

# INTERNATIONAL STANDARD



Miscellaneous lampholders –  
Part 1: General requirements and tests

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IEC 60838-1

Edition 5.0 2016-05  
REDLINE VERSION

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INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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ICS 29.140.10

ISBN 978-2-8322-3427-3

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**MISCELLANEOUS LAMPHOLDERS –****Part 1: General requirements and tests****FOREWORD**

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International Standard IEC 60838-1 has been prepared by subcommittee 34B: Lamp caps and holders, of IEC technical committee 34: Lamps and related equipment.

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

The significant technical changes in this edition with respect to the previous edition include the introduction of new or revised requirements for single and dual contact ignition voltages, steel test caps and brass test caps and an Annex E 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/1850A/FDIS	34B/1856/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.

A list of all parts in the IEC 60838 series, published under the general title *Miscellaneous lampholders*, can be found on the IEC website.

In this standard, the following type is used:

- *compliance statements: in italic type.*

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

- reconfirmed,
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## MISCELLANEOUS LAMPHOLDERS –

### Part 1: General requirements and tests

#### ~~1~~ **General**

##### **1 Scope**

This part of IEC 60838 applies to lampholders of miscellaneous types intended for building-in (to be used with general purpose light sources, projection lamps, floodlighting lamps and street-lighting lamps with caps as listed in Annex A) and the methods of test to be used in determining the safe use of lamps in lampholders.

This part of IEC 60838 also covers lampholders which are integral with a luminaire. It covers the requirements for the lampholder only.

This part of IEC 60838 also covers lampholders integrated in an outer shell and dome similar to Edison screw lampholders. Such lampholders are further tested in accordance with the relevant clauses of IEC 60238.

~~Lampholders designed with a barrel thread for shade holder rings should comply with IEC 60399.~~

Requirements for lampholders for tubular fluorescent lamps, Edison screw lampholders and bayonet lampholders are covered by separate standards.

##### **2 Normative references**

[IEC 60838-1:2016](https://standards.iteh.ai/catalog/standards/iec/834205e1-8121-45bf-aca1-50653068c296/iec-60838-1-2016)

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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.

~~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* (available at <http://std.iec.ch/iec60061>)

~~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 60068-2-75:1997 2014, *Environmental testing – Part 2-75: Tests – Test Eh: Hammer tests*

IEC 60112:~~1979~~ 2003, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*

IEC 60112:2003/AMD1:2009

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

IEC 60238:~~2004~~, *Edison screw lampholders*

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

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

IEC 60399, ~~Standard sheets for Barrel thread for E14 and E2~~ *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)*<sup>1</sup>

IEC 60529:1989/AMD1:1999

IEC 60529:1989/AMD2:2013

IEC 60598-1:2014, *Luminaires – Part 1: General requirements and tests*

IEC 60664-1:~~1992~~, *Insulation co-ordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*<sup>2)</sup>

~~Amendment 1 (2000)~~

~~Amendment 2 (2002)~~

IEC 60838-1:2016

~~IEC 60695-2-2, Fire hazard testing – Part 2: Test methods – Section 2: Needle flame test~~

IEC 60695-2-11, *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*

ISO 1456:~~2003~~, *Metallic and other inorganic coatings – Electrodeposited coatings of nickel, nickel plus chromium, copper plus nickel and of copper plus nickel plus chromium*

ISO 2081:~~1986~~, *Metallic and other inorganic coatings – Electroplated coatings of zinc with supplementary treatments on iron or steel*

ISO 2093:~~1986~~, *Electroplated coatings of tin – Specification and test methods*

ISO 4046-4:2002, *Paper, board, pulps and related terms – Vocabulary – Part 4: Paper and board grades and converted products*

<sup>1</sup> A consolidated version of this publication exists, comprising IEC 60529:1989, IEC 60529:1989/AMD1:1999 and IEC 60529:1989/AMD2:2013.

~~<sup>2)</sup> A consolidated edition 1.2 (2002) exists that includes edition 1.0 (1992), its amendment 1 (2000) and amendment 2 (2002).~~



### 3 Terms and definitions

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

#### 3.1

##### **rated voltage**

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

#### 3.2

##### **working voltage**

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

#### 3.3

##### **rated current**

current declared by the manufacturer to indicate the highest current for which the lampholder is intended

#### 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 enclosures, 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 it fulfils on its own the requirements of this standard with regard to protection against electric shock

#### 3.5

##### **rated operating temperature**

highest temperature for which the lampholder is designed

#### 3.6

##### **rated pulse voltage**

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

#### 3.7

##### **lamp connectors**

set of contacts specially designed to provide for electrical contact but not supporting the lamp

#### 3.8

##### **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

#### 3.9

##### **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

### 3.10

#### **live part**

conductive part which may cause an electric shock

### 3.11

#### **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.

### 3.12

#### **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.

### 3.13

#### **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 as defined above.

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.

### 3.14

#### **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.

### 3.15

#### **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

**3.16****double insulation**

insulation comprising both basic insulation and supplementary insulation

**3.17****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 shall be one homogeneous piece. It may comprise several layers which cannot be tested singly as supplementary or basic insulation.

**3.18****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

**3.19****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.

**3.20****polarized lampholder**

lampholder for building-in, specially designed for asymmetric rated pulse voltages, where the rated ignition voltage (higher rated pulse voltage) is designated to a fixed contact

**3.21****single contact ignition voltage**

ignition voltage which appears on one contact of the lampholder only

**3.22****dual contact ignition voltage**

ignition voltage which is split between the two contacts of the lampholder

**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.*

**5 General conditions for tests****5.1 Tests according to this standard are type tests.**

NOTE 1 The requirements and tolerances permitted by the standard are related to testing of type test sample submitted for that purpose. Compliance of type test sample does not ensure compliance of the whole production of a manufacturer with this safety standard. Conformity of production is the responsibility of the manufacturer and ~~should~~ can include routine tests and quality assurance in addition to type testing.

NOTE 2 For further information ~~(inclusion of guidance on conformity testing during manufacture is in preparation)~~ see IEC 60061-4<sup>3)</sup>.

<sup>3)</sup> IEC 60061-4: Lamp caps and holders together with gauges for the control of interchangeability and safety — Part 4: Guidelines and general information

**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 in the most unfavourable position for normal use.

If a lampholder is declared to accept different lamp fits, it shall comply with the requirements of each of the fits mentioned.

*Compliance is checked with separate sets of specimens according to 5.3.*

*If the use of different lamp fits in turn is permitted by the manufacturer, only one set of specimens is used to check compliance with all requirements.*

*For all tests the most critical of the relevant fits and gauges shall be used and in the most onerous sequence.*

**5.3** The tests and inspections are carried out in the order of the clauses, on a total of

- 10 pairs of matching holders intended for linear double-capped lamps;

**NOTE** If a pair of holders consists of identical holders, it is sufficient that one holder instead of one pair is subjected to all the tests, except for the tests of Clause 8, of 11.2, 11.3, of Clause 13, Clause 16 and of 17.6 where pairs are needed.

- 10 specimens intended for single-capped lamps;

in the order of the clauses, as follows:

- three pairs or three specimens: Clause 4 up to and including Clause 15 (except for 9.2);

**NOTE** The tests of 9.2 are carried out on the number of separate specimens as required by the relevant standards.

- three pairs or three specimens: Clause 16 and 17.6;
- one pair or one specimen: 17.1;
- one pair or one specimen: 17.3;
- one pair or one specimen: 17.4;
- one pair or one specimen: 17.5 and Clause 18.

Together with these units, the manufacturer's mounting instructions (see 7.3) shall be supplied.

In such cases, where according to the mounting instructions the rated pulse voltage of the holder can only be achieved with a cap inserted, suitable caps shall be supplied together with the type test sample. The relevant tests are then carried out with a cap inserted.

**5.4** 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 for 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.

The applicant may submit, together with the first set of specimens, the additional set which may be needed 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 will entail the rejection.

## 6 Classification

Lampholders are classified as follows.

### 6.1 According to their installation conditions

- unenclosed lampholders;
- enclosed lampholders;
- partly reinforced insulated lampholders;
- enclosed reinforced insulated lampholders.

NOTE 1 Where a lampholder is used with a working voltage of 50 % or less of its maximum rating, it can be regarded as equivalent to a reinforced insulated lampholder.

### 6.2 According to their resistance to heat:

- for rated operating temperatures up to and including 80 °C;
- for rated operating temperatures over 80 °C (T-marked lampholders).

The measuring point for the operating temperature is that area of the lampholder which makes electrical contact with the lamp cap/base. If the heat resistance of insulating parts, terminals and leads of the lampholder deviates from this operating temperature, these different values shall be stated in the manufacturer's catalogue and are checked after appropriate installation in a luminaire or other additional enclosure, when that equipment is tested according to its own standard.

### 6.3 According to polarization

- non-polarized lampholders;
- polarized lampholders.

### 6.4 According to the application of ignition voltages

- lampholders for single-contact ignition voltages
- lampholders for dual-contact ignition voltages

NOTE 2 By using dual contact ignition voltages advantage can be taken of reduced creepage distance and clearance requirements.

## 7 Marking

### 7.1 Lampholders shall be marked with the following mandatory markings:

- a) mark of origin (this may take the form of a trade mark, manufacturer's identification mark or the name of the responsible vendor);
- b) either a unique catalogue number or an identifying reference.

~~NOTE—An identifying reference may include numbers, letters, colour, etc., to identify the lampholder by reference to the manufacturer's catalogue or similar literature.~~

Available technical documentation of the manufacturer such as printed catalogues or online catalogues shall allow a clear identification of a lampholder either by a unique catalogue number or by an identifying reference on the holder, specifying the essential characteristic features and the basic design of the product supplemented by a clear description. Variations of the basic design, for example different cable length, fixing means, colours, which do not affect safety or performance of the lampholder, may be disregarded in the type reference marked on the product. Variations included in the type testing procedure are listed in the corresponding test reports.

If a combination of lampholder components determines the lampholder designation, for example an assembly of a lamp connector and a retaining spring, the combination should be clearly identifiable.

*Compliance is checked by inspection.*


**7.2** In addition to the above mandatory markings, the following information shall be given either on the lampholder or be made available in the manufacturer's catalogue or the like:

- a) the rated voltage in volts and rated pulse voltage in kilovolts (kV), if applicable; for polarized lampholders, the rated voltage in volts and the pair of rated pulse voltages;
 

NOTE 1 Some lampholders still show rated voltages higher than 500 V. This is an earlier way of expressing the permissible pulse voltage via a rated voltage. For such lampholders, the creepage distances and clearances can be found in IEC 60598-1.
- b) the rated current in amperes;
- c) the rated operating temperature *T*, if greater than 80 °C, in steps of 10 °C;
- d) the conductor sizes for which the terminal is designed;
- e) the high voltage arrow (see IEC 60417-5036:2002-10) for polarized lampholders to identify the connection for the higher pulse voltage, if applicable; it shall be visible close to the relevant terminal or wire entry during lampholder installation;
- f) information on the application of ignition voltages.

If symbols are used, these shall be as follows.

For electrical rating:

- volt: V;
- ampere: A;
- watt: W;
- pulse voltage: kV;
- high pulse voltage terminal/wire on polarized lampholders:  (see IEC 60417-5036:2002-10)

NOTE 2 Alternatively, for volt and ampere ratings, figures ~~may~~ can be used alone, the figure for the rated current being marked before or above that for the rated voltage and separated from the latter by an oblique stroke or line. Therefore the marking of current and voltage ~~may~~ can be as follows:

$$2 \text{ A } 250 \text{ V or } 2/250 \text{ or } \frac{2}{250}$$

For the rated pulse voltage, the symbol shall be preceded by its value (e. g. 5 kV). For polarized lampholders as well as for dual contact ignition voltage lampholders, the two rated pulse voltages shall be separated by an oblique stroke (e. g. 15/2,5 kV or 5/2,5 kV).

~~For rated operating temperature:~~

~~the symbol T shall be followed by its value in °C (e. g. T 300).~~

~~For cross-section of conductors:~~

~~the relevant value or values in the case of a range, in square millimetres (mm<sup>2</sup>), shall be followed by a small square (e.g. 0,5 □).~~

If a lamp holder is intended to be used for dual contact ignition voltages this information shall be indicated in the manufacturer's catalogue or the like.