

PD IEC/PAS 62815-1:2013



BSI Standards Publication

Cold cathode fluorescent lamps

Part 1: Safety specifications

bsi.

...making excellence a habit.™

National foreword

This Published Document is the UK implementation of IEC/PAS 62815-1:2013.

The UK participation in its preparation was entrusted by Technical Committee CPL/34, Lamps and Related Equipment, to Subcommittee CPL/34/1, Electric lamps.

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

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2013.
Published by BSI Standards Limited 2013

ISBN 978 0 580 80166 2
ICS 29.140.99

Compliance with a British Standard cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 30 November 2013.

Amendments/corrigenda issued since publication

Date	Text affected
-------------	----------------------



PUBLICLY AVAILABLE SPECIFICATION

PRE-STANDARD

**Cold cathode fluorescent lamps –
Part 1: Safety specifications**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

PRICE CODE

K

ICS 29.140.99

ISBN 978-2-8322-1124-3

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD	3
1 Scope	5
2 Normative references	5
3 Terms and definitions	5
4 Safety requirements	6
4.1 General	6
4.2 Marking	6
4.3 Insulation resistance	7
4.4 Electric strength	7
4.5 Resistance to heat and fire	7
5 Sequence of the tests	8
Annex A (normative) Condition of compliance for design tests	9
Bibliography	10
Table 1 – Sampling and acceptable quality levels	8

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COLD CATHODE FLUORESCENT LAMPS –

Part 1: Safety specifications

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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

A PAS is a technical specification not fulfilling the requirements for a standard, but made available to the public.

IEC/PAS 62815-1 has been processed by subcommittee 34A: Lamps, of IEC technical committee 34: Lamps and related equipment.

The text of this PAS is based on the following document:

This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document

Draft PAS	Report on voting
34A/1595/PAS	34A/1614/RVD

Following publication of this PAS, which is a pre-standard publication, the technical committee or subcommittee concerned may transform it into an International Standard.

This PAS shall remain valid for an initial maximum period of 3 years starting from the publication date. The validity may be extended for a single period up to a maximum of 3 years, at the end of which it shall be published as another type of normative document, or shall be withdrawn.

COLD CATHODE FLUORESCENT LAMPS –

Part 1: Safety specifications

1 Scope

This part of IEC/PAS 62815 specifies the safety requirements for tubular type cold cathode fluorescent lamps for backlight unit purposes (used for flat panel displays such as TVs and monitors etc.), hereafter called “lamps”. This PAS will be revised to include other types of lamp when a need for them is recognized.

It also specifies the method a manufacturer should use to show compliance with the requirements of this PAS on the basis of whole production appraisal in association with test records on finished products.

NOTE Compliance with this PAS concerns only safety criteria and does not take into account the performance of cold cathode fluorescent lamps for general lighting purposes with respect to colour, starting and operational characteristics.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050 (all parts), *International Electrotechnical Vocabulary* (available at <http://www.electropedia.org>)

IEC 60410, *Sampling plans and procedures for inspection by attributes*

IEC 60695-2-10, *Fire hazard testing – Part 2-10: Glowing/hot-wire based test methods – Glow-wire apparatus and common test procedure*

IEC 61195, *Double-capped fluorescent lamps – Safety specifications*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-845 and the following apply.

3.1

cold cathode fluorescent lamp

fluorescent lamp with cold cathode, in which most light is emitted by the excitation of phosphors coated in the discharge vessel

3.2

rated value

quantity value for a characteristic of a lamp for specified operating conditions

Note 1 to entry: The value and the conditions are specified in this PAS, or assigned by the manufacturer or responsible vendor.

**3.3
design test**

test made on a sample for the purpose of checking compliance of the design of a family, group or a number of groups with the requirements of the relevant clause

**3.4
periodic test**

test, or series of tests, repeated at intervals in order to check that a product does not deviate in certain respects from the given design

**3.5
running test**

test repeated at frequent intervals to provide data for assessment

**3.6
batch**

all lamps of one family and/or group identified as such and put forward at one time for testing to check compliance

**3.7
whole production**

production during a period of twelve months of all types of lamps within the scope of this PAS

4 Safety requirements

4.1 General

Lamps shall be so designed and constructed that in normal use they present no danger to the user or to the surroundings.

It may be expected that lamps which comply with this PAS can be operated at voltages between 94 % and 106 % of rated voltage and at an ambient temperature of between 23 °C and 27 °C.

4.2 Marking

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

- a) manufacturer's model number or type reference;
- b) date of manufacture;
- c) mark of origin (this may take the form of a trade mark, the manufacturer's identification mark or the name of the responsible vendor);
- d) tube length, tube diameter, and the name of the product.

NOTE For b) to d), if it is difficult to mark on the lamp, these can be marked on the packing unit.

4.2.2 Compliance with the requirements of 4.2.1 is checked by inspection and by the following test.

The durability of the marking is checked by trying to remove it by rubbing lightly for 15 s with a piece of cloth soaked with water and, after drying, for a further 15 s with a piece of cloth soaked with petroleum spirit.

4.3 Insulation resistance

When measured using test equipment with a d.c. voltage of 500 V, the insulation resistance shall not be less than 2 MΩ.

4.4 Electric strength

4.4.1 Electric strength shall withstand the test voltage of 4.4.2. No flashover or breakdown shall occur during the test.

Conditions and method of test are given in Annex A.

4.4.2 A 2 500 V (2U + 1 000 V) a.c. voltage of substantially sine-wave form, with a frequency of 50 Hz or 60 Hz shall be applied for 1 min. Initially, not more than half the prescribed voltage shall be applied, it shall then be raised gradually to the full value.

NOTE U specifies the operating voltage.

Glow discharges without a drop in voltage are neglected.

4.5 Resistance to heat and fire

4.5.1 Insulating material of caps shall be resistant to heat.

4.5.2 Compliance is checked by the following test.

Samples are tested in a heating cabinet at a temperature of 125 °C ± 5 °C for a period of 168 h.

At the end of the test, the samples shall not have undergone any change impairing their further safety, especially in the following respects:

- reduction in the protection against electric shock as required in 4.4 and 4.5;
- loosening of cracks, swelling and shrinking as determined by visual inspection.

4.5.3 External parts of insulating material shall be resistant to abnormal heat and to fire.

4.5.4 Compliance is checked by the following test.

Parts are subjected to a test using a nickel-chromium glow-wire heated to 650 °C. The test apparatus shall be that described in IEC 60695-2-10.

The sample to be tested is mounted vertically on the carriage and pressed against the glow-wire tip with a force of 1 N, preferably 15 mm or more from the upper edge of the sample. The penetration of the glow-wire into the sample is mechanically limited to 7 mm. After 30 s the sample is withdrawn from contact with the glow-wire tip.

The glow-wire temperature and heating current shall be constant for 1 min prior to commencing the test. Care shall be taken to ensure that heat radiation does not influence the sample during this period. The glow-wire tip temperature is measured in IEC 60695-2-1/0.

NOTE Precautions should be taken to safeguard the health of personnel conducting tests against risk of

- explosion of fire;
- inhalation of smoke and/or toxic products;
- toxic residues.

5 Sequence of the tests

The testing shall be carried out in the order listed in Table 1.

Where tests are subsequently carried out on the same samples, the influence of previous tests carried out shall not affect the subsequent test results.

Except for design tests (see Annex A), where tests can be applied to both ends of the lamps, both ends shall be tested. The lamp shall be non-compliant if either one or both ends fail the requirement.

Damage test shall be carried out at the end of the test and each test sample may be taken separately from the original sample.

Table 1 – Sampling and acceptable quality levels

Test item	Sample quantity	Acceptance number
Marking	10	1
Insulation resistance, electric strength	5	0
Resistance to heat and fire	1	0

Annex A (normative)

Condition of compliance for design tests

A.1 General

For these tests, both ends of the lamp shall be connected and after the tube is wrapped with aluminum foil, the test voltage shall be applied.

The one end of the aluminum foil shall be positioned at the end of the electrode inside the glass tube. The width of aluminum foil shall be the same as the distance between internal electrodes if the distance between internal electrodes is less than 20 cm or 20 cm if the distance between internal electrodes is more than 20 cm and shall be tested again with the end of the aluminum foil positioned at the end of other electrode.

A.2 Insulation resistance and electric strength (see 4.3 and 4.4.2)

(Each test shall be assessed separately.)

First sample: 125

Rejection number: 2

If one failure is found, take a second sample of 125

Rejection number: 2 in the combined sample

Bibliography

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

IEC 61347-2-3, *Lamp control gear – Part 2-3: Particular requirements for a.c. and/or d.c. supplied electronic control gear for fluorescent lamps*

ISO 2859-1, *Sampling procedures for inspection by attribute –Part 1: Sampling schemes indexed by acceptable quality level (AQL) for lot-by-lot inspection*

British Standards Institution (BSI)

BSI is the national body responsible for preparing British Standards and other standards-related publications, information and services.

BSI is incorporated by Royal Charter. British Standards and other standardization products are published by BSI Standards Limited.

About us

We bring together business, industry, government, consumers, innovators and others to shape their combined experience and expertise into standards-based solutions.

The knowledge embodied in our standards has been carefully assembled in a dependable format and refined through our open consultation process. Organizations of all sizes and across all sectors choose standards to help them achieve their goals.

Information on standards

We can provide you with the knowledge that your organization needs to succeed. Find out more about British Standards by visiting our website at bsigroup.com/standards or contacting our Customer Services team or Knowledge Centre.

Buying standards

You can buy and download PDF versions of BSI publications, including British and adopted European and international standards, through our website at bsigroup.com/shop, where hard copies can also be purchased.

If you need international and foreign standards from other Standards Development Organizations, hard copies can be ordered from our Customer Services team.

Subscriptions

Our range of subscription services are designed to make using standards easier for you. For further information on our subscription products go to bsigroup.com/subscriptions.

With **British Standards Online (BSOL)** you'll have instant access to over 55,000 British and adopted European and international standards from your desktop. It's available 24/7 and is refreshed daily so you'll always be up to date.

You can keep in touch with standards developments and receive substantial discounts on the purchase price of standards, both in single copy and subscription format, by becoming a **BSI Subscribing Member**.

PLUS is an updating service exclusive to BSI Subscribing Members. You will automatically receive the latest hard copy of your standards when they're revised or replaced.

To find out more about becoming a BSI Subscribing Member and the benefits of membership, please visit bsigroup.com/shop.

With a **Multi-User Network Licence (MUNL)** you are able to host standards publications on your intranet. Licences can cover as few or as many users as you wish. With updates supplied as soon as they're available, you can be sure your documentation is current. For further information, email bsmusales@bsigroup.com.

BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK

Revisions

Our British Standards and other publications are updated by amendment or revision.

We continually improve the quality of our products and services to benefit your business. If you find an inaccuracy or ambiguity within a British Standard or other BSI publication please inform the Knowledge Centre.

Copyright

All the data, software and documentation set out in all British Standards and other BSI publications are the property of and copyrighted by BSI, or some person or entity that owns copyright in the information used (such as the international standardization bodies) and has formally licensed such information to BSI for commercial publication and use. Except as permitted under the Copyright, Designs and Patents Act 1988 no extract may be reproduced, stored in a retrieval system or transmitted in any form or by any means – electronic, photocopying, recording or otherwise – without prior written permission from BSI. Details and advice can be obtained from the Copyright & Licensing Department.

Useful Contacts:

Customer Services

Tel: +44 845 086 9001

Email (orders): orders@bsigroup.com

Email (enquiries): cservices@bsigroup.com

Subscriptions

Tel: +44 845 086 9001

Email: subscriptions@bsigroup.com

Knowledge Centre

Tel: +44 20 8996 7004

Email: knowledgecentre@bsigroup.com

Copyright & Licensing

Tel: +44 20 8996 7070

Email: copyright@bsigroup.com



...making excellence a habit.™