

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

Self-ballasted LED-lamps for general lighting services by voltage > 50 V – Safety specifications

(standards.iteh.ai)

Lampes à LED autoballastées pour l'éclairage général fonctionnant à des tensions > 50 V – Spécifications de sécurité

<https://standards.iteh.ai/catalog/standards/sis/12ab088a-9cd4-49c8-98c5-a3e1bd0bd38e/iec-62560-2011-amd1-2015>





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FOREWORD

This amendment has been prepared by subcommittee 34A: Lamps, of IEC technical committee 34: Lamps and related equipment.

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

FDIS	Report on voting
34A/1836/FDIS	34A/1845/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- withdrawn,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.

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The contents of the corrigendum of June 2015 have been included in this copy.

[IEC 62560:2011/AMD1:2015
https://standards.iteh.ai/catalog/standards/sist/12ab088a-9cd4-49c8-98c5-a3e1bd0bd38e/iec-62560-2011-amd1-2015](https://standards.iteh.ai/catalog/standards/sist/12ab088a-9cd4-49c8-98c5-a3e1bd0bd38e/iec-62560-2011-amd1-2015)

CONTENTS

Replace the title of subclause 6.2 as follows:

6.2 Bending moment and mass imparted by the lamp at the lamp holder

Replace the titles of subclauses 9.1, 9.2 and 9.3 as follows.

9.1 Requirements
9.2 Tests
9.3 Compliance criteria

Add the title of the new subclause 9.4 as follows.

9.4 Axial strength of Edison caps

Replace the titles of subclauses 13.1, 13.2 and 13.3 as follows:

13.1 General requirements
13.2 Test conditions
13.3 Compliance

Delete the titles of the existing subclauses 13.4 to 13.6.

Add the titles of new Clauses 15 to 18 along with their corresponding subclauses as follows:

- 15 Abnormal operation
- 16 Test conditions for dimmable lamps
- 17 Photobiological safety
 - 17.1 UV radiation
 - 17.2 Blue light hazard
 - 17.3 Infrared radiation
- 18 Ingress protection
 - 18.1 Requirements
 - 18.2 Tests
- 19 Information for luminaire design

Replace the title of Annex A as follows:

Annex A (informative) Information for luminaire design

Delete the title of Annex B.

Replace, in the list of figures, the titles for Figures 3 and 4 as follows.

Figure 3 – Holder for torque test on lamps with screw caps (from IEC 60432-1, Figure C.2)
Figure 4 – Holder for torque test on lamps with bayonet caps (from IEC 60432-1, Figure C.1)

Add, in the list of figures, the titles for new Figures 6, 7 and 8 as follows:

Figure 6 – Lamp not suitable for use under moisture
Figure 7 – Test equipment for applying an axial force
Figure 8 – Test circuit for testing a non-dimmable lamp at a dimmer or electronic switch

Add, in the list of tables, the title for new Table 4 as follows:

Table 4 – Values for axial force

1 Scope

Add, below the existing note, a new note 2 as follows and renumber the existing note to NOTE 1:

NOTE 2 This standard includes photobiological safety.

2 Normative references

Update the reference to IEC 61347-1:2007 as follows:

IEC 61347-1:—, *Lamp controlgear – Part 1: General and safety requirements*

Add, to the existing list, the following new reference:

IEC TR 62778: 2014, *Application of IEC 62471 for the assessment of blue light hazard to light sources and luminaires*

Delete, from the existing list, the following references:

IEC/TR 62471-2, *Photobiological safety of lamps and lamp systems – Part 2: Guidance on manufacturing requirements relating to non-laser optical radiation safety*

IEC 60432-1, *Incandescent lamps – Safety specifications – Part 1: Tungsten filament lamps for domestic and similar general lighting purposes*

3 Terms and definitions

Add, after definition 3.9, the following new definition 3.10:

3.10 ultraviolet hazard efficacy of luminous radiation

$K_{S,v}$
quotient of an ultraviolet hazard quantity to the corresponding photometric quantity

NOTE 1 Ultraviolet hazard efficacy of luminous radiation is expressed in mW/klm.

NOTE 2 The ultraviolet hazard efficacy of luminous radiation is obtained by weighting the spectral power distribution of the lamp with the UV hazard function $S_{UV}(\lambda)$. Information about the relevant UV hazard function is given in IEC 62471. It only relates to possible hazards regarding UV exposure of human beings. It does not deal with the possible influence of optical radiation on materials, such as mechanical damage or discoloration.

Subclause 5.2

Delete, item a) and its text.

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Replace the text of item e) with the following new text and new Figure 6:

- e) Lamps with bulbs not suitable for water contact shall be marked with the symbol according to Figure 6. The marking shall be provided on the packaging or accompanying information. The height of the graphical symbol shall be at least 5 mm. The symbol is not needed if a written cautionary notice is provided such as 'Use in Dry Locations only'.



[SOURCE: IEC 60417-6179-1 (2014-10)]

Figure 6 – Lamp not suitable for use under moisture

6.2 Bending moment, axial pull and mass

Replace the title and text of this subclause including Table 2 as follows:

6.2 Bending moment and mass imparted by the lamp at the lamp holder

The value of the bending moment and mass, imparted by the lamp at the lampholder shall not exceed the value given in Table 2 or, where not given, the value in the system information on cap sheets specified in IEC 60061-1.

The bending moment shall be determined by measuring the weight of the lamp (e. g. by means of a balance) at the tip of the bulb of the horizontally held lamp and multiplying this force by the distance between the tip of the bulb and the pivot line. The pivot line shall lie at

the bottom end of the cylindrical part (for Edison and bayonet caps) or at the end of the contact pins (for pin caps). It shall be supported by an upright held thin metal sheet or a similar means.

Table 2 – Bending moments and masses

Cap	Bending moment Nm	Mass kg
B15d	1	u.c.
B22d	2	1
E11	0,5	u.c.
E12	0,5	u.c.
E14	1	u.c.
E17	1	u.c.
E26	2	1
E27	2	1
E39	1 (u.c.)	u.c.
E40	1 (u.c.)	u.c.
GU10	0,1	u.c.
GZ10	0,1	u.c.
GX53	0,3	u.c.
u.c.: under consideration		

NOTE 1 For lamps with caps different to those in Table 2, the effect of the bending moment should be regarded and limited. A measurement method for these lamps with these caps is under consideration.

NOTE 2 It should be taken care that the luminaire surface where the lampholder is fixed to can withstand the bending moment. For the calculation of this bending moment, the length of the lampholder needs to be taken into account when measuring the overall length. This should be made sure for the elevated temperature during operation in order to check the possible softening of the surface material.

NOTE 3 Requirements for lamps with additional mechanical fixation e.g. rim mounted lamps, is under consideration.

8.3 Electric strength

Replace the existing text of this subclause by the following:

Immediately after the insulation resistance test, the same parts as specified above shall withstand a voltage test for 1 min with an a.c. voltage or a d.c. voltage equal to the peak voltage of the prescribed a.c. voltage as follows.

NOTE The use of either a.c. or d.c. voltage is advised by the manufacturer.

During the test, the supply contacts of the cap are short-circuited. Accessible parts of insulating material of the lamp are covered with metal foil. Initially, no more than half the voltage prescribed in IEC 60598-1, Table 10.2, reference d) for double and reinforced insulation is applied between the contacts and the metal foil. It is then gradually raised to the full value. Care shall be taken that the metal foil is so placed that no flashover occurs at the edges of the insulation.

No flashover or breakdown shall occur during the test. Measurements shall be carried out in the humidity cabinet.

9 Mechanical strength

Replace the entire text of this clause including existing subclauses 9.1 to 9.3 along with Figures 3 and 4 and Table 3 with the following new subclauses 9.1 to 9.4, new Figures 3, 4 and 7 and new Tables 3 and 4:

9.1 Requirements

Lamps shall be able to withstand the relevant mechanical strength tests as given in 9.2.

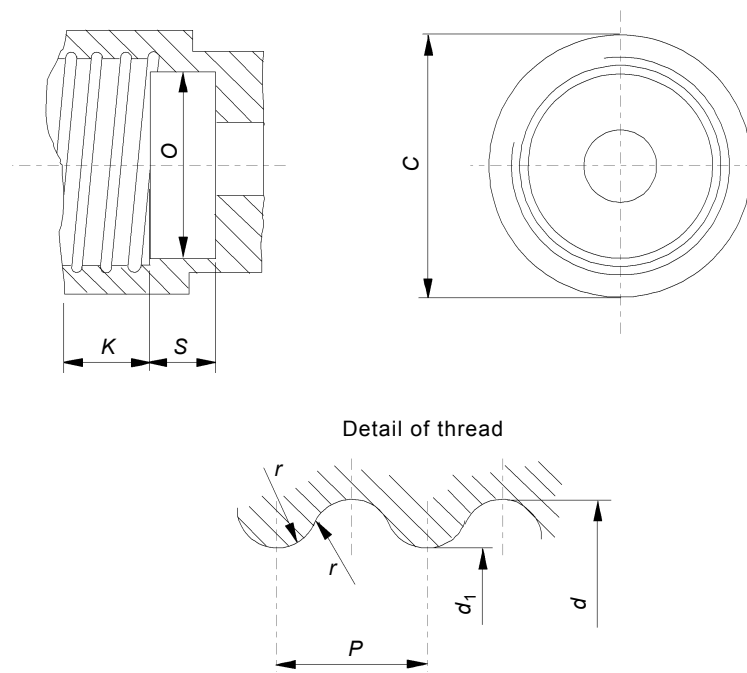
9.2 Tests

9.2.1 Torsion resistance of unused lamps

In order to test the connection of the cap to the lamp shell the torsion resistance of unused lamps is tested as follows.

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Surface finish of screw thread $R_a = 0,4 \mu\text{m}$ minimum (see note).

NOTE A smoother surface might result in mechanical overloading of the cap, see also C.1.2 of IEC 60432-1.

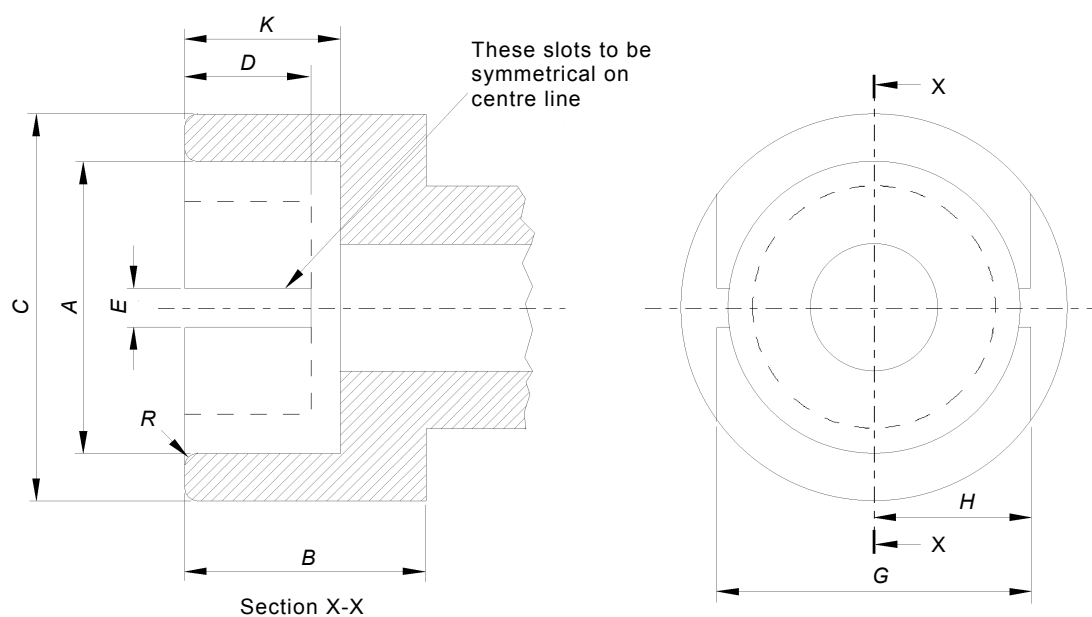
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Dimensions in millimetres

Dimension	E12	E14	E17	E26 and E26d	E27	Tolerance
C	15,27	20,0	20,0	32,0	32,0	Min.
K	9,0	11,5	10,0	11,0	13,5	0,0 -0,3
O	9,5	12,0	14,0	23,0	23,0	+0,1 -0,1
S	4,0	7,0	8,0	12,0	12,0	Min.
d	11,89	13,89	16,64	26,492	26,45	+0,1 0,0
d ₁	10,62	12,29	15,27	24,816	24,26	+0,1 0,0
P	2,540	2,822	2,822	3,629	3,629	-
r	0,792	0,822	0,897	1,191	1,025	-

NOTE The drawing illustrates the essential dimensions of the holder which need only be checked if doubt arises from the application of the test.

Figure 3 – Holder for torque test on lamps with screw caps
 (from IEC 60432-1, Figure C.2)



Dimension	B15 mm	B22 mm	Tolerance mm
A	15,27	22,27	+0,03
B	19,0	19,0	Min.
C	21,0	28,0	Min.
D	9,5	9,5	Min.
E	3,0	3,0	+0,17
G	18,3	24,6	±0,3
H	9,0	12,15	Min.
K	12,7	12,7	±0,3
R	1,5	1,5	Approximate
NOTE The drawing illustrates the essential dimensions of the holder which need only be checked if doubt arises from the application of the test.			

Figure 4 – Holder for torque test on lamps with bayonet caps
(from IEC 60432-1, Figure C.1)

Table 3 – Torque test values for unused lamps

Cap	Torsion moment Nm
B15d	1,15
B22d	3
E11	0,8
E12	0,8
E14	1,15
E17	1,5
E26	3
E26d	3
E27	3
E39	5
E40	5
GU10	u.c.
GZ10	u.c.
GX53	3
u.c.: under consideration	

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Before each use, the test holder for screw caps shall be checked to ensure that it is clean and completely free of lubricants and grease.

The cap of the test lamp shall be placed in the appropriate holder shown in Figures 3 and 4. Either the cap or the part of the lamp which is used for inserting or removing the lamp may be mechanically clamped.

Torque shall be applied steadily to the appropriate lamp component, so that no jerk occurs. The application of the torque may follow either of the following schemes.

- a) The required torque shall be applied, according to the limits given in Table 3.
- b) Higher torque values than the relevant limit shall be applied so that the value of torque for failure is obtained. In this case, the equipment is to be provided with suitable means for measuring torque over a wide range of failure levels.

Compliance:

The cap shall remain firmly attached to the bulb or that part of the lamp which is used for inserting or removing the lamp when subjected to the torque levels listed in Table 3 above. Some lamps are made with parts designed to be moved after insertion (for example a light sensor or decorative ring). Movement of these parts does not constitute non-compliance.

In the case of un-cemented caps, relative movement between cap and bulb is permitted provided it does not exceed 10°.

9.2.2 Torsion resistance of lamps after a defined time of usage

The torsion resistance of used lamps is under consideration.

9.2.3 Externally applied axial pull and bending moment

The lamp construction shall withstand externally applied axial pull and bending moment.

The bending shall be applied by holding in a uniform manner that part of the material closest to the cap. The pivot point lies at the cap reference plane (mating plane with the lamp holder). The pulling force and bending moment shall not be applied suddenly but shall be increased gradually from zero to the specified value.

Values are under consideration.

9.3 Compliance criteria

After the mechanical strength test of 9.2, the sample shall comply with the requirements of Clause 8.

9.4 Axial strength of Edison caps

The lamps shall be screwed into gauge of Table 4. After full insertion an axial force of Table 4 is applied to the central contact. See Figure 7.

In case axial strength of the cap does not decrease when the unmounted cap was assembled to the finished lamp, test results on the unmounted cap can be applied.

NOTE The gauges are used to hold the lamp. Calibration is not required.

Compliance:

After this test the insulation around the central contact shall remain intact. The application of the torque test in 9.2.1 shall not lead to impressing the bottom part of the cap into the shell.

Table 4 – Values for axial force

Cap	Gauge sheet no. from IEC 60061-3	Axial force N	Additional information
E11	7006-6-1	u.c.	
E12	7006-27H-1	u.c.	The portion for contact making check is not needed; Full threaded gauge with T1 height; C and H dimension are irrelevant
E14	7006-27F-1	80	
E26	7006-27B-1	120	
E26d	7006-27B-1	120	
E27	7006-27B-1	120	
E39	7006-24B-1	u.c.	
E40	7006-27-7	u.c.	
u.c.: under consideration			