



Auxiliaries for lamps—Capacitors for use in tubular fluorescent and other discharge lamp circuits—General safety requirements (IEC 61048:2015, MOD)

STANDARDS
Australia



AS 61048:2019

This Australian Standard® was prepared by EL-041, Lamps and Related Equipment. It was approved on behalf of the Council of Standards Australia on 14 December 2018.

This Standard was published on 17 January 2019.

The following are represented on Committee EL-041:

Australian Industry Group
Consumers' Federation of Australia
Department of the Environment and Energy, Australian Government
Electrical Compliance Testing Association of Australia
Electrical Regulatory Authorities Council
IES: The Lighting Society
Joint Accreditation System of Australia and New Zealand
Lighting Council Australia
Master Electricians Australia
NSW Fair Trading

This Standard was issued in draft form for comment as DR2 AS 61048:2018.

Keeping Standards up-to-date

Ensure you have the latest versions of our publications and keep up-to-date about Amendments, Rulings, Withdrawals, and new projects by visiting:

www.standards.org.au

www.saiglobal.com (sales and distribution)

ISBN 978 1 76072 346 0



Auxiliaries for lamps—Capacitors for use in tubular fluorescent and other discharge lamp circuits—General safety requirements (IEC 61048:2015, MOD)

Originates as AS 2644—1983.
Previous edition AS 2644—1990.
Jointly revised and redesignated in part as AS/NZS 61048:2002.
Second edition 2019.

COPYRIGHT

© IEC 2019 — All rights reserved
© Standards Australia Limited 2019

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Cth).

Published by SAI Global Pty Limited under licence from Standards Australia Limited, GPO Box 476, Sydney, NSW 2001, Australia.

Preface

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee EL-041, Lamps and related equipment, to supersede AS/NZS 61048:2002, *Auxiliaries for lamps—Capacitors for use in tubular fluorescent and other discharge lamp circuits—General and safety requirements (IEC 61048:1991, MOD)* will also remain current for 12 months after the date of publication of this Standard and after this time it will be superseded by AS 61048:2019. Regulatory authorities that reference this Standard in regulation may apply these requirements at a different time. Users of this Standard should consult with these authorities to confirm their requirements.

After consultation with stakeholders, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this Standard is to specify safety and performance requirements for capacitors.

This Standard is an adoption with national modifications and has been reproduced from IEC 61048:2006+AMD1:2015 CSV (ED. 2.1), *Auxiliaries for lamps — Capacitors for use in tubular fluorescent and other discharge lamp circuits — General and safety requirements*. The modifications are additional requirements and are set out in Appendix ZZ.

Appendix ZZ lists the variations to IEC 61048:2015 (ED. 2.1) for the application of this Standard in Australia.

The major changes in this edition are as follows:

- (a) Addition of particular requirements for built-in capacitors having insulation equivalent to double or reinforced insulation (see Annex E).
- (b) Addition of information for luminaire design (see Annex F).

This Standard is structured as follows:

- (i) Preface.
- (ii) IEC 61048:2015 (ED. 2.1) (unedited from the contents page to the final clause of the source document).
- (iii) Appendix ZZ — Australian variations to the source document.

As this Standard is reproduced from an International Standard, the following applies:

- (A) In the source text “this International Standard” should read “this Australian Standard”.
- (B) A full point substitutes for a comma when referring to a decimal marker.

Australian or Australia/New Zealand Standards that are identical adoptions of international normative references may be used interchangeably. Refer to the online catalogue for information on specific Standards.

The terms “normative” and “informative” have been used in this Standard to define the application of the annex or appendix to which they apply. A “normative” annex or appendix is an integral part of a Standard, whereas an “informative” annex or appendix is only for information and guidance.

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references.....	7
3 Terms and definitions.....	8
4 General requirements.....	9
5 General notes on tests.....	9
6 Marking.....	9
6.1 Required marking.....	10
6.2 Additional information.....	10
6.3 Durability and legibility of marking.....	10
7 Terminations.....	10
8 Creepage distances and clearances.....	11
9 Voltage rating.....	12
10 Fuses.....	12
11 Discharge resistors.....	13
12 Testing sequence.....	13
13 Sealing and heating test.....	13
13.1 Sealing and heating test for type A capacitors.....	13
13.2 Sealing and heating test for type B capacitors.....	14
14 High-voltage test.....	14
14.1 High-voltage test between terminals.....	14
14.2 High-voltage test between terminals and case.....	14
15 Resistance to adverse operating conditions.....	15
15.1 Humidity test with voltage applied.....	15
15.2 Current (discharge) test.....	16
16 Resistance to heat, fire and tracking.....	16
17 Self-healing test.....	17
18 Destruction test.....	18
18.1 Test A.....	18
18.2 Test B.....	21
18.3 Non-self-healing capacitors.....	23
Annex A (normative) Test voltage.....	29
Annex B (normative) Temperature adjustment of test enclosure.....	30
Annex C (normative) Test for conformity of manufacture.....	31
Annex D (informative) Guide to calculating equipment settings for tests in subclauses 15.2 and 18.1.3.....	32
Annex E (normative) Additional requirements for built-in capacitors having an insulation equivalent to double or reinforced insulation.....	34
Annex F (informative) Information for luminaire design.....	37
Bibliography.....	38

Figure 1 – AC conditioning circuit	24
Figure 2 – DC conditioning circuit	24
Figure 3 – Self-healing breakdown test equipment	25
Figure 4 – Voltage and current waveform for the tests in 15.2 and 18.1.3	26
Figure 5 – Typical test circuit for the tests in 15.2 and 18.1.3	27
Figure 6 – Summary of test procedure	28
Table 1 – Minimum creepage distances and clearances	12
Table 2 – Voltage and test duration for endurance test, first test sequence	8
Table 3 – Voltage and test duration for endurance test, second test sequence	19

Currently in preview, click buy full version

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**AUXILIARIES FOR LAMPS –
CAPACITORS FOR USE IN TUBULAR FLUORESCENT AND
OTHER DISCHARGE LAMP CIRCUITS –
GENERAL AND SAFETY REQUIREMENTS**

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 far 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.

DISCLAIMER

This Consolidated version is not an official IEC Standard and has been prepared for user convenience. Only the current versions of the standard and its amendment(s) are to be considered the official documents.

This Consolidated version of IEC 61048 bears the edition number 2.1. It consists of the second edition (2006-03) [documents 34C/720/FDIS and 34C/736/RVD] and its amendment 1 (2015-07) [documents 34C/1155/FDIS and 34C/1160/RVD]. The technical content is identical to the base edition and its amendment.

This Final version does not show where the technical content is modified by amendment 1. A separate Redline version with all changes highlighted is available in this publication.

This International Standard has been prepared by subcommittee 34C: Auxiliaries for lamps, of IEC technical committee 34: Lamps and related equipment.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

In this standard, the following print types are used:

- requirements proper: in roman type;
- *test specifications: in italic type;*
- notes: in smaller roman type.

The committee has decided that the contents of the base publication and its amendment will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

Currently in preview, click buy full vers.

INTRODUCTION

This International Standard covers general and safety requirements for certain capacitors for use in tubular fluorescent and other discharge lamp circuits.

Performance requirements for these capacitors are the subject of IEC 61049.

NOTE Safety requirements ensure that electrical equipment constructed in accordance with these requirements, does not endanger the safety of persons, domestic animals or property when properly installed and maintained and used in applications for which it was intended.

Currently in preview, click buy full version

AUXILIARIES FOR LAMPS – CAPACITORS FOR USE IN TUBULAR FLUORESCENT AND OTHER DISCHARGE LAMP CIRCUITS – GENERAL AND SAFETY REQUIREMENTS

1 Scope

This International Standard states the requirements for both self-healing and non-self-healing continuously rated a.c. capacitors of up to and including 2,5 kVAr, and not less than 0,1 µF, having a rated voltage not exceeding 1 000 V, which are intended for use in discharge lamp circuits operating at 50 Hz or 60 Hz and at altitudes up to 3 000 m.

NOTE These lamps and associated ballasts are covered by IEC 60081, IEC 60901, IEC 60188, IEC 60192, IEC 60662, and IEC 61167 and by IEC 61347-2-8 and IEC 61347-2-9, respectively.

It covers capacitors intended for connection in shunt or in series with the lamp circuit or an effective combination of these.

It covers only impregnated or unimpregnated capacitors, having a dielectric of paper, plastic film or a combination of both, either metallized or with metal foil electrodes.

This standard does not cover radio-interference suppressor capacitors the requirements for which are found in IEC 60384-14.

Tests given in this standard are type tests. Requirements for testing individual capacitors during production are not included.

Particular requirements for built-in capacitors having an insulation equivalent to double or reinforced insulation are given in Annex 1.

2 Normative references

The following referenced documents are indispensable for the application 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 60269 (all parts), *Low-voltage fuses*

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*

IEC 60508-1, *Luminaires – Part 1: General requirements and tests*

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

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

IEC 61049:1991, *Capacitors for use in tubular fluorescent and other discharge lamp circuits – Performance requirements*

ISO 4046-4:2002, *Paper, board, pulps and related terms – Vocabulary – Paper and board grades and converted products*