SLOVENSKI STANDARD
SIST EN IEC 62471-6:2023

01-december-2023

Fotobiološka varnost ultravijoličnih sijalk

Photobiological Safety of Ultraviolet Lamp Products

Photobiologische Sicherheit von Lampen und Lampensystemen - Teil 6: Produkte mit ultravioletter Strahlung

Sécurité photobiologique des appareils à lampes ultraviolettes

Ta slovenski standard je istoveten z: **EN IEC 62471-6:2023**

ICS:

29.140.01 Žarnice na splošno Lamps in general

SIST EN IEC 62471-6:2023 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 62471-6

November 2023

ICS 29.140.01; 31.260

English Version

Photobiological safety of lamps and lamp systems - Part 6: Ultraviolet lamp products (IEC 62471-6:2022)

Sécurité photobiologique des lampes et des appareils utilisant des lampes - Partie 6: Appareils à lampes ultraviolettes
(IEC 62471-6:2022)

Photobiologische Sicherheit von Lampen und Lampensystemen) Teil 6: Produkte mit ultravioletter Strahlung
(IEC 62471-6:2022)

This European Standard was approved by CENELEC on 2023-10-11. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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

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European foreword

The text of document 76/714/FDIS, future edition 1 of IEC 62471-6, prepared by IEC/TC 76 "Optical radiation safety and laser equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62471-6:2023.

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) 2024-07-11
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2026-10-11

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 Standardization Request addressed to CENELEC by the European Commission.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 62471-6:2022 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standard indicated:

IEC 61010-2-040	NOTE Approved as EN IEC 61010-2-040
IEC 61228	NOTE Approved as EN IEC 61228
IEC 61508 (series)	NOTE Approved as EN 61508 (series)
IEC 62035:2014	NOTE Approved as EN 62035:2014 (modified)
IEC 62061	NOTE Approved as EN IEC 62061
IEC 62368-1:2018	NOTE Approved as EN IEC 62368-1:2020 (not modified)
ISO 13849 (series)	NOTE Approved as EN ISO 13849 (series)

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.cencenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60335-2-27	-	Household and similar electrical appliances - Safety - Part 2-27: Particular requirements for appliances for skin exposure to optical radiation	EN 60335-2-27	-
IEC 60417	2002	Graphical symbols for use on equipment - 12-month subscription to regularly updated online database comprising all graphical symbols published in IEC 60417	-	-
IEC 60601-2-57	-	Medical electrical equipment - Part 2-57: Particular requirements for the basic safety and essential performance of non-laser light source equipment intended for therapeutic, diagnostic, monitoring, cosmetic and aesthetic use	EN 60601-2-57	-
IEC 61549	-	Miscellaneous lamps	EN 61549	-
IEC 62471 /CIE S009	2006 /2002	Photobiological safety of lamps and lamp systems	EN 62471	2008
ISO 7010	-	Graphical symbols - Safety colours and safety signs - Registered safety signs	-	-
ISO 15004-2	-	Ophthalmic instruments - Fundamental requirements and test methods - Part 2: Light hazard protection	EN ISO 15004-2	-
CIE 247	2021	Guide for the Gonioradiometric Measurement of Upper Air Ultraviolet Germicidal Irradiation Luminaires, ISBN 978-3-902842-19-0, Vienna	-	-

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colour inside

Photobiological safety of lamps and lamp systems – Part 6: Ultraviolet lamp products

Sécurité photobiologique des lampes et des appareils utilisant des lampes – Partie 6: Appareils à lampes ultraviolettes

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PHOTOBIOLOGICAL SAFETY OF LAMPS AND LAMP SYSTEMS –

Part 6: Ultraviolet lamp products

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.
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IEC 62471-6 has been prepared by IEC technical committee 76: Optical radiation safety and laser equipment. It is an International Standard.

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

FDIS	Report on voting
76/714/FDIS	76/718/RVD

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 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.

In this standard, the following print types are used:

conformity statements: in italic type.

A list of all parts in the IEC 62471 series, published under the general title *Photobiological safety of lamps and lamp systems*, 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.

IMPORTANT – The "colour inside" logo on the cover page of this document 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.

INTRODUCTION

Most lamps and lamp products are safe and do not pose photobiological risks except under unusual exposure conditions; however, one group of products-ultraviolet lamp products-can under some conditions pose optical hazards during use and require risk assessment for direct and indirect exposure of the eyes and skin. Optical radiation hazards from all types of lamps or other broadband light sources are assessed by the application of IEC 62471:2006/CIE S009:2002. IEC 62471 covers light emitting diodes (LEDs), incandescent, low- and high- pressure gas-discharge, arc and other lamps. It also covers lamps which are designed primarily to emit ultraviolet radiant energy, such as ultraviolet sources intended to excite fluorescence of irradiated materials, for insect light traps, for scientific studies, mineral identification, for non-destructive testing, germicidal irradiation, and other purposes.

This document provides a risk group (RG) classification system for all ultraviolet lamp products, and the assessment distances and measurement conditions for different products (Annex A and Annex C). It includes manufacturing and user safety requirements that may be required as a result of an ultraviolet lamp product being assigned to a particular risk group. The scope is limited to products where the sole intent is to emit ultraviolet radiant energy. The advantage of applying this document, intended solely for ultraviolet lamp products, instead of the horizontal IEC 62471 standard, is that the risks from visible and infrared optical radiation need not be assessed using this document, as they are assumed to be insignificant for a lamp that emits mainly UV. The assigned risk group of an ultraviolet lamp product using this document may also be used to assist with any needed risk assessments, e.g. for occupational exposure in workplaces.

PHOTOBIOLOGICAL SAFETY OF LAMPS AND LAMP SYSTEMS –

Part 6: Ultraviolet lamp products

1 Scope

This part of IEC 62471 provides the optical radiation safety requirements for ultraviolet lamp products, including UV LED lamp products.

This document provides requirements for:

- optical radiation safety assessment and ultraviolet-product risk groups;
- user information for safety measures;
- appropriate labelling of ultraviolet lamp products.

This document addresses those lamps and lamp products where the ultraviolet emission serves the primary purpose of the product and where more than half of the radiant power emitted between 180 nm and 3 000 nm is in the spectral region 180 nm to 400 nm. If more than half of the optical radiation emitted between 180 nm and 3 000 nm is outside of the spectral region 180 nm to 400 nm, then the base standard IEC 62471 should be used. This document covers medical diagnostic and cosmetic devices/products that emit primarily UV radiation.

Because photobiological effects from UV radiation are based on the total accumulated exposure (dose) received, this document relies on the concept of 'time-weighted average' exposures where the assessment distance for determining the RG is chosen based on realistic exposure distances and exposure durations. In other words, it is not expected that people will be exposed at very close distances, e.g. 20 cm to 30 cm, for extended periods of time. This document provides assessment distances and specific guidance that are application-specific and realistic rather than the more general values in IEC 62471 where the specific application is unknown and time-weighted average exposures are not application-specific.

This document does not provide requirements for:

- lamps which primarily emit visible (such as GLS – general lighting source) and/or infrared radiant energy;
- lamp products used for general lighting or infrared illumination or heating, which are treated in separate standards;
- fluorescent ultraviolet lamps for tanning (covered by IEC 60335-2-27 and IEC 61228);
- medical treatment devices/products (see IEC 60601-2-57), but covers UV medical diagnostic products;
- non-optical hazards, e.g. ozone, mercury, etc.

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 60335-2-27, *Household and similar electrical appliances – Safety – Part 2-27: Particular requirements for appliances for skin exposure to optical radiation*