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INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

Lampholders for tubular fluorescent lamps and starterholders

Douilles pour lampes tubulaires à fluorescence et douilles pour starters

IEC 60400:2008/A1:2011

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Douilles pour lampes tubulaires à fluorescence et douilles pour starters

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FOREWORD

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

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

FDIS	Report on voting
34B/1591/FDIS	34B/1600/RVD

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

The committee has decided that the contents of this amendment and the base publication 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- withdrawn,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.

1 General

1.1 Scope

Add, after the last paragraph, the following new text:

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

2 Terms and definitions

2.3 Flexible lampholders for linear double-capped fluorescent lamps

Replace the existing note by the following new note:

NOTE In case of doubt as to whether a lampholder G5, GX5 or G13 provides the required axial movement of the contacts, a test with the device shown in Figure 3 may be carried out.

Add the following new definitions:

2.19
basic insulation
insulation applied to live parts to provide basic protection against electric shock

NOTE Basic insulation does not necessarily include insulation used exclusively for functional purposes.

2.20
supplementary insulation
independent insulation applied in addition to basic insulation in order to provide protection against electric shock in the event of a failure of basic insulation

2.21
double insulation
insulation comprising both basic insulation and supplementary insulation

2.22
reinforced insulation
single insulation system applied to live parts, which provides a degree of protection against electric shock equivalent to double insulation under the conditions specified

NOTE The term "insulation system" does not imply that the insulation must be one homogeneous piece. It may comprise several layers which cannot be tested singly as supplementary or basic insulation.

2.23
enclosed reinforced insulated lampholder
lampholder for building-in so designed that on its own it fulfils the requirements for double or reinforced insulated parts in class II applications

2.24
partly reinforced insulated lampholder
lampholder for building-in, so designed that some parts of the lampholder require additional means to fulfil the requirements with regard to double or reinforced insulation

NOTE In some cases, the dimensions might be achieved only after mounting into the luminaire.

4 General conditions for tests

*Replace, in 4.4, the paragraph following the second note (“*In the case of *…”) by the following new paragraph:*

In the case of flexible and inflexible lampholders G5, GX5 or G13 (see Definitions 2.3 and 2.4 respectively), the specimens are mounted on two pairs of mounting sheets as specified in Figure 2.

5 Electrical rating

Replace the existing third dashed item by the following:

– not less than 2 A for lampholders GX5, G13, 2G8, 2G13, G20, Fa6, Fa8 and R17d.

6 Classification

Replace the existing Subclause 6.1 by the following:

6.1 According to protection against electric shock:

– unenclosed lampholders;
– enclosed lampholders;
– independent lampholders;
– partly reinforced insulated lampholders;
– enclosed reinforced insulated lampholders.

NOTE Where a lampholder is used with a working voltage of 50 % or less of its maximum rating, it may be regarded as equivalent to a reinforced insulated lampholder.

7 Marking

Add the following new note to Subclause 7.1 below item "b) type reference":

NOTE Available technical documentation of the manufacturer like printed catalogues or online catalogues should allow a clear identification of a lampholder either by a unique catalogue number or by an identifying reference on the holder, specifying the essential characteristic features and the basic design of the product supplemented by a clear description. Variations of the basic design like for example different cable length, fixing means, colours etc., which do not affect safety or performance of the lampholder, may be disregarded in the type reference marked on the product. Variations included in the type testing procedure are listed in the corresponding test reports.

*Replace, in Subclause 7.2, the fourth paragraph ("*Lampholders and starterholders complying…"*), the note and the fifth paragraph by the following new text:*

Enclosed reinforced insulated lampholders offer an adequate level of protection for use in luminaires where they are accessible in normal use. This information shall be indicated in the manufacturer's catalogue ore the like.

For partly reinforced insulated lampholders, sufficient creepage distances and clearances to outer accessible surfaces will require additional protection to some parts of the lampholder by the luminaire design or by use of additional attachment(s) or cover(s). This information shall be indicated in the manufacturer's catalogue or the like.

8 Protection against electric shock

Replace, in Subclause 8.2, the third paragraph by the following:

In the case of side entry lampholders for linear G5, GX5 and G13 capped lamps, compliance is checked:

– *for lampholders G5 by means of gauge II as per IEC 60061-3, standard sheet 7006-47C, and*
– *for lampholders GX5 by means of gauge II as per IEC 60061-3, standard sheet 7006-47E, and*
– *for lampholders G13 by means of gauge II as per IEC 60061-3, standard sheet 7006-60C,*

with the gauge face touching the lampholder face

Add, in 8.2, after the second compliance paragraph (after Note 2), the following new dashed item:

– *for lampholders GX5, by means of the gauge as per IEC 60061-3, standard sheet 7006-47A, and in conjunction with gauge II as per IEC 60061-3, standard sheet 7006-47E and the standard test finger shown in Figure 41;*

10 Construction

Add, at the end of Subclause 10.2, the following new text:

Lampholders GX5 shall only be for side entry, requiring a single entry slot as shown in Figures C.3 and C.4.

Lampholders GX5 shall be of flexible type or flexibly mounted. The maximum mounting distance between a pair of GX5 lampholders without a lamp inserted shall be based on the minimum lamp length as given in IEC 60081. This information shall be given in the lampholder manufacturer's or responsible vendor's documents.

Replace item a) of Subclause 10.3.1 by the following:

10.3.1 *a) For bi-pin lampholders G5, GX5, G13 and G20 making contact mainly along one side of each pin of the cap, the contact force is measured with a single-ended gauge having pin dimensions and pin distances according to the following sheets of IEC 60061-3:*

- *for lampholders G5: 7006-47B, gauges III and V;*
- *for lampholders GX5: 7006-47D, gauges IV and V;*
- *for lampholders G13: 7006-60B, gauges III and V;*
- *for lampholders G20: under consideration.*

The contact force is between:

- *2 N and 30 N for lampholders not providing support for the lamp pins;*
- *2 N and 35 N for lampholders G5 and GX5, when the lamp pins are supported by the holder construction;*
- *2 N and 45 N for lampholders G13 and G20, when the lamp pins are supported by the holder construction.*

First the maximum contact force is measured with a pin distance as shown for gauge V. This is followed by measurement of the minimum contact force with the pin distance of gauge III for lampholders G5 and G13 and with the pin distance of gauge IV for lampholders GX5.

Replace item d) of Subclause 10.3.1 by the following:

d) For bi-pin lampholders G5, GX5, G13 and G20 requiring a rotary motion for the insertion and removal of the lamp, the torque required shall be measured with single-ended gauges having pin dimensions and pin distances according to the following standard sheets of IEC 60061-3:

- *for lampholders G5: 7006-47B, gauge V, and a second gauge of the same dimensions but with E and D changed to 2,44 mm and 4,4 mm respectively;*
- *for lampholders GX5: 7006-47D, gauge V, and a second gauge of the same dimensions but with E2 and D changed to 2,75 mm and 4,4 mm respectively;*
- *for lampholders G13: 7006-60B, gauge V, and a second gauge of the same dimensions but with E and D changed to 2,44 mm and 12,35 mm respectively;*
- *for lampholders G20: under consideration.*

The torque required to insert the gauges until the position representing the operating position of the lamp is reached shall not exceed:

- *0,3 Nm for lampholders G5 and GX5;*
- *0,5 Nm for lampholders G13 and G20.*

The torque required to clear the gauges from the normal seated position shall be between:

- *0,02 Nm and 0,3 Nm for lampholders G5 and GX5;*
- *0,1 Nm and 0,5 Nm for lampholders G13 and G20.*

During complete removal of the gauges, the maximum values shall not be exceeded.

Add, to item a) of Subclause 10.5 a), the following new dashed items:

- *7005-51A: Mounting of combined pair of lampholders GX5*
- *7005-82A: Lampholder 2GX11*
- *7005-115: Lampholder W4.3x8.5d*
- *7005-125: Lampholder 2GX13*
- *7005-131: Lampholder GRZ10d*
- *7005-132: Lampholder GRZ10t*
- *7005-141: Lampholder 2G8*
- *7005-142: Lampholder GX53*
- *7005-156: Lampholder GR14q*
- *7005-160: Lampholder G28d*

Replace item d) of Subclause 10.5 by the following:

d) *Compliance is checked as follows:*

- *For lampholders G5, GX5 and G13, with two pairs of matching holders mounted in the mounting jig shown in Figure 1 and by use of the specified gauges, that is:*
  - *for lampholders G5: "Go" gauges 7006-47C and the gauges for testing contact-making 7006-47B;*
  - *for lampholders GX5: "Go" gauges 7006-47E and the gauges for testing contact-making 7006-47D;*
  - *for lampholders G13: "Go" gauges 7006-60C and the gauges for testing contact-making 7006-60B.*
- *Lampholders which, due to their design, do not allow testing in the mounting jig, and flexibly mounted lampholders (see 2.5) shall be tested together with the relevant luminaire and by use of the above gauges adapted to the specific lamp length according to IEC 60081.*

When testing holders, the force required to insert the "Go" gauge shall not exceed:

for lampholders	*G5*	*G13*
– *force in the direction of the lamp axis:*	*15 N*	*30 N*
– *force in the direction perpendicular to the lamp axis:*	*under consideration*[1]	*under consideration*

[1] Not applicable for lampholders where the final seating position of the cap within the holder is reached without an additional turning motion. These holders are already tested under 10.3.1 with single-ended gauges.

When testing contact-making, the gauges are pushed in the direction of each of the holder faces in turn with a force of:

- *for lampholders G5 and GX5: 2 N;*
- *for lampholders G13: 5 N.*

When testing in the mounting jig, this force can be achieved by vertical position of the gauge:

NOTE 3 For lampholders intended for use with more than one lamp at the same time, additional mass according to the number of lamps is placed on the lampholder face.

- *for lampholders R17d, by means of the gauges shown in standard sheets 7006-57A and 7006-57B of IEC 60061-3;*
- *for lampholders Fa8, by means of the gauges shown in standard sheets 7006-58 and 7006-58G of IEC 60061-3;*
- *for lampholders 2G13, by means of the gauges shown in standard sheets 7006-33A and 7006-33B of IEC 60061-3;*
- *for all other lampholders, by means of the relevant gauges shown in IEC 60061-3;*
- *for starterholders, by means of the gauges shown in Figures 11, 12 and 13;*
- *for starterholders intended for accepting only starters for class II luminaires, dimensions V and W indicated in Figure 10a are measured in addition.*

The manufacturer's mounting instructions shall show all information necessary for the correct mounting of the holders.

For (multi-key) lampholders G24q and GX24q, allowing insertion of lamps with keys –3 and –4, the lampholder manufacturer's documents shall include a warning notice about the restricted application, stating that these holders may only be used with ballasts which are approved for the operation of lamps with keys –3 and –4 (multilamp ballast).

NOTE 4 It is essential that the relevant safety and performance requirements are met with every lamp key.

11 Resistance to dust and moisture

Replace the penultimate and the last paragraph of Subclause 11.1 by the following:

The holders are mounted as in normal use and fitted either with test probes of minimum and maximum diameter according to Figure 46 for which the holders are designed or, if available, with lamps of the smallest and largest diameters as required by Figure 46.

Before the test, the holders are heated and brought to a stable operating temperature either by operating the lamp or with the test probes by heating within the heating cabinet at a temperature according to the T-marking or Tm-marking of the holder.

NOTE This test is for type test approval of the lampholder only and does not replace luminaire testing.

12 Insulation resistance and electrical strength

Add, in the third paragraph of Subclause 12.3, the following new dashed item to the existing list:

- *for enclosed and unenclosed reinforced insulated lampholders, the test voltage shall be determined from Table 10.2 of IEC 60598-1.*

13 Endurance

Replace the existing fourth paragraph by the following:

After the test, the holder shall show no damage within the meaning of this standard and, being fitted with a solid brass test cap or starter, complying with the corresponding Figures 6, 14 to 29, 39, 40 and 42 to 46, it is loaded for 1 h with rated current in an a. c. circuit of not more than 6 V.

14 Mechanical strength

Change the heading of Subclause 14.1 to roman type.

Replace, in Subclause 14.3, the existing list of standard sheets by the following:

Gauges shall comply with the following standard sheets (see IEC 60061-3):

- *7006-47C, gauge I for lampholders G5;*
- *7006-47E, gauge I for lampholders GX5;*
- *7006-60C, gauge I for lampholders G13;*
- *7006-33A: for lampholders 2G13;*
- *7006-58: for lampholders Fa8;*
- *7006-115: for lampholders W4.3x8.5d;*
- *gauges for other lampholders are under consideration.*

After these tests, the lampholder shall show no damage.

Table 3 – Minimum distances for a. c. (50 Hz/60 Hz) sinusoïdal voltages – Impulse withstand category II

Replace the existing Table 3 by the following new table:

Distances mm	Rated voltage V			
	50	**150**	**250**	**500**
1 Between live parts of different polarity, and				
2 Between live parts and external metal parts, or the outer surface of parts of insulating material which are permanently fixed to the holder[a], including screws or devices for fixing covers or fixing the holder to its support:				
Basic insulation				
- Creepage distances insulation PTI [b] ≥ 600	0,6	0,8	1,5	3
PTI [b] < 600	1,2	1,6	2,5	5
- Clearances	0,2	0,8	1,5	3
Reinforced Insulation				
- Creepage distances insulation PTI [b] ≥ 600	-	1,6	3	6
PTI [b] < 600	-	3,2	5	6
- Clearances	-	1,6	3	6
3 Between live parts and the mounting surface or a loose metal cover, if any, if the construction does not ensure that the values under item 2 are maintained under the most unfavourable circumstances:				
- Clearances	0,6	0,8	1,5	3

In Japan, the values given in the table are not applicable. Japan requires larger values than the values given in the table.

NOTE 1 The distances specified in the table apply to impulse withstand category II in accordance to IEC 60664-1 and refer to pollution degree 2, where normally only non-conductive pollution occurs but occasionally a temporary conductivity caused by condensation must be expected. For information on distances for other impulse withstand categories or higher pollution degrees, IEC 60598-1 and IEC 60664-1 should be consulted.

NOTE 2 Information on standard ratings for specific holder types is given in Clause 5.

NOTE 3 Values for creepage distances and clearances may be found for intermediate values of working voltages by linear interpolation between tabulated values. No values are specified for working voltages below 25 V as the voltage test of 12.3 is considered sufficient.

NOTE 4 Attention is drawn to the fact that the values for creepage distance and clearance given in this clause are the absolute minimum.

[a] The distances between live contacts and the lampholder face (reference plane) shall, however, be in accordance with the relevant standard sheets of IEC 60061-2.

The distances for starter holders shall be in accordance with Figures 10 and 10a.

[b] PTI (proof tracking index) in accordance with IEC 60112.

– In the case of creepage distances to parts not energized or not intended to be earthed, where no tracking can occur, the values specified for material with PTI ≥ 600 apply for all materials (in spite of the real PTI).

– For creepage distances subjected to working voltages of less than 60 s duration, the values specified for material with PTI ≥ 600 apply for all materials.

– For creepage distances not liable to contamination by dust or moisture, the values specified for material with PTI ≥ 600 apply for all materials (independently of the real PTI).

17 Resistance to heat, fire and tracking

Replace, in item b) of Subclause 17.1, the paragraph following Note 1 by the following new paragraph:

G5 and GX5 lampholders are placed on a steel test cap with dimensions according to Figure 9a.

Figure 1 – Mounting jig for the testing of lampholders

Replace footnote 1) below the table by the following:

1) Z = 69,5 mm for testing lampholders G5 (derived from dimension Amax of a 4 W lamp, see IEC 60081). This dimension is also applicable for testing GX5 lampholders.

Figure 3 – Fixture for the testing of lampholder flexibility

Replace the penultimate sentence of the testing clause by the following:

The force required shall not exceed 15 N for lampholders G5 and GX5 and 30 N for lampholders G13.

Figure 4 – Test caps G5 and G13

Replace the table and the title of the figure by the following table and title:

Reference	Dimension mm		Tolerance mm
	G5 and GX5	G13	
A 2)	15,5	25,6	± 0,1
D	4,75	12,7	± 0,05
E	2,37		± 0,02
F	7,1		± 0,05
H 2)	35,0		± 0,1
r 2)	0,5		+ 0,3 – 0,0
2) These test caps differ from the test caps used in Clause 14 by the material and the additional dimensions A, H and r.			

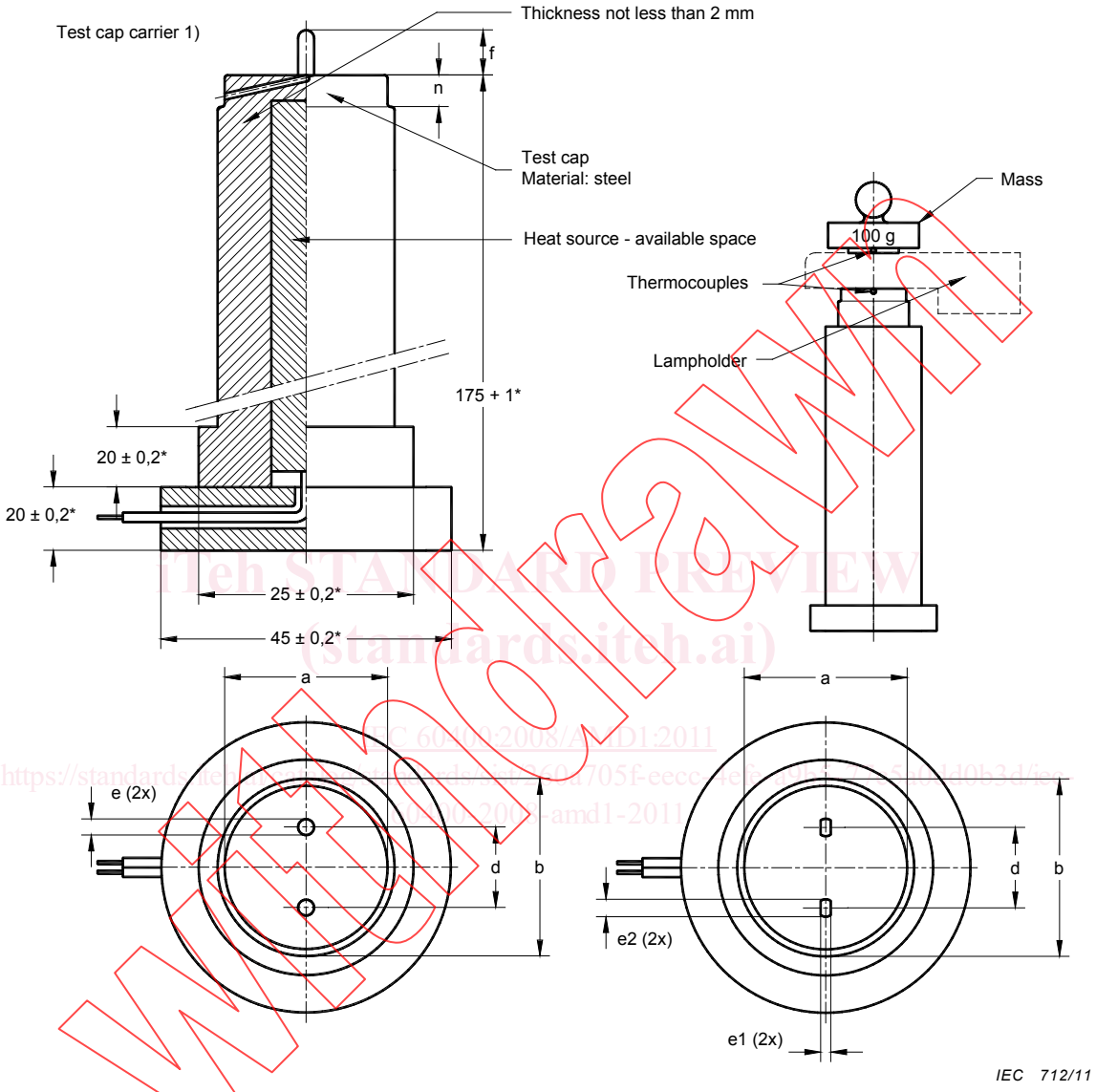
1) This part of the gauge and the cap pins shall be of hardened steel.

Figure 4 – Test caps G5, GX5 and G13

Delete the footnote with the asterisk.

Figure 9a – Test cap and test assembly for testing of resistance to heat of lampholders G5 with T marking (see 17.1)

Replace the existing figure and title by the following:



Lampholders G5 Lampholders GX5

Reference	Test cap mm	Tolerance mm
a	15,75	+ 0,0 – 0,1
b [2]	16,0	+ 0,0 – 0,1
d	4,75	+ 0,05 – 0,05
e	2,5	+ 0,05 – 0,05
e1	1,6	+ 0,05 – 0,05
e2	2,75	+ 0,05 – 0,05
f	7,1	+ 0,0 – 0,1
n	8,71	+ 0,1 – 0,0

The test cap shall be provided with an internal heat source, for example a cartridge heater which provides equal heat distribution over the front side of the test cap.

1) Test cap and test cap carrier need not be separated parts.
2) Dimension b refers to the nominal lamp diameters. It does not take into account the possible eccentricity of the caps referred to the lamp tube.

* Recommended design values for the test cap carrier. Adoption of these values will serve the unification of test devices.

Figure 9a – Test cap and test assembly for testing of resistance to heat of lampholders G5 and GX5 with T marking (see 17.1)