BS EN IEC 60598-1:2021+A11:2022
Incorporating corrigendum August 2022

BSI Standards Publication

Luminaires

Part 1: General requirements and tests

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Full document details: BS EN IEC 60598-1:2021+A11:2022

National foreword

This British Standard is the UK implementation of EN IEC 60598-1:2021+A11:2022. It supersedes BS EN IEC 60598-1:2021 which will be withdrawn on 16 February 2025.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to CENELEC text carry the number of the CENELEC amendment. For example, text altered by CENELEC amendment A11 is indicated by ⟩A11⟨ ⟩A11⟨.

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.

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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.

For the Northern Ireland market, UK law will continue to implement relevant EU law subject to periodic confirmation. Therefore Annex ZA/ZZ in the European text, and references to EU legislation, are still valid for this market.

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 July 2022	Implementation of CENELEC amendment A11:2022
31 August 2022	Correction to National Foreword text

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 60598-1:2021+A11:2022

April 2022

ICS 29.140.40

Supersedes EN 60598-1:2015 and all of its amendments and corrigenda (if any)

English Version

Luminaires - Part 1: General requirements and tests (IEC 60598-1:2020)

Luminaires - Partie 1: Exigences générales et essais (IEC 60598-1:2020)

Leuchten - Teil 1: Allgemeine Anforderungen und 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 Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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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

〈A11〉 The text of the International Standard IEC 60598-1:2020 was approved by CENELEC as a European Standard with agreed common modifications. 〈A11〉

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 60432-3	NOTE	Harmonized as EN 60432-3
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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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.

Publication	Year	Title	EN/HD	Year
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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Publication	Year	Title	EN/HD	Year
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) A1 A2	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) A1 (mod) A2	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	Electrical supply track systems for luminaires	EN 60570	2003
+ A1	2017		+ A1	2018
+ A2	2019		+ A2	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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Publication	Year	Title	EN/HD	Year
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 transformersand 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	2018
			+ A1	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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Publication	Year	Title	EN/HD	Year
-	-		+ 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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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 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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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;	Section 4 Section 7 Section 14 and 15 Section 5 Section 8	All to be used in conjunction with relevant part 2
b) temperatures, arcs or radiation which would cause a danger, are not produced;	Section 4 Section 11 Section 12 Section 10	All to be used in conjunction with relevant part 2
c) persons, domestic animals and property are adequately protected against non-electrical dangers caused by the electrical equipment which are revealed by experience;	Section 4 Section 10 Section 11	All to be used in conjunction with relevant part 2
d) the insulation is suitable for foreseeable conditions.	Section 9 Section 10	All to be used in conjunction with relevant part 2
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;	Section 3 Section 4	All to be used in conjunction with relevant part 2
b) is resistant to non-mechanical influences in expected environmental conditions, in such a way that persons, domestic animals and property are not endangered;	Section 9 Section 13	All to be used in conjunction with relevant part 2
c) does not endanger persons, domestic animals and property in foreseeable conditions of overload.	Section 4 Section 12	All to be used in conjunction with relevant part 2

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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.

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Annex ZB
(normative)

Special national conditions

Special national condition: National characteristic or practice that cannot be changed even over a long period, e.g. climatic conditions, electrical earthing conditions.

NOTE If it affects harmonization, it forms part of the European Standard or Harmonization Document.

For the countries in which the relevant special national conditions apply these provisions are normative, for other countries they are informative.

Clause	Special national condition

3.3 **Denmark**

Supply cords of class I luminaires, which are delivered without a plug, shall be provided with a visible tag with the following text:

Vigtigt !
Lederen med grøn/gul isolation
må kun tilsluttes en klemme mærket

If essential for the safety of the luminaire, the tag shall in addition be provided with a diagram, which shows the connection of the other conductors, or be provided with the following text:

For tilslutning af the øvrige ledere,

se medfølgende vejledning.

NOTE “ø” may be replaced by “oe”; “æ” may be replaced by “ae”.

5.2.18 **Denmark**

Socket-outlets intended for providing power to other appliances shall be in compliance with DS60884-2-D1:2017, the Standard Sheets being applied as follows:

Class I . . . . . Standard Sheet DK 1-3a, DK 1-1c and

DK 1-1d

For class I luminaires, the earthing contact of the socket-outlet shall be electrically connected to the earthing terminal of the appliance.

Class II luminaires with a degree of protection not higher than IPX0, Standard Sheet DKA 1-4a can be used.

EXEMPTION:

Socket-outlets supplied from isolation transformers (shaver supply units) and socket-outlets on outdoor luminaires may be in accordance with the requirement of DS60884-2-D1:2017 for fixed socket-outlets.

5.2.1 **Cyprus**

Domestic luminaires intended for connection to a standard United Kingdom 13 A socket must be pre-fitted with an approved plug complying with BS 1363.

Cord sets for domestic luminaires for connection with an appliance inlet must be pre-fitted with an approved plug complying with BS 1363.

Plugs must be fitted with the correct fuse.

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Denmark

Supply cords on single-phase portable luminaires having a rated current not exceeding 13 A

shall be provided with a plug according to the following table:

Class of luminaire	DS60884-2-D1:2017	EN 50075 Standard Sheet
Class I	DK 2-1a, C 2b, C 3b or C 4	
Class II	DKA 2-1a, DKA 2-1b, C 5, C 6	I

For luminaires having an appliance inlet, the plug on the supply cord shall comply with the above requirements.

If multi-phase luminaires and single-phase luminaires having a rated current exceeding 13 A are provided with a supply cord with a plug, the plug shall comply with the following table or EN 60309.

Plug	
Class of luminaire	**DS60884-2-D1:2017**
Class I	**DK 6-1a**
Class II	**DK 6-1a***
*** Earthing contact not connected.**	

Finland

For luminaires provided with non-detachable flexible cables and cords and a plug, the plug shall comply with the requirements of SFS 5610 and EN 50075, the Standard Sheets to be applied being as follows:

- Class I luminaires SFS 5610, sheet IV or VII or IVA or VIIA

- Class II luminaires SFS 5610, sheet XVI (alt I only) or SFS 5610, sheet XVII or EN 50075, sheet I

United Kingdom

Domestic luminaires intended for connection to a standard United Kingdom 13 A socket must be pre-fitted with an approved plug complying with BS 1363.

Cord sets for domestic luminaires for connection with an appliance inlet must be pre-fitted with an approved plug complying with BS 1363.

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Annex ZC
(informative)

A-deviations

A-deviation: National deviation due to regulations, the alteration of which is for the time being outside the competence of the CEN-CENELEC national member.

This European Standard falls under Directive 2014/35/EU.

NOTE (from CEN/CENELEC IR Part 2:2018, 2.16) Where standards fall under EC Directives or Regulations, it is the view of the Commission of the European Communities (OJ No C 59; 1982-03-09) that the effect of the decision of the Court of Justice in case 815/79 Cremonini/Vrankovich (European Court Reports 1980, p. 3583) is that compliance with A-deviations is no longer mandatory and that the free movement of products complying with such a standard should not be restricted within the EC except under the safeguard procedure provided for in the relevant Directive or Regulation.

A-deviations in an EFTA-country are valid instead of the relevant provisions of the European Standard in that country until they have been removed.

Clause	Deviation
4 and 5	**France**
	(Arrêté of the 22th September 1969)
	Socket-outlets 10/16 A intended for providing power to other appliances except those supplied by an isolating transformer shall be shuttered.
	(Arrêté du 30 décembre 2011 portant règlement de sécurité pour la construction des immeubles de grande hauteur et leur protection contre les risques d'incendie et de panique)
	Section VIII, Installations électriques et éclairage
	Article GH 48, Eclairage
	§ Généralités:
	c) Les parties externes des luminaires satisfont à l'essai au fil incandescent, la température du fil incandescent étant de:
	– 850°C pour les luminaires dans les escaliers et les circulations horizontales communes ;
	– 650°C pour les luminaires dans les locaux.
	United Kingdom
	(Approved Document B of the United Kingdom Building Regulations)
	Particular fire protection requirements relating to thermoplastic diffusers are listed in Subclause 6.15 of the above Regulations."

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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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 25ÁC;

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:

ï requirements: in roman type;

ï *test specifications: in italic type;*

ï 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.

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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.

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For explosion proof luminaires, as covered by IEC 60079, the requirements of IEC 60598 (selecting the appropriate parts 2) are applied in addition to the requirements of IEC 60079. In the event of any conflict between IEC 60598 and IEC 60079, the requirements of IEC 60079 take priority.

Improvements in safety to take into account the state of the art technology are incorporated in the standards with revisions and amendments on an ongoing basis. Regional standardization bodies can include statements in their derived standards to cover products which have complied with the previous document as shown by the manufacturer or standardization body. The statements may require that for such products, the previous standard may continue to apply to production until a defined date after which the new standard shall apply.

0.2 Normative references

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.

IEC 60061 (all parts), *Lamp caps and holders together with gauges for the control of interchangeability and safety* (available at http://std.iec.ch/iec60061)

IEC 60061-2, *Lamp caps and holders together with gauges for the control of interchangeability and safety – Part 2: Lampholders* (available at http://std.iec.ch/iec60061)

IEC 60061-3, *Lamp caps and holders together with gauges for the control of interchangeability and safety – Part 3: Gauges* (available at http://std.iec.ch/iec60061)

IEC 60065:2014, *Audio, video and similar electronic apparatus – Safety requirements*

IEC 60068-2-6:2007, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-14:2009, *Environmental testing – Part 2-14: Tests – Test N: Change of temperature*

IEC 60068-2-31:2008, *Environmental testing – Part 2-31: Tests – Test Ec: Rough handling shocks, primarily for equipment-type specimens*

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

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*

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

IEC 60155, *Glow-starters for fluorescent lamps*

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

IEC 60238:2016, *Edison screw lampholders*

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

IEC 60320 (all parts), *Appliance couplers for household and similar general purposes*

IEC 60360, *Standard method of measurement of lamp cap temperature rise*

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*

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

IEC 60432-1:1999, *Incandescent lamps – Safety specifications – Part 1: Tungsten filament lamps for domestic and similar general lighting purposes*
IEC 60432-1:1999/AMD1:2005
IEC 60432-1:1999/AMD2:2011

IEC 60432-2:1999, *Incandescent lamps – Safety specifications –Part 2: Tungsten halogen lamps for domestic and similar general lighting purposes*
IEC 60432-2:1999/AMD1:2005
IEC 60432-2:1999/AMD2:2012

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 60570:2003, *Electrical supply track systems for luminaires*
IEC 60570:2003/AMD1:2017
IEC 60570:2003/AMD2:2019

IEC 60598-2 (all parts), *Luminaires – Part 2: Particular requirements*

IEC 60598-2-4:2017, *Luminaires – Part 2-4: Particular requirements – Portable general purpose luminaires*

IEC 60603 (all parts), *Connectors for frequencies below 3 MHz for use with printed boards*

IEC 60662, *High-pressure sodium vapour lamps – Performance specifications*

IEC 60664-4:2005, *Insulation coordination for equipment within low-voltage systems – Part 4: Consideration of high-frequency voltage stress*

IEC 60684 (all parts), *Flexible insulating sleeving*

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

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

IEC 60989, *Separating transformers, autotransformers, variable transformers and reactors*

IEC 60990, *Methods of measurement of touch current and protective conductor current*

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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*

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*

IEC 61032:1997, *Protection of persons and equipment by enclosures – Probes for verification*

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

IEC 61167, *Metal halide lamps – Performance specification*

IEC 61249 (all parts), *Materials for printed boards and other interconnecting structures*

IEC 61347 (all parts), *Lamp controlgear*

IEC 61347-1:2015, *Lamp controlgear – Part 1: General and safety requirements*
IEC 61347-1:2015/AMD1:2017

IEC 61347-2-9, *Lamp controlgear – Part 2-9: Particular requirements for electromagnetic controlgear for discharge lamps (excluding fluorescent lamps)*

IEC 61535:2009 [2], *Installation couplers intended for permanent connection in fixed installations*

IEC 61558 (all parts), *Safety of power transformers, power supplies, reactors and similar products*

IEC 61558-1:2005 [3], *Safety of power transformers, power supplies, reactors and similar products – Part 1: General requirements and tests*

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*

IEC 61643-11, *Low-voltage surge protective devices – Part 11: Surge protective devices connected to low-voltage power systems – Requirements and test methods*

IEC 61984:2008, *Connectors – Safety requirements and tests*

IEC 62368-3:2017, *Audio/video, information and communication technology equipment – Part 3: Safety aspects for DC power transfer through communication cables and ports*

IEC 62493:2015, *Assessment of lighting equipment related to human exposure to electromagnetic fields*

IEC 62680 (all parts), *Universal serial bus interfaces for data and power*

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1 Withdrawn.

2 Withdrawn.

3 Withdrawn.

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IEC TR 62778, *Application of IEC 62471 for the assessment of blue light hazard to light sources and luminaires*

IEC 80416-1, *Basic principles for graphical symbols for use on equipment ï Part 1: Creation of graphical symbol for registration*

0.3 General requirements

0.3.1 Luminaires shall be so designed and constructed that in normal use they function safely and cause no danger to persons or surroundings. In general, compliance is checked by carrying out all the tests specified.

0.3.2 A luminaire shall comply with a part of IEC 60598-2. If, however, an appropriate part of IEC 60598-2 does not exist for a particular luminaire or group of luminaires, the nearest applicable part of IEC 60598-2 may be used as a guide to the requirements and tests.

Where the design of a luminaire is such that two or more parts of IEC 60598-2 are applicable, the luminaire shall comply with both or all of the appropriate sections.

0.3.3 Semi-luminaires should be regarded as luminaires for test purposes.

0.4 General test requirements and verification

0.4.1 Tests according to this document are type tests. For the definition of a "type test", see Section 1.

The requirements and tolerances permitted by this document 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. Compliance for production is the responsibility of the manufacturer and may include routine tests and quality assurance in addition to type testing.

0.4.2 Except where otherwise specified in the sections of this document or relevant part of IEC 60598-2, luminaires shall be tested as delivered, and installed as for normal use, in an ambient temperature of between 10 ÁC and 30 ÁC, having regard to the manufacturer's installation instructions. The lamp (or lamps) is (are) not included except where essential for the test.

Luminaires cannot be regarded as meeting the requirements of this document unless all internal wiring is complete.

In general, the tests are made on a single sample luminaire or, where a range of similar luminaires is involved, on a single luminaire of each rated wattage in the range or on a representative selection from the range as agreed with the manufacturer (see Annex S). This selection shall include the luminaire, together with any attachments, which represents the most unfavourable combination from a testing point of view.

Each sample luminaire shall comply with all the relevant tests. In order to reduce the time of testing and to allow for any tests which may be destructive, the manufacturer may submit additional luminaires or parts of luminaires, provided that these are of the same materials and design as the original luminaire and that the results of the test are the same as if carried out on an identical luminaire. Where the test for compliance is shown as being "by inspection", this shall include any necessary handling.

For track-mounted luminaires the manufacturer shall provide, together with the luminaire, a sample of the appropriate track, connector and adaptors for the luminaire to be connected.

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Combination luminaires are tested for safety requirements with that assemblage of parts which gives the most unfavourable result.

Certain parts of luminaires, such as joints, raising and lowering devices, may be tested separately provided that the design of these parts is such that their performance is not dependent upon the other parts of the luminaires.

Luminaires intended to be used with supply cords are tested with the flexible supply cord connected to the luminaire.

For luminaires intended to be used with a shade, but not normally supplied with a shade, the manufacturer shall provide a shade, typical of the type that might be used with the luminaire.

0.4.3 Verification and tests

Luminaires for testing to the requirements of this document may have earlier test reports updated in accordance with this document by submitting a new sample for test together with the previous test reports.

Full type testing need not generally be necessary and the product and the previous test results shall be reviewed only against any amended clauses marked "R" and scheduled in Annex R.

NOTE Clauses marked "R" and scheduled in Annex R will be included in future amendments/editions.

0.5 Components of luminaires

0.5.1 Components, other than integral components, shall comply with the requirements of the relevant IEC standards, if any.

Components which comply with the requirements of the relevant IEC standard and marked with individual ratings are checked to establish that they suit the conditions which may occur in use. Aspects of use not covered by the respective standard shall require them to satisfy the additional relevant requirements of this document.

Compliance is checked by inspection and the relevant tests.

Integral components shall comply as far as is reasonable with the IEC component standards, as part of the luminaire.

NOTE 1 This does not imply that components need to be separately tested before approval of the luminaire.

NOTE 2 Guidance on the selection of components in different kinds of luminaires can be found in Annex L.

Internal wiring of a luminaire shall comply with the requirements in 5.3.

NOTE 3 This does not exclude the use of standardized cables.

0.5.2 Components complying with the requirements of their own standard and used in accordance with their intended use, shall only be tested to the requirements of this document where there are no requirements in the component standard (covering the requirement heading of this document).

A valid test report is considered adequate to show compliance.

Lampholders and starterholders shall additionally comply with the gauging and inter-changeability requirements of the appropriate IEC component standard where applicable after building into the luminaire.

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For terminal blocks with an integrated screwless protective earthing contact for direct connection to the luminaire or to parts of the body, special requirements apply according to Annex V.

0.5.3 Components for which no appropriate IEC standard exists shall satisfy the relevant requirements of this luminaire standard as part of the luminaire. Lampholders and starterholders shall additionally comply with the gauging and interchangeability requirements of the appropriate IEC component standard where applicable.

NOTE Examples of components are lampholders, switches, transformers, ballasts, flexible cables and cords and plugs.

0.5.4 Compliance with this document can only be ensured if protective shields of identical specification are used.

0.6 List of parts of IEC 60598-2

Part 2-1 Fixed general purpose luminaires
Part 2-2 Recessed luminaires
Part 2-3 Luminaires for road and street lighting
Part 2-4 Portable general purpose luminaires
Part 2-5 Floodlights
Part 2-6 Luminaires with built-in transformers for tungsten filament lamps[4]
Part 2-7 Portable luminaires for garden use[5]
Part 2-8 Handlamps
Part 2-9 Photo and film luminaires (non-professional)[6]
Part 2-10 Portable luminaires for children
Part 2-11 Aquarium luminaires
Part 2-12 Mains socket-outlet mounted nightlights
Part 2-13 Ground recessed luminaires
Part 2-14 Luminaires for cold cathode tubular discharge lamps (neon tubes) and similar equipment
Part 2-15 Not used at present
Part 2-16 Not used at present
Part 2-17 Luminaires for stage lighting, television and film studios (outdoor and indoor)
Part 2-18 Luminaires for swimming-pools and similar applications
Part 2-19 Air-handling luminaires (safety requirements)
Part 2-20 Lighting chains
Part 2-21 Rope lights
Part 2-22 Luminaires for emergency lighting
Part 2-23 Extra-low-voltage lighting systems for filament lamps
Part 2-24 Luminaires with limited surface temperatures
Part 2-25 Luminaires for use in clinical areas of hospitals and health care buildings

4 Withdrawn.

5 Withdrawn.

6 Withdrawn.

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0.7 Information for luminaire design in light sources standards

0.7.1 In accordance with IEC guidelines, IEC standards are divided into those covering either safety or performance.

0.7.2 In light source safety standards, "information for luminaire design" is given for the safe operation of light sources; this shall be regarded as normative when testing luminaires in accordance with this document.

0.7.3 In light source performance standards, "information for luminaire design" is given for the correct performance of light sources; this shall be regarded as informative when testing luminaires in accordance with this document. Testing of light source performance is not required as part of the type test approval for luminaires.

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SECTION 1: TERMS AND DEFINITIONS

1.1 General

This section gives general definitions applicable to luminaires.

1.2 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

NOTE 1 Other definitions related to lamps can be found in the relevant lamp standards.

NOTE 2 Where the terms "voltage" and "current" are used, they imply the RMS values unless otherwise stated.

1.2.1
luminaire
apparatus which distributes, filters or transforms the light transmitted from one or more lamps and which includes all the parts necessary for supporting, fixing and protecting the lamps, but not the lamps themselves, and where necessary, circuit auxiliaries together with the means for connecting them to the supply

Note 1 to entry: A luminaire with integral non-replaceable lamps is regarded as a luminaire, except that the tests are not applied to the integral lamp or integral self ballasted lamp.

1.2.2
main part of luminaire
part that is fixed to the mounting surface or is directly suspended from it or standing on it

Note 1 to entry: It may or may not carry the lamps, lampholders and auxiliary gear.

Note 2 to entry: In luminaires for tungsten filament lamps, the part carrying the lampholder is normally the main part.

1.2.3
ordinary luminaire
luminaire providing protection against accidental contact with live parts but without any other special protection against dust, solid objects or moisture

1.2.4
general purpose luminaire
luminaire which is not designed for a special purpose

Note 1 to entry: Examples of general purpose luminaires include pendants, some spotlights and certain fixed luminaires for surface or recessed mounting. Examples of special purpose luminaires are those for rough usage, photo and film applications and swimming-pools.

1.2.5
adjustable luminaire
luminaire, the main part of which can be turned or moved by means of joints, raising and lowering devices, telescopic tubes or similar devices

Note 1 to entry: An adjustable luminaire may be fixed or portable.

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1.2.6
basic luminaire
smallest number of assembled parts that can satisfy the requirements of any of the parts of IEC 60598-2

1.2.7
combination luminaire
luminaire consisting of a basic luminaire in combination with one or more parts which may be replaced by other parts, or used in a different combination with other parts and changed either by hand or with the use of tools

1.2.8
fixed luminaire
luminaire which cannot easily be moved from one place to another, either because the fixing is such that the luminaire can only be removed with the aid of a tool, or because it is intended for use out of arms reach

Note 1 to entry: In general, fixed luminaires are designed for permanent connection to the supply, but connection may also be made by means of a plug or similar device.

1.2.9
portable luminaire
luminaire which, in normal use, can be moved from one place to another while connected to the supply

Note 1 to entry: Luminaires for wall mounting provided with a supply cord for connection to a plug and luminaires which may be fixed to their support by means of a wing screw, a clip or a hook so that they can easily be removed from their support by hand, are considered to be portable luminaires.

1.2.10
recessed luminaire
luminaire intended by the manufacturer to be fully or partly recessed into a mounting surface

Note 1 to entry: The term applies both to luminaires for operation in enclosed cavities and to luminaires for mounting through a surface such as a suspended ceiling.

1.2.11
rated voltage
supply voltage or voltages assigned to the luminaire by the manufacturer

1.2.11.1
rated constant input voltage
input voltage or voltages assigned by the manufacturer for luminaires not equipped with controlgear

Note 1 to entry: The rated constant input voltage of the luminaire corresponds to the rated output voltage of the constant voltage controlgear.

1.2.12
supply current
current at the supply terminals when the luminaire has stabilized in normal use at the rated voltage and frequency

1.2.12.1
rated constant input current
input current or currents assigned by the manufacturer for luminaires not equipped with controlgear

Note 1 to entry: The rated constant input current of the luminaire corresponds to the rated output current for constant current controlgear.

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1.2.13
rated wattage
number and rated wattage of the lamps for which the luminaire is designed

1.2.14
supply cord
external flexible cable or cord, for supply purposes, that is fixed to the luminaire

Note 1 to entry: Luminaires may be provided with the supply cord or designed for attachment of a supply cord e.g. type X or Y attachment.

Note 2 to entry: It is the intention to amend each Part 2 of IEC 60598 to align with this modification; however, this will be done when each Part 2 is amended for other reasons. In the meantime, therefore, wherever a Part 2 makes reference to a "non-detachable flexible cable or cord" read "supply cord".

1.2.15
live part
conductive part which may cause an electric shock in normal use

Note 1 to entry: The test to determine whether or not a conductive part is a live part which may cause an electric shock is given in Annex A.

Note 2 to entry: The neutral conductor is, however, regarded as a live part.

1.2.16
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.

1.2.17
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

1.2.18
double insulation
insulation comprising both basic insulation and supplementary insulation

1.2.19
reinforced insulation
single insulation system applied to live parts, which provides a degree of protection against electric shock equivalent to double insulation

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

1.2.20
protective impedance device
component or assembly of components used to bridge double or reinforced insulation and the impedance and construction of which are such as to ensure that steady state touch current and charge are limited to a non-hazardous level

1.2.21
(Void)

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1.2.22
class I luminaire
luminaire in which protection against electric shock does not rely on basic insulation only, but which includes an additional safety precaution in such a way that means are provided for the connection of accessible conductive parts to the protective (earthing) conductor in the fixed wiring of the installation in such a way that accessible conductive parts cannot become live in the event of a failure of the basic insulation

Note 1 to entry: For a luminaire intended for use with a flexible cord or cable, this provision includes a protective conductor as part of the flexible cord or cable.

Note 2 to entry: Class I luminaires may have parts with double insulation or reinforced insulation.

Note 3 to entry: Class I luminaires may have parts in which protection against electric shock relies on operation at safety extra-low voltage (SELV) or protective extra-low voltage (PELV).

1.2.23
class II luminaire
luminaire in which protection against electric shock does not rely on basic insulation only, but in which additional safety precautions such as double insulation or reinforced insulation are provided, there being no provision for protective earthing or reliance upon installation conditions

Note 1 to entry: Such a luminaire may be of one of the following types:

a) A luminaire having a durable and substantially continuous enclosure of insulating material which envelops all metal parts with the exception of small parts such as nameplates, screws and rivets which are isolated from live parts by insulation at least equivalent to reinforced insulation. Such a luminaire is called an insulation encased class II luminaire.

b) A luminaire having a substantially continuous enclosure of metal, insulated from live parts by insulation at least equivalent to double or reinforced insulation. Such a luminaire is called a metal-encased class II luminaire.

c) A luminaire which is a combination of types a) and b) above.

Note 2 to entry: The enclosure of an insulation-encased class II luminaire may form a part or the whole of the supplementary insulation or the reinforced insulation.

Note 3 to entry: If functional earthing is provided to assist starting, or for EMC reasons, but is not connected to an accessible metal part, the luminaire may still be deemed to be of class II. Accessible metal parts in compliance with the appropriate IEC lamp specification and other metal parts not normally earthed and not normally accessible during normal use are not regarded to be conductive parts which may cause an electric shock unless the tests of Annex A show them to be live parts.

Note 4 to entry: If a luminaire with double insulation and/or reinforced insulation throughout has a protective earthing terminal or a protective earthing contact, it is a class I construction. However, a fixed class II luminaire may have an internal terminal or contact for maintaining the electrical continuity (e.g. for looping in or through wiring) of a protective earthing conductor, provided that the terminal is insulated from accessible metal parts by class II insulation.

Note 5 to entry: Class II luminaires may have parts in which protection against electric shock relies on operation at safety extra-low voltage (SELV) or protective extra-low voltage (PELV).

1.2.24
class III luminaire
luminaire in which protection against electric shock relies on supply at safety extra-low voltage (SELV) or protective extra-low voltage (PELV) and in which voltages higher than those of SELV or PELV are not generated

Note 1 to entry: An ES1 PSE fulfilling the requirements of IEC 62368-3:2017 can be regarded as SELV.

1.2.25
rated maximum ambient temperature
t_a
temperature assigned to a luminaire by the manufacturer to indicate the highest sustained temperature in which the luminaire may be operated under normal conditions

Note 1 to entry: This does not preclude temporary operation at a temperature not exceeding (t_a + 10) °C.

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1.2.26
rated maximum operating temperature
t_c
<of a controlgear or capacitor> highest permissible temperature which may occur on the outer surface (at the indicated place if marked) of the component under normal operating conditions at the rated voltage or maximum of the rated voltage range

1.2.27
rated maximum operating temperature
t_w
<of a lamp controlgear winding> winding temperature assigned by the manufacturer as the highest temperature at which 50/60 Hz lamp controlgear may be expected to have a service life of at least 10 years continuous operation

1.2.28
ballast
unit inserted between the supply and one or more discharge lamps which, by means of inductance, capacitance or resistance, single or in combination, serves mainly to limit the current of the lamp(s) to the required value

Note 1 to entry: It may also include means for transforming from the supply voltage and arrangements which help to provide starting voltage and preheating current, prevent cold starting, reduce stroboscopic effect, correct the power factor and suppress radio interference.

1.2.29
independent lamp controlgear
lamp controlgear consisting of one or more separate elements so designed that it, or they, can be mounted separately outside a luminaire with protection according to the marking on the lamp controlgear and without any additional enclosure

1.2.30
built-in lamp controlgear
lamp controlgear designed to be built into a luminaire and not intended to be mounted outside a luminaire without special precautions

1.2.31
integral lampholder
part of a luminaire which supports the lamp and provides electrical contact with it and which is designed as part of the luminaire

1.2.32
(Void)

1.2.33
translucent cover
light-transmitting parts of the luminaire which may also protect the lamps and other component parts including diffusers, lens panels and similar light-control elements

1.2.34
fixed wiring
cable which is part of the fixed installation to which the luminaire is connected

Note 1 to entry: Fixed wiring may be brought into the luminaire and connected to terminals, including terminals of lampholders, switches and the like.

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1.2.35
appliance coupler
means enabling a flexible cable to be connected at will to the luminaire consisting of two parts: a connector provided with contact tubes which is the part integral with or designed to be attached to the flexible cable connected to the supply and an appliance inlet, provided with contact pins, which is the part incorporated in or fixed to the luminaire

1.2.36
external wiring
wiring generally outside the luminaire but delivered with it

Note 1 to entry: External wiring may be used for connecting the luminaire to the supply, to other luminaires, or to any external ballast.

Note 2 to entry: External wiring is not necessarily outside the luminaire for its full length.

1.2.37
internal wiring
wiring generally inside the luminaire and delivered with it, which forms the connection between terminations for external wiring or supply cords and terminations of lampholders, switches and similar components

Note 1 to entry: Internal wiring is not necessarily inside the luminaire for its full length.

1.2.38
normally flammable material
material having an ignition temperature of at least 200 ÁC and which will not deform or weaken at this temperature

EXAMPLE Wood and materials based on wood of more than 2 mm thickness.

Note 1 to entry: The ignition temperature and the resistance of normally flammable materials to deformation or weakening are based on widely accepted values determined during a test period of 15 min.

1.2.39
readily flammable material
material which cannot be classified as either normally flammable or non-combustible

EXAMPLE Wood fibre and materials based on wood of up to 2 mm thickness.

1.2.40
non-combustible material
material incapable of supporting combustion

Note 1 to entry: For the purposes of this document, materials such as metal, plaster and concrete are regarded as non-combustible materials.

1.2.41
flammable material
material which does not comply with the glow-wire test requirements of 13.3.2

1.2.42
ELV
extra-low voltage
voltage which does not exceed 50 V AC RMS or 120 V ripple free DC between conductors, or between any conductor and earth (voltage band I of IEC 60449)

Note 1 to entry: "Ripple free" is conventionally defined for sinusoidal ripple voltage as a ripple content of not more than 10 % RMS: the maximum peak value does not exceed 140 V for a nominal 120 V ripple-free DC system, respectively 70 V for a nominal 60 V ripple-free DC system, and 35 V for a nominal 30 V ripple-free system.

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Note 2 to entry: For interrupted DC, for frequencies between 10 Hz and 200 Hz, this document applies a maximum 50 V peak limit for ELV, this limit includes a possible ripple. For frequencies outside this frequency range, the limits of direct current apply.

Note 3 to entry: The requirements for the frequency range between 10 Hz and 200 Hz comes from a 1936 research paper, entitled "Electric Shock Effects of Frequency", authored by W.B. Kouwenhoven, D.R. Hooker and E.L. Lotz.

1.2.42.1
FELV
functional extra-low voltage
ELV in a circuit provided for functional purposes and not fulfilling the requirements for SELV (or PELV)

1.2.42.2
SELV system
safety extra-low-voltage system
electric system in which the voltage cannot exceed the value of extra-low voltage

– under normal conditions and

– under single fault conditions, including earth faults in other electric circuits

Note 1 to entry: In this document the term "SELV" is used when a SELV system is meant.

Note 2 to entry: Maximum voltage lower than 50 V AC RMS or 120 V ripple free DC may be specified in particular requirements, especially when direct contact with current-carrying parts is allowed.

[SOURCE: IEC 60050-826:2004, 826-12-31, modified – The notes have been added.]

1.2.42.3
PELV system
protective extra-low-voltage system
electric system in which the voltage cannot exceed the value of extra-low voltage

– under normal conditions and

– under single fault conditions, except earth faults in other electric circuits

Note 1 to entry: In this document the term "PELV" is used when a PELV system is meant.

[SOURCE: IEC 60050-826:2004, 826-12-32, modified – The note has been added.]

1.2.43
working voltage
highest RMS voltage which may occur across any insulation at rated supply volts, transients being neglected, in open-circuit conditions or during normal operation

1.2.43.1
maximum working peak output voltage
$\hat{U}_{\text{out}}$
maximum repetitive occurring peak working voltage between the output terminals or between the output terminals and earth, during normal or abnormal operating condition and with transients neglected

[SOURCE: IEC 61347-1:2015, 3.45]

1.2.43.2
ignition voltage
peak voltage applied to ignite a discharge lamp

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

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1.2.43.3
ignition pulse voltage
peak ignition voltage with a total duration of ≤ 750 µs (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 ε s 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]

1.2.43.4
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 1.2.43.3.

[SOURCE: IEC 61347-1:2015, 3.47, modified ï Notes 3 and 4 have been deleted.]

1.2.44
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

1.2.45
type test sample
sample consisting of one or more similar units submitted by the manufacturer or the responsible vendor for the purpose of a type test

1.2.46
by hand
not requiring the use of a tool

1.2.47
terminal
that part of a luminaire or component which is necessary to make electrical connection to a conductor

Note 1 to entry: See Sections 14 and 15.

1.2.48
looping-in
system of mains supply connection to two or more luminaires where each supply conductor is taken into and out of the same terminal

Note 1 to entry: A supply conductor may be cut to facilitate connections to a terminal (see Figure 20).

1.2.49
through wiring
wiring which passes through the luminaire intended for interconnection of a row of luminaires

Note 1 to entry: Some countries do not permit joints in through wiring.

Note 2 to entry: The luminaire may or may not be electrically connected to the through wiring (see Figure 20).

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1.2.50
starting device
apparatus that, by itself or in combination with other components in the circuit, provides the appropriate electrical conditions to start a discharge type of lamp

1.2.51
starter
starting device, usually for fluorescent lamps, that provides for the necessary preheating of the electrodes and in combination with the series impedance of the ballast, causes a surge in the voltage applied to the lamp

1.2.52
ignitor
starting device that generates voltage pulses to start a discharge lamp and that does not provide for preheating of electrodes

1.2.53
terminal block
assembly of one or more terminals in or on a housing or body of insulating material to facilitate interconnection between conductors

1.2.54
rough service luminaire
luminaire designed to withstand severe mechanical handling

Note 1 to entry: The luminaire may:

– be permanently fixed, or

– be temporarily fixed on a construction or stand, or

– incorporate an integral stand or handle.

Note 2 to entry: Such luminaires are for use where normally rough circumstances occur, or where temporary lighting is required, for example on building sites, in engineering workshops and similar applications.

1.2.55
electro-mechanical contact system
connection system within a luminaire by which the main part carrying the lampholder is electrically and mechanically connected to the base plate or suspension device

SEE: Figure 31 describes an electro-mechanical contact system as defined in 1.2.55. As such the requirements of 4.11.6 and 7.2.1 apply. Because, in the situation described, the base and gear tray are unique and non-interchangeable, the base plate does not require marking with the rated current of the electrical connection, as specified in 3.2.

Note 1 to entry: The system can incorporate an adjusting device.

Note 2 to entry: The system can be dedicated to a specific luminaire design or can provide for connection of a variety of luminaire types.

1.2.56
(Not used at present)

1.2.57
mounting surface
part of any building, furniture or other structure which a luminaire may in any way be attached to, suspended from, stood on or placed upon in normal use and which will or is intended to support the luminaire

1.2.58
integral component
component which forms a non-replaceable part of a luminaire and which cannot be tested separately from the luminaire

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1.2.59
self-ballasted lamp
unit which cannot be dismantled without being permanently damaged, provided with a lamp cap and incorporating a light source and any additional elements necessary for starting and stable operation of the light source

Note 1 to entry: The light source component of a self-ballasted lamp is not replaceable.

Note 2 to entry: The ballast component is part of the self-ballasted lamp; it is not part of the luminaire. It is discarded at the end of the life of the unit.

Note 3 to entry: For test purposes, self-ballasted lamp units should be regarded as conventional lamps.

Note 4 to entry: For examples and further information, see IEC 60972.

1.2.60
semi-luminaire
unit similar to a self-ballasted lamp but designed to utilize a replaceable light source and/or starting device

Note 1 to entry: The light source component and/or starting device of a semi luminaire is readily replaceable.

Note 2 to entry: The ballast component is not replaceable and is not disposed of each time a light source is replaced.

Note 3 to entry: A lampholder is required for a supply connection.

Note 4 to entry: For examples and further information, see IEC 60972.

1.2.61
plug-in independent controlgear
independent controlgear provided with an integral plug as the means of connection to the electrical supply

1.2.62
mains socket-outlet-mounted luminaire
luminaire provided with an integral plug as the means of both mounting and connection to the electrical supply

1.2.63
clip-mounted luminaire
integral assembly of a luminaire and resilient spring clip, securing the luminaire in position on its mounting surface by a single hand action

1.2.64
lamp connectors
set of contacts specially designed to provide a means of electrical contact but not to support the lamp

1.2.65
mains socket-outlet
accessory having socket-contacts designed to engage with the pins or blades of a mains plug and having terminals for the connection of cables or cords

1.2.66
(Void)

1.2.67
(Void)

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1.2.68
lamp controlgear
devices employed for the control of lamps, for example ballasts, transformers and step-down convertors

Note 1 to entry: The definition does not include devices for the switching of lamps or the control of brightness such as dimmers and daylight sensors.

1.2.69
(Void)

1.2.70
dummy lamp
device incorporating a cap which is in compliance with the requirements of IEC 60061 (all parts) where applicable

1.2.71
self-shielded lamp
tungsten halogen lamp or metal halide lamp for which the luminaire needs no protective shield for protection against UV emission or lamp shattering

1.2.72
external flexible cable or cord
flexible cable or cord for external connection to the input or output circuit, fixed to or assembled with, the luminaire according to a type X (1.2.72.1), Y (1.2.72.2) or Z (1.2.72.3) method of attachment

1.2.72.1
type X attachment
method of attachment of the cable or cord such that it can be easily replaced

Note 1 to entry: The flexible cable or cord may be specially prepared and only available from the manufacturer or his service agent.

Note 2 to entry: A specially prepared cable or cord may also include a part of the luminaire.

1.2.72.2
type Y attachment
method of attachment of the cable or cord such that any replacement can only be made by the manufacturer, his service agent or similarly qualified person

Note 1 to entry: Type Y attachment may be used either with an ordinary or a special flexible cable or cord.

1.2.72.3
type Z attachment
method of attachment of the cable or cord such that it cannot be replaced without breaking or destroying the luminaire

1.2.73
earthing

1.2.73.1
protective earthing
earthing of a point or points in a system or in an installation or in equipment, for purposes of electrical safety

[SOURCE: IEC 60050-195:2001, 195-01-11]

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1.2.73.2
functional earthing
earthing of a point in a system or in an installation or in equipment, which is necessary for the proper function, but does not form part of the protection against electric shock

1.2.74
inter-connecting cable
wiring or wiring assembly between two main parts of a luminaire as supplied by the luminaire manufacturer and which can be regarded as being part of the luminaire

Note 1 to entry: A wiring assembly may contain a combination of different wiring, e.g. to feed through the supply voltage, to provide earthing, to supply starting and working voltages and wiring providing functional connection. Examples of applications are: between a luminaire and a controlgear box, a mounting box or a connector fitting to a track system.

1.2.75
ferrule
mechanical fixture, generally a rigid tube, used to confine the stripped end of a cable

1.2.76
impulse withstand category
overvoltage category
numeral defining a transient overvoltage condition

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

Note 2 to entry: The following explanation is taken from IEC 60364-4-443 (withdrawn).

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, coordination 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.

1.2.77
circuits and circuit characteristics

1.2.77.1
primary circuit
circuit that 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.

[SOURCE: IEC 60950-1:2005, 1.2.8.4, modified – Additional information has been transferred to a note to entry and the existing note has been deleted]

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1.2.77.2
secondary circuit
circuit that has no direct connection to a primary circuit and derives its power from a transformer, converter or equivalent device, or from a battery

Note 1 to entry: In autotransformers, although having direct connection to a primary circuit, the tapped part of the transformer is also deemed to be a secondary circuit in the above sense.

Note 2 to entry: Mains transients in such a circuit are attenuated by the corresponding primary windings. Inductive ballasts also 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, see Annex U.

[SOURCE: IEC 60950-1:2005, 1.2.8.5, modified – In the definition, the word "isolation" has been deleted from "equivalent isolation device" and the note has been replaced with the notes to entry.]

1.2.78
touch current
electric current passing through a human body or through an animal body when it touches one or more accessible parts of an installation or equipment

Note 1 to entry: In this document, the human body is represented by the networks in Figure G.2 or Figure G.3.

[SOURCE: IEC 60050-826:2004, 826.11.12, modified – The word "electrical" has been deleted from "electrical installation or electrical equipment" and a note to entry has been added.]

1.2.79
protective conductor current
current which flows in a protective conductor

Note 1 to entry: This current may have an influence on the operation of RCDs (residual current protection devices) connected in the same circuit.

1.2.80
electric burn
burning of the skin or an organ caused by an electric current along its surface or through it

[SOURCE: IEC 60050-195:1998, 195-03-01]

1.2.81
means of adjustment
part of a luminaire, which may be the lamp compartment, obviously intended to be manipulated by the user during use of the luminaire, for example to redirect the light beam

1.2.82
arm's reach
zone of accessibility to touch extending from any point on a surface where persons usually stand or move about to the limits which a person can reach with the hand, in any direction, without assistance

Note 1 to entry: IEC 60364-4-41 incorporates a drawing representing the zone of accessibility. In general terms, the height is 2,5 m from the floor, and the width is 1,25 m in all horizontal directions from the locations a person may be.

[SOURCE: IEC 60050-195:1998, 195.06.12, modified – The note to entry has been added.]

1.2.83
terminal block with integrated screwless protective earthing contact
terminal with earthing connection performed by means of an integrated contact or by means of an auxiliary contact without additional assembly actions (e.g. screwing) when fitted

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1.2.84
detachable cord
flexible cable or cord, for supply or interconnection, intended to be connected to the luminaire by means of a suitable appliance connector

Note 1 to entry: A detachable cord is considered to be easily replaceable.

1.2.85
tool
screwdriver, coin or other object that may be used to operate a screw or similar fixing means

1.2.86
specially prepared cord
flexible cable or cord the replacement of which with another non-special cable or cord would create a hazard or diminish safety

1.2.87
settable luminaire
fixed luminaire, the main part of which can be turned or moved by means of joints, raising and lowering devices, telescopic tubes or similar devices, but which has a locking device (or devices) operated by a tool and is not intended to be adjusted during use

1.2.88
light source
lamp, provided with a lamp-cap, or module (LED) or other light source made in order to produce an optical visible radiation to be used or incorporated into the luminaire

1.2.88.1
replaceable light source
lamp, provided with a lamp-cap, or light source designed to be connected by terminals, connector or similar devices and designed to be replaced during normal use or during maintenance of the luminaire

EXAMPLE All kinds of lamps provided with lamp caps.

Note 1 to entry: Built-in LED modules according to IEC 62031 are normally considered as replaceable light sources unless the requirements for non-replaceable or non-user replaceable light sources are fulfilled.

1.2.88.2
non-replaceable light source
light source which is a non-replaceable part of the luminaire either because it cannot be replaced without breaking or destroying the luminaire or because it is enclosed under a cover fixed by a screw or similar fixing means designed to be used only once and which is not possible to be opened

1.2.88.3
non-user replaceable light source
light source which can only be replaced by the manufacturer, his service agent, or similar qualified person

1.2.89
controllable luminaire
luminaire having a control terminal for the purpose of controlgear information exchange and/or setting of controlgear functions

1.2.90
control terminal
control terminal connections, other than power supply terminals to the electronic controlgear, which are used to exchange information with the controlgear

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Note 1 to entry: The power supply terminals can also be used to exchange information with the controlgear.

1.2.91
LV supply
circuits, wiring or part of them connected to the low voltage (LV) public distribution network and whose voltage corresponds to the voltage band II of IEC 60449

EXAMPLE 230 V distribution network.

Note 1 to entry: SELV, PELV and FELV are not included in the definition given here for LV supply.

Note 2 to entry: High voltage (HV) supply corresponding to band III of IEC 60449 is not included in the definition given here for LV supply.

1.2.92
connecting leads
tails
internal wiring of luminaires intended to be connected to fixed wiring through separate terminals which are to be enclosed inside the luminaire or connecting box

1.2.93
rated value
value of a quantity used for specification purposes, established under standard test conditions as declared by the manufacturer or responsible vendor

[SOURCE: IEC 62504:2014, 3.33, modified – the note has been deleted.]

1.2.94
input power
electrical power consumed by the luminaire

1.2.95
constant light output function
function where the current passing through a LED module is gradually increased through life to compensate for the gradual light output degradation of the LED module that could be expected to occur

Note 1 to entry: Constant light output functions can be controlled by a programmed software algorithm based on the expected gradual light output degradation or on feedback from a connected sensor such as a photocell.

1.2.96
interrupted DC voltage
DC voltage changing between zero and a DC level with a certain frequency, where the time of the signal being at the DC level can vary within one period

1.2.97
power sourcing equipment
PSE
equipment generating power to supply other equipment through information technology communication cabling providing ES1 according to IEC 62368 (all parts)

Note 1 to entry: The IEEE 802.3-2012 standard provides a similar but different definition.

1.2.98
power over Ethernet
PoE
powering of a device with a PSE according to IEC 62368-3, via twisted pair Ethernet cabling including the appropriate connectors

Note 1 to entry: Typical examples of cables are CAT 5 cables and CAT 7 cables.

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