

Australian/New Zealand Standard™

**Edison screw lampholders
(IEC 60238, Ed. 8.2 (2011) MOD)**



AS/NZS 60238:2015

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Australian/New Zealand Standard™

Edison screw lampholders (IEC 60238, Ed. 8.2 (2011) MOD)

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-041, Lamps and Related Equipment, to supersede AS/NZS 60238:2007, *Edison screw lampholders (IEC 60238, Ed.8.0 (2004) MOD)* six months from publication. During this period, both editions of the Standard will operate in parallel, then the 2007 edition is anticipated to be withdrawn.

This Standard will also operate in parallel with AS/NZS 3140, *Approval and test specification—Edison screw lampholders*, until AS/NZS 3140 is withdrawn. It is anticipated AS/NZS 3140 will be withdrawn in December 2016.

While this Standard (AS/NZS 60238:2015) and AS/NZS 3140 operate in parallel, they are separate stand-alone documents and the chosen Standard (i.e. AS/NZS 60238 or AS/NZS 3140) is applied in its entirety. The interchanging of requirements from each Standard is not permitted to determine overall compliance of an Edison screw lampholder, except when either Standard specifically references the other Standard's requirements.

The objective of this Standard is to specify particular requirements for Edison screw lampholders used in general purpose lighting.

This Standard is an adoption with national modifications; it has been reproduced from IEC 60238, Ed. 8.2 (2011), *Edison screw lampholders*, its Amendment 1 (2008) and its Amendment 2 (2011), which have been incorporated into the source text. A vertical line in the margin shows where the base publication has been modified by Amendments 1 and 2. This Standard has been varied as indicated to take account of Australian/New Zealand conditions.

The Standard is structured as follows:

- (a) Preface (including Australian and Australian/New Zealand references).
- (b) IEC 60238, Ed. 8.2 (2011) (unedited from the contents page to the final clause of the IEC Standard).
- (c) Appendix ZZ—Australian/New Zealand variations to the IEC Standard.

The variations listed in Appendix ZZ address issues including resistance to flame and ignition.

The variations described in Appendix ZZ form the Australian and New Zealand variations for the purposes of the IECEE CB Scheme for recognition of testing to Standards for safety of electrical equipment (the CB Scheme).

The essential safety requirements of AS/NZS 3820, *Essential safety requirements for electrical equipment*, that could be applicable to Edison screw lampholders are covered by this Standard, taken in conjunction with any other relevant requirements affecting safety.

As this Standard is reproduced from an International Standard, the following applies:

- (i) In the source text 'this International Standard' should read 'this Australian/New Zealand Standard'.
- (ii) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

<i>Reference to International Standard</i>		<i>Australian/New Zealand Standard</i>	
IEC		AS	
60068	Environmental testing	60068	Environmental testing
60068-2-20	Part 2: Tests—Test T: Soldering	60068.2.20	Part 2: Tests—Test T: Soldering
60068-2-75	Part 2-75: Tests—Test Eh: Hammer tests	60068.2.75	Part 2.75: Tests—Test Eh: Hammer tests
		AS/NZS	
60227	Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V (series)	60227	Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V (series)
60245	Rubber-insulated cables—Rated voltages up to and including 450/475 V (series)	60245	Rubber-insulated cables—Rated voltages up to and including 450/475 V (series)
60335	Safety of household and similar electrical appliances	60335	Household and similar electrical appliances—Safety
60335-1	Part 1: General requirements	60335.1	Part 1: General requirements (IEC 60335-1 Ed 4.2, MOD)
		AS	
60529	Degrees of protection provided by enclosures (IP Code)	60529	Degrees of protection provided by enclosures (IP Code)
		AS/NZS	
60598	Luminaires	60598	Luminaires
60598-1	Part 1: General requirements and tests	60598.1	Part 1: General requirements and tests (IEC 60598-1, Ed. 7.0 (2008) MOD)
60695	Fire hazard testing	60695	Fire hazard testing
60695-2-11	Part 2-11: Glowing/hot-wire based test methods—Glow-wire flammability test method for end-products	60695.2.11	Part 2.11: Glowing/hot-wire based test methods—Glow-wire flammability test method for end-products (IEC 60695-2-11:2000, MOD)
60695-11-5	Part 11-5: Test flames—Needle-flame test method—Apparatus, confirmatory test arrangement and guidance	60695.11.5	Part 11.5: Test flames—Needle-flame test method—Apparatus, confirmatory test arrangement and guidance (IEC 60695-11-5 Ed 1.0, IDT)

Only normative references that have been adopted as Australian or Australian/New Zealand Standards have been listed.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the annex or appendix to which they apply. A ‘normative’ annex or appendix is an integral part of a Standard, whereas an ‘informative’ annex or appendix is only for information and guidance.

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AUSTRALIAN/NEW ZEALAND STANDARD

Edison screw lampholders (IEC 60238, Ed. 8.2 (2011) MOD)**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.

* 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.

2.28

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

2.29

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 In some cases, the dimensions might be achieved only after mounting into the luminaire.

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).

4.2 Unless otherwise specified, the tests are made at an ambient temperature of $20\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ 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.*

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

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.

5 Standard ratings

5.1 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 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 These lampholders should also be used for such special cases as series-connected lamps, whereby 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.

5.2 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.

5.3 Lampholders E40 to be used on 125 V (see note) 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.

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

NOTE The values of the temperature marking should be increased by steps of 10 °C.

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.

6 Classification

Lampholders are classified:

6.1 According to the material of the external parts:

- lampholders of insulating material;
- metal lampholders.

NOTE Lampholders with external parts consisting partly of metal and lampholders comprising external parts of insulating material with a conductive outer surface, for example a metallized outer shell, are considered as metal lampholders (see 12.3). This does not apply to threaded entries and external parts, as for example a metal shade ring mounted onto the outside of a lampholder of insulating material, which cannot become live even in the case of an insulation fault. Metal holders with insulating coverings are considered as metal lampholders (see 9.5).

In order to check whether or not a surface is conductive, two stripe-electrodes 1,5 mm wide, 25 mm long and with a distance of 2 mm from each other are applied to the surface (e.g. with silver conductive paint). In accordance with 14.4, the insulating resistance is measured between the stripes. The surface is considered to be conductive if the resistance is less than 5 MΩ.

6.2 According to degree of protection against ingress of water:

- ordinary lampholders;
- drip-proof lampholders.

6.3 According to method of fixing:

- threaded entry lampholders;
- cord-grip lampholders;
- backplate lampholders;
- other lampholders.

NOTE Examples of other lampholders are lampholders provided with a mechanical suspension device, e.g. a hook.

6.4 According to type:

- switched-lampholders, provided with an integral switch to control the supply to the lamp;
- non-switched lampholders.

6.5 According to protection against electric shock

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

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

6.6 According to resistance to heat:

- lampholders for rated operating temperatures up to the limits given in 5.4;
- lampholders for operating in high temperature conditions (T marked holders).

7 Marking

7.1 Lampholders, other than lampholders E5 and E10, shall be marked with

- rated current, in amperes
- rated voltage, in volts, and rated pulse voltage, in kV, if higher than:
 - 2,5 kV for lampholders rated 250 V;
 - 4 kV for lampholders rated 500 V.

NOTE 1 The rated pulse voltage of the lampholder (in kV) should either be marked on the lampholder or made available in the manufacturer's catalogue or the like.

NOTE 2 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.

- symbol for nature of current, if required, (for switched lampholders only);
- mark of origin (this may take the form of a trade mark, manufacturer's identification mark or the name of the responsible vendor);
- type reference;

NOTE 3 Available technical documentation of the manufacturer like printed catalogues or online catalogues should 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 like for example different cable length, fixing means, colours etc., 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.

- the degree of protection against ingress of water for drip-proof lampholders (see 7.2);
- rated operating temperature "T", indicating the highest operating temperature, if applicable.

The marking of the rated operating temperature is not required for lampholders the exterior of which is made wholly of ceramic material. For these lampholders, this information, if applicable, shall either be marked on the lampholder or be made available in the manufacturer's catalogue.

For lampholders according to this standard, the distances for impulse withstand category II are usually applicable. For holders in equipment where a higher degree of availability is expected, distances for impulse withstand category III may be applicable. This information has to be indicated in the manufacturer's catalogue or the like.

Enclosed reinforced insulated lampholders offer an adequate level of protection for use in luminaires where they are accessible in normal use. This information shall be indicated in the manufacturer's catalogue or the like.

For partly reinforced insulated lampholders, sufficient creepage distances and clearances to outer accessible surfaces will require additional protection to some parts of the lampholder by the luminaire design or by use of additional attachment(s) or cover(s). This information shall be indicated in the manufacturer's catalogue or the like.

Lampholders E10 shall be marked with

- rated voltage, in volts;
- mark of origin;
- type reference;

NOTE 4 Note 3 applies.

- the degree of protection against ingress of water, if applicable.

Lampholders E5 shall be marked with

- mark of origin;
- type reference.

NOTE 5 Note 3 applies.

Compliance is checked by inspection.

NOTE 6 The type reference for lampholders E10 and E5 may be a catalogue number.

7.2 If symbols are used for current and voltage, A shall denote amperes and V volts.

NOTE Alternatively, for volt and ampere ratings, figures may 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 be as follows:

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

The symbol for d.c. shall be — — — (see IEC 60417-5031 (DB:2002-10)).

The symbol for protection against ingress of water for drip-proof lampholders shall be IPX1.

NOTE Where X is used in the IP number it indicates a missing numeral in the example, but both the appropriate numerals in accordance with IEC 60529 shall be marked.

The letter T shall be followed by the value of the rated operating temperature in degrees Celsius.

Compliance is checked by inspection.

7.3 The marking of the degree of protection against ingress of water shall be on the outside of the holder.

Compliance is checked by inspection.

7.4 An earthing terminal shall be indicated by the symbol  (see IEC 60417-5019 (DB:2002-10)).

This symbol shall not be placed on screws, removable washers or other easily removable parts.

Compliance is checked by inspection.

7.5 Marking shall be durable and easily legible.

Compliance is checked by inspection and, after the tests of clause 19 have been completed, by trying to remove the marking by rubbing lightly for 15 s with a piece of cloth soaked with water and for a further 15 s with a piece of cloth soaked with petroleum spirit.

After the tests the marking shall be still legible.

NOTE The petroleum spirit used should consist of a solvent hexane with a content of aromatics of maximum 0,1 volume percentage, a kauri-butanol value of 29, an initial boiling-point of approximately 65 °C, a dry-point of approximately 69 °C and a specific density of approximately 0,68 g/cm³.

8 Dimensions

8.1 Lampholders E10, E14, E27 and E40 shall comply with the current edition of the standard sheets of IEC 60061 series.

Compliance shall be checked, by measuring in conformity with the current edition of IEC 60061-2, Standard Sheet 7005-20.

The minimum dimensions of the screw thread and dimension X shall be checked by means of gauges according to the current edition of Standard Sheets 7006-25 (E10, E14 and E40) and 7006-25A (E27), and by means of the gauge according to the current edition of Standard Sheet 7006-26 of IEC 60061-3.

Lampholders designed with a barrel thread for shade holder rings and shade holder rings shall comply with IEC 60399.

Compliance is checked by means of the gauges given in IEC 60399.

8.2 Lampholders shall allow insertion of all corresponding lamps so as to make contact.

Compliance is checked by means of gauges according to the current edition of the following standard sheets of IEC 60061-3 and according to the indications of these sheets:

- lampholders E14: 7006-30 and 7006-31;
- candle lampholders E14: 7006-30A and 7006-31;
- lampholders E27: 7006-21 and 7006-22A;
- lampholders E40: 7006-23 and 7006-24.

Pending gauges for lampholders E5 and E10, the contact-making is checked by means of the corresponding lamps. It is presumed that the manufacturer of the lampholder for the purpose of the test delivers the lamps for which the lampholder is intended.

The checking of contact-making is done on lampholders as delivered and after the tests of clauses 18 and 19.2.

For lampholders for use in appliances other than luminaires only:

If fixing means of lampholders are integrated parts of the rim and the lampholder is designed for use with a selected standardized lamp only, parts of the lampholder rim could interfere with the relevant contact-making gauge. In this case compliance with the requirements for maximum lamp outlines according to IEC 60630 for the lamp indicated in the lampholder manufacturer's instructions has to be checked. Following this checking the contact-making gauge shall be applied after those parts of the lampholder interfering with the gauge have been removed.

NOTE – For testing such lampholders, two additional specimen specially prepared to accept the relevant contact-making gauge, are required.

8.3 The following dimensions shall be not less than the values shown in table 1.

Table 1 – Thickness of screw shells and contacts

Thickness of the screw shell, if any, in mm:	E5	E10	E14	E27	E40
– when the shell is unsupported	0,20	0,20	0,30	0,30	0,50
– when the shell is supported by insulating material over a total distance of at least three-quarters of the circumference of the shell	0,15	0,15	0,25	0,25	0,40
Thickness of side or central contacts, if resilient	0,18	0,18	0,28	0,38	0,48*
* For the use of side-contacts in lampholders E40, see 12.11.					

Compliance is checked by measurement.

NOTE Thicknesses are measured by means of a micrometer with pointed noses and ratchet screw.

For the screw shell, two sets of three measurements are made, each set carried out on one of two different generating lines of the screw shell. The mean value of the six measurements shall be at least equal to the specified value.

NOTE The deletion of dimensional requirements is under consideration.

8.4 The effective length of screw engagement, if any, of outer shell and dome shall meet one of the following requirements whereby the engagement shall always be over one full turn.

Either the effective length shall be not less than the values shown in table 2,

Table 2 – Minimum effective screw lengths

	E14 mm	E27 mm	E40 mm
Metal lampholders:			
for rolled thread	5,0	7,0	10,0
for cut thread	5,0	5,0	7,0
Lampholders of insulating material	5,0	7,0	10,0

or the effective length shall be at least two turns provided the test according to 15.3 is withstood with a torque equal to 1,2 times the torque given in 15.2.

These requirements do not apply to lampholders E5 and E10.

Compliance is checked by measurement.

8.5 The threaded entries of lampholders shall be provided with one of the following screw threads:

- lampholders E14: M10×1;
- lampholders E27: M10×1, M13×1 or M16×1;
- lampholders E40: M13×1, M16×1 (or G3/8A).

NOTE 1 The size between brackets is non-preferred; in addition, the threaded entry M10 is mainly intended for internal wiring of luminaires.

NOTE 2 In France, threaded entry lampholders with 11 mm × 19 TPI and 17 mm × 19 TPI (turns per inch) screw threads are permitted for replacement.

The thread of the entry shall comply with figures 1a or 1b.

These requirements do not apply to lampholders E5 and E10.

Compliance is checked by measurement and by means of gauges according to figures 2a or 2b.

In case of doubt, the gauge is introduced into the entry by applying a torque of 0,5 Nm.

8.6 The dimensions of threaded entries and set screws, if any, shall be not less than the values shown in table 3.

Table 3 – Dimensions of threaded entries and set screws

Nominal thread diameter	M10×1 M13×1 mm	M16×1 G3/8A mm
Length of the thread:		
metal entry	3	8
entry of insulating material	5	10
Diameter of set-screw:		
screw with head	2,5	3,0
screw without head:		
– in case of one screw	3,0	4,0
– in case of more than one screw	3,0	3,0

A negative deviation of 0,15 mm from the nominal values for thread diameter is allowed.

Compliance is checked by measurement.

These requirements do not apply to lampholders E5 and E10.

NOTE If it is necessary to take the lampholder apart in order to check compliance with the requirements under 8.3 to 8.6, such checking is done after the test of clause 17.

8.7 Lampholders shall be so designed that they do not interfere with the proper engagement or disengagement of lamps, even if the lamp cap is slightly dented. In no case shall the holder contacts present a cutting edge to the lamp cap.

Compliance is checked by the following test:

For lampholders E27, compliance shall be checked by means of a gauge according to the current edition of Standard Sheet 7006-22B of IEC 60061-3.

For lampholders other than E27, compliance shall be checked by inspection.

9 Protection against electric shock

9.1 Lampholders E5, E10, E14 and E27 shall be so designed that the lamp caps are not accessible when they become live during insertion.

NOTE 1 Details for checking compliance regarding protection against accidental contact with live parts during insertion for lampholders E5 and E10 are under consideration. Due to that, lampholders E10 with a rated voltage exceeding 60 V are for sale to luminaire or other equipment manufacturers only.

For lampholders E10 with a rated voltage exceeding 60 V the protection against electric shock may be provided by measures taken in the luminaire or equipment where the lampholders are used.

Lampholders E40 shall be so designed that the lamp cap is not accessible when fully inserted.

Candle lampholders are tested without decorative cover, unless this cover cannot be removed without making the lampholders obviously useless.

Compliance is checked as follows:

- *for lampholders E10, by means of corresponding lamps and the standard test finger, shown in figure 16. For the purpose of the test, the lampholder manufacturer shall provide the lamps for which the lampholder is intended;*
- *for lampholders E14, E27 and E40, by means of gauges according to the current edition of the following standard sheets of IEC 60061-3:*
 - *7006-31 for lampholders E14;*
 - *7006-22A for lampholders E27;*
 - *7006-24 for lampholders E40.*

NOTE 2 In order to ensure protection against electric shock during insertion on unused lampholders, the tests according to 9.1 are made on new specimens.

9.2 The external parts of enclosed and independent lampholders shall be so designed that live parts of the lampholder ready for use and with a corresponding normal lamp inserted are not accessible.

Candle lampholders are tested without decorative cover, unless this cover cannot be removed without making the lampholder obviously useless.

Compliance is checked by means of the standard test finger.

For the purpose of the test:

- *enclosed lampholders are mounted as in normal use, for example on a threaded support, or the like, if appropriate, and provided with the most unfavourable conductor size fitted for which the lampholders are intended;*
- *independent lampholders shall be mounted as in normal use on an appropriate plane surface.*

The standard test finger shown in figure 16 is applied in every possible position with a force of 10 N, an electrical indicator being used to show contact with live parts.

It is recommended that a voltage of not less than 40 V be used.

NOTE Unenclosed lampholders are only tested after appropriate installation in a luminaire or other additional enclosure.

9.3 Parts providing protection against accidental contact with the lamp cap shall be reliably secured so that they will not become detached when a tightly fitting lamp is removed, or when rotating the shade, if applicable.

Compliance is checked by the following test:

The coupling between dome and outer shell is tightened initially with a torque equal to two-thirds of the torque test value specified below. The relevant parts are then subjected to a torque during 1 min in an anticlockwise direction with the following test values:

- *1 Nm for lampholders E14;*
- *2 Nm for lampholders E27.*

The lampholder is mounted as in normal use and is tested first with and then without the appropriate test cap according to figure 13 (test cap B) or figure 14.

After the test, the parts providing protection against accidental contact with the lamp cap shall not have become dismantled.

It shall not be possible to dismantle lampholders E5 and E10 without the aid of a tool.

Requirements for lampholders E40 are under consideration.

9.4 Where provision is made for attaching a shade to the lampholder, it is fitted to the lampholder by separate means, such as a shade ring; it is not permitted to fix a shade between parts providing protection against electric shock.

Compliance is checked by inspection.

9.5 The external parts of

- drip-proof lampholders;
- lampholders with a rated voltage of more than 250 V;
- switched-lampholders, and
- lampholders E5 and E10

shall be of insulating material, with the exception of threaded entries and of those parts which cannot become live even in the event of a fault.

Lacquer or enamel is not deemed to provide adequate protection for the purpose of this clause.

Compliance is checked by inspection.

NOTE 1 Parts which are separated from live parts by double or reinforced insulation are considered as parts which cannot become live in the event of a fault.

NOTE 2 An example of an external part which cannot become live, even in the event of a fault, is a metal shade ring mounted on the outside of an insulated lampholder.

NOTE 3 Switched-lampholders with external metal parts are permitted under the conditions of 12.3.

10 Terminals

10.1 Lampholders, other than those provided with connecting leads (tails), shall be provided with terminals which allow connection of conductors having the following nominal cross-sectional areas:

- 0,5 mm² to 0,75 mm² for lampholders E10;
- 0,5 mm² to 1,0 mm² for lampholders E14 and E27 with M10×1 threaded entry;
- 0,5 mm² to 2,5 mm² for other lampholders E27;
- 1,5 mm² to 4 mm² for lampholders E40 with a rated current of 16 A;
- 2,5 mm² to 6 mm² for lampholders E40 with a rated current of 32 A.

Compliance is checked by inspection and by fitting conductors of the smallest and largest cross-sectional area specified. For cord-grip lampholders, lampholders E10, E14 and lampholders E27 with M10×1 threaded entry, stranded conductors are used; in all other cases the conductors are of the solid type.

Threaded entry lampholders are tested in a screwed conduit.

NOTE Lampholders E27 with screwless terminals intended for use by luminaire or equipment manufacturers only need not fulfil the requirements for all the appropriate nominal cross-sectional areas.

10.2 Connections

10.2.1 Lampholders shall be provided with at least one of the following means of connection:

- screw type terminals;
- screwless terminals;
- tabs or pins for push-on connections;
- posts for wire wrapping;
- soldering lugs;
- connecting leads (tails).

Terminal screws and nuts shall have a metric ISO thread or a thread comparable in pitch and mechanical strength.

Conductors may be connected to E5, E10 and similar small lampholders by soldering, welding, crimping or other equally effective means.

Lampholders with screwless terminals, unless intended for sale to luminaire or equipment manufacturers, shall be provided with terminals which are equally satisfactory with both rigid (solid or stranded) conductors and flexible cables or cords.

Compliance is checked by the tests of 10.2.2.

10.2.2 Terminals shall comply with the following requirements, with the restriction that the requirements referring to internal wiring relate to wiring inside independent holders and to wiring inside luminaires for holders for building-in.

All terminal tests shall be made on separate specimens which have not been subjected to any other test:

- *terminals with screw clamping shall comply with the requirements specified in 10.3 to 10.6 inclusive, and 10.8;*
- *screwless terminals shall comply with section 15 of IEC 60598-1, provided that the heating test is carried out at the rated operating temperature of the lampholder ± 5 °C;*
- *tabs or pins for push-on connections shall comply with section 15 of IEC 60598-1;*
- *posts for wire wrapping shall comply with IEC 60352-1. Wire wrapping applies only to single solid round wire for internal wiring;*
- *soldering lugs shall comply with the requirements for good solderability. Suitable requirements can be found in IEC 60068-2-20;*
- *connecting leads (tails) shall comply with the requirements prescribed in 10.10.*

10.3 Terminals shall be fixed in such a way that they will not work loose when fastening or loosening the conductors.

For screw terminals, compliance is checked by inspection and by fastening and loosening a conductor of the largest cross-sectional area specified in 10.1 10 times, the applied torque being two-thirds of the torque specified in section 14 of IEC 60598-1.

NOTE Terminals may be prevented from working loose by fixing with one screw in a recess without appreciable play, or by other suitable means. Covering with sealing compound without other means of locking is not deemed to be sufficient.

10.4 Screw terminals shall be so designed that they clamp the conductor between metal surfaces with sufficient contact pressure and without damage to the conductor. Terminals shall be so designed that they will prevent a conductor slipping out when the screws or nuts are tightened. They shall allow a conductor to be connected without special preparation (e.g. soldering of the strands of the conductor, use of cable lugs, formation of eyelets, etc.).

Compliance is checked by inspection of the conductors after fitting according to 10.1 and after the test of 19.3.

NOTE The conductors are considered to be damaged if they show deep or sharp indentations.

10.5 Terminals of the pillar type shall have dimensions not less than those shown in table 4.

Table 4 – Minimum dimensions of pillar-type terminals

Lampholder	Nominal thread diameter mm	Diameter of hole for conductor mm	Length of thread in pillar mm
E10	2,5	2,5	1,8
E14	2,5	2,5	1,8
E27	2,5	2,5	1,8
E40	3,5	3,5	2,5
NOTE The diameter of the hole shall be not more than 0,6 mm larger than the diameter of the screw.			

The length of the threaded part of the terminal screw shall be not less than the sum of the diameter of the hole for the conductor and the length of thread in the pillar.

NOTE The length of the thread of the pillar is measured to the point where the thread is broken by the pillar hole.

Compliance is checked by measurement.

10.6 Screw terminals shall have dimensions not less than those shown in table 5.

Table 5 – Minimum dimensions of screw-type terminals

Lampholder	Nominal thread diameter mm	Length of thread under the head mm	Length of thread in nut mm	Nominal difference between diameter of head and shank of screw mm	Height of head mm
E10	2,5	4,0	1,5	2,5	1,4
E14	3,0	5,0	1,5	3,0	1,8
E27	3,5	5,0	1,5	3,5	2,0
E40	4,0	6,0	2,5	4,0	2,4

If an intermediate part locked against rotation, such as a washer or a pressure plate, is used between the head of the screw and the conductor, the difference in diameter between head and shank of the screw may be reduced by 1 mm.

Compliance is checked by measurement.

A negative deviation of 0,15 mm from then nominal values of the thread diameter and of the difference in diameter of head and shank is allowed.

NOTE If it is necessary to take the lampholder apart in order to check compliance with the requirements under 10.5 and 10.6, such checking is done after the test of clause 17.

10.7 Terminals shall be so located that, after correct fitting of the wires, there is no risk of accidental contact between live parts and accessible metal parts.

Compliance is checked by inspection and by the following test:

The insulation is removed over a length of 4 mm from the end of a flexible conductor having the minimum nominal cross-sectional area specified in 10.1. One wire of the stranded conductor is left free and the remainder are fully inserted into and clamped in the terminal of the lampholder, mounted and installed as in normal use (locking screws tightened, etc.).

The free wire is bent without tearing the insulation back, in every possible direction, but without making sharp bends around barriers.

The free wire of a conductor connected to a live terminal shall not touch any metal part which is not a live part, and that of a conductor connected to the earthing terminal shall not touch any live part.

If necessary, the test is repeated with the free wire in another position.

NOTE The prohibition against making sharp bends around barriers does not imply that the free wire shall be kept straight during the test. Sharp bends are, moreover, made if it is considered likely that such bends can occur during the normal assembly of the lampholder. See also 12.3.

10.8 Pillar terminals in which the end of the conductor is not visible shall have a length of hole beyond the terminal screw at least equal to half the value of the diameter of the screw or 2,5 mm, whichever is the higher.

Compliance is checked by measurement.

10.9 Terminals which are floating shall show no appreciable lateral play and shall not move longitudinally more than 3 mm when a lamp is removed or inserted.

Compliance is checked by measurement.

10.10 The requirements of 10.2 to 10.6 inclusive and of 10.8 do not apply to lampholders intended to be factory-mounted in luminaires and which are provided with connecting leads (tails).

Lampholders intended to be factory-mounted in luminaires or built into equipment may be provided with connecting leads (tails), tab-terminals or equally effective means.

Connecting leads (tails) shall be connected to the lampholders by soldering, welding, crimping or by any other at least equivalent method.

Leads shall consist of insulated conductors.

Insulation of the free end of the leads may be stripped.

Fixing of the leads to the lampholders shall withstand the mechanical forces that may occur in normal use.

Compliance is checked by inspection and by the following test, which is made after the test of 19.2 on the same three specimens.

Each connecting lead is subjected to a pull of 20 N, the pull is applied without jerks for 1 min in the most unfavourable direction.