



BSI Standards Publication

Edison screw lampholders

National foreword

This British Standard is the UK implementation of EN IEC 60238:2018/A11:2021. It is derived from IEC 60238:2018, incorporating IEC amendment A1:2017 and IEC amendment A2:2020. It supersedes BS EN IEC 60238:2018+A2:2021, which will be withdrawn on 6 October 2024.

The start and finish of text introduced or altered by IEC amendments A1:2017 and A2:2020 are indicated in the text by tags. Tags indicating changes to IEC text carry the number of the IEC amendment. For example, text altered by IEC amendment 1 is indicated by **A1** **A1**.

The text of CENELEC amendment A11:2021 has been provided in its entirety at the end of this document. BSI's policy of providing consolidated content remains unchanged; however, in the interest of expediency, in this instance BSI have chosen to collate the relevant content at the end of this document.

The UK participation in its preparation was entrusted to Technical Committee CPL/34/2, Lamp caps and holders.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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For the Great Britain market (England, Scotland and Wales), if UK Government has designated this publication for conformity with UKCA marking (or similar) legislation, it may contain an additional National Annex. Where such a National Annex exists, it shows the correlation between this publication and the relevant UK legislation. If there is no National Annex of this kind, the relevant Annex ZA or ZZ in the body of the European text will indicate the relationship to UK regulation applicable in Great Britain. References to EU legislation may need to be read in accordance with the UK designation and the applicable UK law. Further information on designated standards can be found at www.bsigroup.com/standardsandregulation.

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UK Government is responsible for legislation. For information on legislation and policies relating to that legislation, consult the relevant pages of www.gov.uk.

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Amendments/corrigenda issued since publication

Date	Text affected
31 October 2018	Implementation of IEC amendment 1:2017 with CENELEC endorsement A1:2018
31 October 2021	Implementation of IEC amendment 2:2020 with CENELEC endorsement A2:2021
31 March 2022	Implementation of CENELEC amendment A11:2021

English Version

Edison screw lampholders
(IEC 60238:2016)

Douilles à vis Edison pour lampes
(IEC 60238:2016)

Lampenfassungen mit Edisongewinde
(IEC 60238:2016)

This European Standard was approved by CENELEC on 2016-08-18. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

The text of document 34B/1852/FDIS, future edition 9 of IEC 60238, prepared by SC 34B "Lamp caps and holders" of IEC/TC 34 "Lamps and related equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60238:2018.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement 2018-09-23
- latest date by which the national standards conflicting with the document have to be withdrawn 2021-03-23

This document supersedes EN 60238:2004.

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This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For the relationship with EU Directive(s) see informative Annex ZZ, which is an integral part of this document.

Endorsement notice

The text of the International Standard IEC 60238:2016 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60061	NOTE	Harmonized in EN 60061 series.
IEC 60061-4	NOTE	Harmonized as EN 60061-4.
IEC 60068-2-20	NOTE	Harmonized as EN 60068-2-20.
IEC 60335-1:2001	NOTE	Harmonized as EN 60335-1:2002 (modified).
IEC 60335-2-24:2002	NOTE	Harmonized as EN 60335-2-24:2003 (not modified).
IEC 60598	NOTE	Harmonized in EN 60598 series.
IEC 60664-1	NOTE	Harmonized as EN 60664-1.
IEC 60695-2-10	NOTE	Harmonized as EN 60695-2-10.

European foreword to amendment A1

The text of document 34B/1887/FDIS, future edition 9 of IEC 60238:2016/A1:2017, prepared by IEC/SC 34B " Lamp caps and holders, of IEC technical committee 34: Lamps and related equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60238:2017/A1:2018.

The following dates are fixed:

- latest date by which the document has to be (dop) 2019-02-10
implemented at national level by
publication of an identical national
standard or by endorsement
- latest date by which the national (dow) 2021-08-10
standards conflicting with the
document have to be withdrawn

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Endorsement notice

The text of the International Standard IEC 60238:2016/A1:2017 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60664-4:2005	NOTE	Harmonized as EN 60664-4:2006 (not modified).
IEC 61347-1:2015	NOTE	Harmonized as EN 61347-1:2015 (not modified).

European foreword to amendment A2

The text of document 34B/2029/CDV, future IEC 60238/A2, prepared by SC 34B "Lamp caps and holders" of IEC/TC 34 "Lighting" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60238:2018/A2:2021.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2022-04-01
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2024-10-01

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For the relationship with EU Directive(s) / Regulation(s), see informative Annex ZZ, which is an integral part of this document.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 60238:2016/A2:2020 was approved by CENELEC as a European Standard without any modification.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60061-1 (mod)	1969	Lamp caps and holders together with gauges for the control of interchangeability and safety - Part 1: Lamp caps	EN 60061-1	1993
IEC 60061-2 (mod)	1969	Lamp caps and holders together with gauges for the control of interchangeability and safety - Part 2: Lampholders	EN 60061-2	1993
IEC 60061-3 (mod)	1969	Lamp caps and holders together with gauges for the control of interchangeability and safety - Part 3: Gauges	EN 60061-3	1993
		Environmental testing - Part 2-20: Tests - Test T: Test methods for solderability and resistance to soldering heat of devices with leads	EN 60068-2-20	2008
IEC 60068-2-32	1975	Basic environmental testing procedures - Part 2-32: Tests - Test Ed: Free fall	EN 60068-2-32	1993
IEC 60068-2-75	2014	Environmental testing - Part 2-75: Tests - Test Eh: Hammer tests	EN 60068-2-75	2014
IEC 60112	2003	Method for the determination of the proof and the comparative tracking indices of solid insulating materials	EN 60112	2003
+ A1	2009		+ A1	2009
IEC 60227	series	Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V - Part 1: General requirements	-	-
IEC 60245	series	Rubber insulated cables - Rated voltages up to and including 450/750 V - Part 1: General requirements	-	-
IEC 60352-1	1997	Solderless connections - Part 1: Wrapped connections - General requirements, test methods and practical guidance	EN 60352-1	1997
IEC 60399	2004	Barrel thread for lampholders with shade holder ring	EN 60399	2004
+ A1	2008		+ A1	2008

EN IEC 60238:2018+A2:2021 (E)

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60417	2002	Graphical symbols for use on equipment	-	-
IEC 60529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529	1991
-	-		+ corrigendum May	1993
+ A1	1999		+ A1	2000
+ A2	2013		+ A2	2013
IEC 60598-1 (mod)	2014	Luminaires - Part 1: General requirements and tests	EN 60598-1	2015
IEC 60630 (mod) + A7	1994 2014	Maximum lamp outlines for incandescent lamps	EN 60630 + A7	1998 2015
IEC 60695-2-11	2014	Fire hazard testing - Part 2-11: Glowing/hot-wire based test methods - Glow-wire flammability test method for end-products (GWEPT)	EN 60695-2-11	2014
IEC 60695-11-5	2016	Fire hazard testing - Part 11-5: Test flames - Needle-flame test method - Apparatus, confirmatory test arrangement and guidance	EN 60695-11-5	2017
IEC 61058-1 (mod)	2000	Switches for appliances - Part 1: General requirements	EN 61058-1	2002 ¹⁾
ISO 4046-4	2002	Paper, board, pulps and related terms - Vocabulary - Part 4: Paper and board grades and converted products	-	-

1) EN 61058-1:2002 consists of IEC 61058-1:2000 (modified) and IEC 61058-1:2000/A1:2001 (not modified).

Annex ZZ (informative)

Relationship between this European standard and the safety objectives of Directive 2014/35/EU [2014 OJ L96] aimed to be covered

This European standard has been prepared under a Commission's standardisation request relating to harmonised standards in the field of the Low Voltage Directive, M/511, to provide one voluntary means of conforming to safety objectives of Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits [2014 OJ L96].

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZZ.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding safety objectives of that Directive, and associated EFTA regulations.

Table ZZ.1 — Correspondence between this European standard and Annex I of Directive 2014/35/EU [2014 OJ L96]

Safety objectives of Directive 2014/35/EU	Clause(s) / sub-clause(s) of this EN	Remarks / Notes
1. General conditions		
a) the essential characteristics, the recognition and observance of which will ensure that electrical equipment will be used safely and in applications for which it was made, shall be marked on the electrical equipment, or, if this is not possible, on an accompanying document;	Clause 8	
b) the electrical equipment, together with its component parts, shall be made in such a way as to ensure that it can be safely and properly assembled and connected;	Clauses 11, 12, 13	
c) the electrical equipment shall be so designed and manufactured as to ensure that protection against the hazards set out in points 2 and 3 is assured, providing that the equipment is used in applications for which it was made and is adequately maintained.	See item 2 and 3 of this table	

Safety objectives of Directive 2014/35/EU	Clause(s) / sub-clause(s) of this EN	Remarks / Notes
2. Protection against hazards arising from the electrical equipment Measures of a technical nature shall be laid down in accordance with point 1, in order to ensure that:		
a) persons and domestic animals are adequately protected against the danger of physical injury or other harm which might be caused by direct or indirect contact;	Clauses 4, 9, 10, 11, 12, 13, 14, 15 and 17	
b) temperatures, arcs or radiation which would cause a danger, are not produced;	Clauses 13, 15, 18, 19, 20 and 21	
c) persons, domestic animals and property are adequately protected against non-electrical dangers caused by the electrical equipment which are revealed by experience;	Clauses 4, 13, 16, 19 and 22	
d) the insulation is suitable for foreseeable conditions.	Clauses 10, 12, 13, 16, 18, 20 and 21	
3. Protection against hazards which may be caused by external influences on the electrical equipment Technical measures shall be laid down in accordance with point 1, in order to ensure that the electrical equipment:		
a) meets the expected mechanical requirements in such a way that persons, domestic animals and property are not endangered;	Clauses 8, 9, 13, 16 and 22	
b) is resistant to non-mechanical influences in expected environmental conditions, in such a way that persons, domestic animals and property are not endangered;	Clauses 13, 15, 18, 20 and 21	
c) does not endanger persons, domestic animals and property in foreseeable conditions of overload.	Clauses 13, 15, 20 and 21	

WARNING 1 — Presumption of conformity stays valid only as long as a reference to this European standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 — Other Union legislation may be applicable to the product(s) falling within the scope of this standard.

CONTENTS

FOREWORD	4
A2 INTRODUCTION to Amendment 2 A2	6
1 Scope	7
2 Normative references	8
3 Terms and definitions	9
4 General requirement.....	14
5 General conditions for tests	14
6 Standard ratings	15
7 Classification	16
8 Marking	17
9 Dimensions.....	19
10 Protection against electric shock	22
11 Terminals	24
12 Provision for earthing	28
13 Construction	29
14 Switched lampholders.....	34
15 Moisture resistance, insulation resistance and electric strength	35
16 Mechanical strength	37
17 Screws, current-carrying parts and connections.....	41
18 Creepage distances and clearances	43
19 Normal operation	48
20 General resistance to heat.....	49
21 Resistance to heat, fire and tracking.....	52
22 Resistance to excessive residual stresses (season cracking) and to rusting	54
Annex A (normative) Season cracking/corrosion test	75
Annex B (informative) Guidance for requirements in IEC 61058-1 applicable to switches in lampholders (see 14.2)	77
Annex C (informative) Guidance for special requirements in appliance standards – Household and similar electrical appliances	79
A1 Annex D (informative) Clauses containing new or more stringent requirements with respect to the previous edition A1	81
Bibliography.....	82
Figure 1a –Nipple thread for lampholders: metric thread. Basic profile and design profile for the nut and for the screw.....	55
Figure 1b –Nipple thread for lampholders: ISO standard pipe thread. Basic profile and design profile for the nut and for the screw	56
Figure 2a – Gauges for metric thread for nipples	57
Figure 2b – Gauges for ISO standard pipe thread for nipples	58
Figure 3 – Gauge for holes for backplate lampholder screws	59
Figure 4 – Normal operation test apparatus	60
Figure 5 – Test caps for the test of Clause 18.....	61
Figure 6 – Torque apparatus.....	62

Figure 7 – Tumbling barrel	63
Figure 8 – Impact-test apparatus	64
Figure 9 – Pressure apparatus	65
Figure 10 – Ball-pressure test apparatus.....	65
Figure 11 – Test cap for the tests of 15.4 and 20.3	66
Figure 12 – Bending apparatus	67
Figure 13 – Test cap A and test cap B for lampholders E14 (2 of 2)	69
Figure 14 – Test cap for lampholders E27	70
Figure 15 – Test cap for lampholders E40.....	71
Figure 16 – Standard test finger (according to IEC 60529).....	72
Figure 17 – Clarification of some definitions.....	73
Figure 18 – Preparation of specimens for the needle-flame test of 21.4	74
Table 1 – Thickness of screw shells and contacts	20
Table 2 – Minimum effective screw lengths	21
Table 3 – Dimensions of threaded entries and set screws	22
Table 4 – Minimum dimensions of pillar-type terminals	26
Table 5 – Minimum dimensions of screw-type terminals	26
Table 6 – Pull and torque values.....	32
Table 7 – Insertion torque	34
Table 8 – Minimum and maximum removal torques	34
Table 9 – Test cap dimensions	38
Table 10 – Heights of fall	39
Table 11 – Maximum deformation values	41
Table 12 – Torque values	42
Table 13a – Minimum distances for AC sinusoidal voltages up to 30 kHz – Impulse withstand category II.....	45
Table 13b – Minimum distances for AC sinusoidal voltages up to 30 kHz – Impulse withstand category III.....	46
Table 14 – Minimum distances for ignition pulse voltages or equivalent peak voltages U_p (A1)	48
Table 15 – Heating cabinet temperatures.....	51
Table A.1 – pH adjustment.....	75

INTERNATIONAL ELECTROTECHNICAL COMMISSION

EDISON SCREW LAMPHOLDERS

FOREWORD

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

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

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

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

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

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

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

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

In this standard, the following print types are used:

– *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,
- withdrawn,
- replaced by a revised edition, or
- amended.

A₂ INTRODUCTION to Amendment 2

Some changes and corrections needed for IEC 60238 became obvious during the work relating to the consolidated Edition 9.1 of IEC 60238.

Change 1:

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

This alternative calculation option was removed from the latest edition of IEC 60695-10-2 dated 2014 and during its meeting held in Sydney in 2018, SC 34B/WG1 agreed to delete the alternative method as well from IEC 60238.

Change 2:

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

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

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

Correction

In Amendment 1 to IEC 60238 Edition 9, a complete paragraph was deleted by accident. This was corrected with the publication of a corrigendum to Amendment 1, however an editorial correction needs to be made to the references to previous items, changed to table footnotes "a" and "d", as the referenced text was included in Tables 13a and 13b. **A₂**

EDISON SCREW LAMPHOLDERS

1 Scope

This International Standard applies to lampholders with Edison thread E14, E27 and E40, designed for connection to the supply of lamps and semi-luminaires¹ only.

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

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

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

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

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

This standard also covers lampholders which are, wholly or partly, integral with a luminaire or intended to be built into appliances. It covers the requirements for the lampholder only. For all other requirements, such as protection against electric shock in the area of the terminals or of the lamp cap, the requirements of the relevant appliance standard are observed and tested after building into the appropriate equipment, when that equipment is tested according to its own standard. Such lampholders as well as lampholders provided with a snap-on outer shell, for use by luminaire manufacturers only, are not for retail sale.

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

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

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

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

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

¹ Requirements for lampholders suitable for semi-luminaires are under consideration.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60061-1, *Lamp caps and holders together with gauges for the control of interchangeability and safety – Part 1: Lamp caps*

IEC 60061-2, *Lamp caps and holders together with gauges for the control of interchangeability and safety – Part 2: Lampholders*

IEC 60061-3, *Lamp caps and holders together with gauges for the control of interchangeability and safety – Part 3: Gauges*

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

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

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

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

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

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

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

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

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

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

IEC 60630, *Maximum lamp outlines for incandescent lamps*

IEC 60695-2-11:2014, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods – Glow-wire flammability test method for end-products (GWEPT)*

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

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

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

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

3 Terms and definitions

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

3.1

cord-grip lampholder

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

3.2

threaded entry lampholder

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

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

3.3

backplate lampholder

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

3.4

lampholder for building-in

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

3.4.1

unenclosed lampholder

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

3.4.2

enclosed lampholder

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

3.5

independent lampholder

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

3.6

terminal/contact assembly

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

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

3.7

outer shell

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

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

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

3.7.1

snap-on outer shell

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

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

3.8

screw shell

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

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

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

3.9

insulating ring

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

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

3.10

shade ring

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

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

3.11

dome

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

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

3.12

basic insulation

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

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

3.13

supplementary insulation

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

3.14

double insulation

insulation comprising both basic insulation and supplementary insulation

3.15

reinforced insulation

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

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

3.16

live part

conductive part which may cause an electric shock

3.17

type test

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

3.18

type test sample

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

3.19

semi-luminaire

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

3.20

rated operating temperature

highest temperature for which the holder is designed

3.21

rated minimum temperature

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

3.22

angled lampholder

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

3.23

lampholder with retention device

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

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

3.24

impulse withstand category

numeral defining a transient overvoltage condition

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

a) Purpose of classification of impulse withstand categories

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

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

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

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

b) Description of impulse withstand categories

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

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

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

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

3.25

primary circuit

circuit which is directly connected to the AC mains supply

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

3.26

secondary circuit

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

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

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

3.27

adapter

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

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

3.28

enclosed reinforced insulated lampholder

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

3.29

partly reinforced insulated lampholder

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

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

A1 3.30

rated voltage

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

[SOURCE: IEC 60838-1:2016, 3.1]

3.31

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

[SOURCE: IEC 60838-1:2016, 3.2]

3.32 rated current

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

[SOURCE: IEC 60838-1:2016, 3.3]

3.33 critical frequency

f_{crit}
frequency at which the reduction of the breakdown voltage of a clearance begins (occurs)

Note 1 to entry: $f_{\text{crit}} \approx 0,2/d$ [MHz] where d (in mm) is the clearance according to Table 3 (basic or supplementary insulation and reinforced insulation respectively) disregarding the frequency.

[SOURCE: IEC 61347-1:2015, 3.40, modified – the note has been added]

3.34 ignition voltage

peak voltage applied to ignite a discharge lamp

[SOURCE: IEC 61347-1:2015, 3.46]

3.34.1 ignition pulse voltage

peak ignition voltage with a total duration of $\leq 750 \mu\text{s}$ (summation of all pulses durations) within 10 ms, with the duration time (width) of each pulse being measured at the level of 50 % of the maximum absolute peak value

Note 1 to entry: Ignition pulse waveforms, which are considered as ignition pulse voltage, should not contain any dominant frequency above 30 kHz or should be usually highly damped (after 20 μs the peak voltage level should be less than one half of the maximum peak voltage). For the assessment of the dominant frequency IEC 60664-4:2005, Annex E should be consulted.

[SOURCE: IEC 61347-1:2015, 3.46.1]

3.35 rated ignition voltage

highest peak value of an ignition pulse voltage the holder is able to withstand

3.36 maximum working voltage

U_{out}
maximum occurring working voltage (r.m.s.) between the output terminals of a controlgear or between the output terminals and earth, during normal or abnormal operating condition

Note 1 to entry: Transients and ignition voltages have to be neglected.

[SOURCE: IEC 61347-1:2015, 3.33, modified – "of a controlgear" has been added]

3.37 maximum working peak output voltage

$\hat{U}_{\text{out}}$
maximum repetitive occurring peak working voltage between the output terminals of a controlgear or between its output terminals and earth, during normal or abnormal operating condition and with transients neglected

[SOURCE: IEC 61347-1:2015, 3.45, modified – "of a controlgear" has been added]

3.38 equivalent transformed peak voltage

U_p

transformed output peak voltage, which is converted for the worst case peak voltage with its related frequency into an ignition pulse voltage

Note 1 to entry: The value of the declared equivalent transformed output peak voltage is the essential parameter for selecting the associated components.

Note 2 to entry: See 3.34.1.

Note 3 to entry: To determine the declared equivalent transformed output peak voltage for basic insulation U_p [basic] the worst case combination of the maximum occurring peak voltage and frequency has to be taken into account, which means the maximum clearance according to IEC 61347-1:2015, Table 10 for basic insulation.

Note 4 to entry: To determine the declared equivalent transformed output peak voltage for the reinforced insulation U_p [reinforced] the worst case combination of the maximum occurring peak voltage and frequency has to be taken into account, which means the maximum clearance according to IEC 61347-1:2015, Table 11 for reinforced insulation.

[SOURCE: IEC 61347-1:2015, 3.47] 

4 General requirement

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

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

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

5 General conditions for tests

5.1 Tests according to this standard are type tests.

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

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

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

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

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

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

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

in the following order of clauses:

- three specimens: Clauses 2 to 13 (except for 10.1 and 11.2) and Clauses 15 to 18;
- three specimens: Clause 14 (switched-lampholder tests only);
- three specimens: 10.1 and Clauses 19 and 20;

- two specimens: Clause 21 (of which one specimen for the test of 21.1 and the other for the tests of 21.3 or 21.4);
- one specimen: 21.5 and Clause 22.

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

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

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

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

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

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

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

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

6 Standard ratings

6.1 Standard rated voltages are 250 V and 500 V.

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

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

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

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

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

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

Compliance is checked by inspection of the marking.

6.2 Standard rated currents are

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

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

Compliance is checked by inspection of the marking.

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

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

Compliance is checked by inspection of the marking.

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

Compliance is checked by inspection of the marking.

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

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

7 Classification

Lampholders are classified as defined in 7.1 to 7.6.

7.1 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 13.3). This does not apply to threaded entries and external parts, 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 10.5).

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 15.4, the insulating resistance is measured between the stripes. The surface is considered to be conductive if the resistance is less than 5 MΩ.

7.2 According to degree of protection against ingress of water:

- ordinary lampholders;

- drip-proof lampholders.

7.3 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.

7.4 According to type:

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

7.5 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 can be regarded as equivalent to a reinforced insulated lampholder.

7.6 According to resistance to heat:

- lampholders for rated operating temperatures up to the limits given in 6.4;
- lampholders for operating in high temperature conditions (T marked holders).

8 Marking

8.1 Lampholders, other than lampholders E5 and E10, shall be marked with the following:

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

If applicable, the rated ignition voltage of the lampholder (in kV) shall be marked either on the lampholder or made available in the manufacturer's catalogue or the like.

NOTE 1 Some lampholders still show rated voltages higher than 500 V. This is an earlier way of expressing the permissible ignition 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;

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, can 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 8.2);
- rated operating temperature "T", indicating the highest operating temperature, if applicable.

The marking of the rated operating temperature is not required for lampholders whose exterior 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 shall 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 the following:

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

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, can 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, if applicable.

Lampholders E5 shall be marked with the following:

- mark of origin;
- type reference.

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, can be disregarded in the type reference marked on the product. Variations included in the type testing procedure are listed in the corresponding test reports.

Compliance is checked by inspection.

NOTE 2 The type reference for lampholders E10 and E5 can be a catalogue number.

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

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 direct current shall be — — — (IEC 60417-5031:2002-10).

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 are marked.

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

Compliance is checked by inspection.

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

Compliance is checked by inspection.

8.4 An earthing terminal shall be indicated by the symbol — — — (IEC 60417-5019:2002-10).

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

Compliance is checked by inspection.

8.5 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 typically consists 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.

9 Dimensions

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

Compliance shall be checked by measuring in conformity with 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 Standard Sheets 7006-25 (E10, E14 and E40) and 7006-25A (E27), and by means of the gauge according to 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.

9.2 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 19 and 20.2.

For lampholders for use in appliances other than luminaires only:

If the 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 shall 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.

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

9.3 The following dimensions shall be not less than the values shown in Table 1.

Table 1 – Thickness of screw shells and contacts

Dimension	Lampholder				
	E5	E10	E14	E27	E40
Thickness of the screw shell, if any (mm):					
– 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 (mm)	0,18	0,18	0,28	0,38	0,48 ^a
^a For the use of side-contacts in lampholders E40, see 13.11.					

Compliance is checked by measurement.