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BSI Standards Publication

Luminaires

Part 1: General requirements and tests

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National foreword

This British Standard is the UK implementation of EN IEC 60598-1:2021. It is identical to IEC 60598-1:2020. It supersedes BS EN 60598-1:2015+A1:2018, which will be withdrawn on 19 March 2024.

The UK participation in its preparation was entrusted to Technical Committee CPL/34/4, Luminaires.

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

This publication has been prepared under a mandate given to the European Standards Organizations by the European Commission and the European Free Trade Association and is intended to support essential requirements of the EU legislation detailed in the European foreword. Annex ZA/ZZ describes how the publication relates to the legislation.

For the Great Britain market (England, Scotland and Wales), if the UK Government has designated this publication for conformity with UKCA marking legislation and has not amended the essential requirements of that legislation, Annex ZA/ZZ and any references to EU law in the publication should be read in accordance with the designation as applying to UK legislation in the same way as to EU law. Further information on designated standards can be found at www.bsigroup.com/standardsandregulation.

For the Northern Ireland market, UK law will continue to implement relevant EU law subject to periodic confirmation. References to EU legislation are therefore still valid.

More information on legislation can be found at www.gov.uk.

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Date

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and corrigenda (if any)

English Version

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Prüfungen
(IEC 60598-1:2020)

This European Standard was approved by CENELEC on 2020-09-21. 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.

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European foreword

The text of document 34D/1546/FDIS, future edition 9 of IEC 60598-1, prepared by SC 34D "Luminaires" of IEC/TC 34 "Lighting" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60598-1:2021.

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) 2021-09-19
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2024-03-19

This document supersedes EN 60598-1:2015 and all of its amendments and corrigenda (if any).

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

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 60598-1:2020 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 60079 (series)	NOTE	Harmonized as EN IEC 60079-7:2015/A1 (series)
IEC 60081	NOTE	Harmonized as EN 60081
IEC 60216 (series)	NOTE	Harmonized as EN 60216 (series)
IEC 60228:2004	NOTE	Harmonized as EN 60228:2005 (not modified)
IEC 60269 (series)	NOTE	Harmonized as EN 60269 (series)
IEC 60357	NOTE	Harmonized as EN 60357
IEC 60364 (series)	NOTE	Harmonized as HD 60364 (series)
IEC 60364-4-41:2005	NOTE	Harmonized as HD 60364-4-41:2017
IEC 60364-5-51	NOTE	Harmonized as HD 60364-5-51
IEC 60364-7-701	NOTE	Harmonized as HD 60364-7-701
IEC 60364-7-702	NOTE	Harmonized as HD 60364-7-702
IEC 60400	NOTE	Harmonized as EN 60400

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IEC 60598-2-3	NOTE	Harmonized as EN 60598-2-3
IEC 60598-2-5	NOTE	Harmonized as EN 60598-2-5
IEC 60634	NOTE	Harmonized as EN 60634
IEC 60664 (series)	NOTE	Harmonized as EN 60664 (series)
IEC 60664-1:2007	NOTE	Harmonized as EN 60664-1:2007 (not modified)
IEC 60664-3	NOTE	Harmonized as EN 60664-3
IEC 60682	NOTE	Harmonized as EN 60682
IEC 60695 (series)	NOTE	Harmonized as EN 60695 (series)
IEC 60695-2 (series)	NOTE	Harmonized as EN 60695-2-13:2010/A1 (series)
IEC 60695-10-2	NOTE	Harmonized as EN 60695-10-2
IEC 60838 (series)	NOTE	Harmonized as EN 60838 (series)
IEC 60901	NOTE	Harmonized as EN 60901
IEC 60921	NOTE	Harmonized as EN 60921
IEC 60923	NOTE	Harmonized as EN 60923
IEC 60929	NOTE	Harmonized as EN 60929
IEC 60950-1:2005	NOTE	Harmonized as EN 60950-1:2006
IEC 61184	NOTE	Harmonized as EN 61184
IEC 61195	NOTE	Harmonized as EN 61195
IEC 61199:2011	NOTE	Harmonized as EN 61199:2011 (not modified)
IEC 61199:2011/A1:2012	NOTE	Harmonized as EN 61199:2011/A1:2013 (not modified)
IEC 61199:2011/A2:2014	NOTE	Harmonized as EN 61199:2011/A2:2015 (not modified)
IEC 61210	NOTE	Harmonized as EN 61210
IEC 61558-2-5	NOTE	Harmonized as EN 61558-2-5
IEC 61995 (series)	NOTE	Harmonized as EN 61995-2:2009/A1 (series)
IEC 62031	NOTE	Harmonized as EN IEC 62031
IEC 62035	NOTE	Harmonized as EN 62035
IEC 62368 (series)	NOTE	Harmonized as EN IEC 62368 (series)
IEC 62471:2006	NOTE	Harmonized as EN 62471:2008
IEC 62504:2014	NOTE	Harmonized as EN 62504:2014 (not modified)

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(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	Series	Lamp caps and holders together with gauges for the control of interchangeability and safety	EN 60061	Series
IEC 60061-2 (mod)		Lamp caps and holders together with gauges for the control of interchangeability and safety - Part 2: Lampholders	EN 60061-2 + A1 to A54	1993
IEC 60061-3		Lamp caps and holders together with gauges for the control of interchangeability and safety - Part 3: Gauges	EN 60061-3 + A1 to A56	1993
IEC 60065 (mod)	2014	Audio, video and similar electronic apparatus - Safety requirements	EN 60065 + A11	2014 2017
IEC 60068-2-6	2007	Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)	EN 60068-2-6	2008
IEC 60068-2-14	2009	Environmental testing – Part 2-14: Tests – Test N: Change of temperature	EN 60068-2-14	2009
IEC 60068-2-31	2008	Environmental testing – Part 2-31: Tests – Test Ec: Rough handling shocks, primarily for equipment-type specimens	EN 60068-2-31	2008
IEC 60068-2-75		Environmental testing - Part 2-75: Tests - Test Eh: Hammer tests	EN 60068-2-75	2014
IEC/TR 60083	–	Plugs and socket-outlets for domestic and similar general use standardized in member countries of IEC	–	–
IEC 60085		Electrical insulation - Thermal evaluation and designation	EN 60085	2008
IEC 60112	2003	Method for the determination of the proof and the comparative tracking indices of solid insulating materials	EN 60112	2003
IEC 60155		Glow-starters for fluorescent lamps	EN 60155 + A1 + A2	1995 1995 2007

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IEC 60227	Series	Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V	EN 50525 ¹	Series
IEC 60238	2016	Edison screw lampholders	EN IEC 60238	2018
IEC 60245	series	Rubber insulated cables - Rated voltages up to and including 450/750 V	EN 50525 ²	series
IEC 60320	Series	Appliance couplers for household and similar general purposes	EN 60320	Series
IEC 60360		Standard method of measurement of lamp cap temperature rise	EN 60360	1998
IEC 60384-14		Fixed capacitors for use in electronic equipment - Part 14: Sectional specification - Fixed capacitors for electromagnetic interference suppression and connection to the supply mains	EN 60384-14 + A1	2013 2016
IEC 60417	data-base	Graphical symbols for use on equipment	-	-
IEC 60432-1 (mod)	1999 2005 2011	Incandescent lamps - Safety specifications - Part 1: Tungsten filament lamps for domestic and similar general lighting purposes	EN 60432-1 A1 A2	2000 2005 2012
IEC 60432-2 (mod)	1999 2005 2012	Incandescent lamps - Safety specifications - Part 2: Tungsten halogen lamps for domestic and similar general lighting purposes	EN 60432-2 A1 A2	2000 2005 2012
IEC 60529	-	Degrees of protection provided by enclosures (IP Code)	EN 60529 + corr. May + A1 + A2	1991 1993 2000 2013
IEC 60570 (mod)	2003 + A1 + A2	Electrical supply track systems for luminaires	EN 60570 + A1 + A2	2003 2018 2020
IEC 60598-2	series	Luminaires - Part 2: Particular requirements	EN 60598-2	series
IEC 60598-2-4 (mod)	2017	Luminaires - Part 2: Particular requirements - Section 4: Portable general purpose luminaires	EN 60598-2-4	2018
IEC 60603	series	Connectors for frequencies below 3 MHz for use with printed boards	EN 60603	series
IEC 60662 (mod)	-	High pressure sodium vapour lamps	EN 60662 + A11	2012 2019
IEC 60664-4	2005	Insulation coordination for equipment within low-voltage systems - Part 4: Consideration of high-frequency voltage stress	EN 60664-4	2006
-	-		+ corrigendum Oct. 2006	

¹ EN 50525 Series, which is related to, but not directly equivalent with IEC 60227 Series, applies instead.

² EN 50525 Series, which is related to, but not directly equivalent with IEC 60245 Series, applies instead.

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IEC 60684	series	Flexible insulating sleeving	EN 60684	series
IEC 60695-2-11	-	Fire hazard testing - Part 2-11: Glowing/hot-wire based test methods - Glow-wire flammability test method for end-products (GWEPT)	EN 60695-2-11	2014
IEC 60695-11-5	-	Fire hazard testing - Part 11-5: Test flames - Needle-flame test method - Apparatus, confirmatory test arrangement and guidance	EN 60695-11-5	2017
IEC 60989	-	Separating transformers, autotransformers, - variable transformers and reactors.	-	-
IEC 60990	-	Methods of measurement of touch current and protective conductor current	EN 60990	2016
IEC 60998-2-1	-	Connecting devices for low-voltage circuits for household and similar purposes - Part 2-1: Particular requirements for connecting devices as separate entities with screw-type clamping units	EN 60998-2-1	2004
IEC 60998-2-2	-	Connecting devices for low-voltage circuits for household and similar purposes - Part 2-2: Particular requirements for connecting devices as separate entities with screwless-type clamping units	EN 60998-2-2	2004
IEC 61032	1997	Protection of persons and equipment by enclosures - Probes for verification	EN 61032	1998
IEC 61058-1	2000	Switches for appliances -- Part 1: General requirements	EN 61058-1	2002 ³
IEC 61167	-	Metal halide lamps	EN 61167 + A1	2018 2018
IEC 61249	series	Materials for printed boards and other interconnecting structures	EN 61249	series
IEC 61347	series	Lamp controlgear	EN 61347	series
IEC 61347-1	2015	Lamp controlgear - Part 1: General and safety requirements	EN 61347-1	2015
+ A1	2017		+ A1	2021
IEC 61347-2-9	-	Lamp controlgear - Part 2-9: Particular requirements for electromagnetic controlgear for discharge lamps (excluding fluorescent lamps)	EN 61347-2-9	2013
IEC 61535 (mod)	2009	Installation couplers intended for permanent connection in fixed installations	EN 61535	2009
IEC 61558	series	Safety of power transformers, power supplies, reactors and similar products	EN 61558	series
IEC 61558-1	2005	Safety of power transformers, power supplies, reactors and similar products -- Part 1: General requirements and tests	EN 61558-1	2005

³ EN 61058-1 includes A1:2001 to IEC 61058-1 (mod).

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-	-		+ corrigendum Aug.2006	
IEC 61558-2-6	-	Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1 100 V - Part 2-6: Particular requirements and tests for safety isolating transformers and power supply units incorporating safety isolating transformers	EN 61558-2-6	2009
IEC 61643-11	-	Low-voltage surge protective devices - Part 11: Surge protective devices connected to low-voltage power systems - Requirements and test methods	EN 61643-11 + A11	2012 2018
IEC 61984	2008	Connectors - Safety requirements and tests	EN 61984	2009
IEC 62368-3	2017	Audio/video, information and communication technology equipment - Part 3: Safety aspects for DC power transfer through communication cables and ports	EN IEC 62368-3	2020
IEC 62493	2015	Assessment of lighting equipment related to human exposure to electromagnetic fields	EN 62493	2015
IEC 62680	series	Universal Serial Bus interfaces for data and power	EN 62680	series
IEC/TR 62778	-	Application of IEC 62471 for the assessment of blue light hazard to light sources and luminaires	IEC/TR 62778	2014
IEC 80416-1	-	Basic principles for graphical symbols for use on equipment - Part 1: Creation of graphical symbols for registration	EN 80416-1	2009

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(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 standardization request relating to harmonized 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 harmonization 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;	Section 3	To be used in conjunction with relevant part 2
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;	Section 4	To be used in conjunction with relevant part 2
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	

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2014/35/EU	of this EN	Remarks / Notes
<p>2. Protection against hazards arising from the electrical equipment</p> <p>Measures of a technical nature shall be laid down in accordance with point 1, in order to ensure that:</p>		
<p>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;</p>	<p>Section 4 Section 7 Section 14 and 15 Section 5 Section 8</p>	<p>All to be used in conjunction with relevant part 2</p>
<p>b) temperatures, arcs or radiation which would cause a danger, are not produced;</p>	<p>Section 4 Section 11 Section 12 Section 10</p>	<p>All to be used in conjunction with relevant part 2</p>
<p>c) persons, domestic animals and property are adequately protected against non-electrical dangers caused by the electrical equipment which are revealed by experience;</p>	<p>Section 4 Section 10 Section 11</p>	<p>All to be used in conjunction with relevant part 2</p>
<p>d) the insulation is suitable for foreseeable conditions.</p>	<p>Section 9 Section 10</p>	<p>All to be used in conjunction with relevant part 2</p>
<p>3. Protection against hazards which may be caused by external influences on the electrical equipment</p> <p>Technical measures shall be laid down in accordance with point 1, in order to ensure that the electrical equipment:</p>		
<p>a) meets the expected mechanical requirements in such a way that persons, domestic animals and property are not endangered;</p>	<p>Section 3 Section 4</p>	<p>All to be used in conjunction with relevant part 2</p>
<p>b) is resistant to non-mechanical influences in expected environmental conditions, in such a way that persons, domestic animals and property are not endangered;</p>	<p>Section 9 Section 13</p>	<p>All to be used in conjunction with relevant part 2</p>
<p>c) does not endanger persons, domestic animals and property in foreseeable conditions of overload.</p>	<p>Section 4 Section 12</p>	<p>All to be used in conjunction with relevant part 2</p>

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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.

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CONTENTS

FOREWORD	9
SECTION 0: GENERAL INTRODUCTION	12
0.1 Scope	12
0.2 Normative references	13
0.3 General requirements	16
0.4 General test requirements and verification	16
0.5 Components of luminaires	17
0.6 List of parts of IEC 60598-2	18
0.7 Information for luminaire design in light sources standards	19
SECTION 1: TERMS AND DEFINITIONS	20
1.1 General	20
1.2 Terms and definitions	20
SECTION 2: CLASSIFICATION OF LUMINAIRES	36
2.1 General	36
2.2 Classification according to type of protection against electric shock	36
2.3 Classification according to degree of protection against ingress of dust, solid objects and moisture	36
2.4 Classification according to material of supporting surface for which the luminaire is designed	36
2.5 Classification according to the circumstances of use	37
SECTION 3: MARKING	38
3.1 General	38
3.2 Marking on luminaires	38
3.3 Additional information	44
3.4 Test of marking	47
SECTION 4: CONSTRUCTION	48
4.1 General	48
4.2 Replaceable components	48
4.3 Wireways	48
4.4 Lampholders	48
4.5 Starterholders	50
4.6 Terminal blocks	50
4.7 Terminals and supply connections	51
4.8 Switches	53
4.9 Insulating linings and sleeves	53
4.10 Double and reinforced insulation	54
4.11 Electrical connections and current-carrying parts	56
4.12 Screws and connections (mechanical) and glands	57
4.13 Mechanical strength	60
4.14 Suspensions, fixings and means of adjustment	63
4.15 Flammable materials	67
4.16 Luminaires for mounting on normally flammable surfaces	68
4.17 Drain holes	70
4.18 Resistance to corrosion	70
4.19 Ignitors	70
4.20 Rough service luminaires – Vibration requirements	71

This is a preview of "BS EN IEC 60598-1:20...". [Click here to purchase the full version from the ANSI store.](#)

4.21	Protective shield	71
4.22	Attachments to lamps.....	72
4.23	Semi-luminaires	72
4.24	Photobiological hazards	72
4.25	Mechanical hazard	73
4.26	Short-circuit protection.....	73
4.27	Terminal blocks with integrated screwless protective earthing contacts.....	74
4.28	Fixing of thermal sensing controls.....	74
4.29	Luminaire with non-replaceable light source.....	75
4.30	Luminaires with non-user replaceable light sources	75
4.31	Insulation between circuits	75
4.32	Overvoltage protective devices	77
4.33	Luminaire powered via information technology communication cabling.....	78
4.34	Electromagnetic fields (EMF)	78
4.35	Protection against moving fan blades.....	78
4.36	Track-mounted luminaires.....	78
SECTION 5: EXTERNAL AND INTERNAL WIRING		79
5.1	General.....	79
5.2	Supply connection and other external wiring	79
5.3	Internal wiring	87
5.4	Test to determine suitability of conductors having a reduced cross-sectional area	89
SECTION 6: Void.....		91
SECTION 7: PROVISION FOR EARTHING		92
7.1	General.....	92
7.2	Provision for earthing.....	92
SECTION 8: PROTECTION AGAINST ELECTRIC SHOCK		95
8.1	General.....	95
8.2	Protection against electric shock.....	95
SECTION 9: RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE		99
9.1	General.....	99
9.2	Tests for ingress of dust, solid objects and moisture	99
9.3	Humidity test.....	103
SECTION 10: INSULATION RESISTANCE AND ELECTRIC STRENGTH, TOUCH CURRENT AND PROTECTIVE CONDUCTOR CURRENT.....		105
10.1	General.....	105
10.2	Insulation resistance and electric strength	105
10.3	Touch current, protective conductor current and electric burn	109
SECTION 11: CREEPAGE DISTANCES AND CLEARANCES		111
11.1	General.....	111
11.2	Creepage distances and clearances.....	111
SECTION 12: ENDURANCE TEST AND THERMAL TEST.....		115
12.1	General.....	115
12.2	Selection of lamps and ballasts	115
12.3	Endurance test.....	115
12.4	Thermal test (normal operation)	117
12.5	Thermal test (abnormal operation)	122
12.6	Thermal test (failed windings in lamp controlgear)	127

This is a preview of "BS EN IEC 60598-1:20...". [Click here to purchase the full version from the ANSI store.](#)

12.7	Thermal test in regard to fault conditions in lamp controlgear or electronic devices incorporated in thermoplastic luminaires	129
SECTION 13: RESISTANCE TO HEAT, FIRE AND TRACKING.....		132
13.1	General.....	132
13.2	Resistance to heat	132
13.3	Resistance to flame and ignition	132
13.4	Resistance to tracking.....	133
SECTION 14: SCREW TERMINALS.....		134
14.1	General.....	134
14.2	Terms and definitions.....	134
14.3	General requirements and basic principles.....	135
14.4	Mechanical tests	137
SECTION 15: SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS.....		141
15.1	General.....	141
15.2	Terms and definitions.....	141
15.3	General requirements	141
15.4	General instructions on tests.....	143
15.5	Terminal and connections for internal wiring	143
15.6	Terminals and connections for external wiring.....	146
Annex A (normative) Test to establish whether a conductive part can cause an electric shock.....		173
Annex B (normative) Test lamps		174
B.1	General.....	174
B.2	Filament lamps within the scope of IEC 60432-1 and IEC 60432-2.....	174
B.3	Halogen lamps within the scope of IEC 60432-3	176
B.4	Tubular fluorescent and other discharge lamps	176
B.5	LED modules within the scope of IEC 62031	176
Annex C (normative) Abnormal circuit conditions		177
Annex D (normative) Thermal testing		180
D.1	Draught-proof enclosure	180
D.2	Mounting surface and test recess.....	180
D.3	Alternative test procedure for adjustment of measured temperatures for luminaire t_a rating(s).....	183
Annex E (normative) Determination of winding temperature rises by the increase-in-resistance method		185
Annex F (normative) Test for resistance to stress corrosion of copper and copper alloys.....		186
F.1	Test cabinet.....	186
F.2	Test solution	186
F.3	Test piece	186
F.4	Test procedure.....	186
Annex G (normative) Measurement of touch current and protective conductor current		188
Annex H (xxx) (Void).....		192
Annex I (xxx) (Void)		193
Annex J (informative) Explanation of IP numbers for degrees of protection		194
Annex K (informative) Temperature measurement.....		196
K.1	Temperature measurements of the luminaire	196
K.2	Temperature measurement of the insulation parts of lampholders	197

This is a preview of "BS EN IEC 60598-1:20...". [Click here to purchase the full version from the ANSI store.](#)

Annex L (informative) Guidelines for good practice in luminaire design	199
L.1 General.....	199
L.2 Plastics in luminaires	199
L.3 Rust resistance	200
L.4 Corrosion resistance	200
L.5 Chemically corrosive atmospheres	201
L.6 Reflector design.....	201
L.7 Components in different kinds of luminaires	202
L.8 Recommendations for electromagnetic ballast protection for end of life phenomenon of HID lamps	202
L.9 Resistance against the effects of vibration	203
L.10 Flammability of components.....	203
Annex M (normative) Determination of creepage distances and clearances	204
Annex N (informative) Explanation of marking for luminaires that are not suitable for mounting on normally flammable surfaces and covering with insulation materials	205
N.0 General.....	205
N.1 Protection against flame	205
N.2 Protection against heat	205
N.3 Thermal protectors.....	206
N.4 Deletion of the F mark requirements	207
Annex O (xxx) (Void)	208
Annex P (normative) Absorption requirements for the protective shield to be fitted to luminaires designed for metal halide lamps which emit a high level of UV radiation	209
P.1 General.....	209
P.2 Procedure A.....	209
P.3 Procedure B.....	210
Annex Q (informative) Conformity testing during manufacture	211
Q.1 General.....	211
Q.2 Testing	211
Annex R (normative) Schedule of amended clauses and subclauses containing more serious/critical requirements which call for products to be retested	213
Annex S (normative) Requirements for the identification of a family or range of luminaires for type testing.....	214
S.1 General.....	214
S.2 Range or family of luminaires.....	214
Annex T (xxx) (Void)	215
Annex U (informative) Additional requirements for luminaires where a higher degree of availability (impulse withstand category III) may be requested	216
U.1 General.....	216
U.2 Requirements for impulse withstand category III	216
Annex V (normative) Additional test requirements for terminal blocks with integrated screwless protective earthing contact for direct connection to the luminaire housing or to parts of the body.....	218
V.1 Additional requirements to 7.2.1.....	218
V.2 Additional requirements to 7.2.3.....	218
Annex W (normative) Alternative thermal test for thermoplastic luminaires.....	220
W.1 Thermal test in regard to fault conditions in lamp controlgear or electronic devices without temperature sensing controls in thermoplastic luminaires for fluorescent lamps ≤ 70 W.....	220

This is a preview of "BS EN IEC 60598-1:20...". [Click here to purchase the full version from the ANSI store.](#)

Annex X (normative) Requirements for insulation between active parts of circuits and accessible conductive parts	222
Annex Y (informative) Information regarding power sourcing equipment powering class III luminaires via information technology communication cabling	224
Y.0 General.....	224
Y.1 Insulation of the mains supply	224
Y.2 Electrical limits of a PSE.....	224
Bibliography.....	226
Figure 34 – Circuit for checking electrical contact between socket outlet and plug	85
Figure 33 – Test to determine suitability of conductors having a reduced cross-sectional area	90
Figure 1 – Symbols	149
Figure 2 – Terminal block arrangement for installation test for luminaires with connecting leads (tails)	152
Figure 3 – Void	152
Figure 4 – Illustration of the requirements of 4.15	152
Figure 5 – Void	152
Figure 6 – Apparatus for proving protection against dust.....	153
Figure 7 – Apparatus for testing protection against rain and splashing.....	154
Figure 8 – Nozzle for spray test	155
Figure 9 – Relation between winding temperature and mounting surface temperature.....	156
Figure 10 – Ball-pressure apparatus	157
Figure 11 – Arrangement and dimensions of the electrodes for the tracking test	157
Figure 12 – Pillar terminals	158
Figure 13 – Screw terminals and stud terminals	159
Figure 14 – Saddle terminals	161
Figure 15 – Lug terminals	162
Figure 16 – Mantle terminals.....	163
Figure 17 – Construction of electrical connections	164
Figure 18 – Examples of spring-type screwless terminals	164
Figure 19 – Further examples of screwless terminals.....	165
Figure 20 – Illustration of the terms "lopping-in" and "through wiring".....	166
Figure 21 – Apparatus for ball impact tests	167
Figure 22 – Examples of self-tapping, thread-cutting and thread-forming screws (from ISO 1891)	167
Figure 23 – Void	167
Figure 24 – Illustration of creepage and clearance measurements at a supply terminal.....	168
Figure 25 – Void	168
Figure 26 – Test circuit for safety during insertion.....	168
Figure 27 – Ignition temperatures of wood as a function of time	169
Figure 28 – Example of permitted degree of soldering	170
Figure 29 – Test chain	170
Figure 30 – Example of a thread forming screw used in a groove of a metallic material	171
Figure 31 – Electro-mechanical contact system with plug/socket connection.....	172

This is a preview of "BS EN IEC 60598-1:20...". [Click here to purchase the full version from the ANSI store.](#)

Figure 32 – Test circuit for luminaires incorporating fluorescent lamp ≤ 70 W	172
Figure C.1 – Circuit for testing rectifying effect (some capacitive starterless ballasts only)	178
Figure C.2 – Circuit for testing rectifying effect (ballasts for single pin lamps)	178
Figure C.3 – Circuit for testing rectifying effect of some high pressure sodium and some metal halide lamps	179
Figure D.1 – Example of test recess where a luminaire comprises separate parts, in accordance with Clause D.2 a)	181
Figure D.2 – Example of test recess where a luminaire comprises separate parts, in accordance with Clause D.2 b)	182
Figure D.3 – Correct test box size (insulating ceilings) for settable and adjustable luminaires	183
Figure G.1 – Test configuration: single-phase equipment on star TN or TT system	190
Figure G.2 – Measuring network, touch current weighted for perception or reaction	190
Figure G.3 – Measuring network, touch current weighted for let-go (for portable class I luminaires)	191
Figure G.4 – Measuring network, weighted for high frequency	191
Figure K.1 – Placing of thermocouples on a typical lampholder	198
Figure V.1 – Arrangement for voltage drop test	219
Figure X.1 – Declaration of LV_{supply} and U_{out} and the insulation barriers between the light source and accessible parts	222
Table 3.1 – Marking	39
Table 3.2 – Identification of extra-low-voltage DC leads and terminations	41
Table 4.6 – Overview of required Y capacitors	55
Table 4.1 – Torque tests on screws	58
Table 4.2 – Torque tests on cable glands	60
Table 4.3 – Impact energy and spring compression	61
Table 4.4 – Test on semi-luminaires	65
Table 4.5 – Test on adjusting devices	66
Table 5.1 – Supply cord	80
Table 5.3 – Wiring dimension	81
Table 5.2 – Tests for cord anchorage	84
Table 9.1 – Solid-object-proof luminaire test	101
Table 10.1 – Minimum insulation resistance	106
Table 10.2 – Electric strength	108
Table 10.3 – Limits of touch current or protective conductor current and electric burn	110
Table 11.1.A – Minimum creepage distances for AC sinusoidal voltages up to 30 kHz (to be used in conjunction with Annex M)	113
Table 11.1.B – Minimum clearance for working voltages (to be used in conjunction with Annex M)	114
Table 11.2 – Minimum distances for ignition pulse voltages or equivalent peak voltage U_p	114
Table 12.1 – Maximum temperatures under the test conditions of 12.4.2, for principal parts	120
Table 12.2 – Maximum temperatures under the test conditions of 12.4.2, for common materials used in luminaires	122

This is a preview of "BS EN IEC 60598-1:20...". [Click here to purchase the full version from the ANSI store.](#)

Table 12.3 – Maximum temperatures under the test conditions of 12.5.1	125
Table 12.4 – Maximum temperature of windings under abnormal operating conditions and at 110 % of rated voltage for lamp controlgear	126
Table 12.5 – Maximum temperature of windings under abnormal operating conditions and at 110 % of rated voltage for lamp controlgear marked "D6"	126
Table 12.6 – Temperature overshoot time limitation	128
Table 14.1 – Nominal cross-sectional areas of conductors according to terminal sizes	136
Table 14.2 – Nominal cross-sectional areas of conductors according to maximum current	136
Table 14.3 – Composition of conductors	137
Table 14.4 – Torque to be applied to screws and nuts	139
Table 14.5 – Pull to be applied to conductor	140
Table 15.1 – Conductor rating	146
Table 15.2 – Conductor pull force	147
Table F.1 – pH value of the test solution	186
Table G.1 – Position of switch e, n and p for the measurements of the different classes of luminaires	189
Table J.1 – Degrees of protection indicated by the first characteristic numeral	194
Table J.2 – Degrees of protection indicated by the second characteristic numeral	195
Table L.1 – Damaging influences	199
Table M.1 – Determination of creepage distances and clearances (see Table 11.1)	204
Table N.1 – Guidance on when to use the symbol and its explanation on the luminaire or in the manufacturer's instructions provided with the luminaire	205
Table N.2 – Thermal protection operation	207
Table Q.1 – Minimum values for electrical tests	212
Table U.1 – Minimum clearance distances for AC sinusoidal working voltages impulse withstand category III	216
Table U.2 – Overview of required Y capacitors	217
Table X.1 – Insulation requirements between active parts and accessible conductive parts	223
Table Y.1 – Limits for the electrical parameters of a PSE	224
Table Y.2 – Electrical parameters for communication cable/connectors	225

INTERNATIONAL ELECTROTECHNICAL COMMISSION

LUMINAIRES –

Part 1: General requirements and tests

FOREWORD

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International Standard IEC 60598-1 has been prepared by subcommittee 34D: Luminaires, of IEC technical committee 34: Lamps and related equipment.

This ninth edition cancels and replaces the eighth edition published in 2014 and Amendment 1:2017. This edition constitutes a technical revision.

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

- a) Revision of Clause 4.30, Fixing cover live parts of non-user replaceable light source;
- b) Subclause 4.24.2, Blue Light Hazard: removal of Risk Group 0;
- c) Subclause 5.2.16: additional requirements for AC mains appliance inlets related to IEC 61984;
- d) Addition of Subclause 3.3.25, UV protection of cable;
- e) Addition of Clause 4.34, Inclusion of EMF safety requirements (IEC 62493);

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- f) Revision of the requirements for functional earth and protective earth;
- g) Addition of Clause 4.35, Protection against fast rotating parts;
- h) Revision of Clause 3.2, Rated voltage marking;
- i) Revision of Subclause 5.2.10, Cord anchorage;
- j) Revision of Annex G for touch current and protective conductor current test set-up;
- k) Addition of requirements for constant light output function and programmable current output;
- l) Revision of Subclause 8.2.3 c), touch voltage limits for interrupted DC voltage;
- m) Introduction of PELV;
- n) Introduction of Ethernet power supply connection for luminaires (PoE);
- o) Section 9, Introduction of IPX9;
- p) Addition of Subclause 3.3.26 for wall mounted luminaires;
- q) Revision of Annex D introducing alternative thermal tests for luminaires with t_a marking higher than 25°C;
- r) Revision of Table 10.3 and Subclause 3.3.19 for protective conductor current limits;
- s) Track-mounted luminaires: cross reference to Annex A of IEC 60570:2003/AMD2:2019;
- t) Revision of Subclause 10.2.2, alternative DC electric strength test;
- u) Revision of Annex D for recessed luminaires;
- v) Subclause 4.12.5: revision of Table 4.2 for torque test on metal glands;
- w) Revision of use of bridging capacitors in luminaires;
- x) Revision of electrical connection to class III plugs.

The major changes which may affect certification are given in Annex R.

Annex R shows where a new text has been included which contains more serious/critical requirements requiring products to be re-tested.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
34D/1546/FDIS	34D/1560/RVD

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

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

A list of all parts in the IEC 60598 series, published under the general title *Luminaires*, can be found on the IEC website.

NOTE In this document, the following print types are used:

- requirements: in roman type;
- *test specifications: in italic type;*
- notes: in small roman type.

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The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

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LUMINAIRES –

Part 1: General requirements and tests

SECTION 0: GENERAL INTRODUCTION

0.1 Scope

This Part 1 of IEC 60598 specifies general requirements for luminaires, incorporating electric light sources for operation from supply voltages up to 1 000 V. The requirements and related tests of this document cover: classification, marking, mechanical construction, electrical construction and photobiological safety.

Each section of this Part 1 is read in conjunction with this Section 0 and with other relevant sections to which reference is made.

Each part of IEC 60598-2 details requirements for a particular type of luminaire or group of luminaires on supply voltages not exceeding 1 000 V. These parts are published separately for ease of revision and additional sections will be added as and when a need for them is recognized.

The presentation of photometric data for luminaires is under consideration by the International Commission on Illumination (CIE) and is not, therefore, included in this Part 1.

Requirements are included in this Part 1 for luminaires incorporating ignitors with nominal peak values of the voltage pulse not exceeding those of Table 11.2. The requirements apply to luminaires with ignitors built into ballasts and to luminaires with ignitors separate from ballasts. For luminaires with ignitors built into lamps, the requirements are under consideration.

Requirements for semi-luminaires are included in this Part 1.

In general, this Part 1 covers safety requirements for luminaires. The object of this Part 1 is to provide a set of requirements and tests which are considered to be generally applicable to most types of luminaires and which can be called up as required by the detail specifications of IEC 60598-2. This Part 1 is thus not regarded as a specification in itself for any type of luminaire, and its provisions apply only to particular types of luminaires to the extent determined by the appropriate part of IEC 60598-2.

The parts of IEC 60598-2, in making reference to any of the sections of Part 1, specify the extent to which that section is applicable and the order in which the tests are performed; they also include additional requirements as necessary.

The order in which the sections of Part 1 are numbered has no particular significance as the order in which their provisions apply is determined for each type of luminaire or group of luminaires by the appropriate part of IEC 60598-2. All parts of IEC 60598-2 are self-contained and therefore do not contain references to other parts of IEC 60598-2.

Where the requirements of any of the sections of Part 1 are referred to in the parts of IEC 60598-2 by the phrase "The requirements of section... of IEC 60598-1 apply", this phrase is interpreted as meaning that all the requirements of that section of Part 1 apply except those which are clearly inapplicable to the particular type of luminaire covered by that part of IEC 60598-2.