

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

Edison screw lampholders

Douilles à vis edison pour lampes

STANDARD PREVIEW  
(standards.iteh.ai)

[IEC 60238:2016](#)

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International Standard IEC 60238 has been prepared by subcommittee 34B: Lamp caps and holders, of IEC technical committee 34: Lamps and related equipment.

This ninth edition cancels and replaces the eighth edition published in 2004, Amendment 1: 2008 and Amendment 2:2011. This edition constitutes a technical revision.

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

- a) Addition of a pull test for certain E5 and E10 lampholders.
- b) Annex D listing amended requirements/clauses which require products to be retested.

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

FDIS	Report on voting
34B/1852/FDIS	34B/1860/RVD

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

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

In this standard, the following print types are used:

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The committee has decided that the contents of this publication 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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## EDISON SCREW LAMPHOLDERS

### 1 Scope

This International Standard applies to lampholders with Edison thread E14, E27 and E40, designed for connection to the supply of lamps and semi-luminaires<sup>1</sup> only.

It also applies to switched-lampholders for use in AC circuits only, where the working voltage does not exceed 250 V r.m.s.

This standard also applies to lampholders with Edison thread E5 designed for connection to the supply mains of series connected lamps, with a working voltage not exceeding 25 V, to be used indoors, and to lampholders with Edison thread E10 designed for connection to the supply mains of series connected lamps, with a working voltage not exceeding 60 V, to be used indoors or outdoors. It also applies to lampholders E10 for building-in, for the connection of single lamps to the supply. These lampholders are not intended for retail sale.

As far as it reasonably applies, this standard also covers lampholders other than lampholders with Edison thread designed for connection of series-connected lamps to the supply.

NOTE This type of lampholder is for example used in Christmas tree lighting chains.

As far as it reasonably applies, this standard also covers adapters.

This standard also covers lampholders which are wholly or partly, 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 or of the lamp cap, the requirements of the relevant appliance standard are observed and tested after building into the appropriate equipment, when that equipment is tested according to its own standard. Such lampholders as well as lampholders provided with a snap-on outer shell, for use by luminaire manufacturers only, are not for retail sale.

This standard applies to lampholders to be used indoors or outdoors in residential as well as in industrial lighting installations. It also applies to candle lampholders. In locations where special conditions prevail, as for street lighting, on board ships, in vehicles and in hazardous locations, for example where explosions are liable to occur, special constructions may be required.

This standard does not apply to three-light lampholders E26d.

This standard is based on the following data relative to lamps for general lighting service:

- caps E14 are used for lamps with a current not exceeding 2 A;
- caps E27 are used for lamps with a current not exceeding 4 A;
- caps E40 are used for lamps with a current not exceeding 16 A, or 32 A if the nominal voltage of the supply does not exceed 130 V (see 5.5 and 6.3).

Where lampholders are used in luminaires, their maximum operating temperatures are specified in IEC 60598.

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<sup>1</sup> Requirements for lampholders suitable for semi-luminaires are under consideration.



## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced 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 60068-2-32:1975, *Basic environmental testing procedures – Part 2-32: Tests – Test Ed: Free fall*

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

IEC 60112:2003, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*  
Amendment 1:2009

IEC 60227 (all parts), *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V*

IEC 60245 (all parts), *Rubber insulated cables – Rated voltages up to and including 450/750 V*

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 60417, *Graphical symbols for use on equipment* (available at: <http://www.graphical-symbols.info/equipment>)

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*  
Amendment 1:1999  
Amendment 2:2013<sup>2</sup>

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

IEC 60630, *Maximum lamp outlines for incandescent lamps*

IEC 60695-2-11:2014, *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, *Fire hazard testing – Part 11-5: Test flames – Needle-flame test method – Apparatus, confirmatory test arrangement and guidance*

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<sup>2</sup> A consolidated edition 2.2 (2013) exists including edition 2.0 (1989) and its Amendment 1 (1999) and Amendment 2 (2013).

IEC 61058-1:2000, *Switches for appliances – Part 1: General requirements*

ISO 4046-4:2002, *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.

#### 3.1

##### **cord-grip lampholder**

lampholder incorporating a method of retaining a flexible cord by which it may then be suspended

#### 3.2

##### **threaded entry lampholder**

lampholder incorporating a threaded component at the point of entry of the supply wires permitting the lampholder to be mounted on a mating threaded support

Note 1 to entry: A threaded entry lampholder was formerly called a “nipple lampholder”.

#### 3.3

##### **backplate lampholder**

lampholder so designed as to be suitable for mounting by means of an associated or integral backplate, directly onto a supporting surface or appropriate box

#### 3.4

##### **lampholder for building-in**

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

##### 3.4.1

##### **unenclosed lampholder**

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

##### 3.4.2

##### **enclosed lampholder**

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

#### 3.5

##### **independent lampholder**

lampholder 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

#### 3.6

##### **terminal/contact assembly**

part or assembly of parts which provides a means of connection between the termination of a supply conductor and the contact making surfaces of the corresponding lamp cap

Note 1 to entry: For clarification of some definitions, see also Figure 17.

#### 3.7

##### **outer shell**

cylindrical component protecting the user from contact with the lamp cap.

Note 1 to entry: It may or may not be provided with an external screw thread for fixing a shade ring.

Note 2 to entry: For clarification of some definitions, see also Figure 17.

### 3.7.1

#### **snap-on outer shell**

outer shell for screwless assembly which does not contain the screw shell

Note 1 to entry: The lampholder should not be used when the snap-on outer shell is removed. It is therefore recommended to place an approval mark, if provided, in such a way that it is not visible when this type of outer shell is removed.

### 3.8

#### **screw shell**

cylindrical component having an internal screw thread of Edison form for the retention of the corresponding lamp (cap)

Note 1 to entry: In some constructions, the screw shell is permanently fixed to or integral with the outer shell.

Note 2 to entry: For clarification of some definitions, see also Figure 17.

### 3.9

#### **insulating ring**

cylindrical intermediate piece of insulating material separating a metal screw shell and a metal outer shell

Note 1 to entry: For clarification of some definitions, see also Figure 17.

### 3.10

#### **shade ring**

cylindrical component having an internal thread or other means to engage a corresponding support on the outer shell and intended to carry or retain a shade

Note 1 to entry: For clarification of some definitions, see also Figure 17.

### 3.11

#### **dome**

part of a cord-grip lampholder or threaded entry lampholder which shields the connecting terminals

Note 1 to entry: For clarification of some definitions, see also Figure 17.

### 3.12

#### **basic insulation**

insulation applied to live parts to provide basic protection against electric shock

Note 1 to entry: Basic insulation does not necessarily include insulation used exclusively for functional purposes.

### 3.13

#### **supplementary insulation**

independent insulation applied in addition to basic insulation in order to provide protection against electric shock in the event of a failure of basic insulation

### 3.14

#### **double insulation**

insulation comprising both basic insulation and supplementary insulation

### 3.15

#### **reinforced insulation**

single insulation system applied to live parts, which provides a degree of protection against electric shock equivalent to double insulation under the conditions specified

Note 1 to entry: The term "insulation system" does not imply that the insulation is one homogeneous piece. It may comprise several layers which cannot be tested singly as supplementary or basic insulation.

**3.16****live part**

conductive part which may cause an electric shock

**3.17****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

**3.18****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

**3.19****semi-luminaire**

unit similar to a self-ballasted lamp but designed to utilize a replaceable light source and/or starting device

**3.20****rated operating temperature**

highest temperature for which the holder is designed

**3.21****rated minimum temperature**

lowest temperature for which the holder is designed (applicable only to lampholders intended for use in refrigerators and food freezers)

**3.22****angled lampholder**

lampholder, the rear side of which (threaded entry and/or dome) is at an angled position to the screw shell axis

**3.23****lampholder with retention device**

lampholder with a device intended to prevent the lamp from becoming loose in the holder

Note 1 to entry: Lamps can, for example, become loose due to changes in temperature or to vibrations.

**3.24****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 category 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.

### 3.25

#### **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.

### 3.26

#### **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 sense of this definition.

Note 2 to entry: Mains transients in such a circuit are attenuated by the corresponding primary windings. Also 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.

### 3.27

#### **adapter**

component used for the electrical and mechanical connection of a lamp to a lampholder

Note 1 to entry: This definition is specific for this standard. The definition of an adapter in principle could vary very much depending on its use. In most cases such a component is used to bridge differences in the screw thread diameter between the lampholder and the lamp.

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### 3.28

#### **enclosed reinforced insulated lampholder**

lampholder for building-in so designed that on its own it fulfils the requirements for double or reinforced insulated parts in class II applications

### 3.29

#### **partly reinforced insulated lampholder**

lampholder for building-in so designed that some parts of the lampholder require additional means to fulfil the requirements with regard to double or reinforced insulation

Note 1 to entry: In some cases, the dimensions might be achieved only after mounting into the luminaire.

## 4 General requirement

Lampholders shall be so designed and constructed that in normal use they function reliably and cause no danger to persons or surroundings.

*In general, compliance is checked by carrying out all the tests specified.*

In addition, the enclosure of independent lampholders shall comply with the requirements of IEC 60598-1, including the classification and marking requirements of that standard.

## 5 General conditions for tests

5.1 Tests according to this standard are type tests.

NOTE The requirements and tolerances permitted by this standard are related to testing of a type test sample submitted for that purpose.

Compliance of the type test sample does not ensure compliance of the whole production of a manufacturer with this safety standard.

In addition to type testing, conformity of production is the responsibility of the manufacturer and can include routine tests and quality assurance.

For further information on conformity testing during manufacture see IEC 60061-4.

**5.2** Unless otherwise specified, the tests are made at an ambient temperature of  $20\text{ °C} \pm 5\text{ °C}$  and with the holder tested as delivered and installed as in normal use.

**5.3** The tests and inspections are carried out on a total of

- nine specimens for non-switched lampholders, or
- 12 specimens for switched lampholders

in the following order of clauses:

- three specimens: Clauses 2 to 13 (except for 10.1 and 11.2) and Clauses 15 to 18;
- three specimens: Clause 14 (switched-lampholder tests only);
- three specimens: 10.1 and Clauses 19 and 20;
- two specimens: Clause 21 (of which one specimen for the test of 21.1 and the other for the tests of 21.3 or 21.4);
- one specimen: 21.5 and Clause 22.

For testing lampholders with a retention device, the retention device shall be removed.

For testing lampholders with a retention device according to 13.14, three additional specimens are required with the retention device kept in place.

For testing of screwless terminals according to 11.2, separate specimens are required in addition.

**5.4** *In case of doubt, gauges, test caps and mandrels are introduced into the specimens, unless otherwise specified, by applying the following torques:*

- 0,2 Nm for lampholders E5;
- 0,2 Nm for lampholders E10;
- 0,2 Nm for lampholders E14;
- 0,4 Nm for lampholders E27;
- 0,8 Nm for lampholders E40.

**5.5** *For lampholders E40 with a rated current of 32 A, the tests shall be based on this rated current.*

**5.6** *Lampholders are deemed to comply with this standard if no specimen fails in the complete series of tests specified in 5.3.*

*If one specimen fails in one test, that test and the preceding ones which may have influenced the result of that test are repeated on another set of specimens to the number required by 5.3, all of which shall then comply with the repeated tests and with the subsequent tests. Lampholders are deemed not to comply with this standard if there are more failures than one.*

## 6 Standard ratings

**6.1** Standard rated voltages are 250 V and 500 V.

For lampholders E14, and for switched lampholders E27, a rated voltage of 250 V only is allowed.

For lampholders E5 and E10 intended for the connection of series-connected lamps to the supply, the rated voltage shall not exceed 25 V for lampholders E5 and not exceed 60 V for lampholders E10.

NOTE 1 These values refer to the voltage between parts of different polarity.

For lampholders E10 intended for the connection of single lamps to the supply, a rated voltage of 250 V only is allowed.

NOTE 2 These lampholders are also used for such special cases as series-connected lamps, where, because of the low number of lamps, 60 V per lampholder is exceeded.

With the exception given for lampholders E5 and E10, the rated voltage shall be not less than 250 V. Additionally a rated voltage of 125 V is allowed for lampholders E40.

*Compliance is checked by inspection of the marking.*

**6.2** Standard rated currents are

- 0,2 A for lampholders E5;
- 0,5 A for lampholders E10;
- 2 A for lampholders E14;
- 2 A for switched-lampholders E27;
- 4 A for other lampholders E27;
- 16 A for lampholders E40.

The rated current shall be not less than the standard value.

*Compliance is checked by inspection of the marking.*

**6.3** Lampholders E40 to be used on 125 V installations may have an additional nominal rating of 32 A.

NOTE This nominal rating covers the voltages up to and including 130 V.

*Compliance is checked by inspection of the marking.*

**6.4** The rated operating temperature for lampholders intended for use in high temperature conditions (T marked holders) shall be not lower than 140 °C for lampholders E14, not lower than 170 °C for lampholders E27 and not lower than 230 °C for lampholders E40.

*Compliance is checked by inspection of the marking.*

NOTE The rated operating temperatures for Edison screw lampholders without T marking are given in IEC 60598-1, Table 12.1. They are

- 135 °C for lampholders E14;
- 165 °C for lampholders E27;
- 225 °C for lampholders E40.

## 7 Classification

Lampholders are classified as defined in 7.1 to 7.6.