



**TEST REPORT**  
**IEC 60598-2-13**  
**Luminaires**  
**Part 2: Particular requirements**  
**Section 13: Ground recessed luminaires**

**Report Number**.....: LCSB080822032S

**Date of issue**.....: August 18, 2022

**Total number of pages**..... 53 pages

**Name of Testing Laboratory preparing the Report**.....: **Shenzhen Southern LCS Compliance Testing Laboratory Ltd.**

**Applicant's name**.....: **Zhongshan Upward Lighting Co., Ltd**

**Address**.....: Floor 5, No. 67 of Jingang Road, Western District, Zhongshan, Guangdong, China

**Test specification:**

**Standard**.....: IEC 60598-2-13:2006, IEC 60598-2-13:2006/AMD1:2011, IEC 60598-2-13:2006/AMD2:2016 used in conjunction with IEC 60598-1:2020

**Test procedure**.....: CE-LVD

**Non-standard test method**.....: N/A

**TRF template used**.....: IECEE OD-2020-F1:2020, Ed.1.4

**Test Report Form No**.....: IEC60598\_2\_13H

**Test Report Form(s) Originator**.....: Intertek Semko AB

**Master TRF**.....: Dated 2022-05-06

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The test results presented in this report relate only to the object tested.

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|   |   |                  |
|---|---|------------------|
| <b>Test item description</b> .....:   | Led Underground Light   |                  |
| <b>Trade Mark</b> .....:  | iPHD  |                  |
| <b>Manufacturer</b> .....:  | Zhongshan Upward Lighting Co., Ltd  |                  |
| <b>Address</b> .....:   | Floor 5, No. 67 of Jingang Road, Western District, Zhongshan,Guangdong, China   |                  |
| <b>Model/Type reference</b> .....:  | See model list on page 5  |                  |
| <b>Ratings</b> .....:   | See model list on page 5  |                  |
| <input checked="" type="checkbox"/>   | <b>Testing Laboratory:</b>  |                  |
| <b>Testing location/ address</b> .....:   | Shenzhen Southern LCS Compliance Testing Laboratory Ltd.<br>101-201, No.39 Building, Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District, Shenzhen, China |                  |
| <b>Tested by</b> .....:   | Yan Shi<br>(Engineer)   | <i>Yan Shi</i>   |
| <b>Check by</b> .....:  | Torres He<br>(Director)   | <i>Torres He</i> |
| <b>Approved by</b> .....:   | Jesse Liu<br>(Manager)  | <i>Jesse Liu</i> |
| <b>List of Attachments (including a total number of pages in each attachment):</b>  |   |                  |
| Attachment No. 1: European group differences and national differences according to EN 60598-2-13:2006+A1:2012+A2:2016 used in conjunction with EN IEC 60598-1:2021. |   |                  |
| Attachment No. 2: Report IEC/EN IEC 62031.  |   |                  |
| Attachment No. 3: Photobiological hazards of IEC/EN 62471 & IEC TR 62778..  |   |                  |
| Attachment No. 4: Photo documentation.  |   |                  |
| <b>Summary of testing:</b>  |   |                  |
| <b>Tests performed (name of test and test clause):</b>  | <b>Testing location:</b>  |                  |
| EN 60598-2-13:2006+A1:2012+A2:2016;   | Shenzhen Southern LCS Compliance Testing Laboratory Ltd.  |                  |
| EN IEC 60598-1:2021;  | 101-201, No.39 Building, Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District, Shenzhen, China   |                  |
| EN 62493:2015;  |   |                  |
| EN IEC 62031:2020;  |   |                  |
| EN 62471:2008   |   |                  |



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**Copy of marking plate:**

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

|   |                      |
|---|----------------------|
| <b>Led Underground Light</b>  | <b>iPHD</b>          |
| <b>Model: UPW-DM-006</b>  |                      |
| <b>220-240V~, 50/60Hz, 40W, T:60°C</b>  |                      |
|   |                      |
| <b>IP65 and IP67 ta.45°C</b>  |                      |
| <b>Zhongshan Upward Lighting Co., Ltd</b>   |                      |
| <b>Importer: xxxxxxxx</b>   |                      |
| <b>Address: xxxxxxxx</b>  |                      |
|   | <b>MADE IN CHINA</b> |



: "luminaires not suitable for direct mounting on normally flammable surfaces" symbol, height of this marks least 25mm.

**Remarks:**

1. Representative markings of UPW-DM-006, markings of all models are identical except for the model name and rating.
2. Height of CE mark at least 5mm, height of WEEE symbol should not less than 7mm, height of other marks at least 5mm, height of letters and numerals at least 2mm.





| <b>Test item particulars</b> ..... :   |  |                  |                |               |         |     |                |                  |                |     |                |                 |           |
|--|--|------------------|----------------|---------------|---------|-----|----------------|------------------|----------------|-----|----------------|-----------------|-----------|
| <b>Classification of installation and use</b> ..... :  | Ground recessed luminaires   |                  |                |               |         |     |                |                  |                |     |                |                 |           |
| <b>Supply Connection</b> ..... :   | Supply cord  |                  |                |               |         |     |                |                  |                |     |                |                 |           |
| <b>Protection Class</b> ..... :  | Class I  |                  |                |               |         |     |                |                  |                |     |                |                 |           |
| <b>Degree of Protection</b> ..... :  | IP65 & IP67  |                  |                |               |         |     |                |                  |                |     |                |                 |           |
| <b>Possible test case verdicts:</b>  |  |                  |                |               |         |     |                |                  |                |     |                |                 |           |
| - test case does not apply to the test object..... :   | N/A  |                  |                |               |         |     |                |                  |                |     |                |                 |           |
| - test object does meet the requirement..... :   | P (Pass)   |                  |                |               |         |     |                |                  |                |     |                |                 |           |
| - test object does not meet the requirement..... :   | F (Fail)   |                  |                |               |         |     |                |                  |                |     |                |                 |           |
| <b>Testing</b> ..... :   |  |                  |                |               |         |     |                |                  |                |     |                |                 |           |
| <b>Date of receipt of test item</b> ..... :  | December 30, 2020  |                  |                |               |         |     |                |                  |                |     |                |                 |           |
| <b>Date (s) of performance of tests</b> ..... :  | December 30, 2020- January 12, 2021  |                  |                |               |         |     |                |                  |                |     |                |                 |           |
| <b>General remarks:</b>  |  |                  |                |               |         |     |                |                  |                |     |                |                 |           |
| <p>"(See Enclosure #)" refers to additional information appended to the report.<br/>         "(See appended table)" refers to a table appended to the report.<br/>         Clause numbers with "*" were not within the scope of CNAS recognition.<br/>         Clause numbers between brackets refer to clauses in IEC/EN IEC 60598-1.<br/>         The general information of applicant and manufacturer (such as the name and address), product name, model/type reference, trademark and other similar information contained in this report are all provided by the applicant, the laboratory is not responsible for verifying its authenticity.</p> <p><b>Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator.</b></p> <p>According to the EU directives which have been aligned with EU NLF (new legislative framework), both of manufacturer and importer's name and address shall be affixed on the product or, where that is not possible, on its packaging or in a document accompanying the product before the product is placed on the EU market.</p> <p style="text-align: center;">Modified Information</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Version</th> <th style="width: 25%;">Report No.</th> <th style="width: 25%;">Revision Date</th> <th style="width: 35%;">Summary</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">000</td> <td style="text-align: center;">LCS201230086BS</td> <td style="text-align: center;">January 14, 2021</td> <td style="text-align: center;">Origin version</td> </tr> <tr> <td style="text-align: center;">001</td> <td style="text-align: center;">LCSB080822032S</td> <td style="text-align: center;">August 18, 2022</td> <td style="text-align: center;">See below</td> </tr> </tbody> </table> <p><b>001:</b>Declared by applicant, require to re-sign the test report, "Update the version of the standard and add some models ", other information and results contained in this report are not changed, original test report become invalid.</p> |  | Version          | Report No.     | Revision Date | Summary | 000 | LCS201230086BS | January 14, 2021 | Origin version | 001 | LCSB080822032S | August 18, 2022 | See below |
| Version  | Report No.   | Revision Date    | Summary        |               |         |     |                |                  |                |     |                |                 |           |
| 000  | LCS201230086BS   | January 14, 2021 | Origin version |               |         |     |                |                  |                |     |                |                 |           |
| 001  | LCSB080822032S   | August 18, 2022  | See below      |               |         |     |                |                  |                |     |                |                 |           |
| <b>Manufacturer's Declaration per sub-clause 4.2.5 of IEC 02:</b>  |  |                  |                |               |         |     |                |                  |                |     |                |                 |           |
| The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided..... :   | <input type="checkbox"/> <b>Yes</b><br><input checked="" type="checkbox"/> <b>Not applicable</b> |                  |                |               |         |     |                |                  |                |     |                |                 |           |
| <b>When differences exist; they shall be identified in the General product information section.</b>  |  |                  |                |               |         |     |                |                  |                |     |                |                 |           |
| <b>Name and address of factory (ies)</b> ..... : Same as manufacturer  |  |                  |                |               |         |     |                |                  |                |     |                |                 |           |



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**General product information:**

- All models have similar appearance.
- Unless otherwise specified, the model UPW-DM-006 was chosen as representative model to perform all test.

**Model List:**

| Model             | Rating                           |
|-------------------|----------------------------------|
| UPW-DM-001        | 220V-240VAC, 50/60Hz, 9W         |
| UPW-DM-002        | 220V-240VAC, 50/60Hz, 3W         |
| UPW-DM-003        | 220V-240VAC, 50/60Hz, 6W         |
| UPW-DM-004        | 220V-240VAC, 50/60Hz, 18W        |
| UPW-DM-005        | 220V-240VAC, 50/60Hz, 7W         |
| <b>UPW-DM-006</b> | <b>220V-240VAC, 50/60Hz, 40W</b> |
| UPW-DM-007        | 220V-240VAC, 50/60Hz, 12W        |
| UPW-DM-008        | 220V-240VAC, 50/60Hz, 12W        |
| UPW-DM-009        | 220V-240VAC, 50/60Hz, 1W         |
| UPW-DM-011        | 220V-240VAC, 50/60Hz, 5W         |
| UPW-DM-012        | 220V-240VAC, 50/60Hz, 9W         |
| UPW-DM-013        | 220V-240VAC, 50/60Hz, 4W         |
| UPW-DM-014        | 220V-240VAC, 50/60Hz, 5W         |
| UPW-DM-015        | 220V-240VAC, 50/60Hz, 15W        |
| UPW-DM-016        | 220V-240VAC, 50/60Hz, 9W         |
| UPW-DM-017        | 220V-240VAC, 50/60Hz, 36W        |
| UPW-DM-018        | 220V-240VAC, 50/60Hz, 3W         |
| UPW-DM-020        | 220V-240VAC, 50/60Hz, 12W        |
| UPW-DM-021        | 220V-240VAC, 50/60Hz, 15W        |
| UPW-DM-022        | 220V-240VAC, 50/60Hz, 24W        |
| UPW-DM-023        | 220V-240VAC, 50/60Hz, 12W        |
| UPW-DM-024        | 220V-240VAC, 50/60Hz, 5W         |
| UPW-DM-025        | 220V-240VAC, 50/60Hz, 1W         |
| UPW-DM-026        | 220V-240VAC, 50/60Hz, 24W        |
| UPW-DM-027        | 220V-240VAC, 50/60Hz, 30W        |
| UPW-DM-029        | 220V-240VAC, 50/60Hz, 3W         |
| UPW-DM-030        | 220V-240VAC, 50/60Hz, 10W        |
| UPW-DM-031        | 220V-240VAC, 50/60Hz, 20W        |
| UPW-DM-032        | 220V-240VAC, 50/60Hz, 30W        |
| UPW-DM-033        | 220V-240VAC, 50/60Hz, 5W         |
| UPW-DM-035        | 220V-240VAC, 50/60Hz, 3W         |
| UPW-DM-045        | 220V-240VAC, 50/60Hz, 5W         |
| UPW-DM-050        | 220V-240VAC, 50/60Hz, 12W        |
| UPW-DM-052        | 220V-240VAC, 50/60Hz, 9W         |
| UPW-DM-053        | 220V-240VAC, 50/60Hz, 9W         |
| UPW-DM-054        | 220V-240VAC, 50/60Hz, 9W         |
| UPW-DM-055        | 220V-240VAC, 50/60Hz, 15W        |
| UPW-DM-056        | 220V-240VAC, 50/60Hz, 15W        |
| UPW-DM-057        | 220V-240VAC, 50/60Hz, 18W        |
| UPW-DM-058        | 220V-240VAC, 50/60Hz, 18W        |
| UPW-DM-061        | 220V-240VAC, 50/60Hz, 20W        |
| UPW-DM-062        | 220V-240VAC, 50/60Hz, 3W         |
| UPW-DM-065        | 220V-240VAC, 50/60Hz, 30W        |
| UPW-DM-066        | 220V-240VAC, 50/60Hz, 6W         |
| UPW-DM-067        | 220V-240VAC, 50/60Hz, 30W        |



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|            |                           |
|------------|---------------------------|
| UPW-DM-068 | 220V-240VAC, 50/60Hz, 5W  |
| UPW-DM-070 | 220V-240VAC, 50/60Hz, 3W  |
| UPW-DM-071 | 220V-240VAC, 50/60Hz, 9W  |
| UPW-DM-072 | 220V-240VAC, 50/60Hz, 15W |
| UPW-DM-073 | 220V-240VAC, 50/60Hz, 10W |
| UPW-DM-074 | 220V-240VAC, 50/60Hz, 20W |
| UPW-DM-075 | 220V-240VAC, 50/60Hz, 9W  |
| UPW-DM-076 | 220V-240VAC, 50/60Hz, 9W  |
| UPW-DM-077 | 220V-240VAC, 50/60Hz, 12W |
| UPW-DM-078 | 220V-240VAC, 50/60Hz, 1W  |
| UPW-DM-079 | 220V-240VAC, 50/60Hz, 18W |
| UPW-DM-080 | 220V-240VAC, 50/60Hz, 12W |
| UPW-DM-081 | 220V-240VAC, 50/60Hz, 9W  |
| UPW-DM-082 | 220V-240VAC, 50/60Hz, 18W |
| UPW-DM-083 | 220V-240VAC, 50/60Hz, 4W  |
| UPW-DM-084 | 220V-240VAC, 50/60Hz, 5W  |
| UPW-DM-085 | 220V-240VAC, 50/60Hz, 12W |
| UPW-DM-086 | 220V-240VAC, 50/60Hz, 18W |
| UPW-DM-087 | 220V-240VAC, 50/60Hz, 3W  |
| UPW-DM-088 | 220V-240VAC, 50/60Hz, 4W  |
| UPW-DM-089 | 220V-240VAC, 50/60Hz, 6W  |
| UPW-DM-090 | 220V-240VAC, 50/60Hz, 9W  |
| UPW-DM-091 | 220V-240VAC, 50/60Hz, 36W |
| UPW-DM-092 | 220V-240VAC, 50/60Hz, 18W |
| UPW-DM-093 | 220V-240VAC, 50/60Hz, 12W |
| UPW-DM-094 | 220V-240VAC, 50/60Hz, 36W |
| UPW-DM-095 | 220V-240VAC, 50/60Hz, 12W |
| UPW-DM-096 | 220V-240VAC, 50/60Hz, 9W  |
| UPW-DM-097 | 220V-240VAC, 50/60Hz, 24W |
| UPW-DM-099 | 220V-240VAC, 50/60Hz, 3W  |
| UPW-DM-100 | 220V-240VAC, 50/60Hz, 36W |
| UPW-DM-101 | 220V-240VAC, 50/60Hz, 36W |
| UPW-DM-102 | 220V-240VAC, 50/60Hz, 6W  |
| UPW-DM-103 | 220V-240VAC, 50/60Hz, 18W |
| UPW-DM-104 | 220V-240VAC, 50/60Hz, 2W  |
| UPW-DM-105 | 220V-240VAC, 50/60Hz, 3W  |
| UPW-DM-106 | 220V-240VAC, 50/60Hz, 4W  |
| UPW-DM-107 | 220V-240VAC, 50/60Hz, 9W  |
| UPW-DM-108 | 220V-240VAC, 50/60Hz, 18W |
| UPW-DM-109 | 220V-240VAC, 50/60Hz, 6W  |
| UPW-DM-110 | 220V-240VAC, 50/60Hz, 2W  |
| UPW-DM-111 | 220V-240VAC, 50/60Hz, 3W  |
| UPW-DM-112 | 220V-240VAC, 50/60Hz, 4W  |
| UPW-DM-116 | 220V-240VAC, 50/60Hz, 18W |
| UPW-DM-117 | 220V-240VAC, 50/60Hz, 24W |
| UPW-DM-118 | 220V-240VAC, 50/60Hz, 30W |
| UPW-DM-119 | 220V-240VAC, 50/60Hz, 36W |
| UPW-DM-120 | 220V-240VAC, 50/60Hz, 24W |
| UPW-DM-121 | 220V-240VAC, 50/60Hz, 6W  |
| UPW-DM-122 | 220V-240VAC, 50/60Hz, 18W |
| UPW-DM-123 | 220V-240VAC, 50/60Hz, 36W |
| UPW-DM-124 | 220V-240VAC, 50/60Hz, 36W |
| UPW-DM-125 | 220V-240VAC, 50/60Hz, 8W  |



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|            |                           |
|------------|---------------------------|
| UPW-DM-126 | 220V-240VAC, 50/60Hz, 8W  |
| UPW-DM-127 | 220V-240VAC, 50/60Hz, 12W |
| UPW-DM-128 | 220V-240VAC, 50/60Hz, 24W |
| UPW-DM-129 | 220V-240VAC, 50/60Hz, 36W |
| UPW-DM-131 | 220V-240VAC, 50/60Hz, 3W  |
| UPW-DM-132 | 220V-240VAC, 50/60Hz, 5W  |
| UPW-DM-133 | 220V-240VAC, 50/60Hz, 6W  |
| UPW-DM-134 | 220V-240VAC, 50/60Hz, 36W |
| UPW-DM-135 | 220V-240VAC, 50/60Hz, 9W  |
| UPW-DM-136 | 220V-240VAC, 50/60Hz, 12W |
| UPW-DM-137 | 220V-240VAC, 50/60Hz, 18W |
| UPW-DM-138 | 220V-240VAC, 50/60Hz, 24W |
| UPW-DM-139 | 220V-240VAC, 50/60Hz, 6W  |
| UPW-DM-140 | 220V-240VAC, 50/60Hz, 18W |
| UPW-DM-141 | 220V-240VAC, 50/60Hz, 36W |
| UPW-DM-143 | 220V-240VAC, 50/60Hz, 18W |
| UPW-DM-145 | 220V-240VAC, 50/60Hz, 36W |
| UPW-DM-146 | 220V-240VAC, 50/60Hz, 9W  |
| UPW-DM-147 | 220V-240VAC, 50/60Hz, 10W |
| UPW-DM-148 | 220V-240VAC, 50/60Hz, 20W |
| UPW-DM-149 | 220V-240VAC, 50/60Hz, 30W |
| UPW-DM-152 | 220V-240VAC, 50/60Hz, 30W |
| UPW-DM-153 | 220V-240VAC, 50/60Hz, 12W |
| UPW-DM-154 | 220V-240VAC, 50/60Hz, 24W |
| UPW-DM-155 | 220V-240VAC, 50/60Hz, 7W  |
| UPW-DM-156 | 220V-240VAC, 50/60Hz, 12W |
| UPW-DM-157 | 220V-240VAC, 50/60Hz, 30W |
| UPW-DM-158 | 220V-240VAC, 50/60Hz, 3W  |
| UPW-DM-159 | 220V-240VAC, 50/60Hz, 5W  |
| UPW-DM-160 | 220V-240VAC, 50/60Hz, 6W  |
| UPW-DM-161 | 220V-240VAC, 50/60Hz, 7W  |
| UPW-DM-162 | 220V-240VAC, 50/60Hz, 9W  |
| UPW-DM-163 | 220V-240VAC, 50/60Hz, 12W |
| UPW-DM-164 | 220V-240VAC, 50/60Hz, 15W |
| UPW-DM-165 | 220V-240VAC, 50/60Hz, 18W |
| UPW-DM-166 | 220V-240VAC, 50/60Hz, 24W |
| UPW-DM-167 | 220V-240VAC, 50/60Hz, 27W |
| UPW-DM-168 | 220V-240VAC, 50/60Hz, 30W |
| UPW-DM-169 | 220V-240VAC, 50/60Hz, 36W |
| UPW-DM-171 | 220V-240VAC, 50/60Hz, 18W |
| UPW-DM-172 | 220V-240VAC, 50/60Hz, 36W |



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| IEC 60598-2-13 |                    |                 |         |
|----------------|--------------------|-----------------|---------|
| Clause         | Requirement + Test | Result - Remark | Verdict |

|                   |  |   |          |
|-------------------|--|---|----------|
| <b>13.2 (0)</b>   | <b>GENERAL TEST REQUIREMENTS</b>                                   |   | <b>P</b> |
| 13.2 (0.3)        | More sections applicable..... :                                    | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Section/s: | —        |
| 13.2 (0.5)        | Components   | (see Annex 1)   | —        |
| <b>13.2 (0.7)</b> | <b>Information for luminaire design in light sources standards</b> |   | —        |
| 13.2 (0.7.2)      | Light source safety standard .....                                 | IEC/EN IEC 62031  | —        |
|                   | Luminaire design in the light source safety standard               |   | P        |

|                 |  |   |   |
|-----------------|--|---|---|
| <b>13.4 (2)</b> | <b>CLASSIFICATION OF LUMINAIRES</b>  |   |   |
| 13.4 (2.2)      | Type of protection .....   | Class I   |   |
| 13.4 (2.3)      | Degree of protection..... :  | IP65 & IP67   | — |
| 13.4 (2.4)      | Luminaire suitable for direct mounting on normally flammable surfaces..... : | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | — |
| 13.4 (2.5)      | Luminaire for normal use .....   | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | — |
|                 | Luminaire for rough service .....  | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | — |

|                 |                                       |         |          |
|-----------------|---------------------------------------|---------|----------|
| <b>13.5 (3)</b> | <b>MARKING</b>                        |         | <b>P</b> |
| 13.5 (3.2)      | Mandatory markings                    |         | P        |
|                 | Position of the marking               |         | P        |
|                 | Format of symbols/text                |         | P        |
| 13.5 (3.3)      | Additional information                |         | P        |
|                 | Language of instructions              | English | P        |
| 13.5 (3.3.1)    | Combination luminaires                |         | N/A      |
| 13.5 (3.3.2)    | Nominal frequency in Hz               | 50/60Hz | P        |
| 13.5 (3.3.3)    | Operating temperature                 |         | N/A      |
| 13.5 (3.3.5)    | Wiring diagram                        |         | N/A      |
| 13.5 (3.3.6)    | Special conditions                    |         | N/A      |
| 13.5 (3.3.7)    | Metal halide lamp luminaire – warning |         | N/A      |
| 13.5 (3.3.8)    | Limitation for semi-luminaires        |         | N/A      |
| 13.5 (3.3.9)    | Power factor and supply current       |         | P        |
| 13.5 (3.3.10)   | Suitability for use indoors           |         | N/A      |



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| Clause           | Requirement + Test   | Result - Remark | Verdict |
| 13.5<br>(3.3.11) | Luminaires with remote control   |                 | N/A     |
| 13.5<br>(3.3.12) | Clip-mounted luminaire – warning   |                 | N/A     |
| 13.5<br>(3.3.13) | Specifications of protective shields   |                 | N/A     |
| 13.5<br>(3.3.14) | Symbol for nature of supply  | ~               | P       |
| 13.5<br>(3.3.15) | Rated current of socket outlet   |                 | N/A     |
| 13.5<br>(3.3.16) | Rough service luminaire  |                 | N/A     |
| 13.5<br>(3.3.17) | Mounting instruction for type Y, type Z and some type X attachments  | Type Z          | P       |
| 13.5<br>(3.3.18) | Non-ordinary luminaires with PVC cable   |                 | N/A     |
| 13.5<br>(3.3.19) | Protective conductor current in instruction if applicable  |                 | N/A     |
| 13.5<br>(3.3.20) | Provided with information if not intended to be mounted within arm's reach                                 |                 | N/A     |
| 13.5<br>(3.3.21) | Non replaceable and non-user replaceable light sources information provided                                | Non replaceable | P       |
| 13.5<br>(3.3.22) | Controllable luminaires, classification of insulation provided   |                 | N/A     |
| 13.5<br>(3.3.23) | Luminaires without control gear provided with necessary information for selection of appropriate component |                 | N/A     |
| 13.5<br>(3.3.24) | If not supplied with terminal block, information on the packaging  |                 | P       |
| 13.5<br>(3.3.25) | Luminaires employing light sources emitting UV on mains wiring, information provided                       |                 | N/A     |
| 13.5<br>(3.3.26) | Wall mounted luminaire using external flexible cable or cord longer than 0.3 m, information provided       |                 | N/A     |
| 13.5 (3.4)       | Test with water  |                 | P       |
|                  | Test with hexane   |                 | P       |
|                  | Legible after test   |                 | P       |
|                  | Label attached   |                 | P       |
| 13.5.1 (-)       | Rated load in the manufacturer's instruction (N)..... :  | --              | P       |
| 13.5.2 (-)       | Rated maximum surface temperature $T$ (°C)..... :  | 60              | P       |



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|------------|--|--|---|
| 13.5.3 (-) | Information concerning external connection box |  | P |
|------------|--|--|---|

|                   |   |  |            |
|-------------------|---|--|------------|
| <b>13.6 (4)</b>   | <b>CONSTRUCTION</b>   |  | <b>P</b>   |
| 13.6 (4.2)        | Components replaceable without difficulty   |  | N/A        |
| 13.6 (4.3)        | Wireways smooth and free from sharp edges   |  | P          |
| <b>13.6 (4.4)</b> | <b>Lamp holders</b>   |  | <b>N/A</b> |
| 13.6 (4.4.1)      | Integral lamp holder  |  | N/A        |
| 13.6 (4.4.2)      | Wiring connection   |  | N/A        |
| 13.6 (4.4.3)      | Lamp holder for end- to- end mounting   |  | N/A        |
| 13.6 (4.4.4)      | Positioning   |  | N/A        |
|                   | - pressure test (N) .....   |  | —          |
|                   | After test the lamp holder comply with relevant standard sheets and show no damage  |  | N/A        |
|                   | After test on single-capped lamp holder the lamp holder has not moved from its position and show no permanent deformation |  | N/A        |
|                   | - bending test (N) .....  |  | —          |
|                   | After test the lamp holder has not moved from its position and show no permanent deformation                              |  | N/A        |
| 13.6 (4.4.5)      | Peak pulse voltage  |  | N/A        |
| 13.6 (4.4.6)      | Centre contact  |  | N/A        |
| 13.6 (4.4.7)      | Parts in rough service luminaires resistant to tracking   |  | N/A        |
| 13.6 (4.4.8)      | Lamp connectors   |  | N/A        |
| 13.6 (4.4.9)      | Caps and bases correctly used   |  | N/A        |
| 13.6 (4.4.10)     | Light source for lamp holder or connection according IEC 60061 not connected another way                                  |  | N/A        |
| <b>13.6 (4.5)</b> | <b>Starter holders</b>  |  | <b>N/A</b> |
|                   | Starter holder in luminaires other than class II  |  | N/A        |
|                   | Starter holder class II construction  |  | N/A        |
| <b>13.6 (4.6)</b> | <b>Terminal blocks</b>  |  | <b>N/A</b> |
|                   | Tails   |  | N/A        |
|                   | Unsecured blocks  |  | N/A        |
| <b>13.6 (4.7)</b> | <b>Terminals and supply connections</b>   |  | <b>P</b>   |
| 13.6 (4.7.1)      | Contact to metal parts  |  | N/A        |





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| Clause             | Requirement + Test   | Result - Remark | Verdict    |
| 13.6 (4.7.2)       | Test 8 mm live conductor   |                 | N/A        |
|                    | Test 8 mm earth conductor  |                 | N/A        |
| 13.6 (4.7.3)       | Terminals for supply conductors  |                 | P          |
| 13.6 (4.7.3.1)     | Welded method and material   |                 | P          |
|                    | - stranded or solid conductor  |                 | P          |
|                    | - spot welding   |                 | P          |
|                    | - welding between wires  |                 | P          |
|                    | - Type Z attachment  |                 | P          |
|                    | - mechanical test according to 15.6.2  |                 | N/A        |
|                    | - electrical test according to 15.6.3  |                 | N/A        |
|                    | - heat test according to 15.6.3.2.3 and 15.6.3.2.4                                 |                 | N/A        |
| 13.6 (4.7.4)       | Terminals other than supply connection   |                 | N/A        |
| 13.6 (4.7.5)       | Heat-resistant wiring/sleeves  |                 | N/A        |
| 13.6 (4.7.6)       | Multi-pole plug  |                 | N/A        |
|                    | - test at 30 N   |                 | N/A        |
| <b>13.6 (4.8)</b>  | <b>Switches</b>  |                 | <b>N/A</b> |
|                    | - adequate rating  |                 | N/A        |
|                    | - adequate fixing  |                 | N/A        |
|                    | - polarized supply   |                 | N/A        |
|                    | - compliance with IEC 61058-1 for electronic switches                              |                 | N/A        |
| <b>13.6 (4.9)</b>  | <b>Insulating lining and sleeves</b>   |                 | <b>P</b>   |
| 13.6 (4.9.1)       | Retainment   |                 | P          |
|                    | Method of fixing.....: By construction   |                 | P          |
| 13.6 (4.9.2)       | Insulated linings and sleeves:   |                 | N/A        |
|                    | Resistant to a temperature > 20 °C to the wire temperature or                      |                 | N/A        |
|                    | a) & c) Insulation resistance and electric strength                                |                 | N/A        |
|                    | b) Ageing test. Temperature (°C).....:   |                 | N/A        |
| <b>13.6 (4.10)</b> | <b>Double or reinforced insulation</b>   |                 | <b>N/A</b> |
| 13.6 (4.10.1)      | No contact, mounting surface – accessible metal parts – wiring of basic insulation |                 | N/A        |
|                    | Safe installation fixed luminaires   |                 | N/A        |



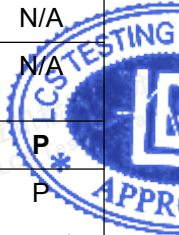


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| Clause             | Requirement + Test   | Result - Remark | Verdict  |
|                    | Capacitors and switches  |                 | N/A      |
| 13.6<br>(4.10.2)   | Assembly gaps:   |                 | N/A      |
|                    | - not coincidental   |                 | N/A      |
|                    | - no straight access with test probe   |                 | N/A      |
| 13.6<br>(4.10.3)   | Retention of insulation:   |                 | N/A      |
|                    | - fixed  |                 | N/A      |
|                    | - unable to be replaced; luminaire inoperative   |                 | N/A      |
|                    | - sleeves retained in position   |                 | N/A      |
|                    | - lining in lamp holder  |                 | N/A      |
| 13.6<br>(4.10.4)   | Protective impedance device  |                 | N/A      |
|                    | Basic and supplementary insulation bridged by resistor(s) or appropriate capacitor                               |                 | N/A      |
|                    | Double or reinforced insulation bridged by at least two separate resistors in series or appropriate capacitor(s) |                 | N/A      |
|                    | Capacitors comply with IEC 60384-14  |                 | N/A      |
|                    | Resistors comply with test (a) in 14.2 of IEC 60065  |                 | N/A      |
| <b>13.6 (4.11)</b> | <b>Electrical connections and current-carrying parts</b>   |                 | <b>P</b> |
| 13.6<br>(4.11.1)   | Contact pressure   |                 | P        |
| 13.6<br>(4.11.2)   | Screws:  |                 | N/A      |
|                    | - self-tapping screws  |                 | N/A      |
|                    | - thread-cutting screws  |                 | N/A      |
| 13.6<br>(4.11.3)   | Screw locking:   |                 | P        |
|                    | - spring washer  |                 | P        |
|                    | - rivets   |                 | N/A      |
| 13.6<br>(4.11.4)   | Material of current-carrying parts   |                 | P        |
| 13.6<br>(4.11.5)   | No contact to wood or mounting surface   |                 | P        |

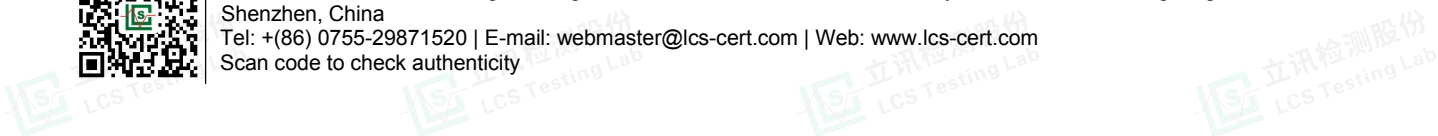




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| Clause             | Requirement + Test                                    | Result - Remark         | Verdict  |
| 13.6<br>(4.11.6)   | Electro-mechanical contact systems                    |                         | N/A      |
| <b>13.6 (4.12)</b> | <b>Screws and connections (mechanical) and glands</b> |                         | <b>P</b> |
| 13.6<br>(4.12.1)   | Screws not made of soft metal                         |                         | P        |
|                    | Screws of insulating material                         |                         | N/A      |
|                    | Torque test: torque (Nm); part..... :                 | Fixed enclosure: 0,6Nm  | P        |
|                    | Torque test: torque (Nm); part..... :                 | Fixed LED driver: 0,6Nm | P        |
|                    | Torque test: torque (Nm); part..... :                 | Fixed LED PCB: 0,6Nm    | P        |
| 13.6<br>(4.12.2)   | Screws with diameter < 3 mm screwed into metal        |                         | N/A      |
| 13.6<br>(4.12.4)   | Locked connections:                                   |                         | N/A      |
|                    | - fixed arms; torque (Nm)..... :                      |                         | N/A      |
|                    | - lamp holder; torque (Nm)..... :                     |                         | N/A      |
|                    | - push-button switches; torque 0,8 Nm..... :          |                         | N/A      |
| 13.6<br>(4.12.5)   | Screwed glands; force (Nm)..... :                     |                         | N/A      |
| <b>13.6 (4.13)</b> | <b>Mechanical strength</b>                            |                         | <b>P</b> |
| 13.6<br>(4.13.1)   | Impact tests:   |                         | P        |
|                    | - fragile parts; energy (Nm)..... :                   | 0,5Nm, no damage        | P        |
|                    | - other parts; energy (Nm)..... :                     | 0,7Nm, no damage        | P        |
|                    | 1) live parts   |                         | P        |
|                    | 2) linings  |                         | P        |
|                    | 3) protection   |                         | P        |
|                    | 4) covers   |                         | P        |
| 13.6<br>(4.13.2)   | Metal parts have adequate mechanical strength         |                         | P        |
| 13.6<br>(4.13.3)   | Straight test finger                                  |                         | P        |
| 13.6<br>(4.13.4)   | Rough service luminaires                              |                         | N/A      |
|                    | - IP54 or higher                                      |                         | N/A      |
|                    | a) fixed  |                         | N/A      |
|                    | b) hand-held  |                         | N/A      |



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| Clause             | Requirement + Test  | Result - Remark               | Verdict    |
|                    | c) delivered with a stand   |                               | N/A        |
|                    | d) for temporary installations and suitable for mounting on a stand |                               | N/A        |
| 13.6<br>(4.13.6)   | Tumbling barrel   |                               | N/A        |
| <b>13.6 (4.14)</b> | <b>Suspensions, fixings and means of adjusting</b>                  |                               | <b>N/A</b> |
| 13.6<br>(4.14.1)   | Mechanical load:  |                               | N/A        |
|                    | A) four times the weight  |                               | N/A        |
|                    | B) torque 2,5 Nm  |                               | N/A        |
|                    | C) bracket arm; bending moment (Nm)..... :                          |                               | N/A        |
|                    | D) load track-mounted luminaires                                    |                               | N/A        |
|                    | E) clip-mounted luminaires, glass-shelve. Thickness (mm) .....      |                               | N/A        |
|                    | Metal rod. diameter (mm) .....                                      |                               | N/A        |
|                    | Fixed luminaire or independent control gear without fixing devices  |                               | N/A        |
| 13.6<br>(4.14.2)   | Load to flexible cables   |                               | N/A        |
|                    | Mass (kg) .....   |                               | —          |
|                    | Stress in conductors (N/mm <sup>2</sup> ) .....                     |                               | N/A        |
|                    | Mass (kg) of semi-luminaire .....                                   |                               | N/A        |
|                    | Bending moment (Nm) of semi-luminaire .....                         |                               | N/A        |
| 13.6<br>(4.14.3)   | Adjusting devices:  |                               | N/A        |
|                    | - flexing test; number of cycles..... :                             |                               | N/A        |
|                    | - strands broken..... :   |                               | N/A        |
|                    | - electric strength test afterwards                                 |                               | N/A        |
| 13.6<br>(4.14.4)   | Telescopic tubes: cords not fixed to tube; no strain on conductors  |                               | N/A        |
| 13.6<br>(4.14.5)   | Guide pulleys   |                               | N/A        |
| 13.6<br>(4.14.6)   | Strain on socket-outlets  |                               | N/A        |
| <b>13.6 (4.15)</b> | <b>Flammable materials</b>  |                               | <b>P</b>   |
|                    | - glow-wire test 650°C..... :                                       | See Test Table 13.15 (13.3.2) | P          |





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| Clause             | Requirement + Test   | Result - Remark              | Verdict    |
|                    | - spacing $\geq 30$ mm   |                              | N/A        |
|                    | - screen withstanding test of 13.3.1   |                              | N/A        |
|                    | - screen dimensions  |                              | N/A        |
|                    | - no fiercely burning material   |                              | P          |
|                    | - thermal protection   |                              | N/A        |
|                    | - electronic circuits exempted   |                              | N/A        |
| 13.6<br>(4.15.2)   | Luminaires made of thermoplastic material with lamp control gear   |                              | N/A        |
|                    | a) construction  |                              | N/A        |
|                    | b) temperature sensing control   |                              | N/A        |
|                    | c) surface temperature   |                              | N/A        |
| <b>13.6 (4.16)</b> | <b>Luminaires for mounting on normally flammable surfaces</b>  |                              | <b>N/A</b> |
|                    | No lamp control gear.....:   | (compliance with Section 12) | N/A        |
|                    | Provided with adaptor for a track meet the requirements for direct mounting on normally flammable surfaces |                              | N/A        |
| 13.6<br>(4.16.1)   | Lamp control gear spacing:   |                              | N/A        |
|                    | - spacing 35 mm  |                              | N/A        |
|                    | - spacing 10 mm  |                              | N/A        |
| 13.6<br>(4.16.2)   | Thermal protection:  |                              | N/A        |
|                    | - in lamp control gear   |                              | N/A        |
|                    | - external   |                              | N/A        |
|                    | - fixed position   |                              | N/A        |
|                    | - temperature marked lamp control gear   |                              | N/A        |
| 13.6<br>(4.16.3)   | Design to satisfy the test of 12.6   | (see clause 12.6)            | N/A        |
| <b>13.6 (4.17)</b> | <b>Drain holes</b>   |                              | <b>N/A</b> |
|                    | Clearance at least 5 mm  |                              | N/A        |
| <b>13.6 (4.18)</b> | <b>Resistance to corrosion</b>   |                              | <b>P</b>   |
| 13.6<br>(4.18.1)   | - rust-resistance  |                              | P          |
| 13.6<br>(4.18.2)   | - season cracking in copper  |                              | N/A        |





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| Clause             | Requirement + Test   | Result - Remark               | Verdict    |
| 13.6 (4.18.3)      | - corrosion of aluminium   |                               | P          |
| 13.6 (4.19)        | Igniters compatible with ballast   |                               | N/A        |
| 13.6 (4.20)        | Rough service vibration  |                               | N/A        |
| <b>13.6 (4.21)</b> | <b>Protective shield</b>   |                               | <b>N/A</b> |
| 13.6 (4.21.1)      | Shield fitted if tungsten halogen lamps or metal halide lamps  |                               | N/A        |
|                    | Shield of glass if tungsten halogen lamps  |                               | N/A        |
| 13.6 (4.21.2)      | Particles from a shattering lamp not impair safety   |                               | N/A        |
| 13.6 (4.21.3)      | No direct path   |                               | N/A        |
| 13.6 (4.21.4)      | Impact test on shield  |                               | N/A        |
|                    | Glow-wire test on lamp compartment.....:   | See Test Table 13.15 (13.3.2) | N/A        |
| 13.6 (4.22)        | Attachments to lamps not cause overheating or damage   |                               | N/A        |
| 13.6 (4.23)        | Semi-luminaires comply Class II  |                               | N/A        |
| <b>13.6 (4.24)</b> | <b>Photobiological hazards</b>   |                               | <b>P</b>   |
| 13.6 (4.24.1)      | No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)   |                               | N/A        |
| 13.6 (4.24.2)      | Retinal blue light hazard  |                               | P          |
|                    | Class of risk group assessed according to IEC/TR 62778 .....   | RG1                           | —          |
|                    | Luminaires with $E_{thr}$ :  |                               | N/A        |
|                    | a) Fixed luminaires  |                               | N/A        |
|                    | - distance x m, borderline between RG1 and RG2... :  |                               | N/A        |
|                    | - marking and instruction according 3.2.23   |                               | N/A        |
|                    | b) Portable and handheld luminaires  |                               | N/A        |
|                    | - marking according 3.2.23 if RG1 exceeded at 200 mm according to IEC/TR 62778   |                               | N/A        |
|                    | Portable luminaires for children IEC 60598-2-10 and Mains socket outlet nightlights IEC 60598-2-12 not exceed RG1 at 200 mm according to IEC/62778 |                               | N/A        |
| <b>13.6 (4.25)</b> | <b>Mechanical hazard</b>   |                               | <b>P</b>   |
|                    | No sharp point or edges  |                               | P          |





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| <b>13.6 (4.26)</b> | <b>Short-circuit protection</b>  |                 | <b>N/A</b> |
| 13.6 (4.26.1)      | Adequate means of uninsulated accessible SELV / PELV parts   |                 | N/A        |
| 13.6 (4.26.2)      | Short-circuit test with test chain according 4.26.3:   |                 | N/A        |
|                    | Supply source ES1 PSE  |                 | N/A        |
|                    | Test chain not melt through  |                 | N/A        |
|                    | Test sample not exceed values of Table 12.1 and 12.2   |                 | N/A        |
| <b>13.6 (4.27)</b> | <b>Terminal blocks with integrated screwless protective earthing contacts</b>  |                 | <b>N/A</b> |
|                    | Test according Annex V   |                 | N/A        |
|                    | Pull test of terminal fixing (20 N)  |                 | N/A        |
|                    | After test, resistance < 0,05 Ω  |                 | N/A        |
|                    | Pull test of mechanical connection (50 N)  |                 | N/A        |
|                    | After test, resistance < 0,05 Ω  |                 | N/A        |
|                    | Voltage drop test, resistance < 0,05 Ω   |                 | N/A        |
| <b>13.6 (4.28)</b> | <b>Fixing of thermal sensing control</b>   |                 | <b>N/A</b> |
|                    | Not plug-in or easily replaceable type   |                 | N/A        |
|                    | Reliably kept in position  |                 | N/A        |
|                    | No adhesive fixing if UV radiations from a lamp can degrade the fixing   |                 | N/A        |
|                    | Not outside the luminaire enclosure  |                 | N/A        |
|                    | Test of adhesive fixing:   |                 | N/A        |
|                    | Max. temperature on adhesive material (°C) .....   |                 | —          |
|                    | 100 cycles between t min and t max   |                 | N/A        |
|                    | Temperature sensing control still in position  |                 | N/A        |
| <b>13.6 (4.29)</b> | <b>Luminaires with non-replaceable light source</b>  |                 | <b>P</b>   |
|                    | Not possible to replace light source   |                 | P          |
|                    | Live part not accessible after parts have been opened by hand or tools   |                 | P          |
| <b>13.6 (4.30)</b> | <b>Luminaires with non-user replaceable light source</b>   |                 | <b>N/A</b> |
|                    | If protective cover provide protection against electric shock and marked with “caution, electric shock risk” symbol: |                 | N/A        |
|                    | At least one fixing means requiring use of tool  |                 | N/A        |





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|--------------------|---|-----------------|------------|
| Clause             | Requirement + Test  | Result - Remark | Verdict    |
| <b>13.6 (4.31)</b> | <b>Insulation between circuits</b>  |                 | <b>N/A</b> |
|                    | Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3   |                 | N/A        |
|                    | Controllable luminaires requiring same level of insulation for all components, the insulation between control terminals and LV supply fulfil requirements according 4.31.1 – 4.31.3 |                 | N/A        |
| 13.6 (4.31.1)      | SELV or PELV circuits   |                 | P          |
|                    | Used SELV/PELV source   |                 | P          |
|                    | Voltage $\leq$ ELV  |                 | P          |
|                    | Insulating of SELV/PELV circuits from LV supply   |                 | N/A        |
|                    | Insulating of SELV/PELV circuits from other non SELV/PELV circuits  |                 | N/A        |
|                    | Insulating of SELV/PELV circuits from FELV  |                 | N/A        |
|                    | Insulating of SELV/PELV circuits from other SELV/PELV circuits  |                 | N/A        |
|                    | SELV/PELV circuits insulated from accessible parts according Table X.1  |                 | P          |
|                    | Plugs not able to make any electrical contact with socket-outlets of other voltage systems  |                 | N/A        |
|                    | Socket outlets does not admit plugs of other voltage systems  |                 | N/A        |
|                    | Plugs and socket-outlets does not have protective conductor contact   |                 | N/A        |
| 13.6 (4.31.2)      | FELV circuits   |                 | N/A        |
|                    | Used FELV source  |                 | N/A        |
|                    | Voltage $\leq$ ELV  |                 | N/A        |
|                    | Insulating of FELV circuits from LV supply  |                 | N/A        |
|                    | FELV circuits insulated from accessible parts according Table X.1   |                 | N/A        |
|                    | Plugs not able to make any electrical contact with socket-outlets of other voltage systems  |                 | N/A        |
|                    | Socket outlets does not admit plugs of other voltage systems  |                 | N/A        |
|                    | Socket-outlets have protective conductor contact  |                 | N/A        |





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|--------------------|--|-----------------|------------|
| Clause             | Requirement + Test   | Result - Remark | Verdict    |
| 13.6<br>(4.31.3)   | Other circuits   |                 | N/A        |
|                    | Other circuits insulated from accessible parts according Table X.1   |                 | N/A        |
|                    | Class II construction with equipotential bonding for protection against indirect contacts with live parts: |                 | N/A        |
|                    | - conductive parts are connected together  |                 | N/A        |
|                    | - test according 7.2.3   |                 | N/A        |
|                    | - conductive part not cause an electric shock in case of an insulation fault                               |                 | N/A        |
|                    | - equipotential bonding in master/slave applications   |                 | N/A        |
|                    | - master luminaire provided with terminal for accessible conductive parts of slave luminaires              |                 | N/A        |
|                    | - slave luminaire constructed as class I   |                 | <b>N/A</b> |
| <b>13.6 (4.32)</b> | <b>Overvoltage protective devices</b>  |                 | N/A        |
|                    | Comply with IEC 61643-11   |                 | N/A        |
|                    | External to controlgear and connected to earth:  |                 | N/A        |
|                    | - only in fixed luminaires   |                 | N/A        |
|                    | - only connected to protective earth   |                 | N/A        |
| <b>13.6 (4.33)</b> | <b>Luminaire powered via information technology communication cabling</b>                                  |                 | <b>N/A</b> |
|                    | Requirements for Class III luminaire   |                 | N/A        |
|                    | Rated voltage within the range of ES1 and does not exceed maximum voltage of used connector                |                 | N/A        |
|                    | Luminaire does not create any hazard from overvoltage  | (see Annex 2)   | N/A        |
| <b>13.6 (4.34)</b> | <b>Electromagnetic fields (EMF)</b>  |                 | <b>P</b>   |
|                    | No harmful electromagnetic fields  |                 | P          |
| <b>13.6 (4.35)</b> | <b>Protection against moving fan blades</b>  |                 | <b>N/A</b> |
|                    | Test with a standard test finger   |                 | N/A        |
|                    | Test with test probe acc. to Figure 13 (IEC 61032) for portable luminaire                                  |                 | N/A        |
|                    | Blades rounded with radius $\geq 0.5$ mm and:  |                 | N/A        |
|                    | -hardness less than D60 Shore  |                 | N/A        |
|                    | -peripheral speed less than 15 m/s   |                 | N/A        |
|                    | -input power of fan $\leq 2$ W at rated voltage  |                 | N/A        |





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|--------------------|--|---|------------|
| Clause             | Requirement + Test   | Result - Remark   | Verdict    |
| <b>13.6 (4.36)</b> | <b>Track-mounted luminaires</b>  |   | <b>N/A</b> |
|                    | Test in accordance with Annex A of IEC60570:2003/AMD2:2019   |   | N/A        |
| <b>13.6.1 (-)</b>  | <b>Resistance to static load</b>   |   | <b>P</b>   |
|                    | Withstand the minimum static load  |   | P          |
|                    | Comply with 4.13.1 of Part 1 after test  |   | P          |
| <b>13.6.2 (-)</b>  | <b>Resistance to torque and shear loads</b>  |   | <b>P</b>   |
| 13.6.2.1 (-)       | Torque test 50 N 1 min.  |   | P          |
|                    | Comply with 4.13.1 of Part 1 after test  |   | P          |
| <b>13.6.3 (-)</b>  | <b>Resistance to thermal shock</b>   |   | <b>P</b>   |
|                    | Resistance to thermal shock with iced water  |   | P          |
| <b>13.6.4 (-)</b>  | <b>Edges</b>   |   | <b>P</b>   |
|                    | Accessible edges are rounded   |   | P          |
|                    | Surface of top assembly is smooth and free from burrs, flashes and the like                        |   | P          |
| <b>13.6.5 (-)</b>  | <b>Mechanical strength</b>   |   | <b>P</b>   |
|                    | Mechanical strength with impact energy of 5 Nm   |   | P          |
| <b>13.7 (11)</b>   | <b>CREEPAGE DISTANCES AND CLEARANCES</b>   |   | <b>N/A</b> |
| 13.7 (11.2.1)      | Impulse withstand category (Normal category II)  | Category II <input checked="" type="checkbox"/> Category III <input type="checkbox"/><br>SELV Max.55Vdc | —          |
|                    | Category III according Annex U   |   | N/A        |
|                    | Protected against pollution, reduced creepage and clearance according Annex P of IEC 61347-1       |   | N/A        |
| 13.7 (11.2.2)      | Creepage distances for frequency up to 30 kHz  | See Test Table 13.7 (11.2) I  | N/A        |
|                    | Creepage distances for frequency over 30 kHz:  |   | N/A        |
|                    | - Controlgear marked with $\hat{U}_{OUT}$ and $f_{UOUT}$ according IEC 61347-1, clause 7.1, item w | See Test Table 13.7 (11.2) II   | N/A        |
|                    | - Requirements according IEC 60664-4 for controlgear not covered by IEC 61347                      | See Test Table 13.7 (11.2) II   | N/A        |
| 13.7 (11.2.3)      | Clearances for frequency up to 30 kHz  | See Test Table 13.7 (11.2) I  | N/A        |
|                    | Clearances distances for frequency over 30 kHz:  |   | N/A        |
|                    | - Controlgear marked with $U_P$  | See Test Table 13.7 (11.2) II   | N/A        |





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|----------------|--------------------|-----------------|---------|
| Clause         | Requirement + Test | Result - Remark | Verdict |

|  |   |                               |     |
|--|---|-------------------------------|-----|
|  | - Requirements according IEC 60664-4 for controlgear not covered by IEC 61347 | See Test Table 13.7 (11.2) II | N/A |
|--|---|-------------------------------|-----|

| 13.8 (7)             | PROVISION FOR EARTHING  |         | P   |
|----------------------|---|---------|-----|
| 13.8 (7.2.1 + 7.2.3) | Accessible metal parts  |         | P   |
|                      | Metal parts in contact with supporting surface  |         | P   |
|                      | Resistance < 0,5 Ω.....   | 0,023 Ω | P   |
|                      | Self-tapping screws used  |         | N/A |
|                      | Thread-forming screws   |         | N/A |
|                      | Thread-forming screw used in a grove  |         | N/A |
|                      | Protective earth makes contact first  |         | P   |
|                      | Terminal blocks with integrated screwless protective earthing contacts tested according Annex V |         | N/A |
|                      | Protective earthing of the luminaire not via built-in control gear                              |         | N/A |
| 13.8 (7.2.2 + 7.2.3) | Protective earth continuity in joints, etc.   |         | P   |
| 13.8 (7.2.4)         | Locking of clamping means   |         | P   |
|                      | Compliance with 4.7.3   |         | P   |
| 13.8 (7.2.5)         | Protective earth terminal integral part of connector socket                                     |         | P   |
| 13.8 (7.2.6)         | Protective earth terminal adjacent to mains terminals   |         | P   |
| 13.8 (7.2.7)         | Electrolytic corrosion of the protective earth terminal   |         | P   |
| 13.8 (7.2.8)         | Material of protective earth terminal   |         | P   |
|                      | Contact surface bare metal  |         | P   |
| 13.8 (7.2.10)        | Class II luminaire for looping-in   |         | N/A |
|                      | Double or reinforced insulation to functional earth   |         | N/A |
| 13.8 (7.2.11)        | Protective earthing core coloured green-yellow  |         | P   |
|                      | Length of protective earthing conductor   |         | P   |
| 13.8 (7.2.12)        | PELV circuit connected to protective earth for functional purpose                               |         | N/A |

| 13.9 (14) | SCREW TERMINALS |  | N/A |
|-----------|-----------------|--|-----|
|-----------|-----------------|--|-----|



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|----------------|--------------------|-----------------|---------|
| Clause         | Requirement + Test | Result - Remark | Verdict |

|  |                                     |               |     |
|--|-------------------------------------|---------------|-----|
|  | Separately approved; component list | (see Annex 1) | N/A |
|  | Part of the luminaire               | (see Annex 3) | N/A |

|                  |   |               |            |
|------------------|---|---------------|------------|
| <b>13.9 (15)</b> | <b>SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS</b> |               | <b>N/A</b> |
|                  | Separately approved; component list..... :            | (see Annex 1) | N/A        |
|                  | Part of the luminaire..... :                          | (see Annex 4) | N/A        |

|                    |   |             |          |
|--------------------|---|-------------|----------|
| <b>13.10 (5)</b>   | <b>EXTERNAL AND INTERNAL WIRING</b>   |             | <b>P</b> |
| <b>13.10 (5.2)</b> | <b>Supply connection and external wiring</b>  |             | <b>P</b> |
| 13.10 (5.2.1)      | Means of connection..... :  | Supply cord | P        |
|                    | Outdoor luminaire has not PVC insulated external wiring if not Class III or SELV/PELV circuits ≤ 25 V AC/60 V DC/25 V peak interrupted DC voltage with frequency 10Hz -200 Hz or protected from outdoor environment |             | N/A      |
| 13.10 (5.2.2)      | Type of cable..... :  | H05RN-F     | P        |
|                    | Nominal cross-sectional area (mm²)..... :   | 3x1,0mm²    | P        |
|                    | Cables equal to IEC 60227 or IEC 60245  |             | P        |
| 13.10 (5.2.3)      | Type of attachment, X, Y or Z   | Type Z      | P        |
| 13.10 (5.2.5)      | Type Z not connected to screws  |             | P        |
| 13.10 (5.2.6)      | Cable entries:  |             | P        |
|                    | - suitable for introduction   |             | P        |
|                    | - adequate degree of protection   |             | P        |
| 13.10 (5.2.7)      | Cable entries through rigid material have rounded edges   |             | P        |
| 13.10 (5.2.8)      | Insulating bushings:  |             | N/A      |
|                    | - suitably fixed  |             | N/A      |
|                    | - material in bushings  |             | N/A      |
|                    | - material not likely to deteriorate  |             | N/A      |
|                    | - tubes or guards made of insulating material   |             | N/A      |





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|---------------------|---|-----------------|---------|
| Clause              | Requirement + Test  | Result - Remark | Verdict |
| 13.10<br>(5.2.9)    | Locking of screwed bushings   |                 | N/A     |
| 13.10<br>(5.2.10)   | Cord anchorage:   |                 | P       |
|                     | - covering protected from abrasion  |                 | P       |
|                     | - clear how to be effective   |                 | P       |
|                     | - no mechanical or thermal stress   |                 | P       |
|                     | - no tying of cables into knots etc.  |                 | P       |
|                     | - insulating material or lining   |                 | P       |
| 13.10<br>(5.2.10.1) | Cord anchorage for type X attachment:   |                 | N/A     |
|                     | a) at least one part fixed  |                 | N/A     |
|                     | b) types of cable   |                 | N/A     |
|                     | c) no damaging of the cable   |                 | N/A     |
|                     | d) whole cable can be mounted   |                 | N/A     |
|                     | e) no touching of clamping screws   |                 | N/A     |
|                     | f) metal screw not directly on cable  |                 | N/A     |
|                     | g) replacement without special tool   |                 | N/A     |
|                     | Glands not used as anchorage  |                 | N/A     |
|                     | Labyrinth type anchorages   |                 | N/A     |
| 13.10<br>(5.2.10.2) | Adequate cord anchorage for type Y and type Z attachment                      |                 | P       |
| 13.10<br>(5.2.10.3) | Tests:  |                 | P       |
|                     | - impossible to push cable; unsafe  |                 | P       |
|                     | - pull test: 25 times; pull (N)..... : 60N                                    |                 | P       |
|                     | - torque test: torque (Nm)..... : 0,25Nm                                      |                 | P       |
|                     | - displacement $\leq 2$ mm  | 0,3mm           | P       |
|                     | - no movement of conductors   |                 | P       |
|                     | - no damage of cable or cord  |                 | P       |
|                     | - function independent of electrical connection                               |                 | P       |
| 13.10<br>(5.2.10.4) | Luminaire with/ designed for use with supply cord with maximum current of 2A: |                 | N/A     |
|                     | - Ordinary Class III luminaire supplied with SELV $\leq 25$ V RMS/60V DC      |                 | N/A     |





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| Clause         | Requirement + Test  | Result - Remark | Verdict |
|                | - Ordinary Class III luminaire supplied with PELV $\leq 12V$ RMS/30V DC               |                 | N/A     |
|                | - Other than ordinary Class III luminaire supplied with voltage $\leq 12V$ RMS/30V DC |                 | N/A     |
|                | Pull test of 30N  |                 | N/A     |
| 13.10 (5.2.11) | External wiring passing into luminaire  |                 | P       |
| 13.10 (5.2.12) | Looping-in terminals  |                 | N/A     |
| 13.10 (5.2.13) | Wire ends not tinned  |                 | N/A     |
|                | Wire ends tinned: no cold flow  |                 | N/A     |
| 13.10 (5.2.14) | Mains plug same protection  |                 | N/A     |
|                | Class III luminaire plug  |                 | N/A     |
|                | No unsafe compatibility   |                 | N/A     |
| 13.10 (5.2.15) | Connectors for Class III luminaires (IEC 60603 or IEC 62680)                          |                 | N/A     |
| 13.10 (5.2.16) | Appliance inlets (IEC 60320)  |                 | N/A     |
|                | Installation couplers (IEC 61535)   |                 | N/A     |
|                | Appliance inlet or connector systems (IEC 61984)                                      |                 | N/A     |
| 13.10 (5.2.17) | No standardized interconnecting cables properly assembled                             |                 | N/A     |
| 13.10 (5.2.18) | Used plug in accordance with  |                 | N/A     |
|                | - IEC 60083   |                 | N/A     |
|                | - other standard  |                 | N/A     |

|                    |   |  |          |
|--------------------|---|--|----------|
| <b>13.10 (5.3)</b> | <b>Internal wiring</b>                    |  | <b>P</b> |
| 13.10 (5.3.1)      | Internal wiring of suitable size and type |  | P        |
|                    | Through wiring                            |  | N/A      |
|                    | - not delivered/ mounting instruction     |  | N/A      |
|                    | - factory assembled                       |  | N/A      |
|                    | - socket outlet loaded (A)..... :         |  | N/A      |





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| Clause             | Requirement + Test   | Result - Remark | Verdict |
|                    | - temperatures..... :  | (see Annex 2)   | N/A     |
|                    | Green- yellow for protective earth only  |                 | P       |
| 13.10<br>(5.3.1.1) | Internal wiring connected directly to fixed wiring                             |                 | N/A     |
|                    | Cross-sectional area (mm <sup>2</sup> )..... :                                 | See Annex1      | N/A     |
|                    | Insulation thickness (mm) ..... :  | See Annex1      | N/A     |
|                    | Extra insulation added where necessary   |                 | N/A     |
| 13.10<br>(5.3.1.2) | Internal wiring connected to fixed wiring via internal current-limiting device |                 | P       |
|                    | Cross-sectional area (mm <sup>2</sup> )..... :                                 | See Annex1      | P       |
| 13.10<br>(5.3.1.3) | Double or reinforced insulation for class II                                   |                 | N/A     |
| 13.10<br>(5.3.1.4) | Conductors without insulation  |                 | N/A     |
| 13.10<br>(5.3.1.5) | SELV/PELV current-carrying parts   |                 | P       |
| 13.10<br>(5.3.1.6) | Insulation thickness other than PVC or rubber                                  |                 | N/A     |
| 13.10<br>(5.3.2)   | Sharp edges etc.   |                 | P       |
|                    | No moving parts of switches etc.   |                 | N/A     |
|                    | Joints, raising/lowering devices   |                 | N/A     |
|                    | Telescopic tubes etc.  |                 | N/A     |
|                    | No twisting over 360°  |                 | P       |
| 13.10<br>(5.3.3)   | Insulating bushings:   |                 | N/A     |
|                    | - suitable fixed   |                 | N/A     |
|                    | - material in bushings   |                 | N/A     |
|                    | - material not likely to deteriorate   |                 | N/A     |
|                    | - cables with protective sheath  |                 | N/A     |
| 13.10<br>(5.3.4)   | Joints and junctions effectively insulated                                     |                 | N/A     |
| 13.10<br>(5.3.5)   | Strain on internal wiring  |                 | N/A     |
| 13.10<br>(5.3.6)   | Wire carriers  |                 | N/A     |





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|--------------------|--|-----------------|------------|
| Clause             | Requirement + Test   | Result - Remark | Verdict    |
| 13.10<br>(5.3.7)   | Wire ends not tinned   |                 | N/A        |
|                    | Wire ends tinned: no cold flow   |                 | P          |
| <b>13.10 (5.4)</b> | <b>Test to determine suitability of conductors having a reduced cross-sectional area</b>                 |                 | <b>N/A</b> |
|                    | Under test the temperature of the luminaire wiring insulation not exceed the limits stated in Table 12.2 | (see Annex 2)   | N/A        |
|                    | No damage to luminaire wiring after test   |                 | N/A        |
| 13.10 (-)          | Cable for outdoor use provided by the luminaire manufacturer equal to:                                   |                 | P          |
|                    | - 60245 IEC 57 or 60245 IEC 66   |                 | P          |
|                    | - other rubber sheathed cables 450/750V according to regional Wiring Rules                               |                 | P          |

|                    |   |  |          |
|--------------------|---|--|----------|
| <b>13.11 (8)</b>   | <b>PROTECTION AGAINST ELECTRIC SHOCK</b>  |  | <b>P</b> |
| 13.11<br>(8.2.1)   | Live parts not accessible   |  | P        |
|                    | Basic insulated parts not used on the outer surface without appropriate protection                                      |  | P        |
|                    | Basic insulated parts not accessible with standard test finger on portable, settable and adjustable luminaires          |  | N/A      |
|                    | Basic insulated parts not accessible with Ø 50 mm probe from outside, other types of luminaires                         |  | P        |
|                    | Lamp and starter holders in portable and adjustable luminaires comply with double or reinforced insulation requirements |  | N/A      |
|                    | Basic insulation only accessible under lamp or starter replacement  |  | N/A      |
|                    | Protection in any position  |  | P        |
|                    | Double-ended tungsten filament lamp   |  | N/A      |
|                    | Insulation lacquer not reliable   |  | N/A      |
|                    | Double-ended high-pressure discharge lamp   |  | N/A      |
|                    | Relevant warning according to 3.2.18 fitted to the luminaire  |  | N/A      |
| 13.11<br>(8.2.2)   | Portable luminaire adjusted in most unfavourable position   |  | N/A      |
| 13.11<br>(8.2.3.a) | Class II luminaire:   |  | N/A      |





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| Clause          | Requirement + Test   | Result - Remark | Verdict |
|                 | - basic insulated metal parts not accessible   |                 | N/A     |
|                 | - required insulation from live parts in compliance with Table X.1                   |                 | N/A     |
|                 |  |                 | N/A     |
|                 | - glass protective shields not used as supplementary insulation                      |                 | N/A     |
| 13.11 (8.2.3.b) | BC lamp holder of metal in class I luminaires shall be connected to protective earth |                 | N/A     |
| 13.11 (8.2.3.c) | SELV circuits with exposed current carrying parts:                                   |                 | N/A     |
|                 | Ordinary luminaire:  |                 | N/A     |
|                 | - voltage under load/ no-load AC (V).....:   |                 | N/A     |
|                 | - voltage under load/ no-load DC (V).....:   |                 | N/A     |
|                 | - interrupted DC voltage (V) .....   |                 | N/A     |
|                 | - touch current if applicable (mA) .....   |                 | N/A     |
|                 | One conductive part insulated if required  |                 | N/A     |
|                 | Other than ordinary luminaire:   |                 | N/A     |
|                 | - voltage under load/ no-load AC (V).....:   |                 | N/A     |
|                 | - voltage under load/ no-load DC (V).....:   |                 | N/A     |
|                 | - interrupted DC voltage (V) .....   |                 | N/A     |
|                 | Class III luminaire only for connection to SELV/PELV                                 |                 | N/A     |
| 13.11 (8.2.3.d) | PELV circuits with exposed current carrying parts:                                   |                 | N/A     |
|                 | Ordinary luminaire:  |                 | N/A     |
|                 | - voltage under load/ no-load AC (V).....:   |                 | N/A     |
|                 | - voltage under load/ no-load DC (V).....:   |                 | N/A     |
|                 | Other than ordinary luminaire:   |                 | N/A     |
|                 | - voltage under load/ no-load AC (V).....:   |                 | N/A     |
|                 | - voltage under load/ no-load DC (V).....:   |                 | N/A     |
|                 | One pole insulated if required   |                 | N/A     |
| 13.11 (8.2.4)   | Portable luminaire has protection independent of supporting surface                  |                 | N/A     |
| 13.11 (8.2.5)   | Compliance with the standard test finger or relevant probe                           |                 | P       |





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|------------------|--|-----------------|---------|
| Clause           | Requirement + Test   | Result - Remark | Verdict |
| 13.11<br>(8.2.6) | Covers reliably secured  |                 | P       |
| 13.11<br>(8.2.7) | Luminaire other than below with capacitor > 0,5 μF not exceed 50 V 1 min after disconnection                         | 0V              | P       |
|                  | Portable luminaire with capacitor > 0,1 μF (0.25) not exceed 34 V 1 s after disconnection                            |                 | N/A     |
|                  | Other luminaires with capacitor > 0,1 μF (0.25) with plug and track adaptors not exceed 60 V 5 s after disconnection |                 | N/A     |

|                     |  |                                 |          |
|---------------------|--|---------------------------------|----------|
| <b>13.12 (12)</b>   | <b>ENDURANCE TEST AND THERMAL TEST</b>   |                                 | <b>P</b> |
| 13.12 (-)           | If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 13.13 |                                 |          |
| <b>13.12 (12.2)</b> | <b>Selection of lamps and ballasts</b>   |                                 | —        |
|                     | Lamp used according Annex B  | (Lamp used see Annex 2)         | —        |
|                     | Control gear if separate and not supplied  | (Control gear used see Annex 2) | —        |
| <b>13.12 (12.3)</b> | <b>Endurance test</b>  |                                 | <b>P</b> |
|                     | a) mounting- position .....  | As normal used                  | —        |
|                     | b) test temperature (°C).....  | 45°C+10°C                       | —        |
|                     | c) total duration (h) .....  | 240h                            | —        |
|                     | d) supply voltage (V).....   | 1,1X240V                        | —        |
|                     | d) if not equipped with control gear, constant voltage/current (V) or (A) .....                      | --                              | —        |
| 13.12<br>(12.3.1d)  | d) Class III luminaires powered via information technology communication cable:                      |                                 | N/A      |
|                     | - voltage under normal operation (V).....  |                                 | —        |
|                     | - voltage under abnormal operation (V).....  |                                 | —        |
|                     | e) luminaire ceases to operate   |                                 | —        |
|                     | f) luminaire with constant light output function   |                                 | N/A      |
| 13.12<br>(12.3.2)   | After endurance test:  |                                 | P        |
|                     | - no part unserviceable  |                                 | P        |
|                     | - luminaire not unsafe   |                                 | P        |





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|-------------------------|---|-----------------|------------|
| Clause                  | Requirement + Test  | Result - Remark | Verdict    |
|                         | - no damage to track system   |                 | N/A        |
|                         | - marking legible   |                 | P          |
|                         | - no cracks, deformation etc.   |                 | P          |
| <b>13.12 (12.4)</b>     | <b>Thermal test (normal operation)</b>                                | (see Annex 2)   | P          |
| <b>13.12 (12.5)</b>     | <b>Thermal test (abnormal operation)</b>                              | (see Annex 2)   | N/A        |
| <b>13.12 (12.6)</b>     | <b>Thermal test (failed lamp control gear condition):</b>             |                 | <b>N/A</b> |
| <b>13.12 (12.6.1)</b>   | Through wiring or looping-in wiring loaded by a current of (A) .....  |                 | —          |
|                         | - case of abnormal conditions.....                                    |                 | —          |
|                         | - electronic lamp control gear  |                 | N/A        |
|                         | - measured winding temperature (°C): at 1,1 Un .....                  |                 | —          |
|                         | - measured mounting surface temperature (°C) at 1,1 Un .....          |                 | N/A        |
|                         | - calculated mounting surface temperature (°C) .....                  |                 | N/A        |
|                         | - track- mounted luminaires   |                 | N/A        |
| <b>13.12 (12.6.2)</b>   | Temperature sensing control   |                 | N/A        |
|                         | - case of abnormal conditions.....                                    |                 | —          |
|                         | - thermal link  |                 | N/A        |
|                         | - manual reset cut- out   |                 | N/A        |
|                         | - auto reset cut- out   |                 | N/A        |
|                         | - measured mounting surface temperature (°C) .....                    |                 | N/A        |
|                         | - track- mounted luminaires   |                 | N/A        |
| <b>13.12 (12.7)</b>     | <b>Thermal test (failed lamp control gear in plastic luminaires):</b> |                 | <b>N/A</b> |
| <b>13.12 (12.7.1)</b>   | Luminaire without temperature sensing control                         |                 | N/A        |
| <b>13.12 (12.7.1.1)</b> | Luminaire with fluorescent lamp ≤ 70W                                 |                 | N/A        |
|                         | Test method 12.7.1.1 or Annex W .....                                 |                 | —          |
|                         | Test according to 12.7.1.1:   |                 | N/A        |
|                         | - case of abnormal conditions.....                                    |                 | —          |





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|------------------|--|--|---------|
| Clause           | Requirement + Test   | Result - Remark  | Verdict |
|                  | - Ballast failure at supply voltage (V) .....                              |  | —       |
|                  | - Components retained in place after the test                              |  | N/A     |
|                  | - Test with standard test finger after the test                            |  | N/A     |
|                  | Test according to Annex W:   |  | N/A     |
|                  | - case of abnormal conditions.....   |  | —       |
|                  | - measured winding temperature (°C): at 1,1 Un.....                        |  | —       |
|                  | - measured temperature of fixing point/exposed part (°C): at 1,1 Un.....   |  | —       |
|                  | - calculated temperature of fixing point/exposed part (°C).....            |  | —       |
|                  | Ball-pressure test.....  | See Test Table 13.15 (13.2.1)                            | N/A     |
| 13.12 (12.7.1.2) | Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA |  | N/A     |
|                  | - case of abnormal conditions.....   |  | —       |
|                  | - measured winding temperature (°C): at 1,1 Un.....                        |  | —       |
|                  | - measured temperature of fixing point/exposed part (°C): at 1,1 Un.....   |  | —       |
|                  | - calculated temperature of fixing point/exposed part (°C).....            |  | —       |
|                  | Ball-pressure test.....  | See Test Table 13.15 (13.2.1)                            | N/A     |
| 13.12 (12.7.1.3) | Luminaire with short circuit proof transformers ≤ 10 VA                    |  | N/A     |
|                  | - case of abnormal conditions.....   |  | —       |
|                  | - Components retained in place after the test                              |  | N/A     |
|                  | - Test with standard test finger after the test                            |  | N/A     |
| 13.12 (12.7.2)   | Luminaire with temperature sensing control                                 |  | N/A     |
|                  | - thermal link.....  | Yes <input type="checkbox"/> No <input type="checkbox"/> | —       |
|                  | - manual reset cut-out.....  | Yes <input type="checkbox"/> No <input type="checkbox"/> | —       |
|                  | - auto reset cut-out.....  | Yes <input type="checkbox"/> No <input type="checkbox"/> | —       |
|                  | - case of abnormal conditions.....   |  | —       |
|                  | - highest measured temperature of fixing point/exposed part (°C):.....     |  | —       |
|                  | Ball-pressure test.....  | See Test Table 13.15 (13.2.1)                            | N/A     |





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|----------------|--|-----------------|---------|
| Clause         | Requirement + Test   | Result - Remark | Verdict |
| 13.12 (-)      | Temperatures of translucent covers and accessible metal parts not exceed rated maximum surface temperature $T$ |                 | N/A     |

| 13.13 (9)   | RESISTANCE TO DUST AND MOISTURE   |  | P   |
|-------------|---|--|-----|
| 13.13.1 (-) | If IP > IP 20 the order of tests as specified in clause 13.12   |  | P   |
| 13.13 (9.2) | Tests for ingress of dust, solid objects and moisture:  |  | P   |
|             | - classification according to IP.....   | IP65 and IP67                                | —   |
|             | - mounting position during test.....  | Normal installation                          | —   |
|             | - fixing screws tightened; torque (Nm).....   | Screw fixed enclosure: 0,4Nm                 | —   |
|             | - tests according to clauses.....   | Clause 9.2.2 and 9.2.8                       | —   |
|             | - electric strength test afterwards   |  | P   |
|             | a) no deposit in dust-proof luminaire   |  | N/A |
|             | b) no talcum in dust-tight luminaire  |  | P   |
|             | c) no trace of water on current-carrying parts or on insulation where it could become a hazard  |  | P   |
|             | c.1) For luminaires without drain holes – no water entry  |  | N/A |
|             | c.2) For luminaires with drain holes – no hazardous water entry   |  | N/A |
|             | d) no water in watertight, pressure watertight, high pressure and temperature water jet-proof or high pressure and cold water jet-proof luminaire |  | P   |
|             | e) no contact with live parts (IP 2X)   |  | N/A |
|             | e) no entry into enclosure (IP 3X and IP 4X)  |  | N/A |
|             | e) no contact with live parts through drain holes and ventilation slots (IP3X and IP4X)   |  | N/A |
|             | f) no trace of water on part of lamp requiring protection from splashing water  |  | P   |
|             | g) no damage of protective shield or glass envelope   |  | N/A |
| 13.13 (9.3) | Humidity test 48 h  | Relative humidity 93%, temperature 25°C, 48h | P   |
| 13.13 (-)   | Meet IP65 and IP67 requirements   |  | P   |





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|-------------------|---|-----------------|----------|
| Clause            | Requirement + Test  | Result - Remark | Verdict  |
| <b>13.14 (10)</b> | <b>INSULATION RESISTANCE AND ELECTRIC STRENGTH</b>  |                 | <b>P</b> |
| 13.14 (10.2.1)    | Insulation resistance test  |                 | P        |
|                   | Cable or cord covered by metal foil or replaced by a metal rod of mm Ø .....  |                 | —        |
|                   | Insulation resistance (MΩ):   |                 | P        |
|                   | SELV/PELV:  |                 | P        |
|                   | - between current-carrying parts of different polarity:   |                 | N/A      |
|                   | - between current-carrying parts and mounting surface.....  | >100MΩ          | P        |
|                   | - between current-carrying parts and metal parts of the luminaire.....  | >100MΩ          | P        |
|                   | - between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... |                 | N/A      |
|                   | - Insulation bushings as described in Section 5 .....   |                 | N/A      |
|                   | Other than SELV/PELV:   |                 | P        |
|                   | - between live parts of different polarity.....   | >100MΩ          | P        |
|                   | - between live parts and mounting surface.....  | >100MΩ          | P        |
|                   | - between live parts and metal parts.....   | >100MΩ          | P        |
|                   | - between live parts of different polarity through action of a switch.....  |                 | N/A      |
|                   | - between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... |                 | N/A      |
|                   | - Insulation bushings as described in Section 5 .....   |                 | N/A      |
| 13.14 (10.2.2)    | Electric strength test  |                 | P        |
|                   | Dummy lamp  |                 | N/A      |
|                   | Luminaires with ignitors after 24 h test  |                 | N/A      |
|                   | Luminaires with manual ignitors   |                 | N/A      |
|                   | Test voltage (V):   |                 | P        |
|                   | SELV/PELV:  |                 | P        |
|                   | - between current-carrying parts of different polarity:   |                 | N/A      |
|                   | - between current-carrying parts and mounting surface.....  | 500V            | P        |





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|----------------|--------------------|-----------------|---------|
| Clause         | Requirement + Test | Result - Remark | Verdict |

|              |   |                      |     |
|--------------|---|----------------------|-----|
|              | - between current-carrying parts and metal parts of the luminaire..... :  | 500V                 | P   |
|              | - between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... : |                      | N/A |
|              | - Insulation bushings as described in Section 5 .....   |                      | N/A |
|              | Other than SELV/PELV:   |                      | P   |
|              | - between live parts of different polarity..... :   | 1480V                | P   |
|              | - between live parts and mounting surface..... :  | 1480V                | P   |
|              | - between live parts and metal parts..... :   | 1480V                | P   |
|              | - between live parts of different polarity through action of a switch..... :  |                      | N/A |
|              | - between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... : |                      | N/A |
|              | - Insulation bushings as described in Section 5 .....   |                      | N/A |
| 13.14 (10.3) | Touch current (mA)..... :   |                      | N/A |
|              | Protective conductor current (mA)..... :  | 0,12mA, limit: 3,5mA | P   |

|                   |  |                               |            |
|-------------------|--|-------------------------------|------------|
| <b>13.15 (13)</b> | <b>RESISTANCE TO HEAT, FIRE AND TRACKING</b> |                               | <b>N/A</b> |
| 13.15 (13.2.1)    | Ball-pressure test..... :                    | See Test Table 13.15 (13.2.1) | N/A        |
| 13.15 (13.3.1)    | Needle-flame test (10 s)..... :              | See Test Table 13.15 (13.3.1) | N/A        |
| 13.15 (13.3.2)    | Glow-wire test (650°C)..... :                | See Test Table 13.15 (13.3.2) | N/A        |
| 13.15 (13.4)      | Proof tracking test (IEC 60112)..... :       | See Test Table 13.15 (13.4)   | N/A        |





| IEC 60598-2-13                                  |   |                    |           |        |  |          |            |
|---|---|--------------------|-----------|--------|--|----------|------------|
| Clause  | Requirement + Test  |                    |           |        | Result - Remark  |          | Verdict    |
| <b>13.7 (11.2)</b>                              | <b>TABLE I: Creepage distances and clearances</b>                       |                    |           |        |  |          | <b>N/A</b> |
|   | <b>Minimum distances (mm) for a.c. up to 30 kHz sinusoidal voltages</b> |                    |           |        |  |          | <b>N/A</b> |
|   | <b>Applicable part of IEC 60598-1 Table 11.1.A*, 11.1.B* and 11.2*</b>  |                    |           |        |  |          | <b>N/A</b> |
|   | Insulation type **  | Measured clearance | Required  |        | Measured creepage  | Required |            |
|   |   |                    | clearance | *Table |  | creepage | *Table     |
| Distance 1:                                     | --  | --                 | --        | --     | --   | --       | --         |
| Working voltage (V)..... :                      |   |                    |           |        | 55Vdc  |          | —          |
| PTI..... :                                      |   |                    |           |        | < 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/> |          | —          |
| Pulse voltage or $U_P$ if applicable (kV) ..... |   |                    |           |        |  |          | —          |
| Supplementary information:                      |   |                    |           |        |  |          |            |
| Distance 2:                                     | --  | --                 | --        | --     | --   | --       | --         |
| Working voltage (V)..... :                      |   |                    |           |        |  |          | —          |
| PTI..... :                                      |   |                    |           |        | < 600 <input type="checkbox"/> ≥ 600 <input type="checkbox"/>            |          | —          |
| Pulse voltage or $U_P$ if applicable (kV) ..... |   |                    |           |        |  |          | —          |
| Supplementary information:                      |   |                    |           |        |  |          |            |
| Distance 3:                                     | --  | --                 | --        | --     | --   | --       | --         |
| Working voltage (V)..... :                      |   |                    |           |        |  |          | —          |
| PTI..... :                                      |   |                    |           |        | < 600 <input type="checkbox"/> ≥ 600 <input type="checkbox"/>            |          | —          |
| Pulse voltage or $U_P$ if applicable (kV) ..... |   |                    |           |        |  |          | —          |
| Supplementary information:                      |   |                    |           |        |  |          |            |

\*\* Insulation type: B – Basic; S – Supplementary; R – Reinforced. See also IEC 60598-1 Annex M.

| <b>13.7 (11.2)</b>  | <b>TABLE II: Creepage distances and clearances</b> |                    |           |        |   |          | <b>N/A</b> |
|---|--|--------------------|-----------|--------|---|----------|------------|
| <b>Minimum distances (mm) for a.c. higher than 30 kHz sinusoidal voltages</b>     |  |                    |           |        |   |          |            |
| <b>Applicable part of IEC 61347-1 Table 7 and 8* or IEC 60664-4 Table 1 and 2</b> |  |                    |           |        |   |          |            |
| Distances   | Insulation type **                                 | Measured clearance | Required  |        | Measured creepage   | Required |            |
|   |  |                    | clearance | *Table |   | creepage | *Table     |
| Distance 1:   |  |                    |           |        |   |          |            |
| Working voltage (V)..... :  |  |                    |           |        |   |          | —          |
| Frequency if applicable (kHz)..... :  |  |                    |           |        |   |          | —          |
| PTI..... :  |  |                    |           |        | < 600 <input type="checkbox"/> ≥ 600 <input type="checkbox"/> |          | —          |



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|----------------------------|--|---|---------|
| Clause                     | Requirement + Test   | Result - Remark   | Verdict |
|                            | Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... |   | —       |
| Supplementary information: |  |   |         |
| Distance 2:                |  |   |         |
|                            | Working voltage (V).....   |   | —       |
|                            | Frequency if applicable (kHz).....   |   | —       |
|                            | PTI.....   | < 600 <input type="checkbox"/> ≥ 600 <input type="checkbox"/> | —       |
|                            | Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... |   | —       |
| Supplementary information: |  |   |         |
| Distance 3:                |  |   |         |
|                            | Working voltage (V).....   |   | —       |
|                            | Frequency if applicable (kHz).....   |   | —       |
|                            | PTI.....   | < 600 <input type="checkbox"/> ≥ 600 <input type="checkbox"/> | —       |
|                            | Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... |   | —       |
| Supplementary information: |  |   |         |

\*\* Insulation type: B – Basic; S – Supplementary; R – Reinforced.



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| Clause         | Requirement + Test | Result - Remark | Verdict |

| <b>13.15 (13.2.1)</b>                         | <b>TABLE: Ball Pressure Test of Thermoplastics</b> |                       |                          | <b>N/A</b> |
|---|--|-----------------------|--------------------------|------------|
| <b>Allowed impression diameter (mm) .....</b> |  | 2,0mm                 | —                        |            |
| Object/ Part No./ Material                    | Manufacturer/ trademark                            | Test temperature (°C) | Impression diameter (mm) |            |
| --  | --   | --                    | --                       |            |
| Supplementary information:--                  |  |                       |                          |            |

| <b>13.15 (13.3.1)</b>        | <b>TABLE: Needle-flame test (IEC 60695-11-5)</b> |   |                                    |                              | <b>N/A</b> |
|------------------------------|--|---|------------------------------------|------------------------------|------------|
| Object/ Part No./ Material   | Manufacturer/ trademark                          | Duration of application of test flame (ta); (s) | Ignition of specified layer Yes/No | Duration of burning (tb) (s) | Verdict    |
| --                           | --   | --  | --                                 | --                           | --         |
| Supplementary information:-- |  |   |                                    |                              |            |

| <b>13.15 (13.3.2)</b>  | <b>TABLE: Glow-wire test (IEC 60695-2-11)</b> |                                    |                              |         | <b>N/A</b> |
|--|---|------------------------------------|------------------------------|---------|------------|
| <b>Glow wire temperature .....</b>   |   | 650°C                              | —                            |         |            |
| Object/ Part No./ Material   | Manufacturer/ trademark                       | Ignition of specified layer Yes/No | Duration of burning (tb) (s) | Verdict |            |
| --   |   | --                                 | --                           | --      |            |
| Any flame or glowing of the sample extinguished within 30 s of withdrawing the glow-wire, and any burning or molten drop did not ignite the underlying parts (Yes/No)..... |   |                                    |                              |         | --         |
| Supplementary information:--   |   |                                    |                              |         |            |

| <b>13.15 (13.4)</b>           | <b>TABLE: Proof tracking test (IEC 60112)</b> |  |    |    | <b>N/A</b> |
|-------------------------------|---|--|----|----|------------|
| <b>Test voltage PTI .....</b> |   | 175 V  | —  |    |            |
| Object/ Part No./ Material    | Manufacturer/ trademark                       | Withstand 50 drops without failure on three places or on three specimens |    |    | Verdict    |
| --                            | --  | --   | -- | -- | --         |
| Supplementary information:    |   |  |    |    |            |





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|----------------|--------------------|-----------------|---------|
| Clause         | Requirement + Test | Result - Remark | Verdict |

| ANNEX 1 TABLE: Critical components information         |      |                                       |                 |  |                             |                                     |
|--|------|---------------------------------------|-----------------|--|-----------------------------|-------------------------------------|
| Object / part No.                                      | Code | Manufacturer/ trademark               | Type / model    | Technical data   | Standard                    | Mark(s) of conformity <sup>1)</sup> |
| Supply cords   | B    | Guangzhou Panyu Cable Group Co., Ltd. | H05RN-F         | 3x1.0mm <sup>2</sup>   | EN 50525-2-21               | VDE 40033315                        |
| Output wire of LED driver and Input wire of LED module | B    | Guangzhou Panyu Cable Group Co., Ltd. | H05RN-F         | 2x1.0mm <sup>2</sup>   | EN 50525-2-21               | VDE 40033315                        |
| LED Driver   | B    | DONE                                  | DL-40H-C900-LAN | Input: 220-240V~, 0,26A, 50/60Hz<br>Output: 25-42Vdc, Uout: 55Vdc, 09A, Max. 37,8W, ta: 50°C, tc: 85°C | EN 61347-1<br>EN 61347-2-13 | CE                                  |
| LED PCB  | C    | RONG HUI ELECTRONICS (HUIZHOU) CO LT  | RH-4            | V-0, 130°C   | --                          | UL E252098                          |
| Heat-shrinkable tube                                   | C    | GUANGZHOU KAIHENG ENTERPRISE GROUP    | K-2             | 600VAC; 125°C  | --                          | UL E214175                          |

Supplementary information:

<sup>1)</sup> Provided evidence ensures the agreed level of compliance. See OD-CB2039.

The codes above have the following meaning:

- A - The component is replaceable with another one, also certified, with equivalent characteristics
- B - The component is replaceable if authorised by the test house
- C - Integrated component tested together with the appliance
- D - Alternative component





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|----------------|--------------------|-----------------|---------|
| Clause         | Requirement + Test | Result - Remark | Verdict |

| ANNEX 2 | TABLE: Temperature measurements, thermal tests of Section 12  |                    | P |
|---------|---|--------------------|---|
|         | Type reference.....   | UPW-DM-006         | — |
|         | Lamp used.....  | LED lamp           | — |
|         | Lamp control gear used.....   | DL-40H-C900-LAN    | — |
|         | Mounting position of luminaire.....   | See product manual | — |
|         | Supply wattage (W).....   | 41,2               | — |
|         | Supply current (A).....   | 0,17               | — |
|         | Calculated power factor.....  | 0,96               | — |
|         | Table: measured temperatures corrected for ta = 45 °C:  |                    | P |
|         | - abnormal operating mode.....  |                    | — |
|         | - test 1: rated voltage.....  |                    | — |
|         | - test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current or 1,06 times rated input voltage of the luminaire at the relevant input port .....  | 1,06x240V~         | — |
|         | - test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage.....  |                    | — |
|         | - test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current or 1,3/1,5 times rated input voltage of the luminaire at the relevant input port..... |                    | — |
|         | Through wiring or looping-in wiring loaded by a current of A during the test .....  |                    | — |

| Temperature measurements, (°C) |         |                      |        |        |       |                        |       |
|--------------------------------|---------|----------------------|--------|--------|-------|------------------------|-------|
| Part                           | Ambient | Clause 12.4 – normal |        |        |       | Clause 12.5 – abnormal |       |
|                                |         | test 1               | test 2 | test 3 | limit | test 4                 | limit |
| Supply cords                   | 45      | --                   | 52,7   | --     | 90    | --                     | --    |
| tc of LED driver               | 45      |                      | 75,7   | --     | 85    |                        |       |
| LED PCB                        | 45      |                      | 82,6   | --     | 130   |                        |       |
| Internal wire near LED         | 45      |                      | 75,1   | --     | 90    |                        |       |
| LED cover                      | 45      | --                   | 65,4   | --     | Ref.  | --                     | --    |
| Luminaire surface              | 45      | --                   | 56,9   | --     | 90    | --                     | --    |



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|----------------------------|--------------------|----|------|----|-----------------|----|---------|
| Clause                     | Requirement + Test |    |      |    | Result - Remark |    | Verdict |
| Mounting surface           | 45                 | -- | 54,6 | -- | 90              | -- | --      |
| Supplementary information: |                    |    |      |    |                 |    |         |

| ANNEX 3    | Screw terminals (part of the luminaire)               |   | N/A |
|------------|---|---|-----|
| (14)       | <b>SCREW TERMINALS</b>                                |   | N/A |
| (14.2)     | Type of terminal..... :                               |   | —   |
|            | Rated current (A)..... :                              |   | —   |
| (14.3.2.1) | One or more conductors                                |   | N/A |
| (14.3.2.2) | Special preparation                                   |   | N/A |
| (14.3.2.3) | Terminal size   |   | N/A |
|            | Cross-sectional area (mm <sup>2</sup> )..... :        |   | —   |
| (14.3.3)   | Conductor space (mm)..... :                           |   | N/A |
| (14.4)     | Mechanical tests                                      |   | N/A |
| (14.4.1)   | Minimum distance                                      |   | N/A |
| (14.4.2)   | Cannot slip out                                       |   | N/A |
| (14.4.3)   | Special preparation                                   |   | N/A |
| (14.4.4)   | Nominal diameter of thread (metric ISO thread)..... : | M | N/A |
|            | External wiring                                       |   | N/A |
|            | No soft metal   |   | N/A |
| (14.4.5)   | Corrosion   |   | N/A |
| (14.4.6)   | Nominal diameter of thread (mm)..... :                |   | N/A |
|            | Torque (Nm)..... :                                    |   | N/A |
| (14.4.7)   | Between metal surfaces                                |   | N/A |
|            | Lug terminal  |   | N/A |
|            | Mantle terminal                                       |   | N/A |
|            | Pull test; pull (N)..... :                            |   | N/A |
| (14.4.8)   | Without undue damage                                  |   | N/A |





| IEC 60598-2-13 |                    |                 |         |
|----------------|--------------------|-----------------|---------|
| Clause         | Requirement + Test | Result - Remark | Verdict |

|                |   |  |     |
|----------------|---|--|-----|
| <b>ANNEX 4</b> | <b>Screwless terminals (part of the luminaire)</b>                            |  | N/A |
| <b>(15)</b>    | <b>SCREWLESS TERMINALS</b>  |  | N/A |
| (15.2)         | Type of terminal.....:  |  | —   |
|                | Rated current (A).....:   |  | —   |
| (15.3.1)       | Material  |  | N/A |
| (15.3.2)       | Clamping  |  | N/A |
| (15.3.3)       | Stop  |  | N/A |
| (15.3.4)       | Unprepared conductors   |  | N/A |
| (15.3.5)       | Pressure on insulating material   |  | N/A |
| (15.3.6)       | Clear connection method   |  | N/A |
| (15.3.7)       | Clamping independently  |  | N/A |
| (15.3.8)       | Fixed in position   |  | N/A |
| (15.3.10)      | Conductor size  |  | N/A |
|                | Type of conductor   |  | N/A |
| (15.5)         | Terminals and connections for internal wiring                                 |  | N/A |
| (15.5.1)       | Mechanical tests  |  | N/A |
| (15.5.1.1.1)   | Pull test spring-type terminals (4 N, 4 samples).....:                        |  | N/A |
| (15.5.1.1.2)   | Pull test pin or tab terminals (4 N, 4 samples).....:                         |  | N/A |
|                | Insertion force not exceeding 50 N  |  | N/A |
| (15.5.1.2)     | Permanent connections: pull-off test (20 N)                                   |  | N/A |
| (15.5.2)       | Electrical tests  |  | N/A |
|                | Voltage drop (mV) after 1 h (4 samples).....:                                 |  | N/A |
|                | Voltage drop of two inseparable joints  |  | N/A |
|                | Number of cycles:   |  | —   |
|                | Voltage drop (mV) after 10th alt. 25th cycle (4 samples).....:                |  | N/A |
|                | Voltage drop (mV) after 50th alt. 100th cycle (4 samples).....:               |  | N/A |
|                | After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples).....:  |  | N/A |
|                | After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples).....: |  | N/A |



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| IEC 60598-2-13 |                    |                 |         |
|----------------|--------------------|-----------------|---------|
| Clause         | Requirement + Test | Result - Remark | Verdict |

|            |   |  |     |
|------------|---|--|-----|
| (15.6)     | Terminals and connections for external wiring                                     |  | N/A |
| (15.6.1)   | Conductors  |  | N/A |
|            | Terminal size and rating  |  | N/A |
| 15.6.2     | Mechanical tests  |  | N/A |
| (15.6.2.1) | Pull test spring-type terminals or welded connections (4 samples); pull (N) ..... |  | N/A |
| (15.6.2.2) | Pull test pin or tab terminals (4 samples); pull (N) .....                        |  | N/A |
| (15.6.3)   | Electrical tests  |  | N/A |
|            | Tests according 15.6.3.1 + 15.6.3.2 in IEC 60598-1                                |  | N/A |

|  |  |   |   |   |   |   |   |   |   |    |     |
|--|--|---|---|---|---|---|---|---|---|----|-----|
| <b>(15.6.3.1)</b><br><b>(15.6.3.2)</b> | <b>TABLE: Contact resistance test / Heating tests</b>      |   |   |   |   |   |   |   |   |    | N/A |
|  | Voltage drop (mV) after 1 h                                |   |   |   |   |   |   |   |   |    | —   |
| terminal                               | 1  | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |     |
| voltage drop (mV)                      |  |   |   |   |   |   |   |   |   |    |     |
|  | Voltage drop of two inseparable joints                     |   |   |   |   |   |   |   |   |    |     |
|  | Voltage drop after 10th alt. 25th cycle                    |   |   |   |   |   |   |   |   |    |     |
|  | Max. allowed voltage drop (mV).....                        |   |   |   |   |   |   |   |   |    | —   |
| terminal                               | 1  | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |     |
| voltage drop (mV)                      |  |   |   |   |   |   |   |   |   |    |     |
|  | Voltage drop after 50th alt. 100th cycle                   |   |   |   |   |   |   |   |   |    |     |
|  | Max. allowed voltage drop (mV).....                        |   |   |   |   |   |   |   |   |    | —   |
| terminal                               | 1  | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |     |
| voltage drop (mV)                      |  |   |   |   |   |   |   |   |   |    |     |
|  | Continued ageing: voltage drop after 10th alt. 25th cycle  |   |   |   |   |   |   |   |   |    |     |
|  | Max. allowed voltage drop (mV).....                        |   |   |   |   |   |   |   |   |    | —   |
| terminal                               | 1  | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |     |
| voltage drop (mV)                      |  |   |   |   |   |   |   |   |   |    |     |
|  | Continued ageing: voltage drop after 50th alt. 100th cycle |   |   |   |   |   |   |   |   |    |     |
|  | Max. allowed voltage drop (mV).....                        |   |   |   |   |   |   |   |   |    | —   |
| terminal                               | 1  | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |     |
| voltage drop (mV)                      |  |   |   |   |   |   |   |   |   |    |     |





| IEC 60598-2-13 |                    |                 |         |
|----------------|--------------------|-----------------|---------|
| Clause         | Requirement + Test | Result - Remark | Verdict |

|                            |  |  |  |
|----------------------------|--|--|--|
| Supplementary information: |  |  |  |
|----------------------------|--|--|--|

|            |   |   |     |
|------------|---|---|-----|
|            | <b>ANNEX 5: EMF test result according to IEC/EN 62493</b>   |   | P   |
| <b>4</b>   | <b>LIMITS</b>   |   | P   |
| <b>4.1</b> | <b>General</b>  |   | P   |
|            | Comply with Van der Hoofden test limit in 4.2.3 or inherently compliant in 4.2.2 and pass assessment procedure for intentional radiators in 4.3 |   | P   |
| <b>4.2</b> | <b>Unintentional radiating part of lighting equipment</b>   |   | P   |
| 4.2.2      | Lighting equipment deemed to comply with the Van der Hoofden test without testing   |   | P   |
|            | 1) electronic controlgear   | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | —   |
|            | 2) incandescent-lamp technology   | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | —   |
|            | 3) LED-light-source technology  | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | —   |
|            | 4) OLED-light-source technology   | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | —   |
|            | 5) high-pressure discharge lamp LED-light-source technologies   | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | —   |
|            | 6) low-pressure discharge lamp technologies with exposure distance $\geq 50$ cm   | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | —   |
|            | 7) independent auxiliary  | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | —   |
|            | Not fulfil any of 1-7 above subject to 4.2.3  |   | —   |
| 4.2.3      | Applications of limits  |   | N/A |
|            | Not fulfil any of 1-7 in 4.2.2 but the compliance factor $F$ is $\leq 1$  |   | N/A |
| <b>4.3</b> | <b>Intentional radiating part of lighting equipment</b>   |   | N/A |
|            | Comply with one of methods in Clause 7 if intentional radiator  |   | N/A |

|            |  |             |     |
|------------|--|-------------|-----|
| <b>6</b>   | <b>MEASUREMENT PROCEDURE FOR THE VAN DER HOOFDEN TEST</b>            |             | N/A |
| <b>6.1</b> | <b>General</b>   |             | N/A |
|            | Measurements carried out under conditions according Clause 6.1 – 6.6 | See Table 6 | N/A |

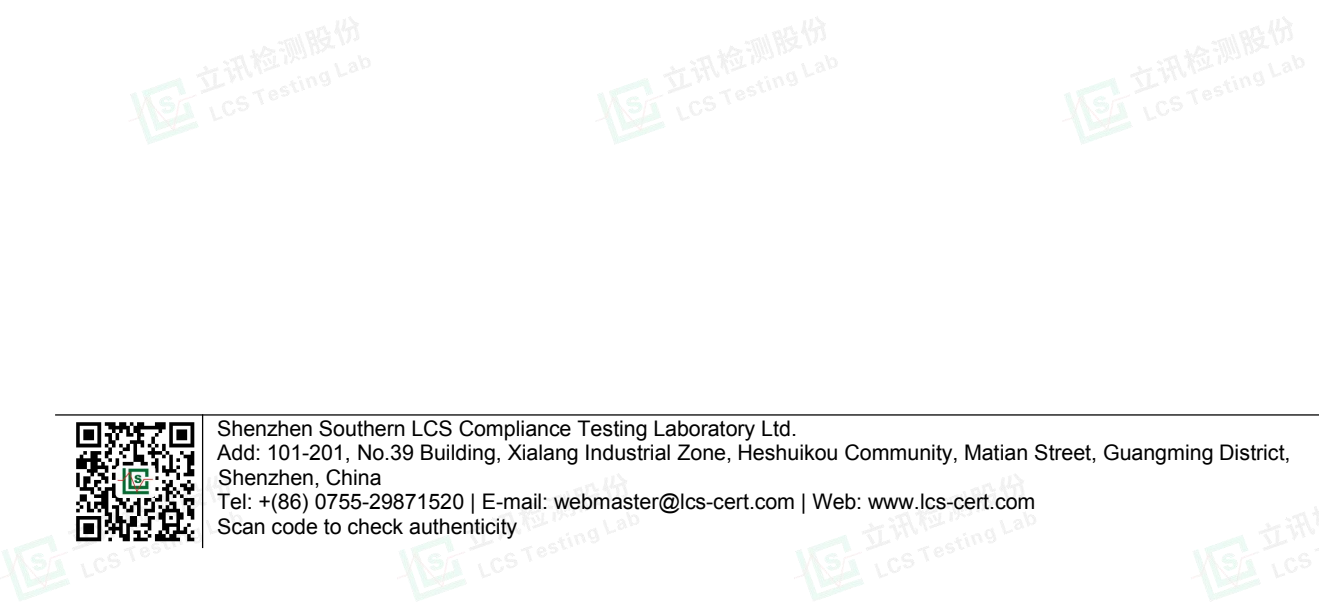
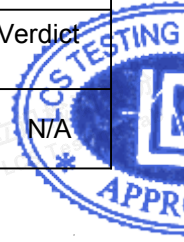
|            |   |  |     |
|------------|---|--|-----|
| <b>7</b>   | <b>ASSESSMENT PROCEDURE INTENTIONAL RADIATORS</b> |  | N/A |
| <b>7.2</b> | <b>Low-power exclusion method</b>                 |  | N/A |





| IEC 60598-2-13 |  |                 |         |
|----------------|--|-----------------|---------|
| Clause         | Requirement + Test   | Result - Remark | Verdict |
| 7.2.1          | Input $P_{int,rad}$ ..... :  |                 | —       |
|                | Exclusion level $P_{max}$ ..... :  |                 | —       |
|                | Input power $P_{int,rad} < \text{exclusion level } P_{max}$  |                 | N/A     |
| <b>7.3</b>     | <b>Application of the EMF product standard for body worn-equipment</b>   |                 | N/A     |
|                | If not Clause 7.2 is met and expose distance $\leq 0.05$ m, comply with IEC 62209-2                                      |                 | N/A     |
| <b>7.4</b>     | <b>Application of the EMF product standard for base stations</b>   |                 | N/A     |
|                | If not Clause 7.2 is met and if intentional radiator is base station, comply with IEC 62232                              |                 | N/A     |
| <b>7.5</b>     | <b>Application of another EMF standard</b>   |                 | N/A     |
|                | If not Clause 7.2 is met and if intentional radiator cannot be considered as in Clause 7.3 or 7.4, comply with IEC 62311 |                 | N/A     |

| 6 TABLE: Measurement results with Van der Hoofden test head |            |                    |           |            |         |
|---|------------|--------------------|-----------|------------|---------|
| Location of EUT   | Test model | Measuring distance | Result(F) | Limit(F)   | Verdict |
| Reference Annex B of IEC/EN 62493:2015                      | --         | --                 | --        | $\leq 1.0$ | N/A     |





## Attachment No.1

| IEC 60598_2_13G-ATTACHMENT |                    |                 |         |
|----------------------------|--------------------|-----------------|---------|
| Clause                     | Requirement + Test | Result - Remark | Verdict |

**ATTACHMENT TO TEST REPORT IEC 60598-2-13**  
**EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES**  
**Luminaires**  
**Part 2: Particular requirements**  
**Section 13: GROUND RECESSED LUMINAIRES**

**Differences according to.....** : EN 60598-2-13:2006+A1:2012 used in conjunction with  
EN 60598-1:2015+A1:2018

|  |  |  |          |
|--|--|--|----------|
|  | <b>CENELEC COMMON MODIFICATIONS (EN)</b> |  | <b>P</b> |
|--|--|--|----------|

|                   |   |  |          |
|-------------------|---|--|----------|
| <b>13.5 (3)</b>   | <b>MARKING</b>  |  | <b>P</b> |
| 13.5<br>(3.3.101) | For luminaires not supplied with terminal block:<br>Adequate warning on the package |  | P        |

|                  |                                    |  |     |
|------------------|------------------------------------|--|-----|
| <b>13.6 (4)</b>  | <b>CONSTRUCTION</b>                |  | N/A |
| 13.6<br>(4.11.6) | Electro-mechanical contact systems |  | N/A |

|                  |   |  |          |
|------------------|---|--|----------|
| <b>13.10 (5)</b> | <b>EXTERNAL AND INTERNAL WIRING</b>   |  | <b>P</b> |
| 13.10<br>(5.2.1) | Connecting leads  |  | N/A      |
|                  | - without a means for connection to the supply                              |  | N/A      |
|                  | - terminal block specified  |  | N/A      |
|                  | - relevant information provided   |  | N/A      |
|                  | - compliance with 4.6, 4.7.1, 4.7.2, 4.10.1, 11.2, 12<br>and 13.2 of Part 1 |  | N/A      |
| 13.10<br>(5.2.2) | Cables equal to EN 50525  |  | P        |
|                  | Replace table 5.1 – Supply cord   |  | P        |

|                    |   |  |          |
|--------------------|---|--|----------|
| <b>13.12 (12)</b>  | <b>ENDURANCE TESTS AND THERMAL TESTS</b>  |  | <b>P</b> |
| 13.12<br>(12.4.2c) | Thermal test (normal operation)<br>see footnote c to table 12.2 relating to unsleeved<br>fixed wiring |  | P        |



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## Attachment No.1

| IEC 60598_2_13G-ATTACHMENT |   |                 |         |
|----------------------------|---|-----------------|---------|
| Clause                     | Requirement + Test  | Result - Remark | Verdict |
| <b>ZB</b>                  | <b>ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)</b>   |                 | N/A     |
| (3.3)                      | DK: power supply cords of class I luminaires with label   |                 | N/A     |
| (4.5.1)                    | DK: socket-outlets  |                 | N/A     |
| (5.2.1)                    | CY, DK, FI, GB: type of plug  |                 | N/A     |
| <b>ZC</b>                  | <b>ANNEX ZC, NATIONAL DEVIATIONS (EN)</b>   |                 | N/A     |
| (4 & 5)                    | FR: Shuttered socket-outlets 10/16A   |                 | N/A     |
|                            | FR: Safety requirements for high buildings<br><br>(Arrêté du 30 décembre 2011 portant règlement de sécurité pour la construction des immeubles de grande hauteur et leur protection contre les risques d'incendie et de panique; Section VIII; Article GH 48, Eclairage)<br><br>Glow-wire test for outer parts of luminaires: |                 | N/A     |
|                            | - 850°C for luminaires in stairways and horizontal travel paths   |                 | N/A     |
|                            | - 650°C for indoor luminaires   |                 | N/A     |
| (13.3)                     | GB: Requirements according to United Kingdom Building Regulation  |                 | N/A     |





## Attachment No.2

| IEC /EN IEC 62031  |   |   |         |
|--|---|---|---------|
| LED modules for general lighting - Safety specifications |   |   |         |
| Clause   | Requirement + Test  | Result - Remark   | Verdict |
| 4.2  | Classification  |   | ---     |
|  | Built-in.....:  | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | —       |
|  | Independent.....:   | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | —       |
|  | Integral.....:  | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | —       |
| 4.6  | Independent modules comply with requirements in IEC 60598-1:2020  |   | N/A     |
| 4.8  | Modules with integrated controlgear providing SELV comply with requirements according to IEC 61347-1:2015/AMD1:2017 clause L.5 to L.11. | (see Annex 1)   | N/A     |
| 6  | Marking   |   | N/A     |
| 6.2  | Contents of marking for built-in and for independent LED modules  |   | N/A     |
| 6.3  | Location of marking for built-in LED modules  |   | N/A     |
| 6.4  | Location of marking for independent LED modules   |   | N/A     |
| 6.5  | Marking of integral LED modules   |   | P       |
| 6.6  | Durability and legibility of marking  |   | N/A     |
| 7  | Terminals   |   | N/A     |
| 8 (9)  | EARTHING  |   | N/A     |
| 9 (10)   | Protection against accidental contact with live parts   |   | N/A     |
| 10 (11)  | Moisture resistance and insulation  |   | P       |
| 11 (12)  | Electric strength   |   | P       |
| 12 (14)  | Fault conditions  |   | P       |
| 12.1   | Fault conditions according to IEC 61347-1, Clause 14  |   | P       |
| 12.2   | Overpower condition   | No damage   | P       |
| 14 (15)  | Construction  |   | P       |
| - (15.1)   | Wood, cotton, silk, paper and similar fibrous material  |   | P       |
|  | Wood, cotton, silk, paper and similar fibrous material not used as insulation   |   | P       |
| - (15.2)   | Printed circuits  |   | P       |
|  | Printed circuits used as internal connections complies with clause 14   |   | P       |



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## Attachment No.2

| IEC /EN IEC 62031  |  |                 |         |
|--|--|-----------------|---------|
| LED modules for general lighting - Safety specifications |  |                 |         |
| Clause   | Requirement + Test                             | Result - Remark | Verdict |
| 15 (16)  | Creepage distances and clearances              |                 | N/A     |
| 16 (17)  | Screws, current-carrying parts and connections |                 | N/A     |
| 17 (18)  | Resistance to heat, fire and tracking          |                 | N/A     |
| 18   | Resistance to corrosion                        |                 | N/A     |
| 20   | Heat management                                |                 | N/A     |
| 22   | Photobiological safety                         |                 | P       |
| 22.1   | UV radiation                                   |                 | N/A     |
| 22.2   | Blue light hazard                              |                 | P       |
|  | Assessed according to IEC TR 62778             |                 | P       |
| 22.3   | Infrared radiation                             |                 | N/A     |





## Attachment No.3

| IEC/EN 62471 & IEC TR 62778                      |   |                 |            |
|--|---|-----------------|------------|
| Photobiological safety of lamps and lamp systems |   |                 |            |
| Clause   | Requirement + Test  | Result - Remark | Verdict    |
| <b>4</b>   | <b>EXPOSURE LIMITS (EL'S)</b>   |                 | <b>---</b> |
| 4.2  | Specific factors involved in the determination and application of retinal exposure limits |                 | P          |
| 4.2.1  | Pupil diameter  |                 | P          |
| 4.2.2  | Angular subtense of source and measurement field-of-view                                  |                 | P          |
| 4.3  | Hazard exposure limits  |                 | P          |
| 4.3.1  | Actinic UV hazard exposure limit for the skin and eye                                     |                 | P          |
| 4.3.2  | Near-UV hazard exposure limit for the eye   |                 | P          |
| 4.3.3  | Retinal blue light hazard exposure limit  |                 | P          |
| 4.3.4  | Retinal blue light hazard exposure limit - small source                                   |                 | N/A        |
| 4.3.5  | Retinal thermal hazard exposure limit   |                 | P          |
| 4.3.6  | Retinal thermal hazard exposure limit – weak visual stimulus                              |                 | N/A        |
| 4.3.7  | Infrared radiation hazard exposure limits for the eye                                     |                 | P          |
| 4.3.8  | Thermal hazard exposure limit for the skin  |                 | P          |
| <b>5</b>   | <b>MEASUREMENT OF LAMPS AND LAMP SYSTEMS</b>  |                 | <b>P</b>   |
| 5.1  | Measurement conditions  |                 | P          |
| 5.1.1  | Lamp ageing (seasoning)   |                 | P          |
| 5.1.2  | Test environment  |                 | P          |
| 5.1.3  | Extraneous radiation  |                 | P          |
| 5.1.4  | Lamp operation  |                 | P          |
| 5.1.5  | Lamp system operation   |                 | N/A        |
| 5.2  | Measurement procedure   |                 | P          |
| 5.2.1  | Irradiance measurements   |                 | P          |
| 5.2.2  | Radiance measurements   |                 | P          |
| 5.2.3  | Measurement of source size  |                 | P          |
| 5.2.4  | Pulse width measurement for pulsed sources  |                 | N/A        |
| 5.3  | Analysis methods  |                 | P          |
| 5.3.1  | Weighting curve interpolations  |                 | P          |



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## Attachment No.3

| IEC/EN 62471 & IEC TR 62778                      |  |                        |          |
|--|--|------------------------|----------|
| Photobiological safety of lamps and lamp systems |  |                        |          |
| Clause   | Requirement + Test   | Result - Remark        | Verdict  |
| 5.3.2  | Calculations   |                        | P        |
| 5.3.3  | Measurement uncertainty  |                        | P        |
| <b>6</b>   | <b>LAMP CLASSIFICATION</b>   |                        | <b>P</b> |
| 6.1  | Continuous wave lamps  |                        | P        |
| 6.1.1  | Exempt group   |                        | N/A      |
| 6.1.2  | Risk Group 1 (Low-Risk)  |                        | P        |
| 6.1.3  | Risk Group 2 (Moderate-Risk)   |                        | N/A      |
| 6.1.4  | Risk Group 3 (High-Risk)   |                        | N/A      |
| 6.2  | Pulsed lamps   |                        | N/A      |
| <b>Annex A</b>                                   | <b>SUMMARY OF BIOLOGICAL EFFECTS</b>   |                        | --       |
| <b>Annex B</b>                                   | <b>MEASUREMENT METHOD</b>  |                        | --       |
| <b>Annex C</b>                                   | <b>UNCERTAINTY ANALYSIS</b>  |                        | --       |
| <b>Annex D</b>                                   | <b>GENERAL REFERENCES</b>  |                        | --       |
|  | <b>CENELEC COMMON MODIFICATIONS (EN)</b>   |                        | <b>P</b> |
| <b>4</b>   | <b>EXPOSURE LIMITS</b>   |                        | <b>P</b> |
|  | Contents of the whole Clause 4 of IEC 62471:2006 moved into a new informative Annex ZB                                       |                        | —        |
|  | Clause 4 replaced by the following:  |                        | <b>P</b> |
|  | Limits of the Artificial Optical Radiation Directive (2006/25/EC) have been applied instead of those fixed in IEC 62471:2006 | See appended Table 6.1 | <b>P</b> |
| 4.1  | General  |                        | <b>P</b> |
|  | First paragraph deleted  |                        | —        |





### Attachment No.3

| IEC/EN 62471 & IEC TR 62778<br>Photobiological safety of lamps and lamp systems |                    |                 |         |
|---|--------------------|-----------------|---------|
| Clause  | Requirement + Test | Result - Remark | Verdict |

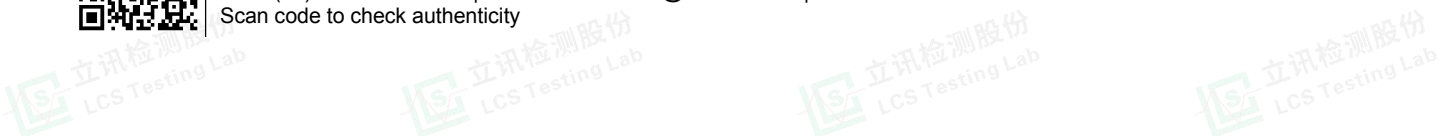
| Table 6.1                               |                  | Emission limits for risk groups of continuous wave lamps |                                     |                                       |          |          |          |                 |        | P |
|---|------------------|--|-------------------------------------|---------------------------------------|----------|----------|----------|-----------------|--------|---|
| Risk                                    | Action spectrum  | Symbol   | Units                               | Emission Measurement                  |          |          |          |                 |        |   |
|   |                  |  |                                     | Exempt                                |          | Low risk |          | Mod risk        |        |   |
|   |                  |  |                                     | Limit                                 | Result   | Limit    | Result   | Limit           | Result |   |
| Actinic UV                              | SUV( $\lambda$ ) | E <sub>s</sub>   | W•m <sup>-2</sup>                   | 0,001                                 | 2,7e-07  | -        | 9,1e-05  | -               | -      |   |
| Near UV                                 |                  | E <sub>UVA</sub>   | W•m <sup>-2</sup>                   | 0,33                                  | 1,6e-05  | -        | 5,4e-05  | -               | -      |   |
| Blue light                              | B( $\lambda$ )   | L <sub>B</sub>   | W•m <sup>-2</sup> •sr <sup>-1</sup> | 100                                   | 1,68e+01 | -        | 3,68e+03 | 4000000         | -      |   |
| Blue light, small source                | B( $\lambda$ )   | E <sub>B</sub>   | W•m <sup>-2</sup>                   | 0,01*                                 | -        | -        | -        | 400             | -      |   |
| Retinal thermal                         | R( $\lambda$ )   | L <sub>R</sub>   | W•m <sup>-2</sup> •sr <sup>-1</sup> | 28000/ $\alpha$                       | 6,5e-03  | -        | 4,4e+04  | 71000/ $\alpha$ | -      |   |
| Retinal thermal, weak visual stimulus** | R( $\lambda$ )   | L <sub>IR</sub>  | W•m <sup>-2</sup> •sr <sup>-1</sup> | 545000                                | -        | -        | -        | -               | -      |   |
|   |                  |  |                                     | 0,0017 $\cong$ $\alpha$ $\cong$ 0,011 | -        | -        | -        | -               | -      |   |
|   |                  |  |                                     | 6000/ $\alpha$                        | -        | -        | -        | -               | -      |   |
|   |                  |  |                                     | 0,011 $\cong$ $\alpha$ $\cong$ 0.1    | -        | -        | -        | -               | -      |   |
| IR radiation, eye                       |                  | E <sub>IR</sub>  | W•m <sup>-2</sup>                   | 100                                   | 2,3e-03  | -        | 1,3e+00  | 3200            | -      |   |

\* Small source defined as one with  $\alpha < 0,011$  radian. Averaging field of view at 10000 s is 0,1 radian.  
 \*\* Involves evaluation of non-GLS source

Note: The action functions: see Table 4.1 and Table 4.2  
 The applicable aperture diameters: see 4.2.1  
 The limitations for the angular subtenses: see 4.2.2  
 The related measurement condition 5.2.3 and the range of acceptance angles: see Table 5.5



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### Attachment No.3

| IEC/EN 62471 & IEC TR 62778                      |                    |                 |         |
|--|--------------------|-----------------|---------|
| Photobiological safety of lamps and lamp systems |                    |                 |         |
| Clause   | Requirement + Test | Result - Remark | Verdict |

| <b>Table 13.6 (4.24) Spectroradiometric measurement (IEC 62778)</b> |                |   |               | --  |
|---|----------------|---|---------------|---|
| <b>Measurement performed on:</b>                                    |                | <b>Luminaire</b>  |               | --  |
| <b>Model number</b> .....   |                | UPW-DM-006  |               | --  |
| <b>Test voltage (V)</b> .....                                       |                | 240   |               | --  |
| <b>Test current (mA)</b> .....                                      |                | --  |               | --  |
| <b>Test frequency (Hz)</b> .....                                    |                | 50  |               | --  |
| <b>Ambient, t (°C)</b> .....  |                | 25.0  |               | --  |
| <b>Measurement distance</b> .....                                   |                | <input checked="" type="checkbox"/> 20 cm<br><input type="checkbox"/> ... cm  |               | --  |
| <b>Source size</b> .....  |                | <input checked="" type="checkbox"/> Non-small<br><input type="checkbox"/> Small : .... mm   |               | --  |
| <b>Field of view</b> .....  |                | <input type="checkbox"/> 100 mrad<br><input checked="" type="checkbox"/> 11 mrad<br><input type="checkbox"/> 1,7 mrad (for small sources) |               | --  |
| Item  | Symbol         | Units   | Result        | Risk Group  |
| Correlated colour temperature                                       | CCT            | K   | 2988          | --  |
| x/y colour coordinates  | --             | --  | 0,4386/0,4061 | --  |
| Blue light hazard radiance  | L <sub>B</sub> | W/(m <sup>2</sup> •sr <sup>1</sup> )  | 1019          | <input type="checkbox"/> RG0: <100<br><input checked="" type="checkbox"/> RG1: <10000<br><input type="checkbox"/> RG2: <4000000 |
| Blue light hazard irradiance  | E <sub>B</sub> | W/m <sup>2</sup>  | 1,089e+001    | --  |
| Luminance   | L              | cd/m <sup>2</sup>   | 3,410e+006    | --  |
| Illuminance   | E              | lx  | 36420         | --  |
| Supplementary information:  |                |   |               |   |



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Attachment No.4

Photo Documentation



Photo 1



Photo 2



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# Attachment No.4

## Photo Documentation



Photo 3

-----End of Test Report-----



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