

Specification for Metal halide lamps

The European Standard EN 61167:1994 has the status of a
British Standard

ICS 29.140.30

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:

Austria	Italy
Belgium	Luxembourg
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Finland	Norway
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Germany	Spain
Greece	Sweden
Iceland	Switzerland
Ireland	United Kingdom

This British Standard, having been prepared under the direction of the Electrotechnical Sector Board, was published under the authority of the Standards Board and comes into effect on 15 March 1995

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National foreword

This British Standard has been prepared under the direction of the Electrotechnical Sector Board, and is the English language version of EN 61167:1994 *Metal halide lamps*, and amendments A1:1995, A2:1997 and A3:1998 published by the European Committee for Electrotechnical Standardization (CENELEC). It is identical with IEC 1167:1992 including Amendment 1:1995, Amendment 2:1997 and Amendment 3:1998 published by the International Electrotechnical Commission (IEC), which has the same title as the European Standard.

The foreword of the EN makes reference to “date of withdrawal (dow) of conflicting national standards” as “1996-03-01”. In this case the relevant national standard is BS EN 61167 but the date of withdrawal relates only to those part of the British Standard subject to amendment A1. Certificates and marks will not be awarded after this date with respect to the British Standard not incorporating amendment A1. They will be awarded only to the amended British Standard. However, such certificates and marks already awarded with respect to the British Standard not incorporating amendment A1 may continue to apply for production until 2001-03-10.

Analogous provisions apply in respect of Amendment No. 2, for which the date of withdrawal is 1998-04-01.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 36 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.

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 61167

August 1994

+ A1

April 1995

+ A2

August 1997

+ A3

October 1998

UDC 621.327.54:620.1

ICS 29.140.30

Descriptors: Lighting equipment, electric lamp, discharge lamp, marking, dimension, electrical characteristics, operating characteristics, electric starting test

English version

Metal halide lamps

(includes amendments A1:1995, A2:1997 and A3:1998)

(IEC 61167:1992 + A1:1995 + A2:1997 + A3:1998)

Lampes aux halogénures métalliques
(inclut les amendements A1:1995, A2:1997
et A3:1998)
(CEI 61167:1992 + A1:1995 + A2:1997 +
A3:1998)

Halogen-Metalllampe
(enthält Änderungen A1:1995, A2:1997
und A3:1998)
(IEC 61167:1992 + A1:1995 + A2:1997 +
A3:1998)

This European Standard was approved by CENELEC on 1995-03-06. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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

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

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

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

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

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Ref. No. EN 61167:1994 + A1:1995 + A2:1997 + A3:1998 E
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Foreword of EN 61167:1994

The CENELEC questionnaire procedure, performed for finding out whether or not the International Standard IEC 1167:1992 could be accepted without textual changes, has shown that no common modifications were necessary for the acceptance as a European Standard.

The reference document was submitted to the CENELEC members for formal vote and was approved by CENELEC as EN 61167 on 8 March 1994.

The following dates were fixed:

- latest date of publication of an identical national standard (dop) 1995-03-15
- latest date of withdrawal of conflicting national standards (dow) 1995-03-15

For products which have complied with the relevant national standard before 1995-03-15, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 2000-03-15.

Annexes designated normative are part of the body of the standard. In this standard, Annex ZA is normative.

Foreword of amendment A1 to EN 61167

The text of document 34A(CO)704, future amendment 1 to IEC 1167:1992, prepared by SC 34A, Lamps, of IEC TC 34, Lamps and related equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A1 to EN 61167:1994 on 1995-03-06.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical standard or by endorsement (dop) 1996-03-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 1996-03-01

Foreword of amendment A2 to EN 61167

The text of document 34A/707/FDIS, future amendment 2 to IEC 61167:1992, prepared by SC 34A, Lamps, of IEC TC 34, Lamps and related equipment, was submitted to the IEC/CENELEC parallel vote and was approved by CENELEC as amendment A2 to EN 61167:1994 on 1997-07-01.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1998-04-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 1998-04-01

Annexes designated “normative” are part of the body of the standard. In this standard, Annex ZA is normative.

Annex ZA has been added by CENELEC.

Foreword of amendment A3 to EN 61167

The text of document 34A/818/FDIS, future amendment 3 to IEC 61167:1992, prepared by SC 34A, Lamps, of IEC TC 34, Lamps and related equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A3 to EN 61167:1994 on 1998-10-01.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1999-07-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 2001-07-01

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Section 1. General

1.1 Scope

This International Standard specifies the methods of test to be used for determining the characteristics of metal halide lamps, both single-ended and double-ended, operated on a.c. mains, 50 Hz or 60 Hz, with ballasts satisfying the requirements of IEC 923.

These requirements relate only to type testing.

The standard specifies lamp dimensions, electrical characteristics for lamp starting and operation together with information for ballast, ignitor and luminaire design and colour characteristics.

1.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 61, *Lamp caps and holders together with gauges for the control of interchangeability and safety.*

IEC 61-1:1969, *Part 1 — Lamp caps including supplements 61-1A to 61-1N.*

IEC 410:1973, *Sampling plans and procedures for inspection by attributes.*

IEC 598-1:1992, *Luminaires — Part 1: General requirements and tests.*

IEC 923:1988, *Ballasts for discharge lamps (excluding tubular fluorescent lamps) — Performance requirements.*

IEC 60357:1982, *Tungsten halogen lamps (non-vehicle).*

IEC 60682:1980, *Method of measuring the pinch temperature of quartz glass lamps.*

1.3 Definitions

For the purposes of this International Standard the following definitions apply:

1.3.1

rated wattage

the wattage marked on the lamp, expressed in watts

1.3.2

rated luminous flux

the luminous flux declared by the manufacturer, expressed in lumens

1.3.3

reference ballast

a special inductive type ballast complying with the requirements of IEC 923 designed for use:

- a) in testing lamps;
- b) as comparison ballast in testing ballasts;
- c) in selection of reference lamps. It is essentially characterized by a stable voltage/current ratio and is relatively uninfluenced by variations in current, temperature and magnetic surroundings.

1.3.4

calibration current

the value of the current on which the calibration of the reference ballast is based

1.3.5

type test

a test or series of tests, made on a type test sample, for the purpose of checking compliance of the design of a given product with the requirements of the relevant specification

1.3.6

type test sample

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

1.3.7

metal halide lamp

a high intensity discharge lamp in which the major portion of the light is produced from a mixture of metallic vapour, metal halides and the products of dissociation of metal halides

NOTE The definition covers clear and coated lamps.

1.3.8

colour

the colour characteristics of metal halide lamps are defined by the chromaticity co-ordinates x and y and the general colour-rendering index R_a

the correlated colour temperature can be used as a guide to the colour appearance of the lamp

1.3.9

specific effective radiant UV power

the effective power of the UV radiation of a general service lamp related to its luminous flux
(Unit: mW/klm)

NOTE The effective power of the UV radiation is obtained by weighting the spectral power distribution of the lamp with the action spectrum published by the ACGIH, which is endorsed by the World Health Organization and recommended by the International Radiation Protection Association.

1.4 Lamp marking

The following information shall be distinctly and durably marked on the lamp:

- a) mark of origin: this may take the form of a trade mark, the manufacturer's identification mark or the name of the responsible vendor;
- b) rated wattage.

In addition, the following information may be given either on the lamp or in the supplier's catalogue:

- c) suitable advice on the colour appearance in the form of the manufacturer's code or the correlated colour temperature.

1.5 Lamp dimensions

The lamp dimensions shall comply with the values given on the relevant lamp data sheet.

1.6 Caps

The caps on the finished lamps shall comply with the requirements of the relevant sheet of IEC 61-1.

1.7 Test requirements

1.7.1 General remarks on tests

1.7.1.1 Tests according to these requirements are type tests.

NOTE The requirements and tolerances permitted by this standard are related to testing of a type test sample submitted by the manufacturer for that purpose. In principle this type test sample should consist of units having characteristics typical of the manufacturer's production and be as close to the production centre point values as possible.

It may be expected with the tolerances given in the standard that products manufactured in accordance with the type test sample will ensure compliance with the standard for the majority of the production. Due to the production spread it is inevitable, however, that there may be lamps outside the specified tolerances. For guidance of sampling plans and procedures for inspection by attributes, see IEC 410.

1.7.1.2 For the tests the lamps shall be operated in free air or as specified in the relevant lamp data sheet at an ambient temperature of $25\text{ °C} \pm 5\text{ °C}$ on a 50 Hz or 60 Hz sinusoidal power supply using the specified reference ballast at rated voltage and in the operating position specified on the relevant lamp data sheet. Due to their temperature-related behaviour, double-ended metal halide lamps should always be operated in luminaires.

Therefore, for measurement of the electrical, photometrical, colour and UV characteristics, lamps shall be operated within a luminaire simulator.

The simulator consists of a quartz or hard glass tube which is closed at both ends by an aluminium disk with matt surfaces (see Figure 1).

The position of the lamp during measurement shall be horizontal. Provisions shall be taken to ensure that the exhaust tip of the discharge tube is not directed downwards.

NOTE If for certain measurements, the UV radiation of the lamp is not suppressed, care should be taken to protect persons in the vicinity

1.7.2 Lamp electrical characteristics

The lamp electrical characteristics shall comply with the values given in the relevant lamp data sheet.

1.7.3 Lamp starting test

Requirements and test conditions are under consideration.

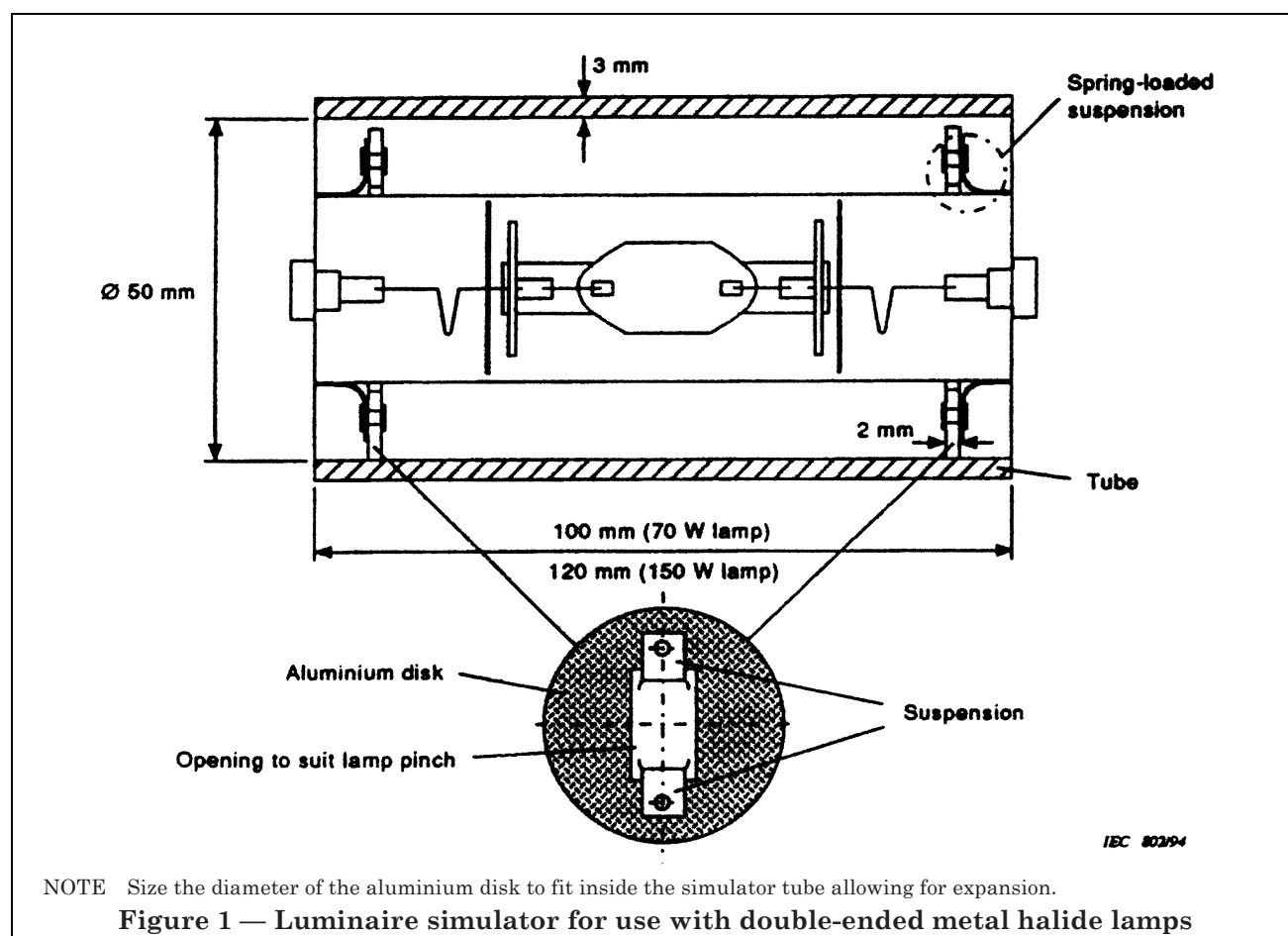
1.7.4 Luminous flux

The luminous flux of individual lamps shall be not less than 90 % of the rated value.

Test conditions are under consideration.

1.7.5 Colour characteristics

Test conditions are under consideration.



1.7.6 UV radiation

The specific effective radiant UV power of the lamp shall not exceed the maximum value specified on the relevant lamp data sheet. The value is measured under the same conditions as the lamp's electrical and colour characteristics.

1.8 Information for ballast, ignitor and luminaire design

In order to ensure reliable starting and operating conditions, ballasts, ignitors and luminaires shall meet the requirements specified on the relevant lamp data sheet.

IEC 60682 provides information for the measurement of the pinch temperature. Advice regarding the measurement of the bulb temperature can be taken from IEC 60357, Annex C.

These measurements are required for performance criteria of the lamps.

Some lamp types emit a high level of UV radiation. For some lamp types there is a risk of the lamp shattering and/or a possibility that lamps may exhibit abnormal operating conditions at the end of lamp life (rectifying effect). For lamps listed in this standard, this information is given on the relevant lamp data sheet. For lamps not listed in this standard, warning that one or more of these risks may occur shall be given by the lamp manufacturer or responsible vendor. To prevent possible unsafe situations, suitable protective measures shall be taken in the luminaire when one or more of these risks may occur.

1.9 Diagrammatic lamp data sheets

Sheet number reference	Description
61167-IEC-0001-	Diagrammatic data sheet for location of single-ended metal halide lamp dimensions
61167-IEC-0002-	Diagrammatic data sheet for location of double-ended metal halide lamp dimensions

Section 2. Lamp data sheets

2.1 Numbering system for lamp data sheets

The first number represents the number of this standard (61167) followed by the letters "IEC".

The second number represents the lamp data sheet number.

The third number indicates the edition of the sheet.

Only those pages of the lamp data sheet which have been modified have a new edition number. For example, the first page of the lamp data sheet 61167-IEC-1000-1 has been modified, so this first page is now numbered 61167-IEC-1000-2. The following page of the lamp data sheet has not been modified and therefore retains the number 61167-IEC-1000-1.

2.2 List of specific lamp types

Wattage W	Correlated colour temperature K	Type	Cap	Sheet number reference
35	3 000	Single-ended	G12	61167-IEC-1000-
70	3 000	Single-ended	G12	61167-IEC-1050-
70	4 000 ^a	Single-ended	G12	61167-IEC-1055-
150	3 000	Single-ended	G12	61167-IEC-1100-
150	4 000 ^a	Single-ended	G12	61167-IEC-1105-
70	3 000	Double-ended	RX7s	61167-IEC-2050-
70	4 200	Double-ended	RX7s	61167-IEC-2055-
150	3 000	Double-ended	RX7s-24	61167-IEC-2100-
150	4 200	Double-ended	RX7s-24	61167-IEC-2105-
250	4 200 ^a	Double-ended	Fc2	61167-IEC-2205-
^a Under consideration				