of substrate handling, manufacturing, storage, use, operation, shipping, and relocation

3.2

flexible OLED tile

smallest functional flexible OLED which cannot be separated into smaller flexible OLED lighting elements containing at least one contact ledge with at least one positive and one negative pole for connection to the electrical power supply

3.3

flexible OLED panel

independently operable unit flexible OLED ~~product~~ light source containing a flexible OLED tile and means of connection to the electrical supply such as a connector, printed circuit board (PCB), passive electronic components and optionally a frame

3.4

glass-based flexible OLED

flexible OLED light source having a substrate and/or encapsulation material that are composed of thin glass

3.5

film-based flexible OLED

flexible OLED light source having components that are made of either barrier film or metal foil

3.6

barrier film

<for OLED ~~product~~ light source> film that keeps water vapour out of an OLED light source

3.7

minimum bending radius

<of safety> limit radius to which the flexible OLED panel may be bent in either a convex or concave curvature without damaging the panel

3.8

maximum bending cycle

<of safety> maximum number of times a flexible OLED panel may be bent without damaging the panel

3.9

as-received

representative of standard sample preparation and handling practices, and therefore free of intentional mechanical damage such as abrasion, scratching, or indentation

Note 1 to entry: The strength of glass is not an intrinsic material property, and like other brittle elastic materials, is highly dependent upon the surface flaw population. The term "as-received" is meant to represent the surface condition upon specimen receipt and is distinguished from a condition where damage has been intentionally introduced prior to testing.

[SOURCE: IEC 61747-40-1:2019, 3.2]

4 General

4.1 General requirements

The requirements of IEC 62868-1:2020 and IEC 62868-1:2020/AMD1:2024, 4.1 apply.

4.2 General test requirements

The requirements of IEC 62868-1:2020, 4.2 and IEC 62868-1:2020/AMD1:2024, 4.2 apply.

The ambient temperature and mounting requirements of IEC 62868-1:2020, 4.2 and IEC 62868-1:2020/AMD1:2024, 4.2 apply.

~~The tests shall be carried out using a flexible OLED panel bent with the minimum bending radius specified by the manufacturer. For those flexible panels which are specified for a specific curvature, the test shall be conducted using the shape and condition specified by the manufacturer in the installation instructions.~~

The tests shall be conducted at the design voltage or current, unless otherwise specified in this document.

For those flexible panels which are specified for a specific curvature, the test shall be conducted using the shape and condition specified by the manufacturer in the installation instructions.

Stabilization shall be conducted in the same conditions and position, ~~for example the position and~~ (e.g., flat or bent), as in the tests.

5 Marking

5.1 Contents and location

The requirements of IEC 62868-1:2020, 5.1 apply. IEC 62868-1:2020, Table 1 applies together with Table 1 of this document.

Table 1 – Additional marking

Parameters	Product	Packaging or product datasheet or leaflet
Flexible OLED classification ^a		Mandatory
Minimum bending radius ^b (safety)		Mandatory
Maximum bending cycles ^b (safety)		Mandatory
^a See Table B.1 for flexible OLED classification. ^b These values can be different from those of the performance.		

5.2 Durability and legibility of marking

The requirements of IEC 62868-1:2020 and IEC 62868-1:2020/AMD1:2024, 5.2 apply.

6 Construction

6.1 General

The requirements of IEC 62868-1:2020, 6.1 apply.

~~The construction of flexible OLED tiles and panels is illustrated in Annex A.~~

6.2 Mechanical strength

6.2.1 Requirements

The OLED panel shall have sufficient mechanical strength which shall be checked by 6.2.2 and 6.2.3.

6.2.2 Vibration test

Compliance is checked by carrying out the test in accordance with IEC 62868-1:2020, 6.2 and IEC 62868-1:2020/AMD1:2024, 6.2.

Electrical contacts which could not be touched before the vibration test (e.g. those in flexible OLED panels according to Figure A.1 and Figure A.2) shall not have become accessible after the test.

6.2.3 Strength and impact test

The strength and impact test shall be conducted depending on the classification of the OLED panel (see Annex B and Table B.1).

a) Glass-based flexible OLED ~~product~~ light source

The strength and impact test shall be conducted according to Table 2, in accordance with IEC 61747-40-1:2019, 5.1, 5.2 and 5.4.

Test (1) shall be conducted if the edges of bare panels are exposed after installation in the luminaire. As long as the panel is installed into the luminaire and no edge has been exposed, this test is not mandatory.

Where no glass edge is exposed, such as being installed into a luminaire or being covered with protecting films, tests (2) and (3) shall be conducted.

Where no glass surface is exposed, such as being installed into a luminaire or being covered with protecting films, tests (1) and (2) shall be conducted.

Table 2 – Mechanical attributes and measurement methods

Test	Failure location	Failure mechanism	Subject (typical)	Attribute	Test method	Unit	Corresponding document
(1)	Edge	Overstress of edge flaws	As-received glass	Edge strength	Uniaxial flexure strength (four-point bend)	MPa	IEC 61747-40-2
(2)	Surface	Overstress from blunt impact	As-received glass	Surface impact resistance	Biaxial flexure energy-to-failure (ball drop)	J	IEC 61747-40-3
(3)	Surface	Overstress of surface flaws	As-received glass	Surface strength	Biaxial flexure stress (ring-on-ring)	N	IEC 61747-40-4
(4)	Surface	Sharp contact damage introduction propagated by central tension under rigid support condition	As-received glass	Resistance against surface sharp contact damage and propagation under rigid support condition	Sharp contact impact under rigid support condition (ball drop on coated abrasives)	J	IEC 61747-40-5

(5)	Surface	Sharp contact damage in combination with or followed immediately by flexural stress	Abraded glass	Retained strength	Abraded biaxial flexural strength (abraded ring-on-ring)	N	IEC 61747-40-6
NOTE This table is reproduced from IEC 61747-40-1:2019, Table 1.							

Compliance:

Compliance is checked by carrying out the following tests specified in Table 2.

After each test, the OLED panel is checked by inspection. As the inside of the panel might have been damaged, conducting fault condition check is desirable. Fault condition is checked in accordance with 8.1. The OLED ~~product~~ light source shall be deemed to have failed the test if:

- any of the glass is splintered or broken,
- fire, smoke or flammable gas is produced,
- there are any loosened parts which could impair safety.

b) Film-based flexible OLED panel

Impact testing for film-based flexible OLED panels shall be carried out by the following tests, in accordance with IEC 62715-6-3:2020, 6.2 to 6.5:

- ball drop test;
- hitting test;
- pendulum side impact test;
- scratch and abrasion test.

Compliance:

After the tests, the OLED panel shall be checked by inspection. As the inside of the panel might have been damaged, conducting a fault condition check is desirable. Fault condition is checked in accordance with 8.1. The OLED panel shall be deemed to have failed the test if:

- fire, smoke or flammable gas is produced,
- there are any loosened parts which could impair safety.

6.3 Internal short circuit

The requirements of IEC 62868-1:2020, 6.3 apply.

6.4 Wireways

The requirements of IEC 62868-1:2020, 6.4 apply.

6.5 Resistance to dust, solid objects and moisture

The requirements of IEC 62868-1:2020, 6.5 apply.

7 Mechanical hazard

The requirements of IEC 62868-1:2020, Clause 7 apply.

8 Fault conditions

8.1 General

~~An OLED panel shall not impair safety under fault conditions that may occur during the intended use.~~

~~Fault condition tests shall be conducted at an ambient temperature of $(25 \pm 5)^\circ\text{C}$ unless otherwise specified by the manufacturer or responsible vendor. The temperature shall be maintained within $\pm 2^\circ\text{C}$ during the test.~~

The requirements of IEC 62868-1:2020/AMD1:2024, 8.1 apply.

8.2 ~~Overpower~~ Overload condition

The requirements and compliance provisions of IEC 62868-1:2020/AMD1:2024, 8.2 apply.

8.3 Input stability test

~~The flexible OLED panel shall be operated with the rated current. The input power and voltage shall be monitored at the input side. The test shall be continued for 15 min.~~

~~Compliance:~~

~~The voltage shall remain within the range of the rated voltage $\pm 10\%$ during the test.~~

The requirements and compliance provisions of IEC 62868-1:2020/AMD1:2024, 8.3 apply.

8.4 Overbending

Overbending tests shall be conducted under a bending radius 70 % smaller than the minimum bending radius specified by the manufacturer.

Compliance:

After the test, the OLED panel is checked by inspection. Any splintered or broken glass is not accepted (for glass-based flexible OLED panel). Fire, smoke or flammable gas shall not be produced. The OLED panel shall have no loosened parts which could impair safety.

8.5 Excess bending cycles

The OLED ~~product~~ light source shall be repeatedly bent for at least 1,5 times of the maximum bending cycles.

Compliance:

After the test, the OLED panel is checked by inspection. The glass-based flexible OLED panel shall not have any splintered or broken glass. Fire, smoke or flammable gas shall not be produced. The OLED panel shall have no loosened parts which could impair safety.

9 Insulation resistance and electric strength

9.1 General requirements

The requirements of IEC 62868-1:2020/AMD1:2024, 9.1 apply.

9.1.2 Insulation resistance

The requirements of IEC 62868-1:2020/AMD1:2024, 9.1.2 apply.

9.1.3 Electric strength

The requirements of IEC 62868-1:2020/AMD1:2024, 9.1.3 apply.

10 Thermal stress

The requirements of IEC 62868-1:2020, Clause 10 apply.

11 Creepage distances and clearances

The requirements of IEC 62868-1:2020, Clause 11 and IEC 62868-1:2020/AMD1:2024, Clause 11 apply.

12 Resistance to heat and fire

12.1 Resistance to heat

The requirements of IEC 62868-1:2020, 12.1 apply.

12.2 Resistance to fire flame and ignition

The requirements of IEC 62868-1:2020, 12.2 and IEC 62868-1:2020/AMD1:2024, 12.2 apply.

13 Photobiological safety

~~OLED products are not expected to reach a level of UV, infrared or blue light hazard that requires marking or measurement.~~

The requirements of IEC 62868-1:2020, Clause 13 and IEC 62868-1:2020/AMD1:2024, Clause 13 apply.

14 Terminals

The requirements of IEC 62868-1:2020, Clause 14 and IEC 62868-1:2020/AMD1:2024, Clause 14 apply.

15 Information for luminaire design

Information for luminaire design is given in IEC 62868-1:2020, Annex B and IEC 62868-1:2020/AMD1:2024, Annex B.

16 Protection against accidental contact with live parts

The requirements of IEC 62868-1:2020/AMD1:2024, Clause 16 apply.

17 Screws, current-carrying parts and connections

The requirements of IEC 62868-1:2020/AMD1:2024, Clause 17 apply.

18 Resistance to corrosion

The requirements of IEC 62868-1:2020/AMD1:2024, Clause 18 apply.

19 Provisions for protective earthing

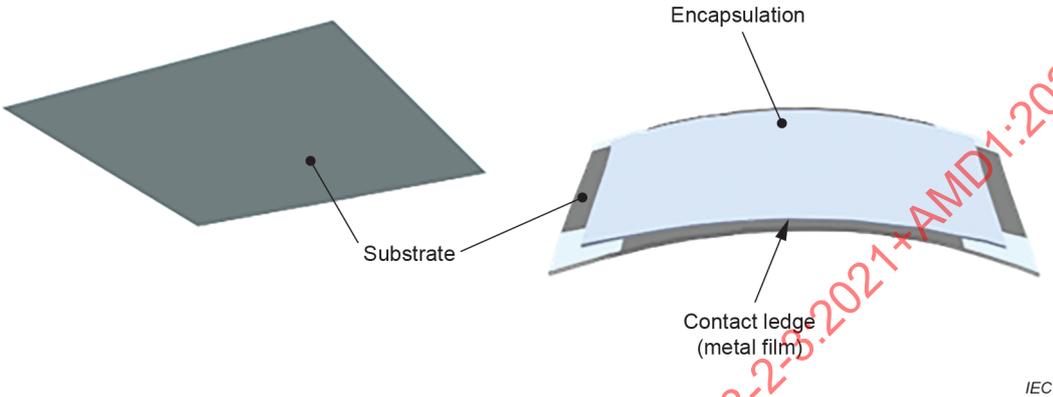
The requirements of IEC 62868-1:2020/AMD1:2024, Clause 19 apply.

IECNORM.COM : Click to view the full PDF of IEC 62868-2-3:2021+AMD1:2025 CSV

Annex A
(informative)

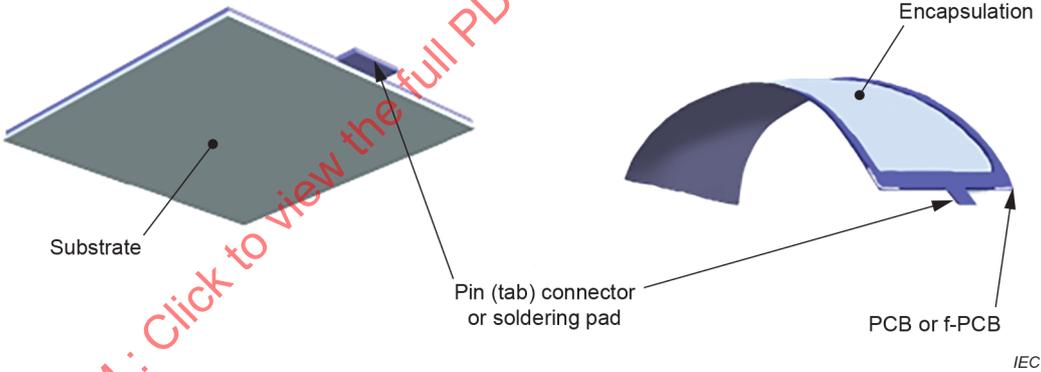
Construction of flexible OLED tiles and panels

Figure A.1 and Figure A.2 provide schematic diagrams of glass-based flexible OLED tiles and panels.



NOTE The diagram on the left represents the front view while that on the right gives the rear view. The OLED tile is the most elementary OLED panel consisting of a substrate, encapsulation, OLED stack and metal ledge without a printed circuit board (PCB), electrical connecting parts, and casing.

Figure A.1 – Schematic diagram of glass flexible OLED tile for lighting



NOTE The diagram on the left represents the front view while that on the right gives the rear view. The OLED panel consists of an OLED tile and PCB or flexible PCB for electrical contacts, and electrical connecting parts.

Figure A.2 – Schematic diagram of film flexible OLED panel for lighting

Annex B
 (normative)

Classification of flexible OLED tiles and panels

Flexible OLED panels are classified as follows depending on the substrate and the encapsulation substrate.

- Glass-based flexible OLED panels

A glass-based flexible OLED panel is an OLED using thin glass as a substrate and/or encapsulation substrate.

- Film-based flexible OLED panels

All types other than glass-based flexible OLED panels.

Table B.1 – Flexible OLED classification

		Substrate		
		flexible glass	film	metal foil
Encapsulation substrate	flexible glass	glass-based	glass-based	glass-based
	film	glass-based	film-based	film-based
	metal foil	glass-based	film-based	–

IECNORM.COM : Click to view the full PDF of IEC 62868-2-3:2021+AMD1:2025 CSV

Bibliography

IEC 61747-40-2:2015, *Liquid crystal display devices – Part 40-2: Mechanical testing of display cover glass for mobile devices – Uniaxial flexural strength (4-point bend)*

IEC 61747-40-3:2015, *Liquid crystal display devices – Part 40-3: Mechanical testing of display cover glass for mobile devices – Biaxial flexural energy to failure (ball drop)*

IEC 61747-40-4:2015, *Liquid crystal display devices – Part 40-4: Mechanical testing of display cover glass for mobile devices – Biaxial flexural strength (ring-on-ring)*

IEC 61747-40-5:2015, *Liquid crystal display devices – Part 40-5: Mechanical testing of display cover glass for mobile devices – Strength against dynamic impact by a sharp object with the specimen rigidly supported*

IEC 61747-40-6:2015, *Liquid crystal display devices – Part 40-6: Mechanical testing of display cover glass for mobile devices – Retained biaxial flexural strength (abraded ring-on-ring)*

IECNORM.COM : Click to view the full PDF of IEC 62868-2-3:2021+AMD1:2025 CSV

IECNORM.COM : Click to view the full PDF of IEC 62868-2-3:2021+AMD1:2025 CSV

CONTENTS

FOREWORD	4
1 Scope	6
2 Normative references	6
3 Terms and definitions	6
4 General	7
4.1 General requirements	7
4.2 General test requirements	7
5 Marking	8
5.1 Contents and location	8
5.2 Durability and legibility of marking	8
6 Construction	8
6.1 General	8
6.2 Mechanical strength	8
6.2.1 Requirements	8
6.2.2 Vibration test	8
6.2.3 Strength and impact test	9
6.3 Internal short circuit	10
6.4 Wireways	10
6.5 Resistance to dust, solid objects and moisture	10
7 Mechanical hazard	10
8 Fault conditions	10
8.1 General	10
8.2 Overload condition	10
8.3 Input stability test	11
8.4 Overbending	11
8.5 Excess bending cycles	11
9 Insulation resistance and electric strength	11
9.1 General requirements	11
9.2 Insulation resistance	11
9.3 Electric strength	11
10 Thermal stress	11
11 Creepage distances and clearances	11
12 Resistance to heat and fire	11
12.1 Resistance to heat	11
12.2 Resistance to flame and ignition	12
13 Photobiological safety	12
14 Terminals	12
15 Information for luminaire design	12
16 Protection against accidental contact with live parts	12
17 Screws, current-carrying parts and connections	12
18 Resistance to corrosion	12
19 Provisions for protective earthing	12
Annex A (informative) Construction of flexible OLED tiles and panels	13
Annex B (normative) Classification of flexible OLED tiles and panels	14

Bibliography.....	15
Figure A.1 – Schematic diagram of glass flexible OLED tile for lighting.....	13
Figure A.2 – Schematic diagram of film flexible OLED panel for lighting.....	13
Table 1 – Additional marking.....	8
Table 2 – Mechanical attributes and measurement methods	9
Table B.1 – Flexible OLED classification.....	14

IECNORM.COM : Click to view the full PDF of IEC 62868-2-3:2021+AMD1:2025 CSV

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ORGANIC LIGHT EMITTING DIODE (OLED) LIGHT
SOURCES FOR GENERAL LIGHTING – SAFETY –****Part 2-3: Particular requirements – Flexible OLED tiles and panels**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization, comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at <https://patents.iec.ch>. IEC shall not be held responsible for identifying any or all such patent rights.

This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

IEC 62868-2-3 edition 1.1 contains the first edition (2021-10) [documents 34A/2254/FDIS and 34A/2261/RVD] and its amendment 1 (2025-02) [documents 34A/2424/FDIS and 34A/2434/RVD].

This Final version does not show where the technical content is modified by amendment 1. A separate Redline version with all changes highlighted is available in this publication.

IEC 62868-2-3 has been prepared by subcommittee 34A: Electric light sources, of IEC technical committee 34: Lighting. It is an International Standard.

The language used for the development of this International Standard 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/standardsdev/publications.

A list of all parts in the IEC 62868 series, published under the general title *Organic light emitting diode (OLED) light sources for general lighting – Safety*, can be found on the IEC website.

This International Standard is to be used in conjunction with IEC 62868-1:2020.

In this document, the following print type is used:

– *compliance statements: in italic type.*

The committee has decided that the contents of this document and its amendment 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, or
- revised.

IECNORM.COM : Click to view the full PDF of IEC 62868-2-3:2021+AMD1:2025 CSV

ORGANIC LIGHT EMITTING DIODE (OLED) LIGHT SOURCES FOR GENERAL LIGHTING – SAFETY –

Part 2-3: Particular requirements – Flexible OLED tiles and panels

1 Scope

This part of IEC 62868 specifies the safety requirements for flexible organic light emitting diode (OLED) tiles and panels for use on supplies up to 120 V ripple free DC for indoor and similar general lighting purposes and designed for being bent during the manufacturing process of curved luminaires.

NOTE The construction of flexible OLED tiles and panels is given in Annex A.

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 61747-40-1:2019, *Liquid crystal display devices – Part 40-1: Mechanical testing of display cover glass for mobile devices – Guidelines*

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

IEC 62715-6-3:2020, *Flexible display devices – Part 6-3: Mechanical test methods – Impact and hardness tests*

IEC 62868-1:2020, *Organic light emitting diode (OLED) light sources for general lighting – Safety – Part 1: General requirements and tests*
IEC 62868-1:2020/AMD1:2024

IEC TS 62972:2016, *General lighting – Organic light emitting diode (OLED) products and related equipment – Terms and definitions*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62504, IEC 62868-1 and IEC TS 62972 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>

3.1

flexible OLED

OLED that is mechanically bendable in one or more of the steps of substrate handling, manufacturing, storage, use, operation, shipping, and relocation

3.2

flexible OLED tile

smallest functional flexible OLED which cannot be separated into smaller flexible OLED lighting elements containing at least one contact ledge with at least one positive and one negative pole for connection to the electrical power supply

3.3

flexible OLED panel

independently operable unit flexible OLED light source containing a flexible OLED tile and means of connection to the electrical supply such as a connector, printed circuit board (PCB), passive electronic components and optionally a frame

3.4

glass-based flexible OLED

flexible OLED light source having a substrate and/or encapsulation material that are composed of thin glass

3.5

film-based flexible OLED

flexible OLED light source having components that are made of either barrier film or metal foil

3.6

barrier film

<for OLED light source> film that keeps water vapour out of an OLED light source

3.7

minimum bending radius

<of safety> limit radius to which the flexible OLED panel may be bent in either a convex or concave curvature without damaging the panel

3.8

maximum bending cycle

<of safety> maximum number of times a flexible OLED panel may be bent without damaging the panel

3.9

as-received

representative of standard sample preparation and handling practices, and therefore free of intentional mechanical damage such as abrasion, scratching, or indentation

Note 1 to entry: The strength of glass is not an intrinsic material property, and like other brittle elastic materials, is highly dependent upon the surface flaw population. The term "as-received" is meant to represent the surface condition upon specimen receipt and is distinguished from a condition where damage has been intentionally introduced prior to testing.

[SOURCE: IEC 61747-40-1:2019, 3.2]

4 General

4.1 General requirements

The requirements of IEC 62868-1:2020 and IEC 62868-1:2020/AMD1:2024, 4.1 apply.

4.2 General test requirements

The requirements of IEC 62868-1:2020, 4.2 and IEC 62868-1:2020/AMD1:2024, 4.2 apply.

The ambient temperature and mounting requirements of IEC 62868-1:2020, 4.2 and IEC 62868-1:2020/AMD1:2024, 4.2 apply.

The tests shall be conducted at the design voltage or current, unless otherwise specified in this document.

For those flexible panels which are specified for a specific curvature, the test shall be conducted using the shape and condition specified by the manufacturer in the installation instructions.

Stabilization shall be conducted in the same conditions and position (e.g., flat or bent) as in the tests.

5 Marking

5.1 Contents and location

The requirements of IEC 62868-1:2020, 5.1 apply. IEC 62868-1:2020, Table 1 applies together with Table 1 of this document.

Table 1 – Additional marking

Parameters	Product	Packaging or product data sheet or leaflet
Flexible OLED classification ^a		Mandatory
Minimum bending radius ^b (safety)		Mandatory
Maximum bending cycles ^b (safety)		Mandatory
^a See Table B.1 for flexible OLED classification.		
^b These values can be different from those of the performance.		

5.2 Durability and legibility of marking

The requirements of IEC 62868-1:2020 and IEC 62868-1:2020/AMD1:2024, 5.2 apply.

6 Construction

6.1 General

The requirements of IEC 62868-1:2020, 6.1 apply.

6.2 Mechanical strength

6.2.1 Requirements

The OLED panel shall have sufficient mechanical strength which shall be checked by 6.2.2 and 6.2.3.

6.2.2 Vibration test

Compliance is checked by carrying out the test in accordance with IEC 62868-1:2020, 6.2 and IEC 62868-1:2020/AMD1:2024, 6.2.

Electrical contacts which could not be touched before the vibration test (e.g. those in flexible OLED panels according to Figure A.1 and Figure A.2) shall not have become accessible after the test.

6.2.3 Strength and impact test

The strength and impact test shall be conducted depending on the classification of the OLED panel (see Annex B and Table B.1).

a) Glass-based flexible OLED light source

The strength and impact test shall be conducted according to Table 2, in accordance with IEC 61747-40-1:2019, 5.1, 5.2 and 5.4.

Test (1) shall be conducted if the edges of bare panels are exposed after installation in the luminaire. As long as the panel is installed into the luminaire and no edge has been exposed, this test is not mandatory.

Where no glass edge is exposed, such as being installed into a luminaire or being covered with protecting films, tests (2) and (3) shall be conducted.

Where no glass surface is exposed, such as being installed into a luminaire or being covered with protecting films, tests (1) and (2) shall be conducted.

Table 2 – Mechanical attributes and measurement methods

Test	Failure location	Failure mechanism	Subject (typical)	Attribute	Test method	Unit	Corresponding document
(1)	Edge	Overstress of edge flaws	As-received glass	Edge strength	Uniaxial flexure strength (four-point bend)	MPa	IEC 61747-40-2
(2)	Surface	Overstress from blunt impact	As-received glass	Surface impact resistance	Biaxial flexure energy-to-failure (ball drop)	J	IEC 61747-40-3
(3)	Surface	Overstress of surface flaws	As-received glass	Surface strength	Biaxial flexure stress (ring-on-ring)	N	IEC 61747-40-4
(4)	Surface	Sharp contact damage introduction propagated by central tension under rigid support condition	As-received glass	Resistance against surface sharp contact damage and propagation under rigid support condition	Sharp contact impact under rigid support condition (ball drop on coated abrasives)	J	IEC 61747-40-5
(5)	Surface	Sharp contact damage in combination with or followed immediately by flexural stress	Abraded glass	Retained strength	Abraded biaxial flexural strength (abraded ring-on-ring)	N	IEC 61747-40-6

NOTE This table is reproduced from IEC 61747-40-1:2019, Table 1.

Compliance:

Compliance is checked by carrying out the following tests specified in Table 2.

After each test, the OLED panel is checked by inspection. As the inside of the panel might have been damaged, conducting fault condition check is desirable. Fault condition is checked in accordance with 8.1. The OLED light source shall be deemed to have failed the test if:

- *any of the glass is splintered or broken,*
- *fire, smoke or flammable gas is produced,*
- *there are any loosened parts which could impair safety.*

b) Film-based flexible OLED panel

Impact testing for film-based flexible OLED panels shall be carried out by the following tests, in accordance with IEC 62715-6-3:2020, 6.2 to 6.5:

- ball drop test;
- hitting test;
- pendulum side impact test;
- scratch and abrasion test.

Compliance:

After the tests, the OLED panel shall be checked by inspection. As the inside of the panel might have been damaged, conducting a fault condition check is desirable. Fault condition is checked in accordance with 8.1. The OLED panel shall be deemed to have failed the test if:

- *fire, smoke or flammable gas is produced,*
- *there are any loosened parts which could impair safety.*

6.3 Internal short circuit

The requirements of IEC 62868-1:2020, 6.3 apply.

6.4 Wireways

The requirements of IEC 62868-1:2020, 6.4 apply.

6.5 Resistance to dust, solid objects and moisture

The requirements of IEC 62868-1:2020, 6.5 apply.

7 Mechanical hazard

The requirements of IEC 62868-1:2020, Clause 7 apply.

8 Fault conditions

8.1 General

The requirements of IEC 62868-1:2020/AMD1:2024, 8.1 apply.

8.2 Overload condition

The requirements and compliance provisions of IEC 62868-1:2020/AMD1:2024, 8.2 apply.