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INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

Miscellaneous lampholders –
Part 1: General requirements and tests

Douilles diverses pour lampes –
Partie 1: Exigences générales et essais

IEC 60838-1:2016-05/AMD1:2017-02(en-fr)

IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

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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/1888/FDIS	34B/1891/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 website 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- withdrawn,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.

3 Terms and definitions

Replace definition 3.6 with the following new definition:

3.6
rated ignition voltage
highest peak value of an ignition pulse voltage the holder is able to withstand

Replace definition 3.20 with the following new definition:

3.20
polarized lampholder
lampholder for building-in specially designed for asymmetric ignition voltages, where the rated ignition voltage (higher rated ignition voltage) is designated to a fixed contact

Add, at the end of Clause 3, the following new terms and definitions:

3.23
critical frequency
f_{crit}
frequency at which the reduction of the breakdown voltage of a clearance begins (occurs)

Note 1 to entry: $f_{crit} \approx 0{,}2/d$ [MHz] where d (in mm) is the clearance according to Table 3 (basic or supplementary insulation and reinforced insulation respectively) disregarding the frequency.

[SOURCE: IEC 61347-1:2015, 3.40, modified — the note has been added]

3.24
ignition voltage
peak voltage applied to ignite a discharge lamp

[SOURCE: IEC 61347-1:2015, 3.46]

3.24.1
ignition pulse voltage
peak ignition voltage with a total duration of ≤ 750 µs (summation of all pulse durations) within 10 ms, with the duration time (width) of each pulse being measured at the level of 50% of the maximum absolute peak value

Note 1 to entry: Ignition pulse waveforms, which are considered as ignition pulse voltage, should not contain any dominant frequency above 30 kHz or should be usually highly damped (after 20 µs the peak voltage level should be less than one half of the maximum peak voltage). For the assessment of the dominant frequency IEC 60664-4:2005, Annex E should be consulted.

[SOURCE: IEC 61347-1:2015, 3.46.1]

3.25
maximum working voltage
U_{out}
maximum occurring working voltage (r.m.s.) between the output terminals of a controlgear or between the output terminals and earth, during normal or abnormal operating condition

Note 1 to entry: Transients and ignition voltages have to be neglected.

[SOURCE: IEC 61347-1:2015, 3.33, modified — "of a controlgear" has been added]

3.26
maximum working peak output voltage
$\hat{U}_{out}$

maximum repetitive occurring peak working voltage between the output terminals of a controlgear or between its output terminals and earth, during normal or abnormal operating condition and with transients neglected

[SOURCE: IEC 61347-1:2015, 3.45, modified — "of a controlgear" has been added]

3.27
equivalent transformed peak voltage
U_p
transformed output peak voltage, which is converted for the worst case peak voltage with its related frequency into an ignition pulse voltage

Note 1 to entry: The value of the declared equivalent transformed output peak voltage is the essential parameter for selecting the associated components

Note 2 to entry: See 3.24.1

Note 3 to entry: To determine the declared equivalent transformed output peak voltage for basic insulation U_p [basic] the worst case combination of the maximum occurring peak voltage and frequency has to be taken into account, which means the maximum clearance according to IEC 61347-1:2015, Table 10 for basic insulation.

Note 4 to entry: To determine the declared equivalent transformed output peak voltage for the reinforced insulation U_p [reinforced] the worst case combination of the maximum occurring peak voltage and frequency has to be taken into account, which means the maximum clearance according to IEC 61347-1:2015, Table 11 for reinforced insulation.

[SOURCE: IEC 61347-1:2015, 3.47]

7 Marking

7.2

Replace item a) including the note with the following new item a) and note:

a) the rated voltage in volts and rated ignition voltage in kilovolts (kV), if applicable. For polarized lampholders the rated voltage in volts and the pair of rated ignition voltages;

NOTE 1 Some lampholders still show rated voltages higher than 500 V. This is an earlier way of expressing the permissible ignition voltage via a rated voltage. For such lampholders, the creepage distances and clearances can be found in IEC 60598-1.

Replace item e) with the following new item e):

e) the high voltage arrow (see IEC 60417-5036:2002-10) for polarized lampholders to identify the connection for the higher ignition voltage, if applicable. It shall be visible close to the relevant terminal or wire entry during lampholder installation.

Replace, in the third paragraph, the last dashed list item with the following new text:

– high ignition voltage terminal/wire on polarized lampholders:  (see IEC 60417-5036:2002-10)

Replace the fourth paragraph with the following new text:

For the rated ignition voltage, the symbol shall be preceded by its value (e.g. 5 kV). For polarized lampholders the two rated ignition voltages shall be separated by an oblique stroke (e.g. 15/2,5 kV).

NOTE 3 The figure marked before the oblique stroke represents the higher ignition voltage, the figure behind represents the rated ignition voltage at least based on the impulse withstand category of the lampholder.

7.3

Replace the first paragraph with the following new text:

The instructions supplied by the holder manufacturer or responsible vendor shall contain all the information required to ensure correct mounting and operation of the connectors or holders. (For example information regarding UV radiation, frequency limitations, increased creepage distances, PTI or the like)

15 Creepage distances and clearances

Replace Table 2a with the following new Table 2a:

Table 2a – Minimum distances for AC sinusoidal voltages up to 30 kHz – Impulse withstand category II

Distances mm	Rated voltage V			
	50	**150**	**250**	**500**
Basic insulation				
1 Distances between live parts of different polarity, and				
2 Distances between live parts and external metal parts, mounting surfaces, loose metal cover, if any, 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:				
– Creepage distances				
insulation PTI ≥ 600 [b]	0,6	0,8	1,5	3
insulation PTI < 600 [b]	1,2	1,6	2,5	5
– Clearances [c]	0,2	0,5	1,5	3
Reinforced insulation				
Distances between live parts and external metal parts, mounting surfaces, loose metal cover, if any, 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:				
– Creepage distances				
insulation PTI ≥ 600 [b]	-	1,6	3	5,5
insulation PTI < 600 [b]	-	3,2	5	10
– Clearances [c]	0,4	1,6	3	5,5

Values for creepage distances may be found for intermediate values of rated voltages by linear interpolation between tabulated values. No values are specified for rated voltages below 25 V AC and 60 V DC ripple free as the voltage test of 12.2.2 is considered sufficient. Creepage distances shall not be less than the required minimum clearance.

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

[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.

[b] PTI (proof tracking index) in accordance with IEC 60112:2003 and IEC 60112:2003/AMD1:2009.

- 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 (independent of the real PTI).
- For creepage distances, the equivalent DC voltage is equal to the r.m.s. value of the sinusoidal AC voltage.

[c] For clearances, the equivalent DC voltage is equal to the peak of the AC voltage.

Replace Table 2b with the following new Table 2b:

Table 2b – Minimum distances for AC sinusoidal voltages up to 30 kHz – Impulse withstand category III

Distances mm	Rated voltage V			
	50	**150**	**250**	**500**
Basic insulation				
1 Distances between live parts of different polarity				
– Creepage distances				
insulation PTI ≥ 600 [b]	0,6	0,8	1,5	3
PTI < 600 [b]	1,2	1,6	2,5	5
– Clearances [c]	0,2	0,5	1,5	3
2 Distances between live parts and external metal parts, mounting surfaces, loose metal cover, if any, 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:				
– Creepage distances				
insulation PTI ≥ 600 [b]	0,6	1,5	3	5,5
PTI < 600 [b]	1,2	1,6	3	5,5
– Clearances [c]	0,2	1,5	3	5,5
Reinforced insulation				
Distances between live parts and external metal parts, mounting surfaces, loose metal cover, if any, 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:				
– Creepage distances				
insulation PTI ≥ 600 [b]	–	3	5,5	8
PTI < 600 [b]	–	3,2	5,5	10
– Clearances [c]	–	3	5,5	8

Values for creepage distances may be found for intermediate values of rated voltages by linear interpolation between tabulated values. No values are specified for rated voltages below 25 V AC and 60 V DC ripple free as the voltage test of 12.2.2 is considered sufficient. Creepage distances shall not be less than the required minimum clearance.

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

[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.

[b] PTI (proof tracking index) in accordance with IEC 60112:2003 and IEC 60112:2003/AMD1:2009.

– 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 (independent of the real PTI).

– For creepage distances, the equivalent DC voltage is equal to the r.m.s. value of the sinusoidal AC voltage.

[c] For clearances, the equivalent DC voltage is equal to the peak of the AC voltage.

Replace, after Table 2b and the fifth paragraph, the existing text with the following new text:

NOTE 1 In case of combination of voltage and frequency (> 30 kHz) requiring higher creepage distances than the values required in Tables 2a and 2b, the controlgear is marked with the details of this combination ($\hat{U}_{out}$ and its corresponding frequency f_{Uout}) – see IEC 61347-1:2015, 7.1, item w). For details and the required values for creepage distances see IEC 61347-1:2015, 16.2.

The clearances for the rated ignition voltage of the holder shall not be less than the values given in Table 3.

NOTE 2 Lampholders can be subjected to a working voltage higher than the rated voltage under the following conditions:

– The nominal voltage and the overvoltage category of the supply voltage does not exceed the rated values of the lampholder.

– The working voltage (r.m.s.) and the maximum repetitive peak working voltage ($\hat{U}_{out}$) marked on the controlgear respectively do not specify a higher creepage distance than the rated voltage of the lampholder.

– The working voltage does not specify a higher clearance than the rated voltage and the rated ignition voltage of the lampholder.

Table 3 – Minimum distances for ignition pulse voltages or equivalent peak voltages U_p

Rated ignition pulse voltage	Minimum clearance mm	
kV	Basic insulation	Reinforced insulation
2	1	2,2
2,5	1,5	3
3	2	3,8
4	3	6
5	4	8
6	5,5	10,4
8	8	15
10	11	19,4
12	14	24
15	18	31,4
20	25	44
25	33	60
30	40	72
40	60	98
50	75	130
60	90	162
80	130	[a]
100	170	[a]
[a] no values available		

The distances specified in Table 3 are derived from IEC 60664-1 (inhomogeneous field conditions). For distances subjected to both sinusoidal voltage as well as ignition voltage, the minimum required distance shall be not less than the highest value indicated in either Table 2a, Table 2b or Table 3 relevant for the impulse voltage category.

NOTE 3 Ignition pulse voltages having total pulse duration of > 750 µs or having a higher frequency than f_{crit} can require higher clearances although its peak value is lower than the rated ignition voltage of the lampholder.

Therefore, the respective control gear is marked with an equivalent peak voltage (U_p) which is directly comparable to the rated ignition voltage of the lampholder.

For clearance distances without influence on safety, for example distances between the contacts, advantage might be taken from improved field conditions, but also in this case the values for the homogenous fields (see IEC 60664-1) remain the absolute minimum.

For polarized lampholders creepage distances and clearances to external metal parts or the outer surface of parts of insulating material may be designed and shall be checked for each pole separately. The distances between the contacts shall be designed according to the high ignition voltage.

Compliance is checked by tests with the rated pulse voltage of the holder. Voltage drops are not permissible.

Creepage distances shall be not less than the required minimum clearances.

Replace Annex E with the following new Annex E:

Annex E
(informative)

Clauses containing new or more stringent requirements with respect to the previous edition

The schedule of clauses given in Annex E details the requirements of this Amendment 1 of IEC 60838-1:2016 which may require retesting to show compliance with this updated standard. Retesting may not be required in cases where examination of previous test results confirms conformity.

a) Clause 15: Update on creepage distances and clearances for frequencies above 30 kHz and inclusion of U_{out} from controlgear.

Bibliography

Add the following new references:

IEC 60664-4:2005, *Insulation coordination for equipment within low-voltage systems – Part 4: Consideration of high-frequency voltage stress*

IEC 61347-1:2015, *Lamp controlgear – Part 1: General and safety requirements*

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