

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

**Edison screw lampholders**

**Douilles à vis Edison pour lampes**

IEC 60238:2004

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**Edison screw lampholders**

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INTERNATIONAL  
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# INTERNATIONAL ELECTROTECHNICAL COMMISSION

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## EDISON SCREW LAMPHOLDERS

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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 consolidated version of IEC 60238 consists of the eighth edition (2004) [documents 34B/1151/FDIS and 34B/1170/RVD] and its amendment 1 (2008) [documents 34B/1381/FDIS and 34B/1397/RVD].

The technical content is therefore identical to the base edition and its amendment and has been prepared for user convenience.

It bears the edition number 8.1.

A vertical line in the margin shows where the base publication has been modified by amendment 1.

In this edition the new requirements for creepage distances and clearances have been adopted which are currently circulated by SC34D to amend the IEC 60598 family of luminaire standards.

Additionally guidances for requirements in IEC 61058-1 applicable to switches in lampholders (see Annex B) and for special requirements in appliance standards (see Annex C) have been included.

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 maintenance result 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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- replaced by a revised edition, or
- amended.

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## EDISON SCREW LAMPHOLDERS

### 1 General

#### 1.1 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\* only.

It also applies to switched-lampholders for use in a.c. 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 shall be 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, e.g. where explosions are liable to occur, special constructions may be required.

NOTE 1 This standard does not apply to three-light lampholders E26d.

NOTE 2 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.

NOTE 3 If the nominal voltage of the supply does not exceed 130 V, the maximum current for caps E40 is 32 A (see 4.5 and 5.3).

NOTE 4 Where lampholders are used in luminaires, their maximum operating temperatures are specified in IEC 60598.

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\* Requirements for lampholders suitable for semi-luminaires are under consideration.



## 1.2 Normative references

The following referenced 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 referenced document (including any amendments) applies.

NOTE With regard to IEC 60598-1, the references cited in this document are liable to change.

IEC 60061 (all parts), *Lamp caps and holders together with gauges for the control of interchangeability and safety*

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 60068-2-20:1979, *Environmental testing – Part 2: Tests – Test T: Soldering*

IEC 60068-2-32:1975, *Environmental testing – Part 2: Tests – Test Ed: Free fall*

IEC 60068-2-75:1997, *Environmental testing – Part 2: Tests – Test Eh: Hammer tests*

IEC 60112:1979, *Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions*

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 60335-1:2001, *Household and similar electrical appliances – Safety – Part 1: General requirements*

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-DB:2002\*\*) *Graphical symbols for use on equipment*

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code) \**  
Amendment 1 (1999)

IEC 60598 (all parts and sections), *Luminaires*

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

IEC 60664-1:1992, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests \*\*\*)*

Amendment 1 (2000)

Amendment 2 (2002)

IEC 60695-2-10:2000, *Fire hazard testing – Part 2–10: Glowing/hot-wire based test methods – Glow-wire apparatus and common test procedure*

\*) A consolidated edition 2.1 (2001) exists including edition 2.0 (1989) and its amendment 1(1999).

\*\*) "DB" refers to the IEC on-line database.

\*\*\*) A consolidated edition 1.2 (2002) exists including edition 1.0 (1992) and its amendment 1 (2000) and amendment 2 (2002).

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*

IEC 60695-11-5:2004, *Fire hazard testing – Part 11-5: Test flames – Needle-flame test method – Apparatus, confirmatory test arrangement and guidance*

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*

## 2 Definitions

For the purpose of this International Standard, the following definitions apply. For clarification of some definitions, see also figure 17.

### 2.1

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

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

### 2.2

#### **threaded entry lampholder**

a 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 (formerly called "nipple lampholder")

### 2.3

#### **backplate lampholder**

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

### 2.4

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

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

#### 2.4.1

##### **unenclosed lampholder**

a 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

#### 2.4.2

##### **enclosed lampholder**

a 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

### 2.5

#### **independent lampholder**

a 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

### 2.6

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

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

## 2.7

### **outer shell**

a cylindrical component protecting the user from contact with the lamp cap. It may or may not be provided with an external screw thread for fixing a shade ring

### 2.7.1

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

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

NOTE 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.

## 2.8

### **screw shell**

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

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

## 2.9

### **insulating ring**

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

## 2.10

### **shade ring**

a 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

## 2.11

### **dome**

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

## 2.12

### **basic insulation**

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

NOTE Basic insulation does not necessarily include insulation used exclusively for functional purposes.

## 2.13

### **supplementary insulation**

an 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

## 2.14

### **double insulation**

an insulation comprising both basic insulation and supplementary insulation

## 2.15

### **reinforced insulation**

a 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 The term "insulation system" does not imply that the insulation must be one homogeneous piece. It may comprise several layers which cannot be tested singly as supplementary or basic insulation.

**2.16**

**live part**

a conductive part which may cause an electric shock

**2.17**

**type test**

a 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

**2.18**

**type test sample**

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

**2.19**

**semi-luminaire**

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

**2.20**

**rated operating temperature**

the highest temperature for which the holder is designed

**2.21**

**rated minimum temperature**

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

**2.22**

**angled lampholder**

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

**2.23**

**lampholder with retention device**

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

NOTE Lamps may, for example, become loose due to changes in temperature or to vibrations.

**2.24**

**impulse withstand categories**

a numeral defining a transient overvoltage condition

NOTE 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.

## 2.25

### primary circuit

a circuit which is directly connected to the AC mains supply. It includes, for example, the means for connection to the AC mains supply, the primary windings of transformers, motors and other loading devices

## 2.26

### secondary circuit

a 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

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 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.

## 2.27

### adapter

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

NOTE 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.

## 3 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.

## 4 General conditions for tests

### 4.1 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 may include routine tests and quality assurance.

For further information see IEC 60061-4\*\*\*\*) (inclusion of guidance on conformity testing during manufacture is in preparation).

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

**4.2** 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.

**4.3** 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 1 to 12 (except for 9.1 and 10.2) and 14 to 17;
- three specimens clause 13 (switched-lampholder tests only);
- three specimens subclause 9.1 and clauses 18 and 19;
- two specimens clause 20 (of which one specimen for the test of 20.1 and the other for the tests of 20.3 or 20.4);
- one specimen 20.5 and clause 21.

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

For testing lampholders with a retention device according to 12.14, three additional specimens are required with the retention device kept in place.

NOTE For testing of screwless terminals according to 10.2, separate specimens are required in addition.

**4.4** *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.

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

**4.6** *Lampholders are deemed to comply with this standard if no specimen fails in the complete series of tests specified in 4.3.*

*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 4.3, 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.*

NOTE In general, it will only be necessary to repeat the relevant test unless the specimen fails in the tests according to clauses 18 and 19, or if failure occurs with regard to resilient side or central contact(s); in these cases, both tests are repeated with a second set of three specimens.

The applicant may submit, together with the first set of specimens, the additional set which may be wanted in case of failure of one specimen. The testing station shall then, without further request, test the additional specimens and will reject only if a further failure occurs.

If the additional set of specimens is not submitted at the same time, a failure of one specimen entails a rejection.