

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



**Lampholders for tubular fluorescent lamps and starterholders**

**Douilles pour lampes tubulaires à fluorescence et douilles pour starters**

IEC 60400:2017

<https://standards.iteh.ai/catalog/standards/sist/f0dfa1b8-2b08-417c-920c-553459c965a4/iec-60400-2017>



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INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
ELECTROTECHNIQUE  
INTERNATIONALE

ICS 29.140.10

ISBN 978-2-8322-4105-9

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### LAMPHOLDERS FOR TUBULAR FLUORESCENT LAMPS AND STARTERHOLDERS

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**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.**

International Standard IEC 60400 has been prepared by subcommittee 34B: Lamp caps and holders, of IEC technical committee 34: Lamps and related equipment.

This eighth edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) alignment with ISO/IEC drafting rules;
- b) renumbering of clauses, tables and figures.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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## INTRODUCTION to Amendment 1

Two changes needed for IEC 60400 became obvious during the work relating to Edition 8.0 of IEC 60400.

### Change 1:

Actual lamp holder safety standards require a ball pressure test in line with IEC 60695-10-2 in sections "Resistance to heat, fire and tracking". Within this test there is an alternative depth indentation method described for the calculation of the indentation diameter.

This alternative calculation option was removed from the latest edition of IEC 60695-10-2 dated 2014 and during its meeting held in Sydney in 2018, SC 34B/WG1 agreed to delete the alternative method as well from IEC 60400.

### Change 2:

Based on IEC 60664-1:2007, 4.8.1.5 "Non tracking materials":

"For glass, ceramics or other inorganic insulating materials which do not track, creepage distances need not be greater than their associated clearance for the purpose of insulation coordination. The dimensions of Table F.2 for inhomogeneous field conditions are appropriate."

This is not completely reflected in TC 34 standards as revised recently. For applications with ELV it is of high importance whether the creepage distance shall be 0,6 mm or may be 0,2 mm in case where inorganic insulating material is used.

An informative annex for the explanation of  $U_{out}$  should give some additional information.

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## INTRODUCTION to Amendment 2

Lampholders specified in this standard are used not only for fluorescent lamps but also now for retrofit LED lamps. LED lamp designers, as well as lampholder designers, refer to this standard. However, it may lead to a misread of the original intention of the relaxation in Clause 17, which indicates that creepage distances or clearances between lamp contacts can be reduced.

The purpose of this amendment is to make the relaxation provision clear and to avoid misreading, i.e.

- the relaxation provision has been moved from the end of Clause 17 to the footnotes in Table 3,

and

- an explanatory note for this relaxation has been added to Table 3.

# LAMPHOLDERS FOR TUBULAR FLUORESCENT LAMPS AND STARTERHOLDERS

## 1 Scope

This document states the technical and dimensional requirements for lampholders for tubular fluorescent lamps and for starterholders, and the methods of test to be used in determining the safety and the fit of the lamps in the lampholders and the starters in the starterholders.

This document covers independent lampholders and lampholders for building-in, used with tubular fluorescent lamps provided with caps as listed in Annex A, and independent starterholders and starterholders for building-in, used with starters in accordance with IEC 60155, intended for use in AC circuits where the working voltage does not exceed 1 000 V r.m.s.

This document also covers lampholders for single-capped tubular fluorescent lamps integrated in an outer shell and dome similar to Edison screw lampholders (e.g. for G23 and G24 capped lamps). Such lampholders are tested in accordance with the following clauses and subclauses of IEC 60238: 9.4; 9.5; 9.6; 10.3; 11.7; 12; 13.2; 13.5; 13.6; 13.7; 14; 16.3; 16.4; 16.5 and 16.9.

This document also covers lampholders which are integral with a luminaire or intended to be built into appliances. It covers the requirements for the lampholder only. For all other requirements, such as protection against electric shock in the area of the terminals, the requirements of the relevant appliance standard are applicable and tested after building into the appropriate equipment, when that equipment is tested according to its own standard. Lampholders for use by luminaire manufacturers only are not for retail sale.

This document also applies, as far as is reasonable, to lampholders and starterholders other than the types explicitly mentioned above and to lamp connectors.

Where the term "holder" is used in this document, both lampholders and starterholders are intended.

Where the term "bi-pin lampholder" is used, lampholders for wedged caps are also intended.

## 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 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 60068-2-75:2014, *Environmental testing – Part 2-75: Tests – Test Eh: Hammer tests*

IEC 60081, *Double-capped fluorescent lamps – Performance specifications*

IEC 60112:2003, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*  
IEC 60112:2003/AMD1:2009

IEC 60155, *Glow-starters for fluorescent lamps*

IEC 60352-1:1997, *Solderless connections – Part 1: Wrapped connections – General requirements, test methods and practical guidance*

IEC 60399, *Barrel thread for lampholders with shade holder ring*

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*  
IEC 60529:1989/AMD1:1999  
IEC 60529:1989/AMD2:2013

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

IEC 60695-2-11:2000, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods – Glow-wire flammability test method for end-products (GWEPT)*

IEC 60695-11-5:2016 *Fire hazard testing – Part 11-5: Test flames – Needle-flame test method – Apparatus, confirmatory test arrangement and guidance*

ISO 4046-4:2016, *Paper, board, pulps and related terms – Vocabulary – Part 4: Paper and board grades and converted products*

### 3 Terms and definitions

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

##### **rated voltage**

voltage declared by the manufacturer to indicate the highest working voltage for which the holder is intended

#### 3.2

##### **working voltage**

highest r.m.s. voltage which may occur across any insulation, transients being disregarded, both when the lamp or starter is operating under normal conditions and when the lamp or starter is removed

#### 3.3

##### **flexible lampholders for linear double-capped fluorescent lamps**

pair of lampholders in which the base of each holder is rigidly mounted in the luminaire but which has one or both of the lampholders so designed as to allow axial movement of the contacts to provide compensation for variations in lamp lengths and, where necessary, to permit insertion and removal of the lamp

Note 1 to entry: In case of doubt as to whether a lampholder G5, GX5 or G13 provides the required axial movement of the contacts, a test with the device shown in Figure 3 can be carried out.

### 3.4

#### **inflexible lampholders for linear double-capped fluorescent lamps**

pair of lampholders intended for rigid mounting and in which no axial movement of the contacts is provided or is needed, either for the insertion and removal of the lamp or as compensation for variation in lamp lengths

### 3.5

#### **flexibly mounted lampholders for linear double-capped fluorescent lamps**

pair of lampholders which do not in themselves provide for any axial movement of the contact system but which are intended to be mounted in a luminaire in a specified manner so that the combination provides the necessary axial movement of the contact system

Note 1 to entry: Lampholders of this type may or may not also be suitable for rigid mounting.

### 3.6

#### **lamp connectors**

set of contacts mounted on flexible conductors which provide for electrical contact but do not support the lamp

### 3.7

#### **holder for building-in**

holder designed to be built into a luminaire, an additional enclosure or the like

#### 3.7.1

##### **unenclosed holder**

holder for building-in so designed that it requires additional means, for example an enclosure, to meet the requirements of IEC 60400 with regard to protection against electric shock

#### 3.7.2

##### **enclosed holder**

holder for building-in so designed that on its own it fulfils the requirements of IEC 60400 with regard to protection against electric shock and IP classification, if appropriate

### 3.8

#### **independent holder**

holder so designed that it can be mounted separately from a luminaire and at the same time providing all the necessary protection according to its classification and marking

### 3.9

#### **rated operating temperature**

highest temperature for which the holder is designed

### 3.10

#### **rated lampholder rearside temperature**

rearside temperature for lampholders with T marking ascertained by test b) in 18.1 of IEC 60400, or a higher temperature as declared by the manufacturer

### 3.11

#### **type test**

test or series of tests made on a type test sample, for the purpose of checking compliance of the design of a given product with the requirements of the relevant standard

### 3.12

#### **type test sample**

sample consisting of one or more similar specimens submitted by the manufacturer or responsible vendor for the purpose of a type test

### 3.13

#### **live part**

conductive part which may cause an electric shock

### 3.14

#### **rated ignition voltage**

highest peak value of the ignition voltages the holder is able to withstand

### 3.15

#### **multilamp ballast**

electronic mains ballast designed and declared to comply for the application of lamps with different keys

### 3.16

#### **impulse withstand category**

numeral defining a transient overvoltage condition

Note 1 to entry: Impulse withstand categories I, II, III and IV are used.

#### a) Purpose of classification of impulse withstand categories

Impulse withstand categories are to distinguish different degrees of availability of equipment with regard to required expectations on continuity of service and on an acceptable risk of failure.

By selection of impulse withstand levels of equipment, insulation co-ordination can be achieved in the whole installation reducing the risk of failure to an acceptable level providing a basis for overvoltage control.

A higher characteristic numeral of an impulse withstand category indicates a higher specific impulse withstand of the equipment and offers a wider choice of methods for overvoltage control.

The concept of impulse withstand categories is used for equipment energized directly from the mains.

#### b) Description of impulse withstand categories

Equipment of impulse withstand category I is equipment which is intended to be connected to the fixed electrical installations of buildings. Protective means are taken outside the equipment – either in the fixed installation or between the fixed installation and the equipment – to limit transient overvoltages to the specific level.

Equipment of impulse withstand category II is equipment to be connected to the fixed electrical installations of buildings.

Equipment of impulse withstand category III is equipment which is part of the fixed electrical installations and other equipment where a higher degree of availability is expected.

Equipment of impulse withstand category IV is for use at or in the proximity of the origin of the electrical installations of buildings upstream of the main distribution board.

### 3.17

#### **primary circuit**

circuit which is directly connected to the AC mains supply

Note 1 to entry: It includes, for example, the means for connection to the AC mains supply, the primary windings of transformers, motors and other loading devices.

### 3.18

#### **secondary circuit**

circuit which has no direct connection to a primary circuit and derives its power from a transformer, converter or equivalent isolation device, or from a battery

Note 1 to entry: *Exception:* autotransformers. Although having direct connection to a primary circuit, the tapped part of them is also deemed to be a secondary circuit in the above sense.

Note 2 to entry: Mains transients in such a circuit are attenuated by the corresponding primary windings. In addition, inductive ballasts reduce the mains transient voltage height. Therefore, components located after a primary circuit or after an inductive ballast can be suited for an impulse withstand category of one step lower, i.e. for impulse withstand category II.