

INTERNATIONAL STANDARD

NORME INTERNATIONALE



Single-capped fluorescent lamps – Safety specifications

Lampes à fluorescence à culot unique – Spécifications de sécurité

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

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

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**SINGLE-CAPPED FLUORESCENT LAMPS –
SAFETY SPECIFICATIONS****FOREWORD**

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IEC 61199 edition 3.2 contains the third edition (2011-07) [documents 34A/1468/FDIS and 34A/1493/RVD], its amendment 1 (2012-09) [documents 34A/1538/CDV and 34A/1578/RVC] and its amendment 2 (2014-07) [documents 34A/1740/CDV and 34A/1779/RVC].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendments 1 and 2. Additions and deletions are displayed in red, with deletions being struck through. A separate Final version with all changes accepted is available in this publication.

International Standard IEC 61199 has been prepared by subcommittee 34A: Lamps, of IEC technical committee 34: Lamps and related equipment.

This publication 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 amendments will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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INTRODUCTION

For the ease of measurement, a new location for measuring the maximum cap temperature and maximum cap temperature rise has been introduced with this third edition of this standard, resulting in new temperature values. However, the design of lampholders is based on the traditional measurement location. Therefore, a new Annex I has been introduced, providing the previous methods and values for those lamp types and kinds of lamp operation, which have been already covered in the previous edition of this standard. For lamps, which are operated by means of an electronic ballast however, also a new measurement method and temperature limits are given.

Special attention has been given to the requirements related to high frequency operation, not covered in the previous edition.

The standards IEC 62471, and IEC/TR 62471-2, contain horizontal requirements available that need to be introduced into product standards, e.g. to IEC 61199.

The horizontal requirements are transformed into requirements for single-capped fluorescent lamps.

The lamps within the scope of this standard are general lighting service (GLS) lamps according to the definition 3.11 of IEC 62471:2006. "...lamps intended for lighting spaces that are typically occupied or viewed by people..."

According to Clause 6 of IEC 62471:2006, radiation of GLS lamps is measured at a distance equivalent to 500 lx.

Measured at the 500 lx distance, GLS lamps will not exceed risk group 1 for blue light hazard and risk group 0 for IR radiation. This combination of risk group and hazard does not require marking (Table 1 of IEC/TR 62471-2:2009).

Hazards from UV radiation of GLS lamps are sufficiently covered in 4.11 of IEC 61199,.

Hence, IEC 62471 does not require any additional marking for GLS lamps.

INTRODUCTION to Amendment 1

The standards IEC 62471, and IEC/TR 62471-2, contain horizontal requirements available that need to be introduced into product standards, e.g. to IEC 61199.

In IEC 61199 the column names in Table F.1 are a bit misleading. These names are:

- “Pre-heat current safety limit (A) (abnormal operation)” in column 2,
- “Discharge current safety limit (A) (normal operation)” in column 3 and
- “SoS safety limit (A²) (normal operation)” in column 4.

Although the additions in brackets of “abnormal operation” and “normal operation” indicate that the corresponding data are dedicated to magnetic ballasts (abnormal operation) and electronic ballasts (normal operation) this is nowhere really stated in IEC 61199.

In fact the “Pre-heat current safety limit” in column 2 of Table F.1 in IEC 61199 is only valid for magnetic operation with internal or external starters. With electronic control gears this limit might be and will be exceeded. It is no safety risk for electronic control gears because there is already a requirement for electronic control gears to avoid any overheating of the base by the pre-heat current in case a lamp does not start (Annex H of IEC 61199). In case of magnetic operation with internal or external starters it might happen that the starter sticks at end of lamp life and the preheat current will be supplied continuously. To avoid a safety risk in this case, with magnetic ballasts the “Pre-heat current safety limit” needs to be observed.

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SINGLE-CAPPED FLUORESCENT LAMPS – SAFETY SPECIFICATIONS

1 Scope

This International Standard specifies the safety requirements for single-capped fluorescent lamps for general lighting purposes of all groups having caps according to Table 1.

It also specifies the method a manufacturer should use to show compliance with the requirements of this standard on the basis of whole production appraisal in association with his test records on finished products. This method can also be applied for certification purposes. Details of a batch test procedure which can be used to make limited assessment of batches are also given in this standard.

This part of the standard covers photobiological safety according to IEC 62471 and IEC/TR 62471-2.

Blue light and infrared hazards are below the level which requires marking.

NOTE Compliance with this standard concerns only safety criteria and does not take into account the performance of single-capped fluorescent lamps for general lighting purposes with respect to luminous flux, colour, starting and operational characteristics. For this information, readers are referred to IEC 60901.

Table 1 – Sheet references of IEC 60061

Cap type	Sheet numbers	
	IEC 60061-1 Lamp caps	IEC 60061-3 Cap gauges
2G7	7004-102	7006-102
2GX7	7004-103	7006-102
2G8	7004-141	7006-141, 141H, 141J, 141K
GR8	7004-68	7006-68A, 68B, 68E
G10q	7004-54	7006-79
GR10q	7004-77	7006-77A, 68B, 68E
GU10q	7004-123	7006-123, 123A
GX10q	7004-84	7006-79, 84, 84A and 84B
GY10q	7004-85	7006-79, 85 and 85A
GZ10q	7004-124	7006-79
2G10	7004-118	7006-118
2G11	7004-82	7006-82
2GX11-1	7004-82A	7006-82F, 82G, 82H
2GX13	7004-125	7006-125A, 125B
G23	7004-69	7006-69
GX23	7004-86	7006-86
G24, GX24	7004-78	7006-78
GZ24q	*	*
GX32	7004-87	7006-87

* to be developed.

It may be expected that lamps which comply with this standard will operate safely at supply voltages between 90 % and 110 % of rated supply voltage of the used ballast and when operated with a ballast complying with IEC 61347-2-3 or IEC 61347-2-8 with a starting device complying with IEC 60155 (if applicable) and in a luminaire complying with IEC 60598-1.

2 Normative references

The following reference documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the reference document (including any amendments) applies.

IEC 60061-1 *Lamp caps and holders together with gauges for the control of interchangeability and safety – Part 1: Lamp caps*

IEC 60061-2, *Lamp caps and holders together with gauges for the control of interchangeability and safety – Part 2: Lampholders*

IEC 60061-3, *Lamp caps and holders together with gauges for the control of interchangeability and safety – Part 3: Gauges*

IEC 60061-4, *Lamp caps and holders together with gauges for the control of interchangeability and safety – Part 4: Guidelines and general information*

IEC 60155, *Glow-starters for fluorescent lamps*

IEC 60360, *Standard method of measurement of lamp cap temperature rise*

IEC 60410, *Sampling plans and procedures for inspection by attributes*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 60598-1:2008, *Luminaires – Part 1: General requirements and tests*

IEC 60695-2-10, *Fire hazard testing – Part 2-10: Glowing/hot-wire based test methods – Glow-wire apparatus and common test procedure*

IEC 60901, *Single-capped fluorescent lamps – Performance specifications*

IEC 61347-2-3, *Lamp control gear – Part 2-3: Particular requirements for a.c. supplied electronic ballasts for fluorescent lamps*

IEC 61347-2-8, *Lamp control gear – Part 2-8: Particular requirements for ballasts for fluorescent lamps*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

single-capped fluorescent lamp

low-pressure mercury discharge lamp having a single cap in which most of the light from the lamp is emitted by a layer of fluorescent material excited by the ultraviolet radiation from the discharge

3.2**group**

lamps having the same electrical and cathode characteristics, the same physical dimensions and the same starting method

3.3**type**

lamps of the same group having the same photometric and colour characteristics

3.4**family**

lamp groups which are distinguished by common features of materials, components, tube diameter and/or method of processing

3.5**nominal value**

approximate quantity value used to designate or identify a lamp

3.6**rated value**

quantity value for a characteristic of a lamp for specified operating conditions

The value and the conditions are specified in this standard, or assigned by the manufacturer or responsible vendor.

3.7**design test**

test made on a sample for the purpose of checking compliance of the design of a family, group or a number of groups with the requirements of the relevant clause

3.8**periodic test**

test, or series of tests, repeated at intervals in order to check that a product does not deviate in certain respects from the given design

3.9**running test**

test repeated at frequent intervals to provide data for assessment

3.10**batch**

all lamps of one family and/or group and identified as such and put forward at one time for test or checking compliance

3.11**whole production**

production during a period of twelve months of all types of lamps within the scope of this standard and nominated in a list of the manufacturer for inclusion in the certificate

3.12**SoS value**

abbreviation for the “sum of the squares” (SoS) of the two currents through the two lead wires at a lamp electrode

The currents are measured as r.m.s. values. The lead current at one electrode coil, which gets the higher r.m.s. current value is called I_{LH} (“lead high”), the lead current with the lower r.m.s. value is called I_{LL} (“lead low”). The values of the two currents have to be squared and added ($SoS = I_{LH}^2 + I_{LL}^2$).