

# Luminaires —

## Part 102: Particular requirements —

### Section 102.17 Specification for luminaires for stage lighting, television, film and photographic studios (outside and indoor)

UDC 628.977.7:654.191

# Cooperating organizations

The European Committee for Electrotechnical Standardization (CENELEC), under whose supervision this European Standard was prepared, comprises the National Committees of the following countries.

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## National foreword

This Section of BS 4533 has been prepared under the direction of the Electrical Illumination Standards Policy Committee and is the English language version of EN 60598-2-17 *“Luminaires — Part 2: Particular requirements — Section 17 — Luminaires for stage lighting, television, film and photographic studios (outdoor and indoor)”*, including Amendment A2 published by the European Committee for Electrotechnical Standardization (CENELEC). It was adopted by that organization from IEC Publication 598-2-17 (1984) edition 1, with Amendment No 1 (1987), and Amendment No. 2 (1990) which is identical with the European Standard.

There is no amendment A1 to EN 60598-2-17 because amendment 1:1987 to IEC 598-2-17:1984 was endorsed by EN 60598-2-17:1989.

The foreword and preface of IEC Publication 598-2-17 (1984) edition 1 and the preface of Amendment No 1 (1987), which do not form part of the text of EN 60598-2-17, have been quoted in National appendix NA. Annexes designated “normative” are part of the body of the standard. Annexes designated “informative” are given for information only. National appendices are designated “informative”.

In **17.1**, **17.2**, **17.12** and **17.13** where the words “Section of Part 2 of IEC Publication 598”, “section of Part 2” and “section of Publication 598-2” appear they should be read as “section of BS 4533”. In **17.1** and **17.2** where “Part 1” appears this should be read as “Part 101”. Where the words “Publication 598-1” appear they should be read as “BS 4533-101”.

**Cross-references.** Details of other international publications quoted in this British Standard are given in Annex ZA. Where there are British Standards corresponding to these international standards the relationships are given in National appendix NB.

**Product certification.** Users of this British Standard are advised to consider the desirability of third party certification of product conformity with this British Standard based on testing and continuing surveillance, which may be coupled with assessment of a supplier’s quality systems against the appropriate Part of BS 5750.

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### Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 8, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

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English version

**Luminaires**  
**Part 2: Particular requirements**  
**Section 17 — Luminaires for stage lighting, television, film**  
**and photographic studios (outdoor and indoor)**

*(includes amendment A2:1991)*  
(IEC 598-2-17 (1984) ed 1 + Amdt 1 (1987))

Luminaires

Deuxième partie: Règles particulières

Section dix-sept — Luminaires pour l'éclairage  
des scènes de théâtre, pour prises de vues de  
télévision et de cinéma (à l'extérieur et à  
l'intérieur)

*(inclut l'amendement A2:1991)*

(CEI 598-2-17 (1984) ed 1 + Amdt 1 (1987))

Leuchten

Teil 2: Besondere Anforderungen

Hauptabschnitt siebzehn: Leuchten für  
Bühnen, Fernseh-, Film und Fotostudios  
(Außen und Innen)

*(enthält Änderungen A2:1991)*

(IEC 598-2-17 (1984) Ausg. 1 + Amdt 1 (1987))

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

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

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Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

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Brief history

The CENELEC Questionnaire Procedure performed for finding out whether or not IEC 598-2-17 (first edition, 1984) as amended by Amendment No. 1 (1987) could be accepted without textual changes, has shown that no common modifications were necessary for the acceptance as European Standard (EN). The Reference Document was submitted to the CENELEC members for formal vote and acceptance by CENELEC.

Technical text

The text of the International Standard IEC 598-2-17 (first edition, 1984) as amended by Amendment No. 1 (1987) was approved by CENELEC on 1988-09-13 as a European Standard. Annexes designated “normative” are part of the body of the standard.

Annexes designated “informative” are given only for information.

In this European Standard, Annex ZA is normative  
The following dates were fixed:

- date of announcement (doa) 1989-04-01
- date of latest publication (dop) 1989-10-01
- date of withdrawal of conflicting national standard (dow) 1990-04-01

Foreword to amendment A2

The proposal of TC 34Z to endorse amendment 2:1990 to the International Standard IEC 598-2-17:1984 was submitted to the CENELEC members for unique acceptance in August 1990.

The reference document was approved by CENELEC as amendment A2 to EN 60598-2-17 on 25 June 1991.

The following dates were fixed:

- latest date of publication of an identical national standard (dop) 1992-06-01
- latest date of withdrawal of conflicting national standards (dow) 1992-11-01

For products which have complied with EN 60598-2-17:1989 before 1992-11-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 1997-11-01.

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## 17.1 Scope

This Section of Part 2 of IEC Publication 598 specifies requirements for stage, television, film and photographic studio luminaires (including spot and floodlighting projectors) for use, outdoor and indoor, with tungsten filament, tubular fluorescent and other discharge lamps on supply voltages not exceeding 1 000 V. It is to be read in conjunction with those sections of Part 1 to which reference is made.

**NOTE** A hanger (stirrup) is a part of the luminaire. Supporting devices such as tripods, telescopic booms and suspensions are not parts of the luminaire. Where applicable, ballasts are built into or mounted separately from the luminaires.

## 17.2 General test requirements

The provisions of Section 0 of Publication 598-1 apply. The tests described in each appropriate section of Part 1 shall be carried out in the order listed in this section of Part 2.

## 17.3 Definitions

For the purposes of this section, the definitions of Section 1 of Publication 598-1 apply.

## 17.4 Classification of luminaires

Luminaires shall be classified in accordance with the provisions of Section 2 of Publication 598-1.

## 17.5 Marking

The provisions of Section 3 of Publication 598-1 apply, together with the requirements of Sub-clauses 17.5.1 to 17.5.7.

**17.5.1** Where the luminaire design imposes restrictions of use, the following information shall be marked on the luminaire:

- a) an indication of the “top” of the luminaire;
- b) the designed positions or range of angles of use;
- c) mounting arrangements (or reference to a document which specifies the mounting arrangements).

**17.5.2** The following warning shall be clearly marked on the exterior of the luminaire:

“Isolate electrically before re-lamping.  
CAUTION — Hot Lamp.”

**17.5.3** The rated maximum ambient temperature  $t_a$  shall be clearly marked on the luminaire.

**17.5.4** Minimum distances from flammable materials to all exterior surfaces of the luminaire (to prevent ignition of the flammable material) shall be clearly marked on the luminaire.

**17.5.5** Luminaires for certain types of high-pressure discharge lamps shall, where appropriate, be marked with the following warning against opening immediately after switching off:

“DO NOT OPEN FOR X SECONDS AFTER SWITCHING OFF”.

**NOTE** The value of “X” is determined by the manufacturer (see Sub-clause 17.6.2).

**17.5.6** The exterior of the luminaire shall be clearly marked with the value of the exterior surface temperature under steady state conditions.

**17.5.7** Luminaires which do not have protection against shattering lamps (see Sub-clause 17.6.3) shall be marked as follows:

“WARNING — use only lamp complying with Sheet 357-IEC-3155.”

**17.5.8** The instruction leaflet supplied with the luminaire shall also contain a warning that:

- “a) shields (see Sub-clause 17.6.3), lenses or ultraviolet screens shall be changed if they have become visibly damaged to such an extent that their effectiveness is impaired, for example by cracks or deep scratches;
- b) the lamp shall be changed if it has become damaged or thermally deformed.”

## 17.6 Construction

The provisions of Section 4 of Publication 598-1 apply, together with the requirements of Sub-clauses 17.6.1 to 17.6.6.

**17.6.1** The design of the luminaire shall be such that it is not possible to insert a lamp into a “live” lampholder of the luminaire. This requirement does not apply to luminaires intended only for professional use. If (e.g. in luminaires with ignitors) the working voltage calculated in accordance with

the equation  $U_R = \frac{U_S}{4.6}^{1)}$  exceeds the value

of 1 000 V, it shall only be possible to open the luminaire with the aid of a tool or the luminaire shall be provided with an automatic switch to interrupt all poles of the mains supply.

<sup>1)</sup>  $U_R$  = effective value of the working voltage

$U_S$  = peak value of the pulse voltage of the ignitor.

**17.6.2** The luminaire for certain types of high-pressure discharge lamp, where an explosion risk is declared by the lamp manufacturer, shall incorporate a device to prevent immediate access to the lamp after switching-off or shall be marked in accordance with the requirements of Sub-clause **17.5.5**.

**17.6.3** The luminaire shall be constructed so as to retain particles of glass or quartz produced in the event of the lamp shattering.

Openings through which particles could fall under gravity with the luminaire in any of its normal operating positions shall be such as to retain fragments larger than 3 mm.

All other openings shall be constructed in such a way that parts of a shattered lamp cannot leave the luminaire by a direct path.

The luminaire is deemed to comply with the direct-path requirements if openings are screened with a mesh with openings not exceeding 8 mm or are screened with a labyrinth.

The above requirements of this sub-clause do not apply if the luminaire is clearly marked that only lamps which comply with Sheet 357-IEC-3155 are to be used.

If in front of the lamp there is a protective shield made of glass, the luminaire is deemed to be in accordance with the requirements if in front of this glass shield a mesh is mounted with openings not exceeding 12 mm.

If the luminaire is provided with a protective glass shield in the form of a single lens, the openings of the mesh shall not exceed 25 mm. If the luminaire is fitted with a multi-lens objective no mesh is necessary.

These protective shields shall be suitable for the temperature in normal use and their clamping means shall be able to keep a broken shield in position.

Compliance with the requirements of Sub-clauses **17.6.1** to **17.6.3** shall be checked by inspection and by the following test:

*Test:*

The luminaire is operated at a rated voltage in the most onerous position of normal use until thermal equilibrium is achieved. Five layers of cotton gauze are placed on a wooden base at a distance of 500 mm below the outer luminaire housing. The lamp is then caused to shatter, for example, for filament lamps, by abruptly increasing the voltage applied to the lamp by about 30 %

If the lamp (i.e. a lamp complying with Sheet 357-IEC-3155) does not shatter owing to the increased voltage, it is broken by mechanical means. The lamp is prepared for the test by making an incision in the bulb wall. After 5 min operation at rated voltage, the lamp is destroyed by hitting at the location of the incision through a hole provided for this purpose in the luminaire.

If parts of the lamp drop down, they shall not ignite the cotton gauze. Discoloration and scorching of the gauze are neglected. The safety of the luminaire shall not be impaired after the lamp is destroyed.

**17.6.4 Hanger (stirrup)**

Where a hanger is provided, the bearing parts of the hanger shall be capable of supporting ten times the weight of the luminaire without permanent deformation and shall be manufactured from non-combustible materials such as steel or its equivalent.

Parts of the hanger carrying the weight of the luminaire shall be capable of supporting ten times the weight of the luminaire without permanent deformation.

Parts of the hanger carrying a proportion of the weight of the luminaire shall be capable of supporting ten times the proportion of the weight. The connection between hanger and luminaire shall be locked against loosening.

**17.6.5** The design of the luminaire shall be such that removeable accessories, e.g. colour frames and barndoors, when properly inserted cannot fall out of the luminaire from any position of the luminaire irrespective of its normal burning angle.

**17.6.6** A secondary suspension shall be provided for the luminaire, except where the luminaire is arranged for floor mounting or intended for hand-held use. This secondary suspension shall be designed and mounted in such a way that even in the event of the failure of the primary suspension no part of the luminaire can fall.

“Compliance shall be checked by the following test:

With the end of the secondary suspension remote from the luminaire securely fixed, the luminaire is allowed to hang freely by means of the secondary suspension alone. The luminaire is raised in its hanging mode a distance of 300 mm vertically and allowed to fall freely. This test is made 30 times.

The secondary suspension shall not fail and no part of the luminaire shall fall”.



**17.6.7** Where the handle of a luminaire encases electrical circuitry it shall be of insulating material, unless the handle is double insulated from current-carrying parts in which case the use of other materials is permitted.

Compliance is checked by inspection.

### **17.7 Creepage distances and clearances**

The provisions of Section 11 of Publication 598-1 apply.

### **17.8 Provisions for earthing**

The provisions of Section 7 of Publication 598-1 apply.

### **17.9 Terminals**

The provisions of Sections 14 and 15 of Publication 598-1 apply except that spring-type screwless terminals of the Type b shown in Figure 19 of Publication 598-1 shall not be used.

### **17.10 External and internal wiring**

The provisions of Section 5 of Publication 598-1 apply, together with the requirements of Sub-clauses **17.10.1** to **17.10.2**.

**17.10.1** External and internal wiring shall have a cross-sectional area not less than  $0.75 \text{ mm}^2$  for current ratings up to 3 A and a cross-sectional area not less than  $1.5 \text{ mm}^2$  for current ratings over 3 A.

**17.10.2** Where luminaires are fitted with plugs and sockets for connection to independent or remote control gear, the plugs and sockets shall not be interchangeable with the plugs and sockets for connection to the mains supply if the direct connection of the luminaire or control gear to the mains supply is dangerous or is capable of causing damage to the surroundings of the control gear or luminaire.

### **17.11 Protection against electric shock**

The provisions of Section 8 of Publication 598-1 apply, together with the requirements of Sub-clause **17.13** (see also Sub-clause **17.5.2**).

### **17.12 Endurance tests and thermal tests**

The provisions of Section 12 of Publication 598-1 apply, together with the requirements of Sub-clause **17.12.1**. Luminaires with an IP classification greater than IP20 shall be subjected to the relevant test of Clauses **12.4**, **12.5** and **12.6** of Section 12 of Publication 598-1 after the test(s) of Clause **9.2** but before the test(s) of Clause **9.3** of Section 9 of Publication 598-1 specified in Clause **17.13** of this Section of Publication 598-2.

**17.12.1** The housing temperature shall not exceed the value marked on the luminaire in accordance with Sub-clause **17.5.6**.

### **17.13 Resistance to dust and moisture**

The provisions of Section 9 of Publication 598-1 apply. For luminaires with an IP classification greater than IP20 the order of the tests specified in Section 9 of Publication 598-1 shall be as specified in Clause **17.12** of this Section of Publication 598-2.

### **17.14 Insulation resistance and electric strength**

The provisions of Section 10 of Publication 598-1 apply.

### **17.15 Resistance to heat, fire and tracking**

The provisions of Section 13 of Publication 598-1 apply.

**Annex ZA (normative)**  
**Other international publications quoted in this standard**

When the international publication has been modified by CENELEC common modifications (mod = modified by CENELEC common modifications) the relevant **EN/HD** applies.

IEC Publications	EN/HD	Date of issue of EN/HD
598-1, mod Luminaires Part 1: <i>General requirements and tests</i>	EN 60598-1	Sliding; latest edition



**National appendix NA (informative)**  
**Deletions from IEC Publication 598-2-17 (1984) edition 1 and**  
**Amendment No 1 (1987)**

**Foreword of IEC Publication 598-2-17 (1984) edition 1**

- 1) The formal decisions or agreements of the IEC on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.
- 3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.

**Preface of IEC Publication 598-2-17 (1984) edition 1**

This standard has been prepared by Sub-Committee 34D: Luminaires, of IEC Technical Committee No. 34: Lamps and Related Equipment.

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

Six Months' Rule	Report on Voting
34D(CO)88	34D(CO)97

Further information can be found in the Report on Voting indicated in the table above.  
This publication should be read in conjunction with IEC Publication 598-1: Luminaires, Part 1: General Requirements and Tests.

**Preface of Amendment No 1 (1987) to IEC Publication 598-2-17 (1984) edition 1**

This amendment has been prepared by Sub-Committee 34D: Luminaires, of IEC Technical Committee No. 34: Lamps and Related Equipment.

The text of this amendment is based upon the following documents:

Six Months' Rule	Reports on Voting
34D(CO)111	34D(CO)128
34D(CO)125	34D(CO)141

Full information on the voting for the approval of this amendment can be found in the Voting Reports indicated in the above table.

**National appendix NB (informative)**

The British Standards corresponding to the international standards referred to in EN 60598-2-17 are as follows:

International standard	British Standard
IEC 357 (mod)	BS 1075:1989 <i>Specification for tungsten halogen lamps (non-vehicle)</i>
EN 60357	(Identical)
IEC 598-1 (mod)	BS 4533 <i>Luminaires</i>
EN 60598-1	Part 101:1990 <i>Specification for general requirements and tests</i>
	(Identical)

## **National appendix NC (informative)**

The United Kingdom participation in the preparation of this European Standard was entrusted by the Electrical Illumination Standards Policy Committee (LGL/-) to Technical Committee LGL/3, upon which the following bodies were represented:

Association of County Councils  
Association of Manufacturers Allied to the Electrical and Electronic Industry (BEAMA Ltd.)  
British Lighting Association for the Preparation of Standards (Britlaps)  
Chartered Institution of Building Services Engineers  
Consumer Standards Advisory Committee of BSI  
Decorative Lighting Association  
Department of Trade and Industry (Consumer Safety Unit, CS Division)  
Electrical Contractors Association  
Electrical Installation Equipment Manufacturers Association (BEAMA Ltd.)  
Electricity Supply Industry in England and Wales  
Health and Safety Executive  
Institution of Lighting Engineers  
Lighting Industry Federation Ltd.  
Society of Glass Technology

The following bodies were also represented through subcommittees and panels:

Association of Consulting Scientists  
Chief and Assistant Chief Fire Officers' Association  
Department of Health and Social Security

**BS 4533-102.17:**  
**1990**  
**EN 60598-2-17:**  
**1989**

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