

Miscellaneous lampholders —

Part 1: General requirements and tests

ICS 29.140.10

National foreword

This British Standard is the UK implementation of EN 60838-1:2004+A2:2011. It is identical with IEC 60838-1:2004, incorporating amendments 1:2008 and 2:2011. It supersedes BS EN 60838-1:2004+A1:2008 which is withdrawn.

The start and finish of text introduced or altered by amendment is 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 UK participation in its preparation was entrusted by Technical Committee CPL/34, Lamps and related equipment, to Subcommittee CPL/34/2, Lamp caps and holders.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 29 November 2004

© BSI 2011

ISBN 978 0 580 70364 5

Amendments/corrigenda issued since publication

Date	Comments
30 April 2010	Implementation of IEC amendment 1:2008 with CENELEC endorsement A1:2008
31 July 2011	Implementation of IEC amendment 2:2011 with CENELEC endorsement A2:2011

Miscellaneous lampholders
Part 1: General requirements and tests
(IEC 60838-1:2004)

Douilles diverses pour lampes
Partie 1: Prescriptions générales et essais
(CEI 60838-1:2004)

Sonderfassungen
Teil 1: Allgemeine Anforderungen
und Prüfungen
(IEC 60838-1:2004)

This European Standard was approved by CENELEC on 2004-10-01. 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 34B/1152/FDIS, future edition 4 of IEC 60838-1, 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 was approved by CENELEC as EN 60838-1 on 2004-10-01.

This European Standard supersedes EN 60838-1:1998 + A1:1999 + A2:2002 + A2:2002/corrigendum July 2003.

In this edition of EN 60838-1 the new requirements for creepage distances and clearances have been adopted which are currently circulated to amend the EN 60598 family of luminaire standards.

It also includes additional requirements regarding testing of lampholders for double-ended R7s/RX7s lamps.

The following dates were fixed:

- | | | |
|--|-------|------------|
| – latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2005-07-01 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn | (dow) | 2007-10-01 |

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60838-1:2004 was approved by CENELEC as a European Standard without any modification.

Foreword to amendment A1

The text of document 34B/1384/FDIS, future amendment 1 to IEC 60838-1:2004, 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 was approved by CENELEC as amendment A1 to EN 60838-1:2004 on 2008-08-01.

The following dates were fixed:

- | | | |
|---|-------|------------|
| – latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2009-05-01 |
| – latest date by which the national standards conflicting with the amendment have to be withdrawn | (dow) | 2011-08-01 |

Annex ZA has been added by CENELEC.

Endorsement notice

The text of amendment 1:2008 to the International Standard IEC 60838-1:2004 was approved by CENELEC as an amendment to the European Standard without any modification.

Foreword to amendment A2

The text of document 34B/1581/FDIS, future amendment 2 to IEC 60838-1:2004, 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 was approved by CENELEC as amendment A2 to EN 60838-1:2004 on 2011-04-18.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

The following dates were fixed:

- | | | |
|---|-------|------------|
| – latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2012-01-18 |
| – latest date by which the national standards conflicting with the amendment have to be withdrawn | (dow) | 2014-04-18 |

Endorsement notice

The text of amendment 2:2011 to the International Standard IEC 60838-1:2004 was approved by CENELEC as an amendment to the European Standard without any modification.

CONTENTS

1	General	5
2	Definitions	7
3	General requirement.....	9
4	General conditions for tests	9
5	Classification	11
6	Marking	11
7	Protection against electric shock	13
8	Terminals	13
9	Provision for earthing	15
10	Construction	16
11	Moisture resistance, insulation resistance and electric strength	17
12	Mechanical strength	18
13	Screws, current-carrying parts and connections.....	20
14	Creepage distances and clearances	20
15	Endurance.....	23
16	Resistance to heat and fire	24
17	Resistance to excessive residual stresses (season cracking) and to rusting	28
	Annex A (normative) Examples of lampholders covered by this standard	29
	Annex B (normative) Examples of suitable metals.....	30
	Annex C (normative) Season cracking/corrosion test	31
	Annex D (normative) Pendulum impact test apparatus	33
	Annex ZA Normative references to international publications with their corresponding European publications	34
	Figure 1 – Ball-pressure test apparatus	25
	Table 1 – Minimum values of insulation resistance.....	18
	Table 2a – Minimum distances for a.c. (50Hz/60 Hz) sinusoidal voltages – Impulse withstand category II.....	21
	Table 2b – Minimum distances for a.c. (50 Hz/60 Hz) sinusoidal voltages – Impulse withstand category III.....	22
	Table 3 – Minimum distances for non-sinusoidal pulse voltages	22

MISCELLANEOUS LAMPHOLDERS –**Part 1: General requirements and tests****1 General****1.1 Scope**

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

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

This part of IEC 60838 also covers lampholders integrated in an outer shell and dome similar to Edison screw lampholders. Such lampholders are further tested in accordance with the following subclauses of IEC 60238: 8.4; 8.5; 8.6; 9.3; 10.7; 11; 12.2; 12.5; 12.6; 12.7; 13; 15.3; 15.4; 15.5 and 15.9.

A1 Text deleted **A1**

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

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

BS EN 60838-1:2004+A2:2011
EN 60838-1:2004+A2:2011 (E)

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

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

IEC 60238:2004, *Edison screw lampholders*

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

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

IEC 60399: *Standard sheets for barrel thread for E14 and E27 lampholders with shade holder ring*

A2 IEC 60417, *Graphical symbols for use on equipment* **A2**

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

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

IEC 60664-1:1992, *Insulation co-ordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*²⁾
Amendment 1 (2000)
Amendment 2 (2002)

A1 IEC 60695-11-5:2004, *Fire hazard testing – Part 11-5: Test flames – Needle-flame test method – Apparatus, confirmatory test arrangement and guidance* **A1**

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

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

ISO 2081:1986, *Metallic coatings – Electroplated coatings of zinc on iron or steel*

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

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

¹⁾ A consolidated edition 2.1 (2001) exists that includes edition 2.0 (1989) and its Amendment 1 (1999).

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

2 Definitions

For the purpose of this International Standard, the following definitions apply.

2.1

rated voltage

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

2.2

working voltage

the 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

2.3

rated current

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

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

2.5

rated operating temperature

The highest temperature for which the lampholder is designed

2.6

rated pulse voltage

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

2.7

lamp connectors

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

2.8

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

2.9

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

2.10

live part

a conductive part which may cause an electric shock

2.11

impulse withstand category

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.

2.12

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

2.13

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 above sense.

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.

**2.14****basic insulation**

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.

2.15**supplementary insulation**

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

2.16**double insulation**

insulation comprising both basic insulation and supplementary insulation

2.17**reinforced insulation**

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

NOTE 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.

2.18**enclosed reinforced insulated lampholder**

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

2.19**partly reinforced insulated lampholder**

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

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

2.20**polarized lampholder**

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

3 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.

4 General conditions for tests**4.1 Tests according to this standard are type tests.**

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

For further information see IEC 60061-4³⁾ (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 in the most unfavourable position for normal use.

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

Compliance is checked with separate sets of specimens according to 4.3.

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

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

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

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

NOTE If a pair of holders consists of identical holders, it is sufficient that one holder instead of one pair is subjected to all the tests, except for the tests of clause 7, 10.2, 10.3, clause 12, clause 15 and 16.6 where pairs are needed.

- 10 specimens intended for single-capped lamps;

in the order of the clauses, as follows:

- three pairs or three specimens: clauses 3 up to and including 14 (except for 8.2);

NOTE The tests of 8.2 are carried out on the number of separate specimens as required by the relevant standards.

- three pairs or three specimens: clause 15 and 16.6;
- one pair or one specimen: 16.1;
- one pair or one specimen: 16.3;
- one pair or one specimen: 16.4;
- one pair or one specimen: 16.5 and clause 17.

Together with these units, the manufacturer's mounting instructions (see 6.3) shall be supplied.

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

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

If one specimen fails in one test, that test and the preceding ones which may have influenced the result of that test are repeated on another set of specimens for 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.

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

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

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