IEC 60598-2-2

Edition 4.0 2023-01
COMMENTED VERSION

INTERNATIONAL STANDARD

colour inside

Luminaires –
Part 2-2: Particular requirements – Recessed luminaires and recessed air-handling luminaires

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LUMINAIRES –

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FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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This commented version (CMV) of the official standard IEC 60598-2-2:2023 edition 4.0 allows the user to identify the changes made to the previous IEC 60598-2-2:2011 edition 3.0. Furthermore, comments from IEC SC 34D experts are provided to explain the reasons of the most relevant changes, or to clarify any part of the content.

A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text. Experts' comments are identified by a blue-background number. Mouse over a number to display a pop-up note with the comment.

This publication contains the CMV and the official standard. The full list of comments is available at the end of the CMV.

IEC 60598-2-2 has been prepared by subcommittee 34D: Luminaires, of IEC technical committee 34:Lighting. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2011. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition (there are no major technical changes, see Annex D):

a) The requirements specific to recessed luminaries given in IEC 60598-1 are now incorporated in this Part 2-2.
b) The requirements for air-handling luminaires given in IEC 60598-2-19 are now incorporated in this Part 2-2.
c) The references to Part 1 have been updated.

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

Draft	Report on voting
34D/1681/FDIS	34D/1688/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

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

This Part 2-2 is to be used in conjunction with the latest edition of IEC 60598-1 and its amendment(s). It was established on the basis of the ninth edition (2020).

NOTE 1 When "Part 1" is mentioned in this document, it refers to IEC 60598-1.

NOTE 2 In this document, the following print type is used:

– compliance statements: *in italic type*.

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

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- withdrawn,
- replaced by a revised edition, or
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LUMINAIRES –

Part 2-2: Particular requirements – Recessed luminaires and recessed air-handling luminaires

2.1 Scope

This part of IEC 60598 specifies requirements for recessed luminaires incorporating electric light sources for operation from supply voltages up to 1 000 V. ~~This section does not apply to air-handling or liquid-cooled luminaires.~~ It also specifies requirements for recessed air-handling luminaires for use with a ventilation duct or ventilated space (plenum).

NOTE The expressions "ventilation" and "ventilated" in this document refer to forced ventilation.

2.2 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 60227 (all parts), *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V*

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

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

2.3 Terms and definitions

For the purposes of this document, the terms and definitions given in Part 1 and the following apply.

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

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

2.3.1
air-handling luminaire 2
luminaire specially designed for use in association with an air conditioning system

Note 1 to entry: The air can pass either through the lamp chamber or through separate passages.

Note 2 to entry: For an explanation of the significance of t_a as applied to air-handling luminaires, see Annex C.

2.3.2
static operation 3
operation of a luminaire when not handling either forced supply or extract air but permitting natural convection

2.4 General test requirements

The provisions of Section 0 of Part 1 apply. The tests described in each appropriate section of Part 1 shall be carried out in the order listed in this document.

A procedure measuring ambient temperature in an installation is given in Annex A.

NOTE Annex A provides additional information on how ambient temperature is considered within the recessed cavity area relative to the t_a marking of the luminaire.

2.5 Classification of luminaires

Luminaires shall be classified in accordance with the provisions of Section 2 of Part 1.

2.6 Marking 4

2.6.1 The provisions of Section 3 of Part 1 apply, together with the requirements of 2.6.2, 2.6.3 and 2.6.4.

The following information shall be distinctly and durably marked on the luminaire and be visible during installation or behind a cover or part which is removed during installation.

2.6.2 For recessed luminaires with two IP ratings, both ratings shall be visible during installation and it shall be obvious to which parts of the luminaire the ratings refer. The relevant information shall be provided even if the rating is IP20 or the lower rating is specified as ordinary.

2.6.3 Where applicable, the relevant symbol for recessed luminaires not suitable for direct mounting on normally flammable surfaces shall be distinctly and durably marked on the luminaire and be visible during installation or behind a cover or part which is removed during installation.

When marked, this symbol shall be explained on the luminaire or in the manufacturer's instructions provided with the luminaire.

The minimum size of the symbol shall be 25 mm for each side. See Figure 1.

Figure 1 – Symbol for luminaires not suitable for direct mounting on normally flammable surfaces (suitable only for mounting on non-combustible surfaces)

2.6.4 Where applicable, the relevant symbol for luminaires not suitable for covering with thermally insulated material shall be distinctly and durably marked on the luminaire and be visible during installation or behind a cover or part which is removed during installation.

When marked, this symbol shall be explained on the luminaire or in the manufacturer's instructions provided with the luminaire.

The minimum size of the symbol shall be 25 mm for each side. See Figure 2.

Figure 2 – Symbol for luminaires not suitable for covering with thermally insulating material

2.7 Construction

The provisions of Section 4 of Part 1 apply.

2.8 Creepage distances and clearances

The provisions of Section 11 of Part 1 apply.

2.9 Provision for earthing

The provisions of Section 7 of Part 1 apply.

2.10 Terminals

The provisions of Sections 14 and 15 of Part 1 apply.

2.11 External and internal wiring

The provisions of Section 5 of Part 1 apply, together with the following.

Flexible cables or cords used as a means of connection to the supply, when supplied by the luminaire manufacturer, shall be at least equal in their mechanical and electrical properties to those specified in the IEC 60227 series or the IEC 60245 series and shall be capable of withstanding without deterioration the highest temperature to which they ~~may~~ can be exposed under normal conditions of use. Materials other than PVC and rubber are suitable if the above requirements are met.

Compliance shall be checked by the tests specified in Clause 2.13.

NOTE The use of flexible cables and cords with recessed luminaires is appropriate for the following reasons:

1) The flexible cable or cord cannot be easily touched as it is normally out of reach within the recess.
2) To facilitate installation of the luminaire into the recess.
3) To permit the adjustment of settable and adjustable recessed luminaires.

2.12 Protection against electric shock

The provisions of Section 8 of Part 1 apply, together with the following.

The parts of the luminaire and components within the ceiling space or cavity shall provide the same degree of protection against electric shock as the luminaire parts below the ceiling space.

NOTE The ceiling space or cavity is regarded as accessible for installation and maintenance, and the barriers do not provide adequate protection against electric shock.

Compliance is checked by inspection.

2.13 Endurance tests and thermal tests

2.13.1 The provisions of Section 12 of Part 1 apply, together with the following requirements.

2.13.2 The luminaire shall be mounted and tested according to Annex B. **5**

Luminaires with an IP classification greater than IP20 shall be subjected to the relevant tests of Clauses 12.4, 12.5, 12.6 and 12.7 of Section 12 of Part 1 after the test(s) of Clause 9.2 but before the test(s) of Clause 9.3 of Section 9 of Part 1 specified in Clause 2.14 of this document.

2.13.3 Wiring, for connection to the supply, which passes into or can touch the luminaire, shall not reach an unsafe temperature.

Compliance shall be checked by the following tests:

The luminaire is connected to the supply using the cable provided with the luminaire or using a cable in accordance with the marking on the luminaire or, if not marked, as specified in the manufacturer's instruction sheet; otherwise PVC cable complying with the IEC 60227 series is used.

The hottest point is found (along the internal route or on the outer surface of the luminaire) with which the cable is likely to lie in contact during normal service. The cable is lightly held in contact at this point and the temperature of the insulation at the point of contact is measured as described in Annex K of Part 1.

The operating temperature of the cable shall not exceed the limits given in Table 1.

~~*Luminaires with an IP classification greater than IP20 shall be subjected to the relevant tests of Clauses 12.4, 12.5, 12.6 and 12.7 of Section 12 of IEC 60598-1 after the test(s) of Clause 9.2 but before the test(s) of Clause 9.3 of Section 9 of IEC 60598-1 specified in Clause 2.14 of this section of IEC 60598-2.*~~

Table 1 – Operating temperature of cable

Designation of cable	Limit of operating temperature
Cable (including sleeves) provided with the luminaire	The maximum temperature specified in Table 12.2 of Part 1
Cable not provided with the luminaire:	
a) luminaires with cable temperature marking	The marked temperature
b) luminaires without cable temperature marking	The maximum temperature specified in Table 12.2 of Part 1 for ordinary PVC not subject to mechanical stress

2.13.4 The test for air-handling luminaires is made under static operating conditions. **6**

When testing air-handling luminaires with stubs for connection of ventilation ducts, the stubs are suitably connected to the sides or to the top of the test box according to the installation instructions.

a) Normal operating conditions: During the test, the temperature of upward facing surfaces within the main air path shall not exceed 100 °C, except that for surfaces of light sources, the temperature shall not exceed 150 °C.

a) Abnormal operating conditions: The temperature of the convection air when leaving the luminaire shall not exceed 100 °C. During the test, the temperature of upward facing surfaces within the main air path shall not exceed 130 °C except that for surfaces of light sources, the temperature shall not exceed 150 °C.

2.14 Resistance to dust and moisture

2.14.1 The provisions of Section 9 of Part 1 apply, as well as the following.

2.14.2 For luminaires with an IP classification greater than IP20, the order of the tests specified in Section 9 of Part 1 shall be as specified in Clause 2.13 of this document.

2.14.3 **7** For recessed luminaires, the parts in the recess and the parts protruding from the recess shall each be tested according to their IP classification as indicated in the manufacturer's mounting instructions. A box encapsulating the part in the recess can be necessary.

NOTE The claimed IP rating is only applicable to the enclosure of the luminaire. In the case of a recessed luminaire, the IP rating of the luminaire does not protect the integrity of any seals outside of the luminaire, e.g. between the lower and upper parts of the ceiling.

2.15 Insulation resistance and electric strength

The provisions of Section 10 of Part 1 apply.

2.16 Resistance to heat, fire and tracking

The provisions of Section 13 of Part 1 apply.

Annex A
(~~informative~~ normative)

Measurement of ambient temperature in an installation

Care is needed in deciding whether a recessed luminaire is operating within its thermal limits in an existing lighting installation. It is even more difficult to predict whether a luminaire will be satisfactory in a proposed installation and a "mock-up" is usually required. In the past, there have been instances of overheating of luminaires, for example, overheating owing to the presence of heating services above the ceiling plane.

The following procedure is for measuring the ambient temperature in which the luminaire operates. The t_a rating of the luminaire should be at least equal to this ambient temperature. The ambient temperature is measured in the plane of the ceiling (or other mounting surface) at the mid-point of a typical cavity. It is important that all other luminaires in the installation and all other services which ~~may~~ can affect the thermal conditions of the luminaire are operating. The cavity is covered above the measuring point to prevent a non-typical interchange of air and so that the cover ~~may~~ can absorb extraneous heat which would be absorbed by the luminaire.

NOTE It ~~may~~ can be convenient to insert for this purpose the shell of the luminaire.

The test recess used to measure operating temperatures of recessed luminaires is intended to represent the most onerous closed recess (without other heat source) which is likely to be experienced in service. A recessed luminaire should not be installed in a cavity with a volume smaller than that of the test recess, unless the manufacturer of the luminaire has verified that operation will be satisfactory.

The test recess ~~may~~ can also approximate to the thermal conditions above a suspended ceiling if the larger air volume is offset by heat-emitting services. In a particular installation, more onerous thermal conditions than this ~~may~~ can exist and it is, therefore, essential to carry out a practical check. Conversely, the space above the ceiling ~~may~~ can have free air movement and no heat-emitting services; for such an installation, the t_a rating of the luminaire as determined in the test recess incorporates a temperature margin and the t_a rating may be exceeded if the manufacturer of the luminaire has verified that operation in the particular installation will be satisfactory.

During tests, to determine or check a t_a rating for a luminaire, measurements of ambient temperature are made inside the draught-proof enclosure and outside the test recess in accordance with Annex K of Part 1.

Annex B
(normative)

Recessed luminaires thermal test methods 8

The requirements of Annex D of Part 1 are applicable with the following additional requirements.

Recessed luminaires suitable for covering with thermal insulating material are mounted in a test recess consisting of a suspended ceiling and thermal insulation material positioned in direct contact with the luminaire.

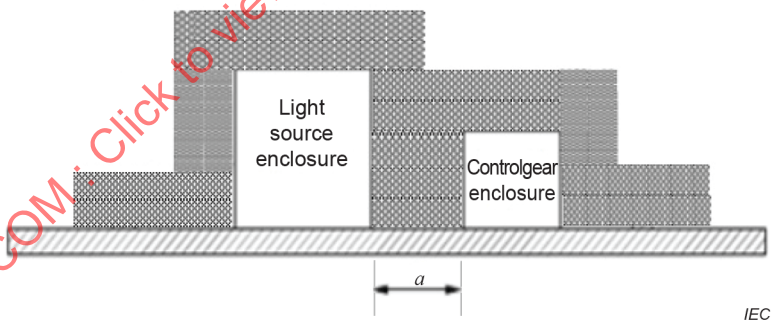
Recessed luminaires not suitable for covering with thermal insulating material are mounted in a test recess consisting of a suspended ceiling, on top of which is a rectangular box with vertical sides and horizontal top.

The suspended ceiling is made of a 12 mm thick general use particle board in which a suitable opening has been made for the luminaire. The general use particle board shall extend at least 100 mm outside the projection of the luminaire on this board.

NOTE 1 An example of general used particle board is boards manufactured according to ISO 16893.

a) Luminaires for recessing into ceilings with thermal insulating material covering the luminaire

Thermal insulating material is tightly fitted to the outside of the luminaire. The thermal insulation shall be equivalent to two 10 cm thick layers of mineral wool with a coefficient of thermal resistivity of 0,04 W/(m · K). Thinner layers can be used when having a higher thermal resistivity. If a luminaire is provided with separate parts intended for recessed mounting, (for example, with separate light source enclosure and controlgear enclosure), the test recess shall be constructed observing the manufacturer's recommendations for minimum spacing between parts (see Figure B.1). The space shall be filled with insulating material.



Key

a minimum separation as specified by the manufacturer

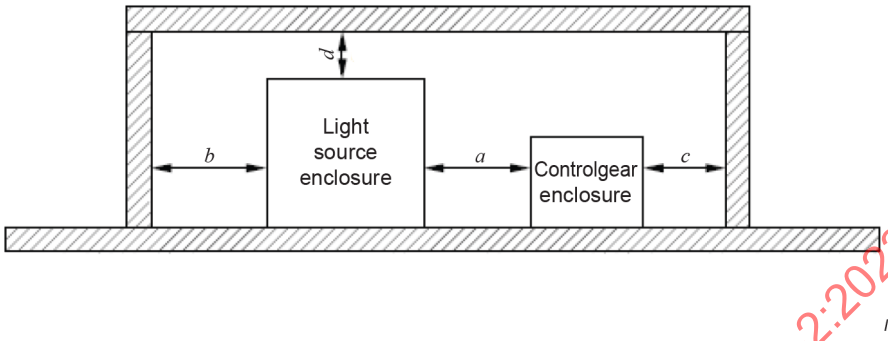
Figure B.1 – Example of test recess where a luminaire suitable for covering with thermal insulating material comprises separate parts

b) Luminaires for recessing into ceilings but not suitable for covering with thermal insulating material.

For recessed luminaires of this kind, the test recess consisting of a suspended ceiling, on top of which is a rectangular box with vertical sides and horizontal top, shall be fixed above the luminaire. The vertical sides of the box are made of 19 mm thick laminated wood and the top of 12 mm thick general use particle board tightly sealed to the sides.

The sides and top of the box shall be spaced from the luminaire in accordance with the manufacturer's instructions supplied with the luminaire. If no spacing is specified, the sealed box shall touch the luminaire all around.

If a luminaire is provided with separate parts intended for recessed mounting, (for example, with separate light source enclosure and controlgear enclosure), the test recess shall be constructed as a single box observing the manufacturer's recommendations for minimum spacing between parts and the inside of the recess (see Figure B.2). Where spacing between parts is not specified (item '*a*' of Figure B.2), separate test recesses shall be used for each part.



Key

a, b, c, d minimum separation as specified by the manufacturer

Figure B.2 – Example of test recess where a luminaire not suitable for covering with thermal insulating material comprises separate parts

If there are projecting spacers on the top or sides of the luminaire, then these spacers shall be placed in direct contact with the inside surfaces of the test box or insulating material.

The suspended ceiling and the interior of the box are painted black with a matt non-metallic paint, and there shall be a gap of not less than 100 mm between this assembly and the inside walls, ceiling and floor of the test enclosure.

NOTE 2 In Australia and New Zealand recessed luminaires are classified and tested for installations with thermal insulation in accordance with AS/NZS 60598-2-2, Particular requirements – Recessed Luminaires.

NOTE 3 It is acceptable in Japan to apply this Annex B or JIL 5002 for the thermal test on recessed luminaires.

When a luminaire is intended to be recessed into a wall, the test is made using a test recess similar to that described above, but with the board placed vertically.

For luminaires classified for mounting in direct contact with a normally flammable surface and suitable for covering with thermal insulating material, no part of the insulating material and the luminaire surface above the suspended ceiling shall exceed 90 °C during the normal operation thermal test and 130 °C during the abnormal operation thermal test.

For luminaires classified for mounting in direct contact with a normally flammable surface not suitable for covering with thermal insulating material, no part of the test recess shall exceed 90 °C during the normal operation thermal test and 130 °C during the abnormal operation thermal test.

For luminaires classified as not suitable for direct mounting on normally flammable surfaces, no temperatures are measured for the mounting surface or test recess.

All spacings shall be measured from the extremes of the positions of movement where luminaires are settable and adjustable in overall dimension or position in either axis when fully installed and during normal operation (see Figure B.3).

Figure B.3 illustrates the correct test box size for a luminaire that is adjustable in both axes and thus needs space within a ceiling for the setting or the adjustment.

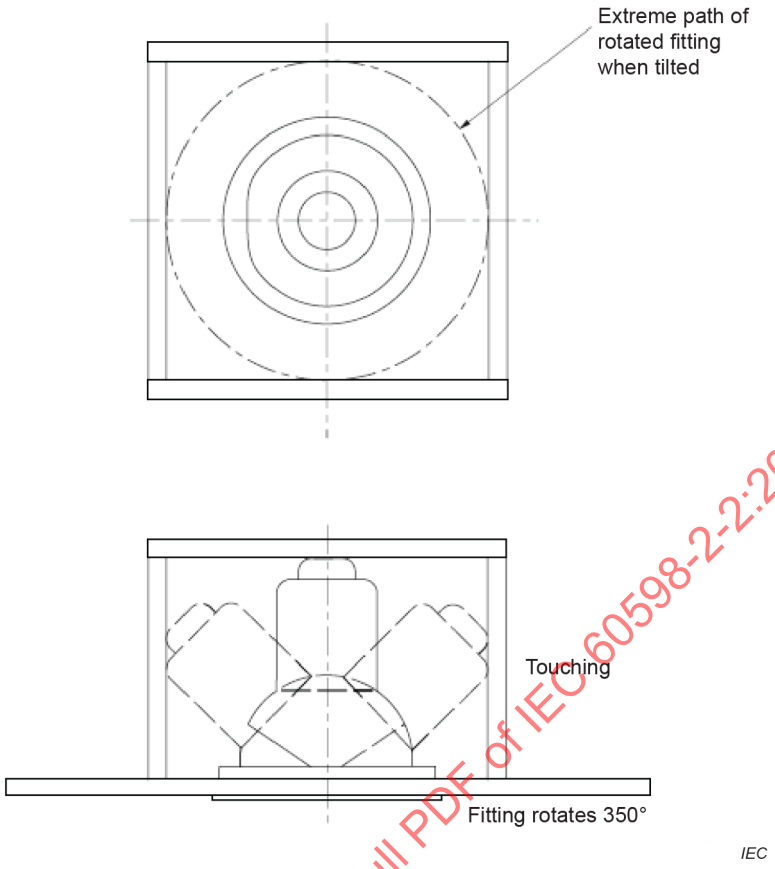


Figure B.3 – Correct test box size (insulating ceilings) for settable and adjustable luminaires

Annex C
(informative)

Explanation of t_a with respect to air-handling luminaires 9

"Rated maximum ambient temperature" (symbol: t_a) is defined in Part 1 and the definition includes the phrase "under normal conditions". In the case of an air-handling luminaire, "normal conditions" depend on the type of air-conditioning system with which the luminaire is associated, and it is therefore necessary to specify a set of conditions under which t_a will be measured and to draw attention to the relationship between these conditions and those which can occur in practice.

The conditions specified in this document are those associated with static operation, that is when the luminaire is not handling forced supply or extract air, but permitting normal convection air flow, and the t_a to be marked on the luminaire is the maximum ambient temperature in which the luminaire will operate under these conditions.

When the luminaire is installed as part of an air conditioning system, however, the ambient temperature in the vicinity of the luminaire depends on the type and characteristics of the system, and these can be assessed only by the user.

For this assessment, the temperature should be measured at the mid-point of the cavity in which the luminaire will be mounted, with a dummy or static luminaire in position to simulate restrictions which the luminaire can cause to free flow.

In order to simulate the worst conditions which can arise in forced air-flow systems, the air-circulation system should be switched off during temperature measurements on systems which either supply cooling air or extract air at room temperature, and switched on during measurements on systems supplying air above room temperature.

A luminaire chosen for use in this position should have a t_a at least as high as the measured temperature.

Annex D
(informative)

Schedule of amended subclauses containing more serious or critical requirements which require products to be retested

No requirements of this document are considered more onerous compared with the previous edition of IEC 60598-2-2 and with IEC 60598-2-19.

Bibliography

IEC 60598-2-19, *Luminaires – Part 2-19: Particular requirements – Air-handling luminaires (safety requirements)*

ISO 16893, *Wood-based panels – Particleboard*

AS/NZS 60598-2-2, *Luminaires Particular requirements – Recessed Luminaires*

JIL 5002, *Recessed lighting fixture*

List of comments

1 The title and scope are revised to include also Part 2-19. After publication of this standard the intention is to withdraw IEC 60598-2-19.

2 This definition is taken from IEC 60598-2-19.

3 This definition is taken from IEC 60598-2-19.

4 Marking requirements previously in IEC 60598-1 and specific to recessed luminaires are now moved into this Part 2-2.

5 The new Annex B was previously part of the Annex D in IEC 60598-1.

6 This new Clause 2.13.4 covers requirements that were previously part of IEC 60598-2-19.

7 These requirements were previously part of the test conditions in IEC 60598-1.

8 The text of this new Annex B was previously part of the Annex D of IEC 60598-1. This consolidates the specific requirements for recessed luminaire to this document for better readability. It is the intention to remove this text from IEC 60598-1 after publication of this standard.

9 This new Annex C covers information that was previously part of IEC 60598-2-19.

IEC 60598-2-2

Edition 4.0 2023-01

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Luminaires –
Part 2-2: Particular requirements – Recessed luminaires and recessed air-handling luminaires

Luminaires –
Partie 2-2: Exigences particulières – Luminaires encastrés et luminaires à circulation d'air encastrés

IEC 60598-2-2:2023-01(en-fr)

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Part 2-2: Particular requirements – Recessed luminaires and recessed air-handling luminaires

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IEC 60598-2-2 has been prepared by subcommittee 34D: Luminaires, of IEC technical committee 34:Lighting. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2011. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition (there are no major technical changes, see Annex D):

a) The requirements specific to recessed luminaries given in IEC 60598-1 are now incorporated in this Part 2-2.
b) The requirements for air-handling luminaires given in IEC 60598-2-19 are now incorporated in this Part 2-2.
c) The references to Part 1 have been updated.

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

Draft	Report on voting
34D/1681/FDIS	34D/1688/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

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

This Part 2-2 is to be used in conjunction with the latest edition of IEC 60598-1 and its amendment(s). It was established on the basis of the ninth edition (2020).

NOTE 1 When "Part 1" is mentioned in this document, it refers to IEC 60598-1.

NOTE 2 In this document, the following print type is used:

– compliance statements: *in italic type*.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under 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.

LUMINAIRES –

Part 2-2: Particular requirements – Recessed luminaires and recessed air-handling luminaires

2.1 Scope

This part of IEC 60598 specifies requirements for recessed luminaires incorporating electric light sources for operation from supply voltages up to 1 000 V. It also specifies requirements for recessed air-handling luminaires for use with a ventilation duct or ventilated space (plenum).

NOTE The expressions "ventilation" and "ventilated" in this document refer to forced ventilation.

2.2 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 60227 (all parts), *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V*

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

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

2.3 Terms and definitions

For the purposes of this document, the terms and definitions given in Part 1 and the following apply.

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

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

2.3.1
air-handling luminaire
luminaire specially designed for use in association with an air conditioning system

Note 1 to entry: The air can pass either through the lamp chamber or through separate passages.

Note 2 to entry: For an explanation of the significance of t_a as applied to air-handling luminaires, see Annex C.

2.3.2
static operation
operation of a luminaire when not handling either forced supply or extract air but permitting natural convection

2.4 General test requirements

The provisions of Section 0 of Part 1 apply. The tests described in each appropriate section of Part 1 shall be carried out in the order listed in this document.

A procedure measuring ambient temperature in an installation is given in Annex A.

NOTE Annex A provides additional information on how ambient temperature is considered within the recessed cavity area relative to the t_a marking of the luminaire.

2.5 Classification of luminaires

Luminaires shall be classified in accordance with the provisions of Section 2 of Part 1.

2.6 Marking

2.6.1 The provisions of Section 3 of Part 1 apply, together with the requirements of 2.6.2, 2.6.3 and 2.6.4.

The following information shall be distinctly and durably marked on the luminaire and be visible during installation or behind a cover or part which is removed during installation.

2.6.2 For recessed luminaires with two IP ratings, both ratings shall be visible during installation and it shall be obvious to which parts of the luminaire the ratings refer. The relevant information shall be provided even if the rating is IP20 or the lower rating is specified as ordinary.

2.6.3 Where applicable, the relevant symbol for recessed luminaires not suitable for direct mounting on normally flammable surfaces shall be distinctly and durably marked on the luminaire and be visible during installation or behind a cover or part which is removed during installation.

When marked, this symbol shall be explained on the luminaire or in the manufacturer's instructions provided with the luminaire.

The minimum size of the symbol shall be 25 mm for each side. See Figure 1.

Figure 1 – Symbol for luminaires not suitable for direct mounting on normally flammable surfaces (suitable only for mounting on non-combustible surfaces)

2.6.4 Where applicable, the relevant symbol for luminaires not suitable for covering with thermally insulated material shall be distinctly and durably marked on the luminaire and be visible during installation or behind a cover or part which is removed during installation.

When marked, this symbol shall be explained on the luminaire or in the manufacturer's instructions provided with the luminaire.

The minimum size of the symbol shall be 25 mm for each side. See Figure 2.

Figure 2 – Symbol for luminaires not suitable for covering with thermally insulating material

2.7 Construction

The provisions of Section 4 of Part 1 apply.

2.8 Creepage distances and clearances

The provisions of Section 11 of Part 1 apply.

2.9 Provision for earthing

The provisions of Section 7 of Part 1 apply.

2.10 Terminals

The provisions of Sections 14 and 15 of Part 1 apply.

2.11 External and internal wiring

The provisions of Section 5 of Part 1 apply, together with the following.

Flexible cables or cords used as a means of connection to the supply, when supplied by the luminaire manufacturer, shall be at least equal in their mechanical and electrical properties to those specified in the IEC 60227 series or the IEC 60245 series and shall be capable of withstanding without deterioration the highest temperature to which they can be exposed under normal conditions of use. Materials other than PVC and rubber are suitable if the above requirements are met.

Compliance shall be checked by the tests specified in Clause 2.13.

NOTE The use of flexible cables and cords with recessed luminaires is appropriate for the following reasons:

1) The flexible cable or cord cannot be easily touched as it is normally out of reach within the recess.
2) To facilitate installation of the luminaire into the recess.
3) To permit the adjustment of settable and adjustable recessed luminaires.

2.12 Protection against electric shock

The provisions of Section 8 of Part 1 apply, together with the following.

The parts of the luminaire and components within the ceiling space or cavity shall provide the same degree of protection against electric shock as the luminaire parts below the ceiling space.

NOTE The ceiling space or cavity is regarded as accessible for installation and maintenance, and the barriers do not provide adequate protection against electric shock.

Compliance is checked by inspection.

2.13 Endurance tests and thermal tests

2.13.1 The provisions of Section 12 of Part 1 apply, together with the following requirements.

2.13.2 The luminaire shall be mounted and tested according to Annex B.

Luminaires with an IP classification greater than IP20 shall be subjected to the relevant tests of Clauses 12.4, 12.5, 12.6 and 12.7 of Section 12 of Part 1 after the test(s) of Clause 9.2 but before the test(s) of Clause 9.3 of Section 9 of Part 1 specified in Clause 2.14 of this document.

2.13.3 Wiring, for connection to the supply, which passes into or can touch the luminaire, shall not reach an unsafe temperature.

Compliance shall be checked by the following tests:

The luminaire is connected to the supply using the cable provided with the luminaire or using a cable in accordance with the marking on the luminaire or, if not marked, as specified in the manufacturer's instruction sheet; otherwise PVC cable complying with the IEC 60227 series is used.

The hottest point is found (along the internal route or on the outer surface of the luminaire) with which the cable is likely to lie in contact during normal service. The cable is lightly held in contact at this point and the temperature of the insulation at the point of contact is measured as described in Annex K of Part 1.

The operating temperature of the cable shall not exceed the limits given in Table 1.

Table 1 – Operating temperature of cable

Designation of cable	Limit of operating temperature
Cable (including sleeves) provided with the luminaire	The maximum temperature specified in Table 12.2 of Part 1
Cable not provided with the luminaire:	
a) luminaires with cable temperature marking	The marked temperature
b) luminaires without cable temperature marking	The maximum temperature specified in Table 12.2 of Part 1 for ordinary PVC not subject to mechanical stress

2.13.4 The test for air-handling luminaires is made under static operating conditions.

When testing air-handling luminaires with stubs for connection of ventilation ducts, the stubs are suitably connected to the sides or to the top of the test box according to the installation instructions.

a) Normal operating conditions: During the test, the temperature of upward facing surfaces within the main air path shall not exceed 100 °C, except that for surfaces of light sources, the temperature shall not exceed 150 °C.

b) Abnormal operating conditions: The temperature of the convection air when leaving the luminaire shall not exceed 100 °C. During the test, the temperature of upward facing surfaces within the main air path shall not exceed 130 °C except that for surfaces of light sources, the temperature shall not exceed 150 °C.

2.14 Resistance to dust and moisture

2.14.1 The provisions of Section 9 of Part 1 apply, as well as the following.

2.14.2 For luminaires with an IP classification greater than IP20, the order of the tests specified in Section 9 of Part 1 shall be as specified in Clause 2.13 of this document.

2.14.3 For recessed luminaires, the parts in the recess and the parts protruding from the recess shall each be tested according to their IP classification as indicated in the manufacturer's mounting instructions. A box encapsulating the part in the recess can be necessary.

NOTE The claimed IP rating is only applicable to the enclosure of the luminaire. In the case of a recessed luminaire, the IP rating of the luminaire does not protect the integrity of any seals outside of the luminaire, e.g. between the lower and upper parts of the ceiling.

2.15 Insulation resistance and electric strength

The provisions of Section 10 of Part 1 apply.

2.16 Resistance to heat, fire and tracking

The provisions of Section 13 of Part 1 apply.

Annex A
(normative)

Measurement of ambient temperature in an installation

Care is needed in deciding whether a recessed luminaire is operating within its thermal limits in an existing lighting installation. It is even more difficult to predict whether a luminaire will be satisfactory in a proposed installation and a "mock-up" is usually required. In the past, there have been instances of overheating of luminaires, for example, overheating owing to the presence of heating services above the ceiling plane.

The following procedure is for measuring the ambient temperature in which the luminaire operates. The t_a rating of the luminaire should be at least equal to this ambient temperature. The ambient temperature is measured in the plane of the ceiling (or other mounting surface) at the mid-point of a typical cavity. It is important that all other luminaires in the installation and all other services which can affect the thermal conditions of the luminaire are operating. The cavity is covered above the measuring point to prevent a non-typical interchange of air and so that the cover can absorb extraneous heat which would be absorbed by the luminaire.

NOTE It can be convenient to insert for this purpose the shell of the luminaire.

The test recess used to measure operating temperatures of recessed luminaires is intended to represent the most onerous closed recess (without other heat source) which is likely to be experienced in service. A recessed luminaire should not be installed in a cavity with a volume smaller than that of the test recess, unless the manufacturer of the luminaire has verified that operation will be satisfactory.

The test recess can also approximate to the thermal conditions above a suspended ceiling if the larger air volume is offset by heat-emitting services. In a particular installation, more onerous thermal conditions than this can exist and it is, therefore, essential to carry out a practical check. Conversely, the space above the ceiling can have free air movement and no heat-emitting services; for such an installation, the t_a rating of the luminaire as determined in the test recess incorporates a temperature margin and the t_a rating may be exceeded if the manufacturer of the luminaire has verified that operation in the particular installation will be satisfactory.

During tests, to determine or check a t_a rating for a luminaire, measurements of ambient temperature are made inside the draught-proof enclosure and outside the test recess in accordance with Annex K of Part 1.

Annex B
(normative)

Recessed luminaires thermal test methods

The requirements of Annex D of Part 1 are applicable with the following additional requirements.

Recessed luminaires suitable for covering with thermal insulating material are mounted in a test recess consisting of a suspended ceiling and thermal insulation material positioned in direct contact with the luminaire.

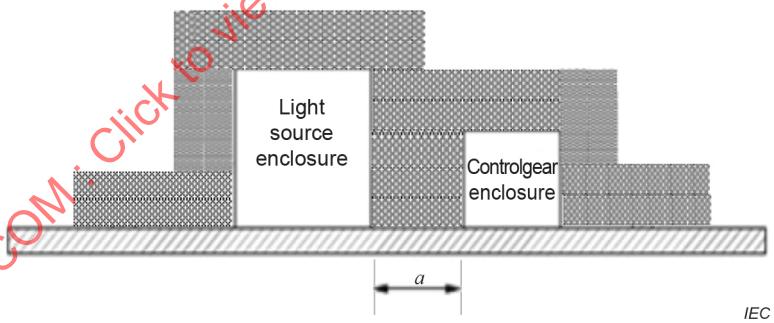
Recessed luminaires not suitable for covering with thermal insulating material are mounted in a test recess consisting of a suspended ceiling, on top of which is a rectangular box with vertical sides and horizontal top.

The suspended ceiling is made of a 12 mm thick general use particle board in which a suitable opening has been made for the luminaire. The general use particle board shall extend at least 100 mm outside the projection of the luminaire on this board.

NOTE 1 An example of general used particle board is boards manufactured according to ISO 16893.

a) Luminaires for recessing into ceilings with thermal insulating material covering the luminaire

Thermal insulating material is tightly fitted to the outside of the luminaire. The thermal insulation shall be equivalent to two 10 cm thick layers of mineral wool with a coefficient of thermal resistivity of 0,04 W/(m · K). Thinner layers can be used when having a higher thermal resistivity. If a luminaire is provided with separate parts intended for recessed mounting, (for example, with separate light source enclosure and controlgear enclosure), the test recess shall be constructed observing the manufacturer's recommendations for minimum spacing between parts (see Figure B.1). The space shall be filled with insulating material.



Key

a minimum separation as specified by the manufacturer

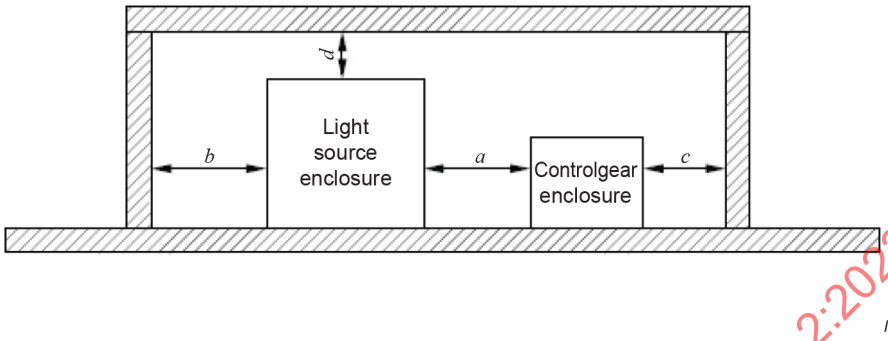
Figure B.1 – Example of test recess where a luminaire suitable for covering with thermal insulating material comprises separate parts

b) Luminaires for recessing into ceilings but not suitable for covering with thermal insulating material.

For recessed luminaires of this kind, the test recess consisting of a suspended ceiling, on top of which is a rectangular box with vertical sides and horizontal top, shall be fixed above the luminaire. The vertical sides of the box are made of 19 mm thick laminated wood and the top of 12 mm thick general use particle board tightly sealed to the sides.

The sides and top of the box shall be spaced from the luminaire in accordance with the manufacturer's instructions supplied with the luminaire. If no spacing is specified, the sealed box shall touch the luminaire all around.

If a luminaire is provided with separate parts intended for recessed mounting, (for example, with separate light source enclosure and controlgear enclosure), the test recess shall be constructed as a single box observing the manufacturer's recommendations for minimum spacing between parts and the inside of the recess (see Figure B.2). Where spacing between parts is not specified (item '*a*' of Figure B.2), separate test recesses shall be used for each part.



Key

a, b, c, d minimum separation as specified by the manufacturer

Figure B.2 – Example of test recess where a luminaire not suitable for covering with thermal insulating material comprises separate parts

If there are projecting spacers on the top or sides of the luminaire, then these spacers shall be placed in direct contact with the inside surfaces of the test box or insulating material.

The suspended ceiling and the interior of the box are painted black with a matt non-metallic paint, and there shall be a gap of not less than 100 mm between this assembly and the inside walls, ceiling and floor of the test enclosure.

NOTE 2 In Australia and New Zealand recessed luminaires are classified and tested for installations with thermal insulation in accordance with AS/NZS 60598-2-2, Particular requirements – Recessed Luminaires.

NOTE 3 It is acceptable in Japan to apply this Annex B or JIL 5002 for the thermal test on recessed luminaires.

When a luminaire is intended to be recessed into a wall, the test is made using a test recess similar to that described above, but with the board placed vertically.

For luminaires classified for mounting in direct contact with a normally flammable surface and suitable for covering with thermal insulating material, no part of the insulating material and the luminaire surface above the suspended ceiling shall exceed 90 °C during the normal operation thermal test and 130 °C during the abnormal operation thermal test.

For luminaires classified for mounting in direct contact with a normally flammable surface not suitable for covering with thermal insulating material, no part of the test recess shall exceed 90 °C during the normal operation thermal test and 130 °C during the abnormal operation thermal test.

For luminaires classified as not suitable for direct mounting on normally flammable surfaces, no temperatures are measured for the mounting surface or test recess.

All spacings shall be measured from the extremes of the positions of movement where luminaires are settable and adjustable in overall dimension or position in either axis when fully installed and during normal operation (see Figure B.3).

Figure B.3 illustrates the correct test box size for a luminaire that is adjustable in both axes and thus needs space within a ceiling for the setting or the adjustment.

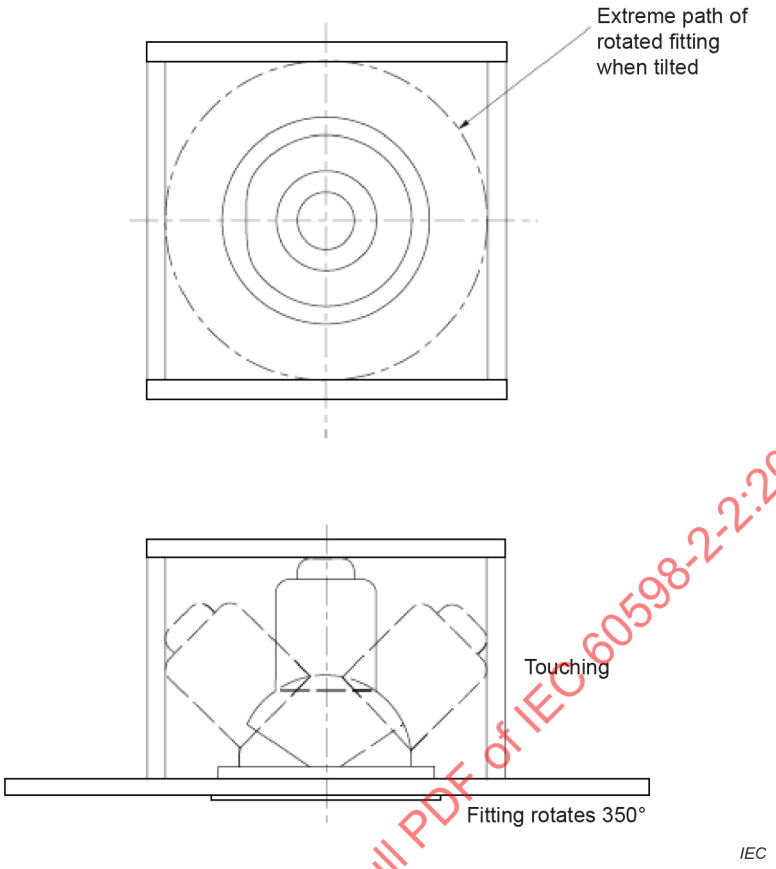


Figure B.3 – Correct test box size (insulating ceilings) for settable and adjustable luminaires

Annex C
(informative)

Explanation of t_a with respect to air-handling luminaires

"Rated maximum ambient temperature" (symbol: t_a) is defined in Part 1 and the definition includes the phrase "under normal conditions". In the case of an air-handling luminaire, "normal conditions" depend on the type of air-conditioning system with which the luminaire is associated, and it is therefore necessary to specify a set of conditions under which t_a will be measured and to draw attention to the relationship between these conditions and those which can occur in practice.

The conditions specified in this document are those associated with static operation, that is when the luminaire is not handling forced supply or extract air, but permitting normal convection air flow, and the t_a to be marked on the luminaire is the maximum ambient temperature in which the luminaire will operate under these conditions.

When the luminaire is installed as part of an air conditioning system, however, the ambient temperature in the vicinity of the luminaire depends on the type and characteristics of the system, and these can be assessed only by the user.

For this assessment, the temperature should be measured at the mid-point of the cavity in which the luminaire will be mounted, with a dummy or static luminaire in position to simulate restrictions which the luminaire can cause to free flow.

In order to simulate the worst conditions which can arise in forced air-flow systems, the air-circulation system should be switched off during temperature measurements on systems which either supply cooling air or extract air at room temperature, and switched on during measurements on systems supplying air above room temperature.

A luminaire chosen for use in this position should have a t_a at least as high as the measured temperature.

Annex D
(informative)

Schedule of amended subclauses containing more serious or critical requirements which require products to be retested

No requirements of this document are considered more onerous compared with the previous edition of IEC 60598-2-2 and with IEC 60598-2-19.

Bibliography

IEC 60598-2-19, *Luminaires – Part 2-19: Particular requirements – Air-handling luminaires (safety requirements)*

ISO 16893, *Wood-based panels – Particleboard*

AS/NZS 60598-2-2, *Luminaires Particular requirements – Recessed Luminaires*

JIL 5002, *Recessed lighting fixture*

SOMMAIRE

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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LUMINAIRES –

Partie 2-2: Exigences particulières – Luminaires encastrés et luminaires à circulation d'air encastrés

AVANT-PROPOS

1) La Commission Électrotechnique Internationale (IEC) est une organisation mondiale de normalisation composée de l'ensemble des comités électrotechniques nationaux (Comités nationaux de l'IEC). L'IEC a pour objet de favoriser la coopération internationale pour toutes les questions de normalisation dans les domaines de l'électricité et de l'électronique. À cet effet, l'IEC – entre autres activités – publie des Normes internationales, des Spécifications techniques, des Rapports techniques, des Spécifications accessibles au public (PAS) et des Guides (ci-après dénommés "Publication(s) de l'IEC"). Leur élaboration est confiée à des comités d'études, aux travaux desquels tout Comité national intéressé par le sujet traité peut participer. Les organisations internationales, gouvernementales et non gouvernementales, en liaison avec l'IEC, participent également aux travaux. L'IEC collabore étroitement avec l'Organisation Internationale de Normalisation (ISO), selon des conditions fixées par accord entre les deux organisations.
2) Les décisions ou accords officiels de l'IEC concernant les questions techniques représentent, dans la mesure du possible, un accord international sur les sujets étudiés, étant donné que les Comités nationaux de l'IEC intéressés sont représentés dans chaque comité d'études.
3) Les Publications de l'IEC se présentent sous la forme de recommandations internationales et sont agréées comme telles par les Comités nationaux de l'IEC. Tous les efforts raisonnables sont entrepris afin que l'IEC s'assure de l'exactitude du contenu technique de ses publications; l'IEC ne peut pas être tenue responsable de l'éventuelle mauvaise utilisation ou interprétation qui en est faite par un quelconque utilisateur final.
4) Dans le but d'encourager l'uniformité internationale, les Comités nationaux de l'IEC s'engagent, dans toute la mesure possible, à appliquer de façon transparente les Publications de l'IEC dans leurs publications nationales et régionales. Toutes divergences entre toutes Publications de l'IEC et toutes publications nationales ou régionales correspondantes doivent être indiquées en termes clairs dans ces dernières.
5) L'IEC elle-même ne fournit aucune attestation de conformité. Des organismes de certification indépendants fournissent des services d'évaluation de conformité et, dans certains secteurs, accèdent aux marques de conformité de l'IEC. L'IEC n'est responsable d'aucun des services effectués par les organismes de certification indépendants.
6) Tous les utilisateurs doivent s'assurer qu'ils sont en possession de la dernière édition de cette publication.
7) Aucune responsabilité ne doit être imputée à l'IEC, à ses administrateurs, employés, auxiliaires ou mandataires, y compris ses experts particuliers et les membres de ses comités d'études et des Comités nationaux de l'IEC, pour tout préjudice causé en cas de dommages corporels et matériels, ou de tout autre dommage de quelque nature que ce soit, directe ou indirecte, ou pour supporter les coûts (y compris les frais de justice) et les dépenses découlant de la publication ou de l'utilisation de cette Publication de l'IEC ou de toute autre Publication de l'IEC, ou au crédit qui lui est accordé.
8) L'attention est attirée sur les références normatives citées dans cette publication. L'utilisation de publications référencées est obligatoire pour une application correcte de la présente publication.
9) L'attention est attirée sur le fait que certains des éléments du présent document de l'IEC peuvent faire l'objet de droits de brevet. L'IEC ne saurait être tenue pour responsable de ne pas avoir identifié de tels droits de brevets.

L'IEC 60598-2-2 a été établie par le sous-comité 34D: Luminaires, du comité d'études 34 de l'IEC: Éclairage. Il s'agit d'une Norme internationale.

Cette quatrième édition annule et remplace la troisième édition parue en 2011. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente (il n'y a aucune modification technique essentielle, voir l'Annexe D):

a) les exigences spécifiques aux luminaires encastrés données dans l'IEC 60598-1 sont désormais intégrées dans la présente Partie 2-2;
b) les exigences relatives aux luminaires à circulation d'air données dans l'IEC 60598-2-19 sont désormais intégrées dans la présente Partie 2-2;

c) les références à la Partie 1 ont été mises à jour.

Le texte de cette Norme internationale est issu des documents suivants:

Projet	Rapport de vote
34D/1681/FDIS	34D/1688/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à son approbation.

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

Le présent document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous www.iec.ch/members_experts/refdocs. Les principaux types de documents développés par l'IEC sont décrits plus en détail sous www.iec.ch/standardsdev/publications.

Une liste de toutes les parties de la série IEC 60598, publiées sous le titre général *Luminaires*, se trouve sur le site web de l'IEC.

La présente Partie 2-2 doit être utilisée conjointement avec la dernière édition de l'IEC 60598-1 et ses amendements. Elle a été établie sur la base de la neuvième édition (2020).

NOTE 1 L'expression "la Partie 1" utilisée dans le présent document fait référence à l'IEC 60598-1.

NOTE 2 Dans le présent document, le caractère d'imprimerie suivant est utilisé:

– déclarations de conformité: *caractères italiques*.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous webstore.iec.ch dans les données relatives au document recherché. À cette date, le document sera

- reconduit,
- supprimé,
- remplacé par une édition révisée, ou
- amendé.

LUMINAIRES –

Partie 2-2: Exigences particulières – Luminaires encastrés et luminaires à circulation d'air encastrés

2.1 Domaine d'application

La présente partie de l'IEC 60598 spécifie des exigences pour les luminaires encastrés qui comporte des sources lumineuses électriques, pour un fonctionnement à des tensions d'alimentation jusqu'à 1 000 V. Elle spécifie également des exigences pour les luminaires à circulation d'air encastrés pour un fonctionnement avec un conduit de ventilation ou un espace ventilé (plenum).

NOTE Dans le présent document, les termes "ventilation" et "ventilé" se rapportent à la ventilation forcée.

2.2 Références normatives

Les documents suivants cités dans le texte constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60227 (toutes les parties), *Conducteurs et câbles isolés au polychlorure de vinyle, de tension nominale au plus égale à 450/750 V*

IEC 60245 (toutes les parties), *Conducteurs et câbles isolés au caoutchouc – Tension assignée au plus égale à 450/750 V*

IEC 60598-1, *Luminaires – Partie 1: Exigences générales et essais*

2.3 Termes et définitions

Pour les besoins du présent document, les termes et définitions de la Partie 1 ainsi que les suivants s'appliquent.

L'ISO et l'IEC tiennent à jour des bases de données terminologiques destinées à être utilisées en normalisation, consultables aux adresses suivantes:

- IEC Electropedia: disponible à l'adresse https://www.electropedia.org/
- ISO Online browsing platform: disponible à l'adresse https://www.iso.org/obp

2.3.1
luminaire à circulation d'air
luminaire spécialement étudié pour emploi associé à un système de conditionnement d'air

Note 1 à l'article: L'air peut passer à travers le logement de la lampe ou à travers des passages indépendants.

Note 2 à l'article: Pour une explication de la signification de t_a telle qu'elle est appliquée aux luminaires à circulation d'air, voir l'Annexe C.

2.3.2
fonctionnement statique
fonctionnement du luminaire lorsqu'aucune circulation d'air ne se produit par soufflage ou extraction forcée, mais qui autorise la convection naturelle

2.4 Exigences générales d'essai

Les dispositions de la Section 0 de la Partie 1 s'appliquent. Les essais décrits dans chaque section appropriée de la Partie 1 doivent être effectués dans l'ordre indiqué dans le présent document.

L'Annexe A décrit une procédure pour le mesurage de la température ambiante dans une installation.

NOTE L'Annexe A fournit des informations complémentaires sur la façon dont la température ambiante est prise en compte dans la cavité encastrée par rapport au marquage t_a apposé sur le luminaire.

2.5 Classification des luminaires

Les luminaires doivent être classés conformément aux dispositions de la Section 2 de la Partie 1.

2.6 Marquage

2.6.1 Les dispositions de la Section 3 de la Partie 1 s'appliquent, ainsi que les exigences données en 2.6.2, 2.6.3 et 2.6.4.

Les informations suivantes doivent être distinctement et durablement marquées sur le luminaire et être visibles pendant l'installation ou derrière une vasque ou une partie qui est enlevée lors de l'installation.

2.6.2 Dans le cas de luminaires encastrés avec deux degrés IP, les deux degrés doivent être visibles pendant l'installation et il ne doit y avoir aucune ambiguïté quant aux parties du luminaire auxquelles les différentes valeurs se rapportent. Les informations pertinentes doivent être fournies même si le degré est IP20 ou si le degré le plus bas est spécifié comme ordinaire.

2.6.3 Le cas échéant, le symbole correspondant pour les luminaires encastrés qui ne sont pas conçus pour être installés directement sur une surface normalement inflammable doit être apposé de manière distincte et durable sur le luminaire et il doit être visible pendant l'installation ou derrière une vasque ou une partie qui est enlevée lors de l'installation.

Lorsqu'il est apposé, ce symbole doit être expliqué sur le luminaire ou dans les instructions du fabricant fournies avec celui-ci.

La taille minimale du symbole doit être de 25 mm pour chaque côté. Voir la Figure 1.

Figure 1 – Symbole pour les luminaires qui ne sont pas conçus pour être installés directement sur des surfaces normalement inflammables (adaptés uniquement pour un montage sur des surfaces non combustibles)

2.6.4 Le cas échéant, le symbole correspondant pour les luminaires qui ne sont pas conçus pour être recouverts d'un matériau isolant thermique doit être apposé de manière distincte et durable sur le luminaire et il doit être visible pendant l'installation ou derrière une vasque ou une partie qui est enlevée lors de l'installation.

Lorsqu'il est apposé, ce symbole doit être expliqué sur le luminaire ou dans les instructions du fabricant fournies avec celui-ci.

La taille minimale du symbole doit être de 25 mm pour chaque côté. Voir la Figure 2.

Figure 2 – Symbole pour les luminaires qui ne sont pas conçus pour être recouverts d'un matériau isolant thermique

2.7 Construction

Les dispositions de la Section 4 de la Partie 1 s'appliquent.

2.8 Lignes de fuite et distances dans l'air

Les dispositions de la Section 11 de la Partie 1 s'appliquent.

2.9 Dispositions en vue de la mise à la terre

Les dispositions de la Section 7 de la Partie 1 s'appliquent.

2.10 Bornes

Les dispositions des Sections 14 et 15 de la Partie 1 s'appliquent.

2.11 Câblage externe et interne

Les dispositions de la Section 5 de la Partie 1 s'appliquent, ainsi que les suivantes.

Les câbles souples utilisés pour le raccordement au réseau d'alimentation, lorsqu'ils sont fournis par le fabricant du luminaire, doivent avoir des caractéristiques mécaniques et électriques au moins égales à celles qui sont spécifiées dans la série IEC 60227 ou dans la série IEC 60245, et être capables de supporter, sans détérioration, les températures les plus élevées auxquelles ils peuvent être soumis dans les conditions normales d'utilisation. Des matériaux autres que le PVC et le caoutchouc sont acceptables si les exigences ci-dessus sont satisfaites.

La conformité doit être vérifiée par les essais spécifiés au 2.13.

NOTE L'emploi de câbles souples avec des luminaires encastrés est approprié, pour les raisons suivantes:

1) le câble souple ne peut être aisément touché puisqu'il est normalement hors d'atteinte dans l'encastrement;
2) pour faciliter l'installation du luminaire dans l'encastrement;
3) pour permettre le réglage des luminaires encastrés réglables et ajustables.