

FINAL VERSION

VERSION FINALE

Lampholders for tubular fluorescent lamps and starters holders

Douilles pour lampes tubulaires à fluorescence et douilles pour starters

CONTENTS

FOREWORD	5
INTRODUCTION to Amendment 1	7
1 Scope	8
2 Normative references	8
3 Terms and definitions	9
4 General requirement.....	13
5 General conditions for tests	14
6 Electrical rating	15
7 Classification	15
8 Marking	16
9 Protection against electric shock	18
10 Terminals	20
11 Construction	22
12 Resistance to dust and moisture	27
13 Insulation resistance and electric strength	28
14 Endurance	29
15 Mechanical strength	30
16 Screws, current-carrying parts and connections.....	32
17 Creepage distances and clearances	34
18 Resistance to heat, fire and tracking.....	36
19 Resistance to excessive residual stresses (season cracking) and to rusting	41
Annex A (normative) Examples of lampholders covered by IEC 60400	87
Annex B (normative) Season cracking / corrosion test	88
B.1 General.....	88
B.2 Test cabinet	88
B.3 Test solution	88
B.4 Test procedure	89
Annex C (informative) Protection against electric shock – Explanatory details for the installation of lampholders according to 9.2	90
Annex D (informative) Clauses containing new or more stringent requirements with respect to the previous edition	91
Annex E (informative) Guidance on working voltages U_{out}	92
E.1 Working voltages – Relation between lampholders and controlgear	92
E.2 Example.....	92
E.2.1 Clearance.....	92
E.2.2 Creepage distance.....	92
E.3 Impulse withstand category.....	93
Bibliography.....	94
Figure 1 – Mounting jig for the testing of lampholders	42
Figure 2 – Mounting sheet	43
Figure 3 – Fixture for the testing of lampholder flexibility	44
Figure 4 – Test caps G5, GX5 and G13	45

Figure 5 – Impact test apparatus and mounting support	47
Figure 6 – Test cap for the test of Clause 14 for lampholders 2GX13	48
Figure 7 – Ball-pressure apparatus	49
Figure 8 – Bracket for fixing lampholders for the impact test	49
Figure 9 – Test cap and test assembly for testing of resistance to heat of lampholders G13, G5 and GX5 with T marking	51
Figure 10 – Dimensions of starterholder and holder	53
Figure 11 – “Go” plug gauges for starterholders	54
Figure 12 – Plug gauge for starterholders for testing contact making and retention	55
Figure 13 – Special plug gauge for starterholders for testing contact making	56
Figure 14 – Test cap for the test of Clause 14 for lampholders G5 and GX5	57
Figure 15 – Test cap for the test of Clause 14 for lampholders G13	57
Figure 16 – Test cap for the test of Clause 14 for lampholders 2G13	58
Figure 17 – Test cap for the test of Clause 14 for lampholders G20	58
Figure 18 – Test cap for the test of Clause 14 for lampholders Fa6	58
Figure 19 – Test cap for the test of Clause 14 for lampholders G10q, G11q and GZ10q	59
Figure 20 – Test cap for the test of Clause 14 for lampholders Fa8	59
Figure 21 – Test starter for the test of Clause 14	60
Figure 22 – Test cap for the test of Clause 14 for lampholders R17d	61
Figure 23 – Test cap for the test of Clause 14 for lampholders 2G11	62
Figure 24 – Test cap for the test of Clause 14 for lampholders G23 and GX23	63
Figure 25 – Test cap for the test of Clause 14 for lampholders GR8	64
Figure 26 – Test cap for the test of Clause 14 for lampholders GR10q	64
Figure 27 – Test cap for the test of Clause 14 for lampholders GX10q and GY10q	65
Figure 28 – Test cap for the test of Clause 14 for lampholders G24, GX24 and GY24	66
Figure 29 – Test cap for the test of Clause 14 for lampholders G32 and GY32	67
Figure 30 – Test cap for the test of 18.1 for lampholders G23	68
Figure 31 – Test cap for the test of 18.1 for lampholders GR8	69
Figure 32 – Test cap for the test of 18.1 for lampholders GR10q	70
Figure 33 – Test cap for the test of 18.1 for lampholders GX10q	71
Figure 34 – Test cap for the test of 18.1 for lampholders GY10q	72
Figure 35 – Test cap for the test of 18.1 for lampholders 2G11	73
Figure 36 – Test cap for the test of 18.1 for lampholders GX23	74
Figure 37 – Test cap for the test of 18.1 for lampholders G24, GX24 and GY24 (1 of 2)	75
Figure 38 – Test cap for the test of 18.1 for lampholders G32, GX32 and GY32 (1 of 2)	77
Figure 39 – Test cap for the test of Clause 14 for lampholders 2G8	79
Figure 40 – Test cap for the test of Clause 14 for lampholders GX53	80
Figure 41 – Standard test finger (according to IEC 60529:2014)	81
Figure 42 – Test cap for the test of Clause 14 for lampholders W4.3x8.5d	82
Figure 43 – Test cap for the test of Clause 14 for lampholders GR14q	83
Figure 44 – Test cap for the test of Clause 14 for lampholders G28d	84
Figure 45 – Test cap for the test of Clause 14 for lampholders 2GX11	85

Figure 46 – Test probes for checking gasket sleeves on lampholders for higher IP protection 86

Figure C.1 – Examples of lampholders 90

Table 1 – Minimum values of insulation resistance 28

Table 2 – Torque tests on screws 32

Table 3 – Minimum distances for AC sinusoidal voltages up to 30 kHz – Impulse withstand category II 35

Table 4 – Minimum distances for rated ignition voltages or equivalent peak voltage U_p 36

Table A.1 – Examples of lampholders covered by IEC 60400 87

Table B.1 – pH adjustment 88

Currently in preview, click buy full version

INTERNATIONAL ELECTROTECHNICAL COMMISSION

LAMPHOLDERS FOR TUBULAR FLUORESCENT LAMPS AND STARTERHOLDERS

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.

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 60400 bears the edition number 8.1. It consists of the eight edition (2017-06) [documents 34B/1900/FDIS and 34B/1911/RVD] and its amendment 1 (2020-02) [documents 34B/2072/FDIS and 34B/2075/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.

International Standard IEC 60400 has been prepared by subcommittee 34B: Lamp caps and holders, of IEC technical committee 34: Lamps and related equipment.

This eighth edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) alignment with ISO/IEC drafting rules;
- b) renumbering of clauses, tables and figures.

This document 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.

INTRODUCTION to Amendment 1

Two changes needed for IEC 60400 became obvious during the work relating to Edition 8.0 of IEC 60400.

Change 1:

Actual lamp holder safety standards require a ball pressure test in line with IEC 60695-10-2 in sections "Resistance to heat, fire and tracking". Within this test there is an alternative depth indentation method described for the calculation of the indentation diameter.

This alternative calculation option was removed from the latest edition of IEC 60695-10-2 dated 2014 and during its meeting held in Sydney in 2018, SC 34B/WG1 agreed to delete the alternative method as well from IEC 60400.

Change 2:

Based on IEC 60664-1:2007, 4.8.1.5 "Non tracking materials":

"For glass, ceramics or other inorganic insulating materials which do not track, creepage distances need not be greater than their associated clearance for the purpose of insulation coordination. The dimensions of Table F.2 for inhomogeneous field conditions are appropriate."

This is not completely reflected in TC 34 standards as revised recently. For applications with ELV it is of high importance whether the creepage distance shall be 0,6 mm or may be 0,2 mm in case where inorganic insulating material is used.

An informative annex for the explanation of U_{out} should give some additional information.

LAMPHOLDERS FOR TUBULAR FLUORESCENT LAMPS AND STARTERHOLDERS

1 Scope

This document states the technical and dimensional requirements for lampholders for tubular fluorescent lamps and for starterholders, and the methods of test to be used in determining the safety and the fit of the lamps in the lampholders and the starters in the starterholders.

This document covers independent lampholders and lampholders for building-in, used with tubular fluorescent lamps provided with caps as listed in Annex A, and independent starterholders and starterholders for building-in, used with starters in accordance with IEC 60155, intended for use in AC circuits where the working voltage does not exceed 1 000 V r.m.s.

This document also covers lampholders for single-capped tubular fluorescent lamps integrated in an outer shell and dome similar to Edison screw lampholders (e.g. for G23 and G24 capped lamps). Such lampholders are tested in accordance with the following clauses and subclauses of IEC 60238: 9.4; 9.5; 9.6; 10.3; 11.7; 12; 13.2; 13.5; 13.6; 13.7; 14; 16.3; 16.4; 16.5 and 16.9.

This document also covers lampholders which are integral with a luminaire or intended to be built into appliances. It covers the requirements for the lampholder only. For all other requirements, such as protection against electric shock in the area of the terminals, the requirements of the relevant appliance standard are applicable and tested after building into the appropriate equipment, when that equipment is tested according to its own standard. Lampholders for use by luminaire manufacturers only are not for retail sale.

This document also applies, as far as is reasonable, to lampholders and starterholders other than the types explicitly mentioned above and to lamp connectors.

Where the term "holder" is used in this document, both lampholders and starterholders are intended.

Where the term "bi-pin lampholder" is used, lampholders for wedged caps are also intended.

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 60061-2, *Lamp caps and holders together with gauges for the control of interchangeability and safety – Part 2: Lampholders*

IEC 60061-3, *Lamp caps and holders together with gauges for the control of interchangeability and safety – Part 3: Gauges*

IEC 60068-2-75:2014, *Environmental testing – Part 2-75: Tests – Test Eh: Hammer tests*

IEC 60081, *Double-capped fluorescent lamps – Performance specifications*