



**TEST REPORT**  
**IEC 60598-2-3**  
**Luminaires**  
**Part 2: Particular requirements**  
**Section 3: Luminaires for road and street lighting**

**Report Number.** ..... : 704021701412-03

**Date of issue**..... : 2020-07-14

**Total number of pages** ..... : 125

**Name of Testing Laboratory preparing the Report** ..... : TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch

**Applicant's name**..... : Ningbo Skyzon Energy Co.,Ltd

**Address**..... : No.19,KeSan Road, 315600 Ninghai, Ningbo  
PEOPLE'S REPUBLIC OF CHINA

**Test specification:**

**Standard** ..... : IEC 60598-2-3:2002, AMD1:2011 used in conjunction with  
IEC 60598-1:2014, AMD1:2017

**Test procedure** ..... : EU-directive

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

**Test Report Form No.**..... : IEC60598\_2\_3L

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

**Master TRF**..... : Dated 2018-03-09

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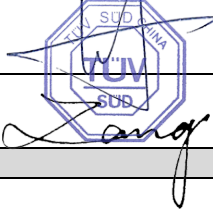
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<b>Test item description..... :</b>	Luminaires for road and street lighting (LED Street Light)	
<b>Trade Mark..... :</b>	N/A	
<b>Manufacturer..... :</b>	Same as applicant	
<b>Model/Type reference..... :</b>	Details see "General product information"	
<b>Ratings..... :</b>	220-240V~; 50/60Hz; IP66; Class II; ta: 50°C; IK10; Others see "General product information"	
<b>Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):</b>		
<input checked="" type="checkbox"/> <b>CB Testing Laboratory:</b>	TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch No.151 Heng Tong Road. Shanghai 200070 P.R. China	
<b>Testing location/ address.....:</b>	No. 1999, Duhui Road, Shanghai, 201108, P. R. China	
<b>Tested by (name, function, signature).....:</b>	Lichen WANG, Project handler	
<b>Approved by (name, function, signature)....:</b>	Xudong ZANG, Designated reviewer	
<input type="checkbox"/> <b>Testing procedure: CTF Stage 1:</b>	N/A	
<b>Testing location/ address.....:</b>	N/A	
<b>Tested by (name, function, signature).....:</b>	N/A	
<b>Approved by (name, function, signature)....:</b>	N/A	
<input type="checkbox"/> <b>Testing procedure: CTF Stage 2:</b>	N/A	
<b>Testing location/ address.....:</b>	N/A	
<b>Tested by (name + signature) .....</b>	N/A	
<b>Witnessed by (name, function, signature)..:</b>	N/A	
<b>Approved by (name, function, signature)....:</b>	N/A	
<input type="checkbox"/> <b>Testing procedure: CTF Stage 3:</b>	N/A	
<input type="checkbox"/> <b>Testing procedure: CTF Stage 4:</b>	N/A	
<b>Testing location/ address.....:</b>	N/A	
<b>Tested by (name, function, signature).....:</b>	N/A	
<b>Witnessed by (name, function, signature)..:</b>	N/A	
<b>Approved by (name, function, signature)....:</b>	N/A	
<b>Supervised by (name, function, signature) :</b>	N/A	

<b>List of Attachments (including a total number of pages in each attachment):</b> N/A	
<b>Summary of testing:</b> The sample's mentioned in this report is/are submitted/ supplied/ manufactured by client. The laboratory therefore assumes no responsibility for accuracy of information on the brand name, model number, origin of manufacture, consignment or any information supplied.	
<b>Tests performed (name of test and test clause):</b> Complete tests were performed for EL-SL18LA-160, EL-SL18MA-80, EL-SL18MA-40, EL-SL58-120, EL-SL68(L)-240, EL-SL68(Mini)-20. IP66 and the cord anchorage test were performed on model EL-SL18MA-90. Construction checks are performed for all models. All of the models comply with the safety requirement. All type of LEDs within the luminaires were performed the related tests according EN 62031, IEC/TR 62778 and EN 62471 and the unfavourable tests were performed. Construction check was performed for all models. All models comply with the safety requirement. EMF requirements of EN 62493 have been evaluated and no test required.	<b>Testing location:</b> TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch No. 1999, Duhui Road, Shanghai, 201108, P. R. China
<b>Summary of compliance with National Differences:</b> EU group differences  <input checked="" type="checkbox"/> <b>The product fulfils the requirements of</b> EN 60598-2-3:2003+A1:2011 used in conjunction with EN 60598-1:2015+A1:2018. Requirements for European group difference and National difference for EN 60598-2-3:2003+A1:2011 used in conjunction with EN 60598-1:2015+A1:2018 are taken into consideration.	
<b>Copy of marking plate:</b> (See Data form for electrical equipment and machinery)	

<b>Test item particulars .....</b> : Luminaires for road and street lighting (LED Street Light)	
<b>Classification of installation and use.....</b> : Fixed luminaires; normal use	
<b>Supply Connection .....</b> : Supply cord .....:	
<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> : 2020-07-01	
<b>Date (s) of performance of tests .....</b> : 2020-07-01 to 2020-07-14	
<b>General remarks:</b>	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report.  <b>Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator.</b>  <b>Clause numbers between brackets refer to clauses in IEC 60598-1</b> <b>Remark 1:</b> This test report replaces the previous version 704021701412-02, issued on 2019-08-22 due to the modifications mentioned as below: -Added LED type  <b>Remark 2:</b> The following contents are included and as appendix of this test report: 1) Test report IEC 60598-2-3:2002 + A1:2011 used in conjunction with IEC 60598-1:2014+A1:2017 2) Appendix 1: EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES 3) Appendix 2: Additional requirements of IEC/TR 62778:2014 4) Appendix 3: Additional requirements of EN 62031:2008+A1:2013+A2:2015 5) Appendix 4: Additional requirements of EN 62471:2008 6) Appendix 5: Additional requirements of EN 62493:2015 7) Appendix 6: Photographs Data form for electrical equipment and machinery	
<b>Manufacturer's Declaration per sub-clause 4.2.5 of IEC 60598-1:</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"/> Yes <input checked="" type="checkbox"/> Not applicable
<b>When differences exist; they shall be identified in the General product information section.</b>	
<b>Name and address of factory (ies).....</b> : Ningbo Skyzon Energy Co.,Ltd. No.19,KeSan Road, 315600 Ninghai, Ningbo PEOPLE'S REPUBLIC OF CHINA	

**General product information:**

All products covered in this test report are LED road light for outdoor use. All the products have similar construction, the difference is quantity of LED module and LEDs, because of different wattage. The mounting rang is up to 12m.

Model list:

Model type	Rated power (W)	LED controlgear 1	LED controlgear 2	LED
EL-SL18MA-20	20	EBS-040S070D TE EBS-040S070BTE	OT 40/120-277/1A0 4DIMLT2 E	SMD
EL-SL18MA-30	30	EBS-040S070DTE EBS-040S070BTE	OT 40/120-277/1A0 4DIMLT2 E	SMD
EL-SL18MA-40	40	EBS-040S070DTE EBS-040S070BTE	OT 40/120-277/1A0 4DIMLT2 E	SMD
EL-SL18MA-50	50	EBS-080S070D TE EBS-080S070BTE	OT 60/170-240/1A0 4DIMLT2 E	SMD
EL-SL18MA-60	60	EBS-080S070DTE EBS-080S070BTE	OT 60/170-240/1A0 4DIMLT2 E	SMD
EL-SL18MA-70	70	EBS-080S070D TE EBS-080S070BTE	OT 90/170-240/1A0 4DIMLT2 E	SMD
EL-SL18MA-80	80	EBS-080S070D TE EBS-080S070BTE	OT 90/170-240/1A0 4DIMLT2 E	SMD
EL-SL18MA-90	90	EBS-120S105D TE EBS-120S105BTE	OT 90/170-240/1A0 4DIMLT2 E	SMD
EL-SL18LA-90	90	EBS-120S070DTE EBS-120S070BTE	OT 90/170-240/1A0 4DIMLT2 E	SMD
EL-SL18LA-100	100	EBS-120S070DTE EBS-120S070BTE	OT 165/170-240/1A0 4DIMLT2 E	SMD
EL-SL18LA-120	120	EBS-120S070DTE EBS-120S070BTE	OT 165/170-240/1A0 4DIMLT2 E	SMD
EL-SL18LA-150	150	EBS-160S070DTE EBS-160S070BTE	OT 165/170-240/1A0 4DIMLT2 E	SMD
EL-SL18LA-160	160	EBS-160S070D TE EBS-160S070BTE	OT 165/170-240/1A0 4DIMLT2 E	SMD
EL-SL58(S)-20	20	EBS-040S070D TE EBS-040S070BTE	OT 40/120-277/1A0 4DIMLT2 E	SMD
EL-SL58(S)-30	30	EBS-040S070DTE EBS-040S070BTE	OT 40/120-277/1A0 4DIMLT2 E	SMD
EL-SL58(S)-40	40	EBS-040S070DTE EBS-040S070BTE	OT 40/120-277/1A0 4DIMLT2 E	SMD
EL-SL58(S)-50	50	EBS-080S070D TE EBS-080S070BTE	OT 60/170-240/1A0 4DIMLT2 E	SMD
EL-SL58(S)-60	60	EBS-080S070DTE EBS-080S070BTE	OT 60/170-240/1A0 4DIMLT2 E	SMD
EL-SL58-30	30	EBS-040S070DTE EBS-040S070BTE	OT 40/120-277/1A0 4DIMLT2 E	SMD
EL-SL58-40	40	EBS-040S070DTE EBS-040S070BTE	OT 40/120-277/1A0 4DIMLT2 E	SMD
EL-SL58-50	50	EBS-080S070D TE EBS-080S070BTE	OT 60/170-240/1A0 4DIMLT2 E	SMD
EL-SL58-60	60	EBS-080S070DTE EBS-080S070BTE	OT 60/170-240/1A0 4DIMLT2 E	SMD
EL-SL58-70	70	EBS-080S070D TE EBS-080S070BTE	OT 90/170-240/1A0 4DIMLT2 E	SMD

EL-SL58-80	80	EBS-080S070D TE EBS-080S070BTE	OT 90/170-240/1A0 4DIMLT2 E	SMD
EL-SL58-90	90	EBS-120S070DTE EBS-120S070BTE	OT 90/170-240/1A0 4DIMLT2 E	SMD
EL-SL58-100	100	EBS-120S070DTE EBS-120S070BTE	OT 165/170-240/1A0 4DIMLT2 E	SMD
EL-SL58-120	120	EBS-120S070DTE EBS-120S070BTE	OT 165/170-240/1A0 4DIMLT2 E	SMD
EL-SL11(Mini)- 20	20	EBS-040S070D TE EBS-040S070BTE	OT 40/120-277/1A0 4DIMLT2 E	SMD
EL-SL11(Mini)- 30	30	EBS-040S070DTE EBS-040S070BTE	OT 40/120-277/1A0 4DIMLT2 E	SMD
EL-SL11(Mini)- 40	40	EBS-040S070DTE EBS-040S070BTE	OT 40/120-277/1A0 4DIMLT2 E	SMD
EL-SL11(S)-50	50	EBS-080S070D TE EBS-080S070BTE	OT 60/170-240/1A0 4DIMLT2 E	SMD
EL-SL11(S)-60	60	EBS-080S070DTE EBS-080S070BTE	OT 60/170-240/1A0 4DIMLT2 E	SMD
EL-SL11(S)-70	70	EBS-080S070D TE EBS-080S070BTE	OT 90/170-240/1A0 4DIMLT2 E	SMD
EL-SL11(S)-80	80	EBS-080S070D TE EBS-080S070BTE	OT 90/170-240/1A0 4DIMLT2 E	SMD
EL-SL11(M)-90	90	EBS-120S070DTE EBS-120S070BTE	OT 90/170-240/1A0 4DIMLT2 E	SMD
EL-SL11(M)-100	100	EBS-120S070DTE EBS-120S070BTE	OT 165/170-240/1A0 4DIMLT2 E	SMD
EL-SL11(M)-120	120	EBS-120S070DTE EBS-120S070BTE	OT 165/170-240/1A0 4DIMLT2 E	SMD
EL-SL11(L)-150	150	EBS-160S070DTE EBS-160S070BTE	OT 165/170-240/1A0 4DIMLT2 E	SMD
EL-SL11(L)-160	160	EBS-160S070D TE EBS-160S070BTE	OT 165/170-240/1A0 4DIMLT2 E	SMD
EL-SL11(L)-180	180	EBS-120S070DTEX2 EBS-120S070BTEX2	OT 90/170-240/1A0 4DIMLT2 EX2	SMD
EL-SL11(L)-200	200	EBS-120S070DTEX2 EBS-120S070BTEX2	OT 165/170-240/1A0 4DIMLT2 EX2	SMD
EL-SL11(L)-220	220	EBS-120S070DTEX2 EBS-120S070BTEX2	OT 165/170-240/1A0 4DIMLT2 EX2	SMD
EL-SL11(L)-240	240	EBS-120S070DTEX2 EBS-120S070BTEX2	OT 165/170-240/1A0 4DIMLT2 EX2	SMD
EL-SL68(Mini)- 20	20	EBS-040S070D TE EBS-040S070BTE	OT 40/120-277/1A0 4DIMLT2 E	SMD
EL-SL68(Mini)- 30	30	EBS-040S070DTE EBS-040S070BTE	OT 40/120-277/1A0 4DIMLT2 E	SMD
EL-SL68(Mini)- 40	40	EBS-040S070DTE EBS-040S070BTE	OT 40/120-277/1A0 4DIMLT2 E	SMD
EL-SL68(S)-50	50	EBS-080S070D TE EBS-080S070BTE	OT 60/170-240/1A0 4DIMLT2 E	SMD
EL-SL68(S)-60	60	EBS-080S070DTE EBS-080S070BTE	OT 60/170-240/1A0 4DIMLT2 E	SMD
EL-SL68(S)-70	70	EBS-080S070D TE EBS-080S070BTE	OT 90/170-240/1A0 4DIMLT2 E	SMD
EL-SL68(S)-80	80	EBS-080S070D TE	OT 90/170-240/1A0 4DIMLT2	SMD

		EBS-080S070BTE	E	
EL-SL68(M)-90	90	EBS-120S070DTE EBS-120S070BTE	OT 90/170-240/1A0 4DIMLT2 E	SMD
EL-SL68(M)-100	100	EBS-120S070DTE EBS-120S070BTE	OT 165/170-240/1A0 4DIMLT2 E	SMD
EL-SL68(M)-120	120	EBS-120S070DTE EBS-120S070BTE	OT 165/170-240/1A0 4DIMLT2 E	SMD
EL-SL68(L)-150	150	EBS-160S070DTE EBS-160S070BTE	OT 165/170-240/1A0 4DIMLT2 E	SMD
EL-SL68(L)-160	160	EBS-160S070D TE EBS-160S070BTE	OT 165/170-240/1A0 4DIMLT2 E	SMD
EL-SL68(L)-180	180	EBS-120S070DTEX2 EBS-120S070BTEX2	OT 90/170-240/1A0 4DIMLT2 EX2	SMD
EL-SL68(L)-200	200	EBS-120S070DTEX2 EBS-120S070BTEX2	OT 165/170-240/1A0 4DIMLT2 EX2	SMD
EL-SL68(L)-220	220	EBS-120S070DTEX2 EBS-120S070BTEX2	OT 165/170-240/1A0 4DIMLT2 EX2	SMD
EL-SL68(L)-240	240	EBS-120S070DTEX2 EBS-120S070BTEX2	OT 165/170-240/1A0 4DIMLT2 EX2	SMD
EL-SL10(1)-30	30	EBS-040S105DTE EBS-040S105BTE	OT 40/120-277/1A0 4DIMLT2 E	COB
EL-SL10(1)-40	40	EBS-040S105DTE EBS-040S105BTE	OT 40/120-277/1A0 4DIMLT2 E	COB
EL-SL10(1)-50	50	EBS-080S105D TE EBS-080S105BTE	OT 60/170-240/1A0 4DIMLT2 E	COB
EL-SL10(1)-60	60	EBS-080S105DTE EBS-080S105BTE	OT 60/170-240/1A0 4DIMLT2 E	COB
EL-SL10(1)-70	70	EBS-080S105D TE EBS-080S105BTE	OT 90/170-240/1A0 4DIMLT2 E	COB
EL-SL10(1)-80	80	EBS-080S105D TE EBS-080S105BTE	OT 90/170-240/1A0 4DIMLT2 E	COB
EL-SL10(2)-90	90	EBS-120S105DTE EBS-120S105BTE	OT 90/170-240/1A0 4DIMLT2 E	COB
EL-SL10(2)-100	100	EBS-120S105DTE EBS-120S105BTE	OT 165/170-240/1A0 4DIMLT2 E	COB
EL-SL10(2)-120	120	EBS-120S105DTE EBS-120S105BTE	OT 165/170-240/1A0 4DIMLT2 E	COB
EL-SL10(3)-150	150	EBS-160S105DTE EBS-160S105BTE	OT 165/170-240/1A0 4DIMLT2 E	COB
EL-GL01-20	20	EBS-040S070DTE EBS-040S070BTE	OT 40/120-277/1A0 4DIMLT2 E	SMD
EL-GL01-30	30	EBS-040S070DTE EBS-040S070BTE	OT 40/120-277/1A0 4DIMLT2 E	SMD
EL-GL01-40	40	EBS-040S070DTE EBS-040S070BTE	OT 40/120-277/1A0 4DIMLT2 E	SMD
EL-GL01-50	50	EBS-080S070D TE EBS-080S070BTE	OT 60/170-240/1A0 4DIMLT2 E	SMD
EL-GL01-60	60	EBS-080S070DTE EBS-080S070BTE	OT 60/170-240/1A0 4DIMLT2 E	SMD
EL-GL01-70	70	EBS-080S070D TE EBS-080S070BTE	OT 90/170-240/1A0 4DIMLT2 E	SMD
EL-GL01-80	80	EBS-080S070D TE EBS-080S070BTE	OT 90/170-240/1A0 4DIMLT2 E	SMD

EL-GL01-90	90	EBS-120S070DTE EBS-120S070BTE	OT 90/170-240/1A0 4DIMLT2 E	SMD
EL-GL01-100	100	EBS-120S070DTE EBS-120S070BTE	OT 165/170-240/1A0 4DIMLT2 E	SMD



IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
<b>3.2 (0)</b>	<b>GENERAL TEST REQUIREMENTS</b>		P
3.2 (0.3)	More sections applicable .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Section/s:	¾
3.2 (0.5)	Components	(see Annex 1)	¾
<b>3.2 (0.7)</b>	<b>Information for luminaire design in light sources standards</b>		¾
3.2 (0.7.2)	Light source safety standard .....	EN 62031	¾
	Luminaire design in the light source safety standard		P

<b>3.4 (2)</b>	<b>CLASSIFICATION OF LUMINAIRES</b>		P
3.4 (2.2)	Type of protection .....	Class II	P
3.4 (2.3)	Degree of protection .....	IP66	¾
3.4 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	¾
3.4 (2.5)	Luminaire for normal use .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	¾
	Luminaire for rough service .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	¾
3.4 (-)	Modes of installation of road or street lighting		¾
	a) on a pipe	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	¾
	b) on a mast arm	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	¾
	c) on a post top	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	¾
	d) on span or suspension wires	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	¾
	e) on a wall	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	¾

<b>3.5 (3)</b>	<b>MARKING</b>		P
3.5 (3.2)	Mandatory markings		P
	Position of the marking		P
	Format of symbols/text		P
3.5 (3.3)	Additional information		P
	Language of instructions	English	P
3.5 (3.3.1)	Combination luminaires		N/A
3.5 (3.3.2)	Nominal frequency in Hz	50/60	P
3.5 (3.3.3)	Operating temperature		P
3.5 (3.3.5)	Wiring diagram		N/A
3.5 (3.3.6)	Special conditions		N/A
3.5 (3.3.7)	Metal halide lamp luminaire – warning		N/A
3.5 (3.3.8)	Limitation for semi-luminaires		N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.5 (3.3.9)	Power factor and supply current		P
3.5 (3.3.10)	Suitability for use indoors		N/A
3.5 (3.3.11)	Luminaires with remote control		N/A
3.5 (3.3.12)	Clip-mounted luminaire – warning		N/A
3.5 (3.3.13)	Specifications of protective shields		N/A
3.5 (3.3.14)	Symbol for nature of supply	~	P
3.5 (3.3.15)	Rated current of socket outlet		N/A
3.5 (3.3.16)	Rough service luminaire		N/A
3.5 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments	Type Y attachment	P
3.5 (3.3.18)	Non-ordinary luminaires with PVC cable		N/A
3.5 (3.3.19)	Protective conductor current in instruction if applicable		N/A
3.5 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N/A
3.5 (3.3.21)	Non-replaceable and non-user replaceable light sources information provided		P
3.5 (3.3.22)	Controllable luminaires, classification of insulation provided		N/A
3.5 (3.3.23)	Luminaire without controlgear provided with necessary information for selection of appropriate component		N/A
3.5 (3.3.24)	If not supplied with terminal block, information on the packaging		N/A
3.5 (3.4)	Test with water		P
	Test with hexane		P
	Legible after test		P
	Label attached		P
3.5 (-)	Additional information in instruction leaflet		P
	a) Design attitude		P
	b) Weight		P
	c) Overall dimensions		P
	d) Maximum projected area if applicable		P
	e) Cross-sectional area of wires if applicable		N/A
	f) Suitability for indoors use		N/A
	g) Dimensions of the compartment		N/A
	h) Torque setting to be applied to bolts or screws		P
	i) Maximum mounting height		P

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
<b>3.6 (4)</b>	<b>CONSTRUCTION</b>		P
3.6 (4.2)	Components replaceable without difficulty		P
3.6 (4.3)	Wireways smooth and free from sharp edges		P
<b>3.6 (4.4)</b>	<b>Lampholders</b>		N/A
3.6 (4.4.1)	Integral lampholder		N/A
3.6 (4.4.2)	Wiring connection		N/A
3.6 (4.4.3)	Lampholder for end-to-end mounting		N/A
3.6 (4.4.4)	Positioning		N/A
	- pressure test (N) .....		—
	After test the lampholder comply with relevant standard sheets and show no damage		N/A
	After test on single-capped lampholder the lampholder have not moved from its position and show no permanent deformation		N/A
	- bending test (N) .....		—
	After test the lampholder have not moved from its position and show no permanent deformation		N/A
3.6 (4.4.5)	Peak pulse voltage		N/A
3.6 (4.4.6)	Centre contact		N/A
3.6 (4.4.7)	Parts in rough service luminaires resistant to tracking		N/A
3.6 (4.4.8)	Lamp connectors		N/A
3.6 (4.4.9)	Caps and bases correctly used		N/A
3.6 (4.4.10)	Light source for lampholder or connection according IEC 60061 not connected another way		N/A
<b>3.6 (4.5)</b>	<b>Starter holders</b>		N/A
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A
<b>3.6 (4.6)</b>	<b>Terminal blocks</b>		N/A
	Tails		N/A
	Unsecured blocks		N/A
<b>3.6 (4.7)</b>	<b>Terminals and supply connections</b>		P
3.6 (4.7.1)	Contact to metal parts		P
3.6 (4.7.2)	Test 8 mm live conductor		P
	Test 8 mm earth conductor		N/A
3.6 (4.7.3)	Terminals for supply conductors		P

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.6 (4.7.3.1)	Welded method and material		N/A
	- stranded or solid conductor		N/A
	- spot welding		N/A
	- welding between wires		N/A
	- Type Z attachment		N/A
	- 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
3.6 (4.7.4)	Terminals other than supply connection		P
3.6 (4.7.5)	Heat-resistant wiring/sleeves		N/A
3.6 (4.7.6)	Multi-pole plug		N/A
	- test at 30 N		N/A
<b>3.6 (4.8)</b>	<b>Switches</b>		N/A
	- adequate rating		N/A
	- adequate fixing		N/A
	- polarized supply		N/A
	- compliance with IEC 61058-1 for electronic switches		N/A
<b>3.6 (4.9)</b>	<b>Insulating lining and sleeves</b>		P
3.6 (4.9.1)	Retainment		P
	Method of fixing .....: Heat-shrinkable tube		P
3.6 (4.9.2)	Insulated linings and sleeves:		P
	Resistant to a temperature > 20 °C to the wire temperature or		P
	a) & c) Insulation resistance and electric strength		N/A
	b) Ageing test. Temperature (°C) .....:		N/A
<b>3.6 (4.10)</b>	<b>Double or reinforced insulation</b>		P
3.6 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		P
	Safe installation fixed luminaires		P
	Capacitors and switches		N/A
	Interference suppression capacitors according to IEC 60384-14		N/A
3.6 (4.10.2)	Assembly gaps:		P
	- not coincidental		P

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- no straight access with test probe		P
3.6 (4.10.3)	Retainment of insulation:		P
	- fixed		P
	- unable to be replaced; luminaire inoperative		P
	- sleeves retained in position		P
	- lining in lampholder		N/A
3.6 (4.10.4)	Protective impedance device		N/A
	Double or reinforced insulation bridged by appropriate and at least two resistors or two Y2 capacitors or one Y1 capacitor		N/A
	Y1 or Y2 capacitors comply with IEC 60384-14		N/A
	Resistors comply with test (a) in 14.1 of IEC 60065		N/A
<b>3.6 (4.11)</b>	<b>Electrical connections and current-carrying parts</b>		P
3.6 (4.11.1)	Contact pressure		P
3.6 (4.11.2)	Screws:		N/A
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
3.6 (4.11.3)	Screw locking:		N/A
	- spring washer		N/A
	- rivets		N/A
3.6 (4.11.4)	Material of current-carrying parts		P
3.6 (4.11.5)	No contact to wood or mounting surface		P
3.6 (4.11.6)	Electro-mechanical contact systems		P
<b>3.6 (4.12)</b>	<b>Screws and connections (mechanical) and glands</b>		P
3.6 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		N/A
	Torque test: torque (Nm); part.....:	1,2Nm; Fixing driver	P
	Torque test: torque (Nm); part.....:	17 Nm; Fixing arm	P
	Torque test: torque (Nm); part.....:		N/A
3.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
3.6 (4.12.4)	Locked connections:		N/A
	- fixed arms; torque (Nm).....:		N/A
	- lampholder; torque (Nm).....:		N/A
	- push-button switches; torque 0,8 Nm.....:		N/A
3.6 (4.12.5)	Screwed glands; force (Nm).....:	6,25	P

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
<b>3.6 (4.13)</b>	<b>Mechanical strength</b>		P
3.6 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm) .....		N/A
	- other parts; energy (Nm).....	Enclosure+ Glass cover; 0,7	P
	1) live parts		P
	2) linings		N/A
	3) protection		P
	4) covers		P
3.6 (4.13.2)	Metal parts have adequate mechanical strength		P
3.6 (4.13.3)	Straight test finger		P
3.6 (4.13.4)	Rough service luminaires		N/A
	- IP54 or higher		N/A
	a) fixed		N/A
	b) hand-held		N/A
	c) delivered with a stand		N/A
	d) for temporary installations and suitable for mounting on a stand		N/A
3.6 (4.13.6)	Tumbling barrel		N/A
<b>3.6 (4.14)</b>	<b>Suspensions, fixings and means of adjusting</b>		P
3.6 (4.14.1)	Mechanical load:		P
	A) four times the weight		P
	B) torque 2,5 Nm		P
	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
3.6 (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
3.6 (4.14.3)	Adjusting devices:		N/A
	- flexing test; number of cycles.....		N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- strands broken .....		N/A
	- electric strength test afterwards		N/A
3.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N/A
3.6 (4.14.5)	Guide pulleys		N/A
3.6 (4.14.6)	Strain on socket-outlets		N/A
<b>3.6 (4.15)</b>	<b>Flammable materials</b>		P
	- glow-wire test 650°C.....	See Test Table 3.15 (13.3.2)	P
	- spacing <sup>3</sup> 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
3.6 (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>3.6 (4.16)</b>	<b>Luminaires for mounting on normally flammable surfaces</b>		P
	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
3.6 (4.16.1)	Lamp control gear spacing:		N/A
	- spacing 35 mm		N/A
	- spacing 10 mm		N/A
3.6 (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
3.6 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	N/A
<b>3.6 (4.17)</b>	<b>Drain holes</b>		N/A
	Clearance at least 5 mm		N/A
<b>3.6 (4.18)</b>	<b>Resistance to corrosion</b>		P
3.6 (4.18.1)	- rust-resistance		P

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.6 (4.18.2)	- season cracking in copper		N/A
3.6 (4.18.3)	- corrosion of aluminium		P
3.6 (4.19)	Igniters compatible with ballast		N/A
3.6 (4.20)	Rough service vibration		N/A
<b>3.6 (4.21)</b>	<b>Protective shield</b>		N/A
3.6 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N/A
	Shield of glass if tungsten halogen lamps		N/A
3.6 (4.21.2)	Particles from a shattering lamp not impair safety		N/A
3.6 (4.21.3)	No direct path		N/A
3.6 (4.21.4)	Impact test on shield		N/A
	Glow-wire test on lamp compartment .....	See Test Table 3.15 (13.3.2)	N/A
3.6 (4.22)	Attachments to lamps not cause overheating or damage		N/A
3.6 (4.23)	Semi-luminaires comply Class II		N/A
<b>3.6 (4.24)</b>	<b>Photobiological hazards</b>		P
3.6 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		N/A
3.6 (4.24.2)	Retinal blue light hazard		P
	Class of risk group assessed according to IEC/TR 62778 .....	Refer to Appendix 2	—
	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>3.6 (4.25)</b>	<b>Mechanical hazard</b>		P
	No sharp point or edges		P
<b>3.6 (4.26)</b>	<b>Short-circuit protection</b>		N/A
3.6 (4.26.1)	Adequate means of uninsulated accessible SELV parts		N/A
3.6 (4.26.2)	Short-circuit test with test chain according 4.26.3		N/A
	Test chain not melt through		N/A



IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Test sample not exceed values of Table 12.1 and 12.2		N/A
<b>3.6 (4.27)</b>	<b>Terminal blocks with integrated screwless earthing contacts</b>		N/A
	Test according Annex V		N/A
	Pull test of terminal fixing (20 N)		N/A
	After test, resistance < 0,05 W		N/A
	Pull test of mechanical connection (50 N)		N/A
	After test, resistance < 0,05 W		N/A
	Voltage drop test, resistance < 0,05 W		N/A
<b>3.6 (4.28)</b>	<b>Fixing of thermal sensing control</b>		N/A
	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>3.6 (4.29)</b>	<b>Luminaires with non-replaceable light source</b>		N/A
	Not possible to replace light source		N/A
	Live part not accessible after parts have been opened by hand or tools		N/A
<b>3.6 (4.30)</b>	<b>Luminaires with non-user replaceable light source</b>		P
	If protective cover provide protection against electric shock and marked with “caution, electric shock risk” symbol:		P
	Minimum two fixing means		P
<b>3.6 (4.31)</b>	<b>Insulation between circuits</b>		P
	Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3		P
	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
<b>3.6 (4.31.1)</b>	<b>SELV circuits</b>		P
	Used SELV source		P
	Voltage ≤ ELV		N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Insulating of SELV circuits from LV supply		P
	Insulating of SELV circuits from other non SELV circuits		P
	Insulating of SELV circuits from FELV		N/A
	Insulating of SELV circuits from other SELV circuits		N/A
	SELV circuits insulated from accessible parts according Table X.1		P
	Plugs not able to enter 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
3.6 (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 enter socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A
	Socket-outlets does not have protective conductor contact		N/A
3.6 (4.31.3)	Other circuits		P
	Other circuits insulated from accessible parts according Table X.1		P
	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		N/A
3.6 (4.32)	Overvoltage protective devices		N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	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
3.6.1 (-)	At least IP X3 or X5 respectively. IP ..... :	IP66	P
	Column-integrated luminaires:		N/A
	- parts below 2,5 m. IP ..... :		N/A
	- parts above 2,5 m. IP ..... :		N/A
3.6.2 (-)	Suspension on span wires		N/A
3.6.3 (-)	Means for attaching the luminaire or external parts to its support appropriate to the weight		N/A
3.6.3.1 (-)	Static load test		P
	- drag coefficient..... :	1,2	P
	- loaded area (m²)..... :	0,246	P
	- used load (N)..... :	488,91	P
	- measured deformation (cm/m) ..... :	0,2	P
	- no rotation		P
3.6.4 (-)	Adjustable lampholders		N/A
3.6.5 (-)	Luminaires installed above 5 m, glass covers shall be:		P
	a) glass that fractures into small pieces (test according to 3.6.5.1), or		N/A
	b) glass having a high impact shock resistance (test according to 3.6.5.2), or		P
	c) protected by any means to retain glass fragments		N/A
	For tunnel luminaires 3.6.5.1 apply		N/A
	Method of protection declared by the manufacturer		N/A
3.6.5.1 (-)	Protection by the use of glass that fractures into small pieces		N/A
	- number of particles is more than 40..... :		N/A
3.6.5.2 (-)	Protection by the use of high impact resistant glass		P
3.6.5.2.1 (-)	Glass covers have high mechanical strength		P
	Test according IEC 62262 with test apparatus according IEC 60068-2-75 with impact energy of 5J on preconditioned sample	Comply with IK 10	P
3.6.5.2.2 (-)	Glass covers not break into large pieces		P
	- test according 3.6.5.1, number of particles is more than 20..... :	78	P
3.6.6 (-)	Connection compartment of column-integrated luminaire		N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- provides adequate space		N/A
	- means for attachment		N/A
	- means for attachment of metal corrosion-resistant		N/A
3.6.7 (-)	Compliance with ISO standard or other..... :		N/A
3.6.8 (-)	Doors of column-integrated luminaires:		N/A
	- corrosion-resistant		N/A
	- opening only possible for an authorized person		N/A
	- impact test 5 Nm		N/A
	- sample show no damage		N/A
3.6.9 (-)	Column-integrated luminaire:		N/A
	- dimension of the cable entry slot (mm)..... :		N/A
	- cable path from the slot to the connection compartment (mm) ..... :		N/A
	- cable path free from obstruction that might cause abrasion of the cable		N/A

<b>3.7 (11)</b>	<b>CREEPAGE DISTANCES AND CLEARANCES</b>		P
3.7 (11.2.1)	Impulse withstand category (Normal category II)	Category II <input checked="" type="checkbox"/> Category III <input type="checkbox"/>	¾
	Category III according Annex U		N/A
	Protected against pollution, reduced creepage and clearance according Annex P of IEC 61347-1		N/A
3.7 (11.2.2)	Creepage distances for frequency up to 30 kHz	See Test Table 3.7 (11.2) I	P
	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 3.7 (11.2) II	N/A
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 3.7 (11.2) II	N/A
3.7 (11.2.3)	Clearances for frequency up to 30 kHz	See Test Table 3.7 (11.2) I	P
	Clearances distances for frequency over 30 kHz:		N/A
	- Controlgear marked with $U_P$	See Test Table 3.7 (11.2) II	N/A
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 3.7 (11.2) II	N/A

<b>3.8 (7)</b>	<b>PROVISION FOR EARTHING</b>		N/A
3.8 (7.2.1 + 7.2.3)	Accessible metal parts		N/A
	Metal parts in contact with supporting surface		N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Resistance < 0,5 W.....:		N/A
	Self-tapping screws used		N/A
	Thread-forming screws		N/A
	Thread-forming screw used in a grove		N/A
	Earth makes contact first		N/A
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
	Protective earthing of the luminaire not via built-in control gear		N/A
3.8 (7.2.2 + 7.2.3)	Earth continuity in joints, etc.		N/A
3.8 (7.2.4)	Locking of clamping means		N/A
	Compliance with 4.7.3		N/A
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
3.8 (7.2.5)	Earth terminal integral part of connector socket		N/A
3.8 (7.2.6)	Earth terminal adjacent to mains terminals		N/A
3.8 (7.2.7)	Electrolytic corrosion of the earth terminal		N/A
3.8 (7.2.8)	Material of earth terminal		N/A
	Contact surface bare metal		N/A
3.8 (7.2.10)	Class II luminaire for looping-in		N/A
	Double or reinforced insulation to functional earth		N/A
3.8 (7.2.11)	Earthing core coloured green-yellow		N/A
	Length of earth conductor		N/A
3.8.1 (-)	Attachment prevented from rotation		N/A
<b>3.9 (14)</b>	<b>SCREW TERMINALS</b>		P
	Separately approved; component list	(see Annex 1)	P
	Part of the luminaire	(see Annex 3)	N/A
<b>3.9 (15)</b>	<b>SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS</b>		P
	Separately approved; component list .....	(see Annex 1)	N/A
	Part of the luminaire .....	(see Annex 4)	P
<b>3.10 (5)</b>	<b>EXTERNAL AND INTERNAL WIRING</b>		P
<b>3.10 (5.2)</b>	<b>Supply connection and external wiring</b>		P

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.10 (5.2.1)	Means of connection.....:	Supply cord	P
	Outdoor luminaire has not PVC insulated external wiring if not class III or SELV $\leq 25$ V a.c./60 V d.c. or protected from outdoor environment		N/A
3.10 (5.2.2)	Type of cable.....:	See Annex 1	P
	Nominal cross-sectional area (mm <sup>2</sup> ).....:	See Annex 1	P
	Cables equal to IEC 60227 or IEC 60245		P
3.10 (5.2.3)	Type of attachment, X, Y or Z	Type Y	P
3.10 (5.2.5)	Type Z not connected to screws		N/A
3.10 (5.2.6)	Cable entries:		P
	- suitable for introduction		P
	- adequate degree of protection		P
3.10 (5.2.7)	Cable entries through rigid material have rounded edges		P
3.10 (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
3.10 (5.2.9)	Locking of screwed bushings		N/A
3.10 (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
3.10 (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

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Labyrinth type anchorages		N/A
3.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment	Type Y	P
3.10 (5.2.10.3)	Tests:		P
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N) .....: 60		P
	- torque test: torque (Nm).....: 0,25		P
	- displacement $\pm$ 2 mm		P
	- no movement of conductors		P
	- no damage of cable or cord		P
	- function independent of electrical connection		P
3.10 (5.2.11)	External wiring passing into luminaire		P
3.10 (5.2.12)	Looping-in terminals		N/A
3.10 (5.2.13)	Wire ends not tinned		P
	Wire ends tinned: no cold flow		N/A
3.10 (5.2.14)	Mains plug same protection		N/A
	Class III luminaire plug		N/A
	No unsafe compatibility		N/A
3.10 (5.2.16)	Appliance inlets (IEC 60320)		N/A
	Installation couplers (IEC 61535)		N/A
	Other appliance inlet or connector according relevant IEC standard		N/A
3.10 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
3.10 (5.2.18)	Used plug in accordance with		N/A
	- IEC 60083		N/A
	- other standard		N/A
<b>3.10 (5.3)</b>	<b>Internal wiring</b>		P
3.10 (5.3.1)	Internal wiring of suitable size and type		P
	Through wiring		N/A
	- not delivered/ mounting instruction		N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- factory assembled		N/A
	- socket outlet loaded (A).....:		N/A
	- temperatures.....:	(see Annex 2)	N/A
	Green-yellow for earth only		N/A
3.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		P
	Cross-sectional area (mm <sup>2</sup> ) .....	(see Annex 1)	P
	Insulation thickness (mm) .....	(see Annex 1)	P
	Extra insulation added where necessary		N/A
3.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		P
	Cross-sectional area (mm <sup>2</sup> ) .....	(see Annex 1)	P
3.10 (5.3.1.3)	Double or reinforced insulation for class II		N/A
3.10 (5.3.1.4)	Conductors without insulation		N/A
3.10 (5.3.1.5)	SELV current-carrying parts		P
3.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		N/A
3.10 (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
3.10 (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
3.10 (5.3.4)	Joints and junctions effectively insulated		N/A
3.10 (5.3.5)	Strain on internal wiring		N/A
3.10 (5.3.6)	Wire carriers		N/A
3.10 (5.3.7)	Wire ends not tinned		P
	Wire ends tinned: no cold flow		N/A
<b>3.10 (5.4)</b>	<b>Test to determine suitability of conductors having a reduced cross-sectional area</b>		N/A



IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	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
3.10.1 (-)	Cord anchorage if applicable		P
	- pull test: 25 times; pull (N) ..... :	60	P
	- torque test: torque (Nm)..... :	0,25	P
<b>3.11 (8)</b>	<b>PROTECTION AGAINST ELECTRIC SHOCK</b>		<b>P</b>
3.11 (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 starterholders 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		P
	Double-ended high-pressure discharge lamp		N/A
	Relevant warning according to 3.2.18 fitted to the luminaire		N/A
3.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N/A
3.11 (8.2.3.a)	Class II luminaire:		P
	- basic insulated metal parts not accessible during starter or lamp replacement		P
	- basic insulation not accessible other than during starter or lamp replacement		N/A
	- glass protective shields not used as supplementary insulation		N/A
3.11 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.11 (8.2.3.c)	SELV circuits with exposed current carrying parts:		N/A
	Ordinary luminaire:		N/A
	- voltage under load (V) .....		N/A
	- no-load 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
	- nominal voltage (V) .....		N/A
	Class III luminaire only for connection to SELV		N/A
	Class III luminaire not provided with means for protective earthing		N/A
3.11 (8.2.4)	Portable luminaire has protection independent of supporting surface		N/A
3.11 (8.2.5)	Compliance with the standard test finger or relevant probe		P
3.11 (8.2.6)	Covers reliably secured		P
3.11 (8.2.7)	Luminaire other than below with capacitor > 0,5 nF not exceed 50 V 1 min after disconnection		P
	Portable luminaire with capacitor > 0,1 nF (0.25) not exceed 34 V 1 s after disconnection		N/A
	Other luminaires with capacitor > 0,1 nF (0.25) with plug and track adaptors not exceed 60 V 5 s after disconnection		N/A

<b>3.12 (12)</b>	<b>ENDURANCE TEST AND THERMAL TEST</b>		<b>P</b>
3.12.2 (-)	If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 3.13		¾
<b>3.12 (12.2)</b>	<b>Selection of lamps and ballasts</b>		<b>¾</b>
	Lamp used according Annex B	(Lamp used see Annex 2)	¾
	Controlgear if separate and not supplied	(Controlgear used see Annex 2)	¾
<b>3.12 (12.3)</b>	<b>Endurance test</b>		<b>P</b>
	a) mounting-position .....	Normal position	¾
	b) test temperature (°C) .....	60	¾
	c) total duration (h) .....	240	¾
	d) supply voltage (V) .....	264	¾
	d) if not equipped with controlgear, constant voltage/current (V) or (A) .....		¾

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	e) luminaire ceases to operate		¾
3.12 (12.3.2)	After endurance test:		P
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N/A
	- marking legible		P
	- no cracks, deformation etc.		P
3.12 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
3.12 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	P
3.12 (12.6)	Thermal test (failed lamp control gear condition):		N/A
3.12 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A) .....		¾
	- case of abnormal conditions .....		¾
	- electronic lamp control gear		N/A
	- measured winding temperature (°C): at 1,1 Un .....		¾
	- measured mounting surface temperature (°C) at 1,1 Un .....		N/A
	- calculated mounting surface temperature (°C) .....		N/A
	- track-mounted luminaires		N/A
3.12 (12.6.2)	Temperature sensing control		N/A
	- case of abnormal conditions .....		¾
	- 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
3.12 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N/A
3.12 (12.7.1)	Luminaire without temperature sensing control		N/A
3.12 (12.7.1.1)	Luminaire with fluorescent lamp ≤ 70W		N/A
	Test method 12.7.1.1 or Annex W .....		¾
	Test according to 12.7.1.1:		N/A
	- case of abnormal conditions .....		¾

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- Ballast failure at supply voltage (V) .....		¾
	- 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 .....		¾
	- measured winding temperature (°C): at 1,1 Un .....		¾
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un .....		¾
	- calculated temperature of fixing point/exposed part (°C) .....		¾
	Ball-pressure test.....	See Test Table 3.15 (13.2.1)	N/A
3.12 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		N/A
	- case of abnormal conditions .....		¾
	- measured winding temperature (°C): at 1,1 Un .....		¾
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un .....		¾
	- calculated temperature of fixing point/exposed part (°C) .....		¾
	Ball-pressure test.....	See Test Table 3.15 (13.2.1)	N/A
3.12 (12.7.1.3)	Luminaire with short circuit proof transformers ≤ 10 VA		N/A
	- case of abnormal conditions .....		¾
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
3.12 (12.7.2)	Luminaire with temperature sensing control		N/A
	- thermal link.....	Yes <input type="checkbox"/> No <input type="checkbox"/>	¾
	- manual reset cut-out.....	Yes <input type="checkbox"/> No <input type="checkbox"/>	¾
	- auto reset cut-out .....	Yes <input type="checkbox"/> No <input type="checkbox"/>	¾
	- case of abnormal conditions .....		¾
	- highest measured temperature of fixing point/exposed part (°C): .....		¾
	Ball-pressure test.....	See Test Table 3.15 (13.2.1)	N/A
3.12.1 (-)	Temperature reduction if for outdoor use only		P
3.12.2 (-)	(See above)		¾

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.12.3 (-)	Glass covers used within the thermal limits declared by the glass manufacturer		P

<b>3.13 (9)</b>	<b>RESISTANCE TO DUST AND MOISTURE</b>		P
3.13.1 (-)	If IP > IP 20 the order of tests as specified in clause 3.12		P
3.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP.....:	IP66	¾
	- mounting position during test.....:	Normal position	¾
	- fixing screws tightened; torque (Nm).....:	2/3 torque	¾
	- tests according to clauses .....	cl 9.2.2 & cl 9.2.7	¾
	- 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		P
	c.2) For luminaires with drain holes – no hazardous water entry		N/A
	d) no water in watertight or pressure watertight luminaire		N/A
	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		N/A
	g) no damage of protective shield or glass envelope		P
3.13 (9.3)	Humidity test 48 h		P

<b>3.14 (10)</b>	<b>INSULATION RESISTANCE AND ELECTRIC STRENGTH</b>		P
3.14 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø .....	Covered by metal foil	¾
	Insulation resistance (MW).....:	See below	¾
	SELV		P
	- between current-carrying parts of different polarity:		N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- between current-carrying parts and mounting surface .....	100 MW	P
	- between current-carrying parts and metal parts of the luminaire.....	100 MW	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		P
	- between live parts of different polarity .....	100 MW	P
	- between live parts and mounting surface .....	100 MW	P
	- between live parts and metal parts.....	100 MW	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 .....	100 MW	P
	- Insulation bushings as described in Section 5 .....		N/A
3.14 (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) .....	See below	P
	SELV		P
	- between current-carrying parts of different polarity :		N/A
	- between current-carrying parts and mounting surface .....	500V	P
	- 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		P
	- between live parts of different polarity.....	1480V	P
	- between live parts and mounting surface .....	2960V/1800V	P
	- between live parts and metal parts.....	2960V/1800V	P

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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 .....	1480V	P
	- Insulation bushings as described in Section 5 .....		N/A
3.14 (10.3)	Touch current or protective conductor current (mA):	Touch current: 0,071	P

<b>3.15 (13)</b>	<b>RESISTANCE TO HEAT, FIRE AND TRACKING</b>		P
3.15 (13.2.1)	Ball-pressure test.....:	See Test Table 3.15 (13.2.1)	P
3.15 (13.3.1)	Needle-flame test (10 s) .....	See Test Table 3.15 (13.3.1)	P
3.15 (13.3.2)	Glow-wire test (650°C).....:	See Test Table 3.15 (13.3.2)	P
3.15 (13.4)	Proof tracking test (IEC 60112).....:	See Test Table 3.15 (13.4)	N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

3.7 (11.2)	TABLE I: Creepage distances and clearances							P
	Minimum distances (mm) for a.c. up to 30 kHz sinusoidal voltages							P
	Applicable part of IEC 60598-1 Table 11.1.A*, 11.1.B* and 11.2*							P
	Insulation type **	Measured clearance	Required		Measured creepage	Required		
			clearance	*Table		creepage	*Table	
Distance 1:	B	6,1	3,0	11.1.B	6,1	4,0	11.1.A	
Working voltage (V) .....					U <sub>out</sub> : 400		¾	
PTI .....					< 600 ☒      ≥ 600 ☐		¾	
Pulse voltage or U <sub>P</sub> if applicable (kV) .....					N/A		¾	
Supplementary information: Current-carrying of different polarity (LED module)								
Distance 2:	B	6,5	3,0	11.1.B	6,5	4,0	11.1.A	
Working voltage (V) .....					U <sub>out</sub> : 400		¾	
PTI .....					< 600 ☒      ≥ 600 ☐		¾	
Pulse voltage or U <sub>P</sub> if applicable (kV) .....					N/A		¾	
Supplementary information: Current-carrying to enclosure (LED module)								
Distance 3:	B	>5,0	1,5	11.1.B	>5,0	2,5	11.1.A	
Working voltage (V) .....					240		¾	
PTI .....					< 600 ☒      ≥ 600 ☐		¾	
Pulse voltage or U <sub>P</sub> if applicable (kV) .....					N/A		¾	
Supplementary information: Live parts of different polarity								
Distance 4:	R	5,1	3,0	11.1.B	6,0	5,0	11.1.A	
Working voltage (V) .....					240		¾	
PTI .....					< 600 ☒      ≥ 600 ☐		¾	
Pulse voltage or U <sub>P</sub> if applicable (kV) .....					N/A		¾	
Supplementary information: Live parts to enclosure								

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

<b>3.7 (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:							



IEC 60598-2-3							
Clause	Requirement + Test				Result - Remark		Verdict
Working voltage (V) .....							3/4
Frequency if applicable (kHz) .....							3/4
PTI .....					< 600 <input type="checkbox"/> ≥ 600 <input type="checkbox"/>		3/4
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) .....							3/4
Supplementary information:							
Distance 2:							
Working voltage (V) .....							3/4
Frequency if applicable (kHz) .....							3/4
PTI .....					< 600 <input type="checkbox"/> ≥ 600 <input type="checkbox"/>		3/4
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) .....							3/4
Supplementary information:							
Distance 3:							
Working voltage (V) .....							3/4
Frequency if applicable (kHz) .....							3/4
PTI .....					< 600 <input type="checkbox"/> ≥ 600 <input type="checkbox"/>		3/4
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) .....							3/4
Supplementary information:							

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

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

3.15 (13.2.1)	TABLE: Ball Pressure Test of Thermoplastics			P
Allowed impression diameter (mm) .....		2		¾
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	
Electro-mechanical contact system	See Annex 1	125	1,17	
Screwless terminal	See Annex 1	125	1,21	
Connector on LED module	See Annex 1	125	1,08	
PC cover	See Annex 1	125	1,05	
Supplementary information: N/A				

<b>3.15 (13.3.1)</b>	<b>TABLE: Needle-flame test (IEC 60695-11-5)</b>				P
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
Electro-mechanical contact system	See Annex 1	10	No	0	P
Screwless terminal	See Annex 1	10	No	0	P
Connector on LED module	See Annex 1	10	No	0	P
Supplementary information:					

3.15 (13.3.2)	TABLE: Glow-wire test (IEC 60695-2-11)				P
Glow wire temperature .....:			650°C		¾
Object/ Part No./ Material	Manufacturer/ trademark		Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
Heat-shrinkable tube	See Annex 1		No	0	P
Lens	See Annex 1		No	0	P
PC cover	See Annex 1		No	0	P
Supplementary information: N/A					

<b>3.15 (13.4)</b>	<b>TABLE: Proof tracking test (IEC 60112)</b>			N/A
<b>Test voltage PTI .....</b>		175 V		¾
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens		Verdict

IEC 60598-2-3					
Clause	Requirement + Test			Result - Remark	Verdict
Supplementary information:					

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 1		TABLE: Critical components information					P
Object / part No.	Code	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity <sup>1)</sup>	
(See Data form for electrical equipment and machinery)							
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							

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	TABLE: Thermal tests of Section 12		P
	Type reference .....	EL-SL18LA-160	¾
	Lamp used.....	LED module	¾
	Lamp control gear used .....	LED driver	¾
	Mounting position of luminaire.....	Normal position	¾
	Supply wattage (W) .....	159,5	¾
	Supply current (A).....	0,68	¾
	Temperatures in test 1 - 4 below are corrected for ta (°C) .....	50	¾
	- abnormal operating mode .....	Short-circuit output of LED controlgear	¾
1.12 (12.4)	- test 1: rated voltage .....	240 V	¾
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....	1,06 x 240 = 254,4 V	¾
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage .....	N/A	¾
	Through wiring or looping-in wiring loaded by a current of A during the test .....	N/A	¾
1.12 (12.5)	- test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....	1,1 x 240 = 264 V	¾

#### Temperature measurements (°C)

Part	Ambient	Cl. 12.4 – normal				Cl. 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
PC cover	50	¾	(88,1-10)	¾	ref	¾	¾
Switch	50	¾	(62,3-10)	¾	85	¾	¾
Internal wire (close to LED)	50	¾	(78,2-10)	¾	200	¾	¾
LED driver tc	50	(98,9-10)	¾	¾	90	78,7	100
Power cord	50	¾	(60,8-10)	¾	90	¾	¾
Mounting surface	50	¾	(58,6-10)	¾	90	51,2	130
SPD	50	¾	(61,2-10)	¾	90	¾	¾

Supplementary information: N/A

	Type reference .....	EL-SL18MA-40	¾
	Lamp used.....	LED module	¾

IEC 60598-2-3								
Clause	Requirement + Test				Result - Remark		Verdict	
	Lamp control gear used .....:				LED driver		¾	
	Mounting position of luminaire.....:				Normal position		¾	
	Supply wattage (W) .....:				42,3		¾	
	Supply current (A).....:				0,188		¾	
	Temperatures in test 1 - 4 below are corrected for ta (°C) .....:				50		¾	
	- abnormal operating mode.....:				Short-circuit output of LED controlgear		¾	
1.12 (12.4)	- test 1: rated voltage .....:				240 V		¾	
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....:				1,06 x 240 = 254,4 V		¾	
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage .....:				N/A		¾	
	Through wiring or looping-in wiring loaded by a current of A during the test .....:				N/A		¾	
1.12 (12.5)	- test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....:				1,1 x 240 = 264 V		¾	
Temperature measurements (°C)								
Part		Ambient	Cl. 12.4 – normal				Cl. 12.5 – abnormal	
			test 1	test 2	test 3	limit	test 4	limit
PC cover		50	¾	(64,2-10)	¾	ref	¾	¾
Switch		50	¾	(62,7-10)	¾	85	¾	¾
Internal wire (close to LED)		50	¾	(68,3-10)	¾	200	¾	¾
LED driver tc		50	(80,0-10)	¾	¾	90	72,6	100
Power cord		50	¾	(52,1-10)	¾	90	¾	¾
Mounting surface		50	¾	(51,3-10)	¾	90	50,2	130
SPD		50	¾	(61,6-10)	¾	90	¾	¾
Supplementary information: N/A								

	Type reference .....	EL-SL18MA-80	¾
	Lamp used.....	LED module	¾
	Lamp control gear used .....	LED driver	¾
	Mounting position of luminaire.....	Normal position	¾
	Supply wattage (W) .....	82,3	¾
	Supply current (A).....	0,34	¾

IEC 60598-2-3							
Clause	Requirement + Test				Result - Remark		Verdict
	Temperatures in test 1 - 4 below are corrected for ta (°C) .....				50		¾
	- abnormal operating mode .....				Short-circuit output of LED controlgear		¾
1.12 (12.4)	- test 1: rated voltage .....				240 V		¾
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....				1,06 x 240 = 254,4 V		¾
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage .....				N/A		¾
	Through wiring or looping-in wiring loaded by a current of A during the test .....				N/A		¾
1.12 (12.5)	- test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....				1,1 x 240 = 264 V		¾
Temperature measurements (°C)							
Part	Ambient	Cl. 12.4 – normal				Cl. 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
PC cover	50	¾	(75,2-10)	¾	ref	¾	¾
Switch	50	¾	(57,3-10)	¾	85	¾	¾
Internal wire (close to LED)	50	¾	(69,4-10)	¾	200	¾	¾
LED driver tc	50	(82,6-10)	¾	¾	90	73,4	100
Power cord	50	¾	(58,8-10)	¾	90	¾	¾
Mounting surface	50	¾	(59,2-10)	¾	90	52,1	130
SPD	50	¾	(61,5-10)	¾	90	¾	¾
Supplementary information: N/A							

	Type reference .....	EL-SL58-120	¾
	Lamp used.....	As delivered	¾
	Lamp control gear used .....	Electronic LED driver	¾
	Mounting position of luminaire.....	Normal position	¾
	Supply wattage (W) .....	122,5	¾
	Supply current (A).....	0,49	¾
	Temperatures in test 1 - 4 below are corrected for $t_a$ (°C) .....	50	¾
	- abnormal operating mode .....	Short-circuit output of LED controlgear	¾
1.12 (12.4)	- test 1: rated voltage .....	240 V	¾

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....	1,06 x 240 = 254,4 V	¾
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage .....	N/A	¾
	Through wiring or looping-in wiring loaded by a current of A during the test .....	N/A	¾
1.12 (12.5)	- test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....	1,1 x 240 = 264 V	¾

#### Temperature measurements (°C)

Part	Ambient	Cl. 12.4 – normal				Cl. 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
PC cover	50	¾	(82,7-10)	¾	ref	¾	¾
Switch	50	¾	(59,4-10)	¾	85	¾	¾
Internal wire (close to LED)	50	¾	(72,2-10)	¾	200	¾	¾
LED driver tc	50	(93,4-10)	¾	¾	90	76,9	100
Power cord	50	¾	(70,8-10)	¾	90	¾	¾
Mounting surface	50	¾	(52,4-10)	¾	90	50,3	130
SPD	50	¾	(58,7-10)	¾	90	¾	¾

Supplementary information: N/A

	Type reference .....	EL-SL68(L)-240	¾
	Lamp used.....	As delivered	¾
	Lamp control gear used .....	Electronic LED driver	¾
	Mounting position of luminaire.....	Normal position	¾
	Supply wattage (W) .....	239,8	¾
	Supply current (A).....	0,961	¾
	Temperatures in test 1 - 4 below are corrected for ta (°C) .....	50	¾
	- abnormal operating mode .....	Short-circuit output of LED controlgear	¾
1.12 (12.4)	- test 1: rated voltage .....	240 V	¾
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....	1,06 x 240 = 254,4 V	¾
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage .....	N/A	¾
	Through wiring or looping-in wiring loaded by a current of A during the test .....	N/A	¾



IEC 60598-2-3							
Clause	Requirement + Test				Result - Remark		Verdict
1.12 (12.5)	- test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....:				1,1 x 240 = 264 V		¾
Temperature measurements (°C)							
Part	Ambient	Cl. 12.4 – normal				Cl. 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Terminal	50	¾	(73,4-10)	¾	110	¾	¾
Internal wire	50	¾	(108,4-10)	¾	200	¾	¾
tc	50	(96,0-10)	¾	¾	90	75,7	100
Power cord	50	¾	(57,6-10)	¾	90	¾	¾
SPD	50	¾	(78,0-10)	¾	90	¾	¾
Mounting surface	50	¾	(61,0-10)	¾	90	52,3	130
Electro-mechanical contactor	50	¾	(75,3-10)	¾	85	¾	¾
Screwless terminal	50	¾	(70,3-10)	¾	85	¾	¾
Supplementary information: N/A							

	Type reference .....	EL-SL68(Mini)-20	¾
	Lamp used.....	As delivered	¾
	Lamp control gear used .....	Electronic LED driver	¾
	Mounting position of luminaire.....	Normal position	¾
	Supply wattage (W) .....	29,3	¾
	Supply current (A).....	0,139	¾
	Temperatures in test 1 - 4 below are corrected for ta (°C) .....	50	¾
	- abnormal operating mode .....	Short-circuit output of LED controlgear	¾
1.12 (12.4)	- test 1: rated voltage .....	240 V	¾
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....	1,06 x 240 = 254,4 V	¾
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage .....	N/A	¾
	Through wiring or looping-in wiring loaded by a current of A during the test .....	N/A	¾
1.12 (12.5)	- test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....	1,1 x 240 = 264 V	¾
Temperature measurements (°C)			

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

Part	Ambient	Cl. 12.4 – normal				Cl. 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Terminal	50	$\frac{3}{4}$	(62,2-10)	$\frac{3}{4}$	110	$\frac{3}{4}$	$\frac{3}{4}$
Internal wire	50	$\frac{3}{4}$	(67,3-10)	$\frac{3}{4}$	200	$\frac{3}{4}$	$\frac{3}{4}$
tc	50	(86,7-10)	$\frac{3}{4}$	$\frac{3}{4}$	90	69,2	100
Power cord	50	$\frac{3}{4}$	(57,4-10)	$\frac{3}{4}$	90	$\frac{3}{4}$	$\frac{3}{4}$
SPD	50	$\frac{3}{4}$	(58,0-10)	$\frac{3}{4}$	90	$\frac{3}{4}$	$\frac{3}{4}$
Mounting surface	50	$\frac{3}{4}$	(58,9-10)	$\frac{3}{4}$	90	51,1	130
Electro-mechanical contactor	50	$\frac{3}{4}$	(57,4-10)	$\frac{3}{4}$	85	$\frac{3}{4}$	$\frac{3}{4}$
Screwless terminal	50	$\frac{3}{4}$	(62,6-10)	$\frac{3}{4}$	85		
Supplementary information: N/A							

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

<b>ANNEX 3</b>	<b>Screw terminals (part of the luminaire)</b>		N/A
<b>(14)</b>	<b>SCREW TERMINALS</b>		N/A
(14.2)	Type of terminal.....:		¾
	Rated current (A).....:		¾
(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 (mm²) .....		¾
(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 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

<b>ANNEX 4</b>	<b>Screwless terminals (part of the luminaire)</b>		P
<b>(15)</b>	<b>SCREWLESS TERMINALS</b>		P
(15.2)	Type of terminal.....:	Permanent connection	¾
	Rated current (A).....:	9	¾
(15.3.1)	Material		P
(15.3.2)	Clamping		P
(15.3.3)	Stop		P
(15.3.4)	Unprepared conductors		P
(15.3.5)	Pressure on insulating material		P
(15.3.6)	Clear connection method		N/A
(15.3.7)	Clamping independently		N/A
(15.3.8)	Fixed in position		P
(15.3.10)	Conductor size		P
	Type of conductor		P
(15.5.1)	Terminals internal wiring		P
(15.5.1.1)	Pull test spring-type terminals (4 N, 4 samples).....:		N/A
(15.5.1.2)	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)		P
(15.5.2)	Electrical tests		P
	Voltage drop (mV) after 1 h (4 samples).....:	0,7	P
	Voltage drop of two inseparable joints		P
	Number of cycles:		¾
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples) .....		N/A
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples) .....	1,0	P
	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
(15.6)	Terminals external wiring		N/A
	Terminal size and rating		N/A
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) .....		N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

	Pull test pin or tab terminals (4 samples); pull (N) .....		N/A
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(15.6.3.1)	TABLE: Contact resistance test										N/A
	Voltage drop (mV) after 1 h										¾
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)..... :										¾
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)..... :										¾
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)..... :										¾
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)..... :										¾
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
Supplementary information:											

Appendix 1: EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES			
Clause	Requirement + Test	Result - Remark	Verdict

<p align="center"><b>ATTACHMENT TO TEST REPORT</b>  <b>IEC 60598-2-3</b>  <b>EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES</b>  Luminaires  Part 2: Particular requirements  Section 3: Luminaires for road and street lighting</p>			
<b>Differences according to.....</b> : EN 60598-2-3:2003, AMD1:2011 used in conjunction with EN 60598-1:2015, AMD1:2018			
<b>Annex Form No. ....</b> : EU_GD_IEC60598_2_3L <b>Annex Form Originator.....</b> : Intertek Semko AB <b>Master Annex Form .....</b> : 2018-12-07			
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	<b>CENELEC COMMON MODIFICATIONS (EN)</b>		
<b>3.6 (4)</b>	<b>CONSTRUCTION</b>		
3.6 (4.11.6)	Electro-mechanical contact systems		P
<b>3.10 (5)</b>	<b>EXTERNAL AND INTERNAL WIRING</b>		
3.10 (5.2.2)	Cables equal to EN 50525		P
	Replace table 5.1 – Supply cord		P
<b>3.12 (12)</b>	<b>ENDURANCE TESTS AND THERMAL TESTS</b>		
3.12 (12.4.2c)	Thermal test (normal operation) see footnote c to table 12.2 relating to unsleeved fixed wiring		P
<b>ZB</b>	<b>ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)</b>		
(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>		
(4 & 5)	FR: Shuttered socket-outlets 10/16A		N/A
	FR: Safety requirements for high buildings (Decree of 30 December 2011 on safety regulations for the construction of high-rise buildings and their protection against fire and panic risks; Section VIII; Article GH 48, Lighting)  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

Appendix 1: EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES			
Clause	Requirement + Test	Result - Remark	Verdict
	GB: Requirements according to United Kingdom Building Regulation		N/A

**Appendix 2: Additional requirements of IEC/TR 62778:2014**

Clause	Requirement + Test	Result - Remark	Verdict
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<b>7</b>	<b>MEASUREMENT INFORMATION FLOW</b>		<b>P</b>
<b>7.1</b>	<b>Basic flow</b>		<b>P</b>
	'Law of conservation of luminance' applied		P
	Use of only true luminance/radiance values		P
	In case of luminaire: The light source is operated in the luminaire under similar conditions as when tested as a component		P
	In case $E_{thr}$ value for RG2 was established the peak value was derived from angular light distribution		N/A
<b>7.2</b>	<b>Conditions for the radiance measurement</b>		<b>P</b>
	Standard condition applied (200mm distance, 0,011rad field of view)		P
	Non-standard condition applied		P
<b>7.3</b>	<b>Special cases (I): Replacement by a lamp or LED module of another type</b>		<b>N/A</b>
	Light source is a white light source		N/A
	Evaluation done based on highest luminance		N/A
	Evaluation done based on CCT value		N/A
<b>7.4</b>	<b>Special cases (II): Arrays and clusters of primary light sources</b>		<b>N/A</b>
	LED package is evaluated as .....	<input type="checkbox"/> RG0 unlimited <input type="checkbox"/> RG1 unlimited	N/A
	$E_{thr}$ of LED package applies to array		N/A
<b>8</b>	<b>RISK GROUP CLASSIFICATION</b>		<b>P</b>
	Risk group achieved:		P
	-.. Risk Group 0 unlimited	EL-SL58(S)-60 with LUMILEDS LUXEON 3030, EL-SL18LA-160 with CREE, INC. chips of CX series	P
	-.. Risk Group 1 unlimited	EL-SL68(S)-50 with LUMILEDS LUXEON 3030, EL-SL18LA-160 with LUMILEDS 5050, EL-SL10(1)-80 with CREE, INC. chips of XTE, EL-SL10(1)-80 with CLU048 chips, EL-SL18LA-160 with OSRAM chips	P
	- $E_{thr}$ ..... (lx) : Distance to reach RG1 ..... (m) :		N/A

According to the client's requirements, the measure distance for model EL-SL18LA-160 with LUMILEDS 5050(I<sub>f</sub>: 800 mA) was changed to 2000mm and classified as RG0.

According to the client's requirements, the measure distance for model EL-SL68(L)-240 with XP-G3 LEDs (I<sub>f</sub>: 2000 mA) was changed to 2150mm and classified as RG0.



**Appendix 2: Additional requirements of IEC/TR 62778:2014**

Clause	Requirement + Test	Result - Remark	Verdict
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TABLE: Spectroradiometric measurement					P
	Measurement performed on:	<input type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input checked="" type="checkbox"/> Luminaire			
	Model number..... :	EL-SL68(S)-50 with LUMILEDS LUXEON 3030			
	Test voltage (V)..... :	240			¾
	Test current (mA)..... :	232			¾
	Test frequency (Hz)..... :	50			¾
	Ambient, t (°C)..... :	25			¾
	Measurement distance .....	<input checked="" type="checkbox"/> 20 cm <input type="checkbox"/> ... cm			¾
	Source size .....	<input checked="" type="checkbox"/> Non-small <input type="checkbox"/> Small: .... mm			¾
	Field of view .....	<input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 1,7 mrad (for small sources)			¾
Item		Symbol	Units	Result	Remark
Correlated colour temperature		CCT	K	4102	
x/y colour coordinates				/	
Blue light hazard radiance		L <sub>B</sub>	W/(m <sup>2</sup> •sr <sup>1</sup> )	201,0	
Blue light hazard irradiance		E <sub>B</sub>	W/m <sup>2</sup>	5,822	
Luminance		L	cd/m <sup>2</sup>	3,823 x 10 <sup>5</sup>	
Illuminance		E	lx	11073	
Supplementary information:					

**Appendix 2: Additional requirements of IEC/TR 62778:2014**

Clause	Requirement + Test	Result - Remark	Verdict
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TABLE: Spectroradiometric measurement					P
	Measurement performed on:		<input type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input checked="" type="checkbox"/> Luminaire		
	Model number .....		EL-SL18LA-160 with LUMILEDS 5050 (If: 800 mA)		
	Test voltage (V) .....		240		¾
	Test current (mA) .....		-		¾
	Test frequency (Hz).....		50/60		¾
	Ambient, t (°C) .....		25		¾
	Measurement distance.....		<input checked="" type="checkbox"/> 20 cm <input type="checkbox"/> ... cm		¾
	Source size .....		<input checked="" type="checkbox"/> Non-small <input type="checkbox"/> Small : .... mm		¾
	Field of view .....		<input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 1,7 mrad (for small sources)		¾
Item		Symbol	Units	Result	Remark
Correlated colour temperature		CCT	K	3964	
x/y colour coordinates				/	
Blue light hazard radiance		L <sub>B</sub>	W/(m²•sr¹)	1,378 x10³	
Blue light hazard irradiance		E <sub>B</sub>	W/m²	3,143x10	
Luminance		L	cd/m²	2,783x10⁶	
Illuminance		E	lx	63471	
Supplementary information: N/A					

**Appendix 2: Additional requirements of IEC/TR 62778:2014**

Clause	Requirement + Test	Result - Remark	Verdict
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<b>TABLE: Spectroradiometric measurement</b>				
	Measurement performed on:	<input type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input checked="" type="checkbox"/> Luminaire		
	Model number .....	EL-SL18LA-160 with LUMILEDS 5050 (If: 800 mA)		
	Test voltage (V) .....	240		¾
	Test current (mA) .....	-		¾
	Test frequency (Hz) .....	50/60		¾
	Ambient, t (°C) .....	25		¾
	Measurement distance .....	<input type="checkbox"/> 20 cm <input type="checkbox"/> ... cm		
	Source size .....	<input checked="" type="checkbox"/> Non-small <input type="checkbox"/> Small : .... mm		
	Field of view .....	<input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 1,7 mrad (for small sources)		
Item	Symbol	Units	Result	Remark
Correlated colour temperature	CCT	K	3938	
x/y colour coordinates			/	
Blue light hazard radiance	L <sub>B</sub>	W/(m <sup>2</sup> •sr <sup>1</sup> )	8,063 x10	
Blue light hazard irradiance	E <sub>B</sub>	W/m <sup>2</sup>	7,756x10 <sup>-1</sup>	
Luminance	L	cd/m <sup>2</sup>	1,647x10 <sup>5</sup>	
Illuminance	E	lx	1584	
Supplementary information: According to the client's requirements, the measure distance was changed to 2000mm, the product was classified as RG0.				

Appendix 2: Additional requirements of IEC/TR 62778:2014				
Clause	Requirement + Test		Result - Remark	Verdict
	<b>TABLE: Spectroradiometric measurement</b>			
	Measurement performed on:	<input type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input checked="" type="checkbox"/> Luminaire		
	Model number.....	EL-SL18LA-160 with LUMILEDS 5050 (If: 160 mA)		
	Test voltage (V).....	240		¾
	Test current (mA).....	-		¾
	Test frequency (Hz) .....	50/60		¾
	Ambient, t (°C).....	25		¾
	Measurement distance .....	<input checked="" type="checkbox"/> 20 cm <input type="checkbox"/> ... cm		¾
	Source size .....	<input checked="" type="checkbox"/> Non-small <input type="checkbox"/> Small : .... mm		¾
	Field of view .....	<input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 1,7 mrad (for small sources)		¾
Item	Symbol	Units	Result	Remark
Correlated colour temperature	CCT	K	6896	
x/y colour coordinates			/	
Blue light hazard radiance	L <sub>B</sub>	W/(m²•sr¹)	3,286 x 10³	
Blue light hazard irradiance	E <sub>B</sub>	W/m²	6,642	
Luminance	L	cd/m²	3,339 x 10⁶	
Illuminance	E	lx	6749	
Supplementary information:				

Appendix 2: Additional requirements of IEC/TR 62778:2014			
Clause	Requirement + Test	Result - Remark	Verdict

	TABLE: Spectroradiometric measurement				P
	Measurement performed on:		<input type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input checked="" type="checkbox"/> Luminaire		
	Model number.....		EL-SL58(S)-60 with LUMILEDS 3030		
	Test voltage (V).....		240		¾
	Test current (mA).....		-		¾
	Test frequency (Hz) .....		50/60		¾
	Ambient, t (°C).....		25		¾
	Measurement distance .....		<input checked="" type="checkbox"/> 20 cm <input type="checkbox"/> ... cm		¾
	Source size .....		<input checked="" type="checkbox"/> Non-small <input type="checkbox"/> Small : .... mm		¾
	Field of view .....		<input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 1,7 mrad (for small sources)		¾
Item		Symbol	Units	Result	Remark
Correlated colour temperature		CCT	K	4005	
x/y colour coordinates				/	
Blue light hazard radiance		L <sub>B</sub>	W/(m²•sr¹)	6,704 x10	
Blue light hazard irradiance		E <sub>B</sub>	W/m²	7,713	
Luminance		L	cd/m²	1,347x10 <sup>5</sup>	
Illuminance		E	lx	15495	
Supplementary information: N/A					

Appendix 2: Additional requirements of IEC/TR 62778:2014				
Clause	Requirement + Test		Result - Remark	
	<b>TABLE: Spectroradiometric measurement</b>			<b>P</b>
	Measurement performed on:	<input type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input checked="" type="checkbox"/> Luminaire		
	Model number.....	EL-SL10(1)-80 with CREE, INC. chips of XTE		
	Test voltage (V).....	240		¾
	Test current (mA).....	-		¾
	Test frequency (Hz) .....	50/60		¾
	Ambient, t (°C).....	25		¾
	Measurement distance .....	<input checked="" type="checkbox"/> 20 cm <input type="checkbox"/> ... cm		¾
	Source size .....	<input checked="" type="checkbox"/> Non-small <input type="checkbox"/> Small : .... mm		¾
	Field of view .....	<input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 1,7 mrad (for small sources)		¾
Item	Symb ol	Units	Result	Remark
Correlated colour temperature	CCT	K	5737	
x/y colour coordinates			/	
Blue light hazard radiance	L <sub>B</sub>	W/(m <sup>2</sup> •sr <sup>1</sup> )	5,958 x10 <sup>3</sup>	
Blue light hazard irradiance	E <sub>B</sub>	W/m <sup>2</sup>	45,67	
Luminance	L	cd/m <sup>2</sup>	7,467x10 <sup>6</sup>	
Illuminance	E	lx	57237	
Supplementary information: N/A				

Appendix 2: Additional requirements of IEC/TR 62778:2014			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE: Spectroradiometric measurement					P
	Measurement performed on:			<input type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input checked="" type="checkbox"/> Luminaire	
	Model number.....			EL-SL10(1)-80 with CLU048 chips	
	Test voltage (V).....			240	¾
	Test current (mA).....			-	¾
	Test frequency (Hz) .....			50/60	¾
	Ambient, t (°C).....			25	¾
	Measurement distance .....			<input checked="" type="checkbox"/> 20 cm <input type="checkbox"/> ... cm	¾
	Source size .....			<input checked="" type="checkbox"/> Non-small <input type="checkbox"/> Small : .... mm	¾
	Field of view .....			<input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 1,7 mrad (for small sources)	¾
Item		Symbol	Units	Result	Remark
Correlated colour temperature		CCT	K	5599	
x/y colour coordinates				/	
Blue light hazard radiance		L <sub>B</sub>	W/(m²•sr¹)	6,525 x10³	
Blue light hazard irradiance		E <sub>B</sub>	W/m²	34,45	
Luminance		L	cd/m²	8,92x10⁶	
Illuminance		E	lx	47089	
Supplementary information: N/A					

**Appendix 2: Additional requirements of IEC/TR 62778:2014**

Clause	Requirement + Test	Result - Remark	Verdict
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	<b>TABLE: Spectroradiometric measurement</b>				<b>P</b>
	Measurement performed on:	<input type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input checked="" type="checkbox"/> Luminaire			
	Model number .....	EL-SL18LA-160 with CREE, INC. chips of CX series			
	Test voltage (V) .....	240			¾
	Test current (mA) .....	0,68			¾
	Test frequency (Hz) .....	50/60			¾
	Ambient, t (°C) .....	25			¾
	Measurement distance .....	<input checked="" type="checkbox"/> 20 cm <input type="checkbox"/> ... cm			¾
	Source size .....	<input checked="" type="checkbox"/> Non-small <input type="checkbox"/> Small: .... mm			¾
	Field of view .....	<input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 1,7 mrad (for small sources)			¾
Item		Symb ol	Units	Result	Remark
Correlated colour temperature		CCT	K	5534	
x/y colour coordinates				/	
Blue light hazard radiance		L <sub>B</sub>	W/(m²•sr¹)	55	
Blue light hazard irradiance		E <sub>B</sub>	W/m²	10,15	
Luminance		L	cd/m²	7,147 x10 <sup>4</sup>	
Illuminance		E	lx	26169	
Supplementary information:					



**Appendix 2: Additional requirements of IEC/TR 62778:2014**

Clause	Requirement + Test	Result - Remark	Verdict
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	<b>TABLE: Spectroradiometric measurement</b>			<b>P</b>
	Measurement performed on:	<input type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input checked="" type="checkbox"/> Luminaire		
	Model number .....	EL-SL18LA-160 with OSRAM chips		
	Test voltage (V) .....	240		¾
	Test current (mA) .....	0,68		¾
	Test frequency (Hz) .....	50/60		¾
	Ambient, t (°C) .....	25		¾
	Measurement distance .....	<input checked="" type="checkbox"/> 20 cm <input type="checkbox"/> ... cm		¾
	Source size .....	<input checked="" type="checkbox"/> Non-small <input type="checkbox"/> Small: .... mm		¾
	Field of view .....	<input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 1,7 mrad (for small sources)		¾
Item	Symbol	Units	Result	Remark
Correlated colour temperature	CCT	K	5883	
x/y colour coordinates			/	
Blue light hazard radiance	L <sub>B</sub>	W/(m <sup>2</sup> •sr <sup>1</sup> )	104	
Blue light hazard irradiance	E <sub>B</sub>	W/m <sup>2</sup>	2,806	
Luminance	L	cd/m <sup>2</sup>	1,251 x 10 <sup>5</sup>	
Illuminance	E	lx	28801	
Supplementary information:				

**Appendix 2: Additional requirements of IEC/TR 62778:2014**

Clause	Requirement + Test	Result - Remark	Verdict
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	<b>TABLE: Spectroradiometric measurement</b>				<b>P</b>
	Measurement performed on:	<input type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input checked="" type="checkbox"/> Luminaire			
	Model number .....	EL-SL68(L)-240 with CREE chips			
	Test voltage (V) .....	240			¾
	Test current (mA) .....	--			¾
	Test frequency (Hz) .....	50/60			¾
	Ambient, t (°C) .....	25			¾
	Measurement distance .....	<input checked="" type="checkbox"/> 20 cm <input type="checkbox"/> ... cm			¾
	Source size .....	<input checked="" type="checkbox"/> Non-small <input type="checkbox"/> Small: .... mm			¾
	Field of view .....	<input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 1,7 mrad (for small sources)			¾
Item		Symbol	Units	Result	Remark
Correlated colour temperature		CCT	K	7259	
x/y colour coordinates				/	
Blue light hazard radiance		L <sub>B</sub>	W/(m²•sr¹)	1,311 x10	
Blue light hazard irradiance		E <sub>B</sub>	W/m²	1,905x10 <sup>-1</sup>	
Luminance		L	cd/m²	1,170x10 <sup>5</sup>	
Illuminance		E	lx	79501	
Supplementary information:					
According to the client's requirements, the measure distance was changed to 2150mm, the product was classified as RG0.					

<b>Appendix 3: Additional requirements of EN 62031:2008+A1:2013+A2:2015</b>			
Clause	Requirement + Test	Result - Remark	Verdict
<b>4</b>	<b>GENERAL REQUIREMENTS</b>		P
4.4	Integral modules tested assembled in the luminaire		P
4.5	Independent modules complies with requirements in IEC 60598-1		N/A
<b>5</b>	<b>GENERAL TEST REQUIREMENTS</b>		P
5.5	SELV-operated LED modules comply with Annex I of IEC 61347-2-13	(see Annex 1)	P
	General conditions for tests in Annex A	(see Annex A)	P
<b>7</b>	<b>MARKING</b>		N/A
<b>7.1</b>	<b>Mandatory markings for built-in or independent modules</b>		N/A
	a) mark of origin		N/A
	b) model number, type reference		N/A
	c1) constant voltage module; rated supply voltage and supply frequency		N/A
	c2) constant current module; rated supply current and supply frequency		N/A
	d) nominal power		N/A
	e) indication of connections, wiring diagram		N/A
	f) value of $t_c$ and place on the module		N/A
	g) $E_{thr}$ if required		N/A
	h) symbol for built-in modules		N/A
	i) heat transfer temperature $t_d$		N/A
	j) power for heat-conduction $P_d$		N/A
	k) working voltage for insulation		N/A
<b>7.2</b>	<b>Location of marking</b>		N/A
	- marking of a), b), c) and f) on the modules		N/A
	- marking of d), e), g), h), i) and j) on the modules or data sheet		N/A
	- marking of k) in manufactures literature		N/A
	- integral modules a) to g) in literature		N/A
<b>7.3</b>	<b>Durable and legibility of marking</b>		N/A
	- marking of a), b), c) and f) legible after test with water		N/A
	- marking of d) to j) inspection of compliance		N/A

<b>Appendix 3: Additional requirements of EN 62031:2008+A1:2013+A2:2015</b>			
Clause	Requirement + Test	Result - Remark	Verdict
<b>8</b>	<b>TERMINALS</b>		<b>N/A</b>
	Screw terminals according section 14 of IEC 60598-1:		N/A
	Separately approved; component list	(see Annex 2)	N/A
	Part of the luminaire	(see Annex 3)	N/A
	Screwless terminals according section 15 of IEC 60598-1:		N/A
	Separately approved; component list	(see Annex 2)	N/A
	Part of the luminaire	(see Annex 4)	N/A
	Connectors according IEC 60838-2-2:		N/A
	Separately approved; component list	(see Annex 2)	N/A
<b>9 (9)</b>	<b>PROVISION FOR PROTECTIVE EARTHING</b>		<b>N/A</b>
<b>- (9.1)</b>	<b>Provisions for protective earthing</b>		<b>N/A</b>
	Terminal complying with clause 8		N/A
	Locked against loosening and not possible to loosen by hand		N/A
	Not possible to loosen clamping means unintentionally on screwless terminals		N/A
	Earthing via means of fixing		N/A
	Earthing terminal only used for the earthing of the control gear		N/A
	All parts of material minimizing the danger of electrolytic corrosion		N/A
	Made of brass or equivalent material		N/A
	Contact surface bare metal		N/A
<b>- (9.2)</b>	<b>Provision for functional earthing</b>		<b>N/A</b>
	Comply with clause 8 and 9.1		N/A
<b>- (9.3)</b>	<b>Earth contact via the track on the printed board</b>		<b>N/A</b>
	Test with a current of 25 A between earthing terminal and each of the accessible metal parts; measured resistance (W) at <sup>3</sup> 10 A according 7.2.3 of IEC 60598-1: < 0,5 W ..... :		N/A
<b>- (9.4)</b>	<b>Earthing of built-in lamp controlgear</b>		<b>N/A</b>
	Earth by means of fixing to earthed metal of luminaire in compliance of 7.2 of IEC 60598-1		N/A
	Earthing terminal only for earthing the built-in controlgear		N/A
<b>- (9.5)</b>	<b>Earthing via independent controlgear</b>		<b>N/A</b>
<b>- (9.5.1)</b>	<b>Earth connection to other equipment</b>		<b>N/A</b>

<b>Appendix 3: Additional requirements of EN 62031:2008+A1:2013+A2:2015</b>			
Clause	Requirement + Test	Result - Remark	Verdict
	Looping or through connection, conductor min. 1,5 mm <sup>2</sup> and of copper or equivalent		N/A
	Protective earthing wires in line with 5.3.1.1 and clause 7		N/A
- (9.5.2)	Earthing of the lamp compartments powered via the independent lamp controlgear		N/A
	Test with a current of 25 A between input and output earth terminals; measured resistance (W) between earthing terminal and each of the accessible metal parts at <sup>3</sup> 10 A according 7.2.3 of IEC 60598-1: < 0,5 W ..... :		N/A
	Output earthing terminal marked as in 7.1 t) of IEC 61347-1		N/A
<b>10 (10)</b>	<b>PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS</b>		<b>N/A</b>
- (10.1)	Controlgear protected against accidental contact with live parts		N/A
- (A2)	The current flowing between the part concerned and earth is measured and does not exceed 0,7 mA (peak) or 2 mA d.c. .... :		N/A
- (A2)	For frequencies above 1 kHz, the current does not exceed 0,7 mA (peak) multiplied by the value of the frequency in kilohertz or 70 mA (peak) ..... :		N/A
- (A3)	The voltage between the part concerned and any accessible part is measured and does not exceed 34 V (peak) ..... :		N/A
- (10.1)	Lacquer or enamel not used for protection or insulation		N/A
	Adequate mechanical strength on parts providing protection		N/A
- (10.2)	Capacitors > 0,5 nF: voltage after 1 min (V): < 50 V ..... :		N/A
- (10.3)	Controlgear providing SELV		N/A
	Accessible conductive parts are insulated from live parts by double or reinforced insulation in SELV controlgear		N/A
	No connection between output circuit and the body or protective earthing circuit		N/A
	No possibility of connection between output circuit and the body or protective earthing circuit through other conductive parts		N/A
	SELV outputs separated by at least basic insulation		N/A
	ELV conductive parts insulated as live parts		N/A

<b>Appendix 3: Additional requirements of EN 62031:2008+A1:2013+A2:2015</b>			
Clause	Requirement + Test	Result - Remark	Verdict
	Tests according Annex L of IEC 61347-1		N/A
- (10.4)	Accessible conductive parts in SELV circuits		N/A
	Output voltage under load $\leq 25$ V r.m.s. or $\leq 60$ V d.c.		N/A
	If output voltage $> 25$ V r.m.s. or $> 60$ V d.c.; No load output $\leq 35$ V peak or $\leq 60$ V d.c and touch current does not exceed 0,7 mA (peak) or 2 mA d.c. ....:		N/A
	One conductive part is insulated if output voltage or current exceeding the values above and withstand test voltage 500 V		N/A
	Double or reinforced insulation bridged by appropriate and at least two resistors or two Y2 capacitors or one Y1 capacitor		N/A
	Y1 or Y2 capacitors comply with IEC 60384-14		N/A
	Resistors comply with test (a) in 14.1 of IEC 60065		N/A
<b>11 (11)</b>	<b>MOISTURE RESISTANCE AND INSULATION</b>		<b>P</b>
	After storage 48 h at 91-95% relative humidity and 20-30 °C measuring of insulation resistance with d.c. 500 V (MW):		P
	For basic insulation $\geq 2$ MW .....:	$>100$ MW	P
	For double or reinforced insulation $\geq 4$ MW.....:		N/A
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1		N/A
<b>12 (12)</b>	<b>ELECTRIC STRENGTH</b>		<b>P</b>
	Immediately after clause 11 electric strength test for 1 min		P
	Basic insulation for SELV, test voltage 500 V		P
	Working voltage $\leq 50$ V, test voltage 500 V		N/A
	Working voltage $> 50$ V $\leq 1000$ V, test voltage (V):		P
	Basic insulation, $2U + 1000$ V		P
	Supplementary insulation, $2U + 1000$ V		N/A
	Double or reinforced insulation, $4U + 2000$ V		N/A
	No flashover or breakdown		P
	Solid or thin sheet insulation for double or reinforced insulation fulfil the requirements in Annex N in IEC 61347-1		N/A

<b>Appendix 3: Additional requirements of EN 62031:2008+A1:2013+A2:2015</b>			
Clause	Requirement + Test	Result - Remark	Verdict
<b>13 (14)</b>	<b>FAULT CONDITIONS</b>		<b>P</b>
- (14)	When operated under fault conditions the controlgear:		P
	- does not emit flames or molten material		P
	- does not produce flammable gases		P
	- protection against accidental contact not impaired		P
	Thermally protected controlgear does not exceed the marked temperature value		N/A
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected	(see appended table)	P
- (14.1)	Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (except between live parts and accessible metal parts)	(see appended table)	N/A
	Creepage distances on printed boards less than specified in clause 16 in Part 1 provided with coating according to IEC 60664-3	(see appended table)	N/A
- (14.2)	Short-circuit or interruption of semiconductor devices	(see appended table)	P
- (14.3)	Short-circuit across insulation consisting of lacquer, enamel or textile	(see appended table)	N/A
- (14.4)	Short-circuit across electrolytic capacitors	(see appended table)	N/A
- (14.5)	After the tests has been carried out on three samples:		P
	The insulation resistance <sup>3</sup> 1 MW ..... :	>100MW	P
	No flammable gases		P
	No accessible parts have become live		P
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		P
- (14.6)	Relevant fault condition tests with high-power supply		N/A
<b>13.2</b>	<b>Overpower condition</b>		<b>P</b>
	Module withstands overpower condition >15 min.		N/A
	Module with automatic protective device or power limiter, test performed 15 min. at limit.		P
	No fire, smoke or flammable gas is produced		P
	Molten material does not ignite tissue paper, spread below the module		P

<b>Appendix 3: Additional requirements of EN 62031:2008+A1:2013+A2:2015</b>			
Clause	Requirement + Test	Result - Remark	Verdict
<b>15</b>	<b>CONSTRUCTION</b>		<b>P</b>
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P
<b>16 (16)</b>	<b>CREEPAGE DISTANCES AND CLEARANCES</b>		
- (16)	Creepage and distances and clearances in compliance with IEC 61347-1	Refer to main report	P
	Insulating lining of metallic enclosures		N/A
	Basic insulation on printed boards tested according to clause 14		N/A
	Distances subjected to both sinusoidal voltage as non-sinusoidal pulses not less than value in Table 16		N/A
	Creepage distances not less than minimum clearance		P
16 (-)	Conductive accessible parts in compliance with applicable parts of IEC 60598-1		N/A
<b>17 (17)</b>	<b>SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS</b>		<b>P</b>
	Cl. 17 refer to Cl. 17 of IEC 61347-1 which refer to Cl. 4.11 and 4.12 of IEC 60598-1 (clause numbers between parentheses refer to IEC 60598-1)		¾
<b>(4.11)</b>	<b>Electrical connections</b>		P
(4.11.1)	Contact pressure		P
(4.11.2)	Screws:		N/A
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
(4.11.3)	Screw locking:		N/A
	- spring washer		N/A
	- rivets		N/A
(4.11.4)	Material of current-carrying parts		P
(4.11.5)	No contact to wood or mounting surface		P
(4.11.6)	Electro-mechanical contact systems		N/A
<b>(4.12)</b>	<b>Mechanical connections and glands</b>		N/A
(4.12.1)	Screws not made of soft metal		N/A
	Screws of insulating material		N/A
	Torque test: torque (Nm); part.....:		N/A
	Torque test: torque (Nm); part.....:		N/A
	Torque test: torque (Nm); part.....:		N/A
(4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A



<b>Appendix 3: Additional requirements of EN 62031:2008+A1:2013+A2:2015</b>			
Clause	Requirement + Test	Result - Remark	Verdict
(4.12.4)	Locked connections:		N/A
	- fixed arms; torque (Nm).....:		N/A
	- lampholder; torque (Nm).....:		N/A
	- push-button switches; torque 0,8 Nm.....:		N/A
(4.12.5)	Screwed glands; force (Nm).....:		N/A
<b>18 (18)</b>	<b>RESISTANCE TO HEAT, FIRE AND TRACKING</b>		<b>P</b>
- (18.1)	Ball-pressure test .....	See Test Table 18 (18.1)	P
- (18.2)	Test of printed boards .....	See Test Table 18 (18.2)	N/A
- (18.3)	Glow-wire test (650°C) .....	See Test Table 18 (18.3)	P
- (18.4)	Needle-flame test (10 s) .....	See Test Table 18 (18.4)	N/A
- (18.5)	Proof tracking test .....	See Test Table 18 (18.5)	N/A
<b>19 (19)</b>	<b>RESISTANCE TO CORROSION</b>		<b>N/A</b>
	- test according 4.18.1 of IEC 60598-1		N/A
	- adequate varnish on the outer surface		N/A
<b>20</b>	<b>INFORMATION FOR LUMINAIRE DESIGN</b>		<b>N/A</b>
	Information in Annex D (informative)		¾
<b>21</b>	<b>HEAT MANAGEMENT</b>		<b>N/A</b>
<b>21.1</b>	<b>General</b>		N/A
	Exchangeability is safeguarded by cap or base		N/A
<b>21.2</b>	<b>Heat-conducting foil and paste</b>		N/A
	Heat-conducting foil delivered with the module if necessary		N/A
<b>22</b>	<b>PHOTOBIOLOGICAL SAFETY</b>		<b>P</b>
<b>22.1</b>	<b>UV radiation</b>		P
	Luminous radiation not exceed 2mW/klm		P
<b>22.2</b>	<b>Blue light hazard</b>		P
	Assessed according to IEC TR 62778	Refer to main report	P
<b>22.3</b>	<b>Infrared radiation</b>		P
	Requirements for infrared radiation when required		P

Appendix 3: Additional requirements of EN 62031:2008+A1:2013+A2:2015							
Clause	Requirement + Test				Result - Remark		Verdict
A	ANNEX A - TESTS						P
	All tests performed in accordance with the advice given in Annex H of IEC 61347-1, if applicable						P
13 (14)	TABLE: tests of fault conditions						P
Part	Simulated fault						Hazard
Single LED	Short-circuit, the luminaire didn't work, recoverable.						NO
16 (16)	TABLE: clearance and creepage distance measurements (mm)						P
Applicable part of IEC 61347-1 Table 7 – 11*							
Distances	Insulation type **	Measured clearance	Required		Measured creepage	Required	
			clearance	*Table		creepage	*Table
Distance 1:	B	6,1	3,0	11.1.B	6,1	4,0	11.1.A
Working voltage (V) .....					Uout: 400		¾
Frequency if applicable (kHz) .....					N/A		¾
PTI .....					< 600 ☒ ≥ 600 ☐		¾
Peak value of the working voltage Ūout if applicable (kV) .....					N/A		¾
Pulse voltage if applicable (kV) .....					N/A		¾
Supplementary information: Current-carrying of different polarity (LED module)							
Distance 2:	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Working voltage (V) .....					N/A		¾
Frequency if applicable (kHz) .....					N/A		¾
PTI .....					< 600 ☐ ≥ 600 ☐		¾
Peak value of the working voltage Ūout if applicable (kV) .....					N/A		¾
Pulse voltage if applicable (kV) .....					N/A		¾
Supplementary information:							
Distance 3:	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Working voltage (V) .....					N/A		¾
Frequency if applicable (kHz) .....					N/A		¾
PTI .....					< 600 ☐ ≥ 600 ☐		¾
Peak value of the working voltage Ūout if applicable (kV) .....					N/A		¾
Pulse voltage if applicable (kV) .....					N/A		¾
Supplementary information:							

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

Appendix 3: Additional requirements of EN 62031:2008+A1:2013+A2:2015					
Clause	Requirement + Test			Result - Remark	Verdict
18 (18.1)	TABLE: Ball Pressure Test of Thermoplastics				P
Allowed impression diameter (mm) .....			2	¾	
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)		Impression diameter (mm)	
PC cover	See Annex 1	75		1,05	
Supplementary information: N/A					
18 (18.2)	TABLE: Test of printed boards				N/A
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (s)	Ignition of specified layer Yes/No	Duration of burning (s)	Verdict
Supplementary information:					
18 (18.3)	TABLE: Glow-wire test				P
Glow wire temperature .....			650°C	¾	
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
PC cover	See Annex 1	30	No	0	P
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) .....					Yes
Supplementary information: N/A					
18 (18.4)	TABLE: Needle-flame test				N/A
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:					
18 (18.5)	TABLE: Proof tracking test				N/A
Test voltage PTI .....			175 V	¾	
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens			Verdict
Supplementary information:					

Appendix 3: Additional requirements of EN 62031:2008+A1:2013+A2:2015			
Clause	Requirement + Test	Result - Remark	Verdict
<b>ANNEX 1</b>	<b>SELV-operated LED modules</b>		<b>N/A</b>
	Cl. 5.5 refer to ANNEX I of IEC 61347-2-13 which refer to ANNEX L of IEC 61347-1 (clause numbers between parentheses refer to ANNEX L of IEC 61347-1)		¾
<b>(L.3)</b>	<b>Classification</b>		N/A
	Class I	Yes <input type="checkbox"/> No <input type="checkbox"/>	¾
	Class II	Yes <input type="checkbox"/> No <input type="checkbox"/>	¾
	Class III	Yes <input type="checkbox"/> No <input type="checkbox"/>	¾
	non-inherently short circuit proof controlgear	Yes <input type="checkbox"/> No <input type="checkbox"/>	¾
	inherently short circuit proof controlgear	Yes <input type="checkbox"/> No <input type="checkbox"/>	¾
	fail safe controlgear	Yes <input type="checkbox"/> No <input type="checkbox"/>	¾
	non-short-circuit proof controlgear	Yes <input type="checkbox"/> No <input type="checkbox"/>	¾
<b>(L.4)</b>	<b>Marking</b>		N/A
	Adequate symbols are used		N/A
<b>(L.5)</b>	<b>Protection against electric shock</b>		N/A
	Comply with 9.2 of IEC 61558-1		N/A
<b>(L.6)</b>	<b>Heating</b>		N/A
	No excessive temperatures in normal use		N/A
	Value if capacitor tc marked .....		¾
	Winding insulation classified as Class .....		¾
	Comply with tests of clause 14 of IEC 61558-1 with adjustments		N/A
<b>(L.7)</b>	<b>Short-circuit and overload protection</b>		N/A
	Comply with tests of clause 15 of IEC 61558-1 with adjustments		N/A
<b>(L.8)</b>	<b>Insulation resistance and electric strength</b>		N/A
<b>(L.8.1)</b>	Conditioned 48 h between 91 % and 95 %		N/A
<b>(L.8.2)</b>	Insulation resistance		N/A
	Between input- and output circuits not less than 5 MW .....		N/A
	Between metal parts of class II convertors which are separated from live parts by basic insulation only and the body not less than 5 MW .....		N/A
	Between metal foil in contact with the inner and outer surfaces of enclosures of insulating material not less than 2 MW .....		N/A
<b>(L.8.3)</b>	Electric strength		N/A

Appendix 3: Additional requirements of EN 62031:2008+A1:2013+A2:2015			
Clause	Requirement + Test	Result - Remark	Verdict
	1) Between live parts of input circuits and live parts of output circuits .....		N/A
	2) Over basic or supplementary insulation between:		N/A
	a) live parts having different polarity .....		N/A
	b) live parts and body if intended to be connected to protective earth .....		N/A
	c) accessible metal parts and a metal rod of the same diameter as the flexible cable or cord .....		N/A
	d) live parts and an intermediate metal part .....		N/A
	e) intermediate metal parts and the body .....		N/A
	f) each input circuit and all other input circuits .....		N/A
	3) Over reinforced insulation between the body and live parts .....		N/A
<b>(L.9)</b>	<b>Construction</b>		N/A
(L.9.1)	Transformer comply with 19.12 of IEC 61558-1 and 19 of IEC 61558-2-6		N/A
	HF transformer comply with 19 of IEC 61558-2-16		N/A
<b>(L.10)</b>	<b>Components</b>		N/A
	Protective devices comply with 20.6 – 20.11 of IEC 61558-1		N/A
<b>(L.11)</b>	<b>Creepage distances, clearances and distances through insulation</b>		N/A
	Creepage distances and clearances not less than in Clause 16		N/A
	Distance through insulation according Table L.5 in IEC 61347-1		N/A
	1) Basic distance through insulation		N/A
	Required distance (mm) .....		¾
	Measured (mm) .....		N/A
	Supplementary information		¾
	2) Supplementary distance through insulation		N/A
	Required distance (mm) .....		¾
	Measured (mm) .....		N/A
	Supplementary information		¾
	3) Reinforced distance through insulation		N/A
	Required distance (mm) .....		¾
	Measured (mm) .....		N/A
	Supplementary information		¾

Appendix 3: Additional requirements of EN 62031:2008+A1:2013+A2:2015						
Clause	Requirement + Test			Result - Remark		Verdict
ANNEX 2	TABLE: Critical components information					P
Object / part No.	Code	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity <sup>1)</sup>
Refer to main report						
Supplementary information:						
1) 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						

Appendix 3: Additional requirements of EN 62031:2008+A1:2013+A2:2015			
Clause	Requirement + Test	Result - Remark	Verdict

<b>ANNEX 3</b>	<b>Screw terminals (part of the luminaire)</b>		N/A
<b>(14)</b>	<b>SCREW TERMINALS</b>		N/A
(14.2)	Type of terminal.....:		¾
	Rated current (A).....:		¾
(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 (mm²).....:		¾
(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

Appendix 3: Additional requirements of EN 62031:2008+A1:2013+A2:2015			
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.....:		¾
	Rated current (A).....:		¾
(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
(15.5.1)	Terminals internal wiring		N/A
(15.5.1.1)	Pull test spring-type terminals (4 N, 4 samples).....:		N/A
(15.5.1.2)	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:		¾
	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
(15.6)	Terminals and connections for external wiring		N/A
(15.6.1)	Conductors		N/A
	Terminal size and rating		N/A



Appendix 3: Additional requirements of EN 62031:2008+A1:2013+A2:2015			
Clause	Requirement + Test	Result - Remark	Verdict
(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

(15.6.3.1) (15.6.3.2)	TABLE: Contact resistance test / Heating tests									N/A
	Voltage drop (mV) after 1 h									¾
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Voltage drop of two inseparable joints									N/A
	Voltage drop after 10th alt. 25th cycle									N/A
	Max. allowed voltage drop (mV)..... :									¾
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Voltage drop after 50th alt. 100th cycle									N/A
	Max. allowed voltage drop (mV)..... :									¾
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Voltage drop after 50th alt. 100th cycle									N/A
	Max. allowed voltage drop (mV)..... :									¾
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Continued ageing: voltage drop after 10th alt. 25th cycle									N/A
	Max. allowed voltage drop (mV)..... :									¾
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Continued ageing: voltage drop after 50th alt. 100th cycle									N/A
	Max. allowed voltage drop (mV)..... :									¾
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Supplementary information:										

Appendix 4: Additional requirements of EN 62471:2008			
Clause	Requirement + Test	Result - Remark	Verdict
<b>4</b>	<b>EXPOSURE LIMITS</b>		P
4.1	General		P
	The exposure limits in this standard is not less than 0,01 ms and not more than any 8-hour period and should be used as guides in the control of exposure		P
	Detailed spectral data of a light source are generally required only if the luminance of the source exceeds $10^4 \text{ cd}\cdot\text{m}^{-2}$		P
4.3	Hazard exposure limits		P
4.3.1	Actinic UV hazard exposure limit for the skin and eye	LED lighting source	P
	The exposure limit for effective radiant exposure is $30 \text{ J}\cdot\text{m}^{-2}$ within any 8-hour period		P
	To protect against injury of the eye or skin from ultraviolet radiation exposure produced by a broadband source, the effective integrated spectral irradiance, $E_s$ , of the light source shall not exceed the levels defined by:		P
	$E_s \cdot t = \sum_{200}^{400} \sum_t E_\lambda(\lambda, t) \cdot S_{UV}(\lambda) \cdot \Delta t \cdot \Delta \lambda \leq 30 \quad \text{J}\cdot\text{m}^{-2}$		P
	The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye or skin shall be computed by:		P
	$t_{\max} = \frac{30}{E_s} \quad \text{s}$		P
4.3.2	Near-UV hazard exposure limit for eye		P
	For the spectral region 315 nm to 400 nm (UV-A) the total radiant exposure to the eye shall not exceed $10000 \text{ J}\cdot\text{m}^{-2}$ for exposure times less than 1000 s. For exposure times greater than 1000 s (approximately 16 minutes) the UV-A irradiance for the unprotected eye, $E_{UVA}$ , shall not exceed $10 \text{ W}\cdot\text{m}^{-2}$ .		P
	The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye for time less than 1000 s, shall be computed by:		P
	$t_{\max} \leq \frac{10\,000}{E_{UVA}} \quad \text{s}$		P
4.3.3	Retinal blue light hazard exposure limit		P
	To protect against retinal photochemical injury from chronic blue-light exposure, the integrated spectral radiance of the light source weighted against the blue-light hazard function, $B(\lambda)$ , i.e., the blue-light weighted radiance, $L_B$ , shall not exceed the levels defined by:		P
	$L_B \cdot t = \sum_{300}^{700} \sum_t L_\lambda(\lambda, t) \cdot B(\lambda) \cdot \Delta t \cdot \Delta \lambda \leq 10^6 \quad \text{J} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	for $t \leq 10^4 \text{ s}$ $t_{\max} = \frac{10^6}{L_B}$	N/A

Appendix 4: Additional requirements of EN 62471:2008			
Clause	Requirement + Test	Result - Remark	Verdict
	$L_B = \sum_{300}^{700} L_{\lambda} \cdot B(\lambda) \cdot \Delta\lambda \leq 100 \quad W \cdot m^{-2} \cdot sr^{-1}$	for $t > 10^4$ s	P
4.3.4	Retinal blue light hazard exposure limit - small source		N/A
	Thus the spectral irradiance at the eye $E_{\lambda}$ , weighted against the blue-light hazard function $B(\lambda)$ shall not exceed the levels defined by:		N/A
	$E_B \cdot t = \sum_{300}^{700} \sum_t E_{\lambda}(\lambda, t) \cdot B(\lambda) \cdot \Delta\lambda \leq 100 \quad J \cdot m^{-2}$	for $t \leq 100$ s	N/A
	$E_B = \sum_{300}^{700} E_{\lambda} \cdot B(\lambda) \cdot \Delta\lambda \leq 1 \quad W \cdot m^{-2}$	for $t > 100$ s	N/A
4.3.5	Retinal thermal hazard exposure limit		P
	To protect against retinal thermal injury, the integrated spectral radiance of the light source, $L_{\lambda}$ , weighted by the burn hazard weighting function $R(\lambda)$ (from Figure 4.2 and Table 4.2), i.e., the burn hazard weighted radiance, shall not exceed the levels defined by:		P
	$L_R = \sum_{380}^{1400} L_{\lambda} \cdot R(\lambda) \cdot \Delta\lambda \leq \frac{50\,000}{\alpha \cdot t^{0,25}} \quad W \cdot m^{-2} \cdot sr^{-1}$	( $10 \mu s \leq t \leq 10$ s)	P
4.3.6	Retinal thermal hazard exposure limit – weak visual stimulus		P
	For an infrared heat lamp or any near-infrared source where a weak visual stimulus is inadequate to activate the aversion response, the near infrared (780 nm to 1400 nm) radiance, $L_{IR}$ , as viewed by the eye for exposure times greater than 10 s shall be limited to:		P
	$L_{IR} = \sum_{780}^{1400} L_{\lambda} \cdot R(\lambda) \cdot \Delta\lambda \leq \frac{6\,000}{\alpha} \quad W \cdot m^{-2} \cdot sr^{-1}$	$t > 10$ s	P
4.3.7	Infrared radiation hazard exposure limits for the eye		P
	The avoid thermal injury of the cornea and possible delayed effects upon the lens of the eye (cataractogenesis), ocular exposure to infrared radiation, $E_{IR}$ , over the wavelength range 780 nm to 3000 nm, for times less than 1000 s, shall not exceed:		P
	$E_{IR} = \sum_{780}^{3000} E_{\lambda} \cdot \Delta\lambda \leq 18\,000 \cdot t^{-0,75} \quad W \cdot m^{-2}$	$t \leq 1000$ s	N/A
	For times greater than 1000 s the limit becomes:		P
	$E_{IR} = \sum_{780}^{3000} E_{\lambda} \cdot \Delta\lambda \leq 100 \quad W \cdot m^{-2}$	$t > 1000$ s	P
4.3.8	Thermal hazard exposure limit for the skin		P
	Visible and infrared radiant exposure (380 nm to 3000 nm) of the skin shall be limited to:		P
	$E_H \cdot t = \sum_{380}^{3000} \sum_t E_{\lambda}(\lambda, t) \cdot \Delta\lambda \leq 20\,000 \cdot t^{0,25} \quad J \cdot m^{-2}$		P

Appendix 4: Additional requirements of EN 62471:2008			
Clause	Requirement + Test	Result - Remark	Verdict
<b>5</b>	<b>MEASUREMENT OF LAMPS AND LAMP SYSTEMS</b>		P
5.1	Measurement conditions		P
	Measurement conditions shall be reported as part of the evaluation against the exposure limits and the assignment of risk classification.		P
5.1.1	Lamp ageing (seasoning)		P
	Seasoning of lamps shall be done as stated in the appropriate IEC lamp standard.		P
5.1.2	Test environment		P
	For specific test conditions, see the appropriate IEC lamp standard or in absence of such standards, the appropriate national standards or manufacturer's recommendations.		P
5.1.3	Extraneous radiation		P
	Careful checks should be made to ensure that extraneous sources of radiation and reflections do not add significantly to the measurement results.		P
5.1.4	Lamp operation		P
	Operation of the test lamp shall be provided in accordance with:		P
	– the appropriate IEC lamp standard, or		P
	– the manufacturer' s recommendation		N/A
5.1.5	Lamp system operation		P
	The power source for operation of the test lamp shall be provided in accordance with:		P
	– the appropriate IEC standard, or		P
	– the manufacturer' s recommendation		N/A
5.2	Measurement procedure		
5.2.1	Irradiance measurements		P
	Minimum aperture diameter 7mm.		N/A
	Maximum aperture diameter 50 mm.		P
	The measurement shall be made in that position of the beam giving the maximum reading.		P
	The measurement instrument is adequate calibrated.		P
5.2.2	Radiance measurements		P
5.2.2.1	Standard method		N/A
	The measurements made with an optical system.		N/A
	The instrument shall be calibrated to read in absolute radiant power per unit receiving area and per unit solid angle to acceptance averaged over the field of view of the instrument.		N/A
5.2.2.2	Alternative method		P
	Alternatively to an imaging radiance set-up, an irradiance measurement set-up with a circular field stop placed at the source can be used to perform radiance measurements.		P
5.2.3	Measurement of source size		P

Appendix 4: Additional requirements of EN 62471:2008			
Clause	Requirement + Test	Result - Remark	Verdict
	The determination of $\alpha$ , the angle subtended by a source, requires the determination of the 50% emission points of the source.		P
5.2.4	Pulse width measurement for pulsed sources		N/A
	The determination of $\Delta t$ , the nominal pulse duration of a source, requires the determination of the time during which the emission is > 50% of its peak value.		N/A
5.3	Analysis methods		
5.3.1	Weighting curve interpolations		P
	To standardize interpolated values, use linear interpolation on the log of given values to obtain intermediate points at the wavelength intervals desired.	see table 4.1	P
5.3.2	Calculations		P
	The calculation of source hazard values shall be performed by weighting the spectral scan by the appropriate function and calculating the total weighted energy.		P
5.3.3	Measurement uncertainty		N/A
	The quality of all measurement results must be quantified by an analysis of the uncertainty.	see Annex C in the norm	N/A
<b>6 LAMP CLASSIFICATION</b>			
6	<b>LAMP CLASSIFICATION</b>		P
	For the purposes of this standard it was decided that the values shall be reported as follows:		P
	– for lamps intended for general lighting service, the hazard values shall be reported as either irradiance or radiance values at a distance which produces an illuminance of 500 lux, but not at a distance less than 200 mm		P
	– for all other light sources, including pulsed lamp sources, the hazard values shall be reported at a distance of 200 mm		N/A
6.1	Continuous wave lamps		P
6.1.1	Exempt Group		P
	In the exempt group are lamps, which does not pose any photobiological hazard. The requirement is met by any lamp that does not pose:		P
	– an actinic ultraviolet hazard ( $E_S$ ) within 8-hours exposure (30000 s), nor		P
	– a near-UV hazard ( $E_{UVA}$ ) within 1000 s, (about 16 min), nor		P
	– a retinal blue-light hazard ( $L_B$ ) within 10000 s (about 2,8 h), nor		P
	– a retinal thermal hazard ( $L_R$ ) within 10 s, nor		P

Appendix 4: Additional requirements of EN 62471:2008			
Clause	Requirement + Test	Result - Remark	Verdict
	– an infrared radiation hazard for the eye ( $E_{IR}$ ) within 1000 s		P
6.1.2	Risk Group 1 (Low-Risk)	(For model EL-SL08(1L)-80 with CLU048 chips and EL-SL68(L)-240 with CREE chips)	P
	In this group are lamps, which exceeds the limits for the except group but that does not pose:		P
	– an actinic ultraviolet hazard ( $E_S$ ) within 10000 s, nor		P
	– a near ultraviolet hazard ( $E_{UVA}$ ) within 300 s, nor		P
	– a retinal blue-light hazard ( $L_B$ ) within 100 s, nor		P
	– a retinal thermal hazard ( $L_R$ ) within 10 s, nor		P
	– an infrared radiation hazard for the eye ( $E_{IR}$ ) within 100 s		P
	Lamps that emit infrared radiation without a strong visual stimulus and do not pose a near-infrared retinal hazard ( $L_{IR}$ ), within 100 s are in Risk Group 1.		P
6.1.3	Risk Group 2 (Moderate-Risk)		N/A
	This requirement is met by any lamp that exceeds the limits for Risk Group 1, but that does not pose:		N/A
	– an actinic ultraviolet hazard ( $E_S$ ) within 1000 s exposure, nor		N/A
	– a near ultraviolet hazard ( $E_{UVA}$ ) within 100 s, nor		N/A
	– a retinal blue-light hazard ( $L_B$ ) within 0,25 s (aversion response), nor		N/A
	– a retinal thermal hazard ( $L_R$ ) within 0,25 s (aversion response), nor		N/A
	– an infrared radiation hazard for the eye ( $E_{IR}$ ) within 10 s		N/A
	Lamps that emit infrared radiation without a strong visual stimulus and do not pose a near-infrared retinal hazard ( $L_{IR}$ ), within 10 s are in Risk Group 2.		N/A
6.1.4	Risk Group 3 (High-Risk)		N/A
	Lamps which exceed the limits for Risk Group 2 are in Group 3.		N/A
6.2	Pulsed lamps		N/A
	Pulse lamp criteria shall apply to a single pulse and to any group of pulses within 0,25 s.		N/A
	A pulsed lamp shall be evaluated at the highest nominal energy loading as specified by the manufacturer.		N/A
	The risk group determination of the lamp being tested shall be made as follows:		N/A
	– a lamp that exceeds the exposure limit shall be classified as belonging to Risk Group 3 (High-Risk)		N/A

Appendix 4: Additional requirements of EN 62471:2008			
Clause	Requirement + Test	Result - Remark	Verdict
	– for single pulsed lamps, a lamp whose weighted radiant exposure or weighted radiance does is below the EL shall be classified as belonging to the Exempt Group		N/A
	– for repetitively pulsed lamps, a lamp whose weighted radiant exposure or weighted radiance dose is below the EL, shall be evaluated using the continuous wave risk criteria discussed in clause 6.1, using time averaged values of the pulsed emission		N/A

**Appendix 4: Additional requirements of EN 62471:2008**

Clause	Requirement + Test	Result - Remark	Verdict
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<b>Table 4.1</b>		Spectral weighting function for assessing ultraviolet hazards for skin and eye	
Wavelength <sup>1</sup> $\lambda$ , nm	UV hazard function $S_{uv}(\lambda)$	Wavelength $\lambda$ , nm	UV hazard function $S_{uv}(\lambda)$
200	0,030	313*	0,006
205	0,051	315	0,003
210	0,075	316	0,0024
215	0,095	317	0,0020
220	0,120	318	0,0016
225	0,150	319	0,0012
230	0,190	320	0,0010
235	0,240	322	0,00067
240	0,300	323	0,00054
245	0,360	325	0,00050
250	0,430	328	0,00044
254*	0,500	330	0,00041
255	0,520	333*	0,00037
260	0,650	335	0,00034
265	0,810	340	0,00028
270	1,000	345	0,00024
275	0,960	350	0,00020
280*	0,880	355	0,00016
285	0,770	360	0,00013
290	0,640	365*	0,00011
295	0,540	370	0,000093
297*	0,460	375	0,000077
300	0,300	380	0,000064
303*	0,120	385	0,000053
305	0,060	390	0,000044
308	0,026	395	0,000036
310	0,015	400	0,000030
<sup>1</sup> Wavelengths chosen are representative: other values should be obtained by logarithmic interpolation at intermediate wavelengths. * Emission lines of a mercury discharge spectrum.			



**Appendix 4: Additional requirements of EN 62471:2008**

Clause	Requirement + Test	Result - Remark	Verdict
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<b>Table 4.2</b>	Spectral weighting functions for assessing retinal hazards from broadband optical sources		
Wavelength nm	Blue-light hazard function B (λ)	Burn hazard function R (λ)	
300	0,01		
305	0,01		
310	0,01		
315	0,01		
320	0,01		
325	0,01		
330	0,01		
335	0,01		
340	0,01		
345	0,01		
350	0,01		
355	0,01		
360	0,01		
365	0,01		
370	0,01		
375	0,01		
380	0,01	0,1	
385	0,013	0,13	
390	0,025	0,25	
395	0,05	0,5	
400	0,10	1,0	
405	0,20	2,0	
410	0,40	4,0	
415	0,80	8,0	
420	0,90	9,0	
425	0,95	9,5	
430	0,98	9,8	
435	1,00	10,0	
440	1,00	10,0	
445	0,97	9,7	
450	0,94	9,4	
455	0,90	9,0	
460	0,80	8,0	
465	0,70	7,0	
470	0,62	6,2	
475	0,55	5,5	
480	0,45	4,5	
485	0,40	4,0	
490	0,22	2,2	
495	0,16	1,6	
500-600	$10^{[(450-\lambda)/50]}$	1,0	
600-700	0,001	1,0	
700-1050		$10^{[(700-\lambda)/500]}$	

**Appendix 4: Additional requirements of EN 62471:2008**

Clause	Requirement + Test	Result - Remark	Verdict
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<b>Table 4.2</b>	Spectral weighting functions for assessing retinal hazards from broadband optical sources		
1050-1150		0,2	
1150-1200		$0,2 \cdot 10^{0,02(1150-\lambda)}$	
1200-1400		0,02	

<b>Table 5.4</b>	Summary of the ELs for the surface of the skin or cornea (irradiance based values)					
Hazard Name	Relevant equation	Wavelength range nm	Exposure duration sec	Limiting aperture rad (deg)	EL in terms of constant irradiance $W \cdot m^{-2}$	
Actinic UV skin & eye	$E_S = \sum E_\lambda \cdot S(\lambda) \cdot \Delta\lambda$	200 – 400	< 30000	1,4 (80)	30/t	
Eye UV-A	$E_{UVA} = \sum E_\lambda \cdot \Delta\lambda$	315 – 400	$\leq 1000$ >1000	1,4 (80)	10000/t 10	
Blue-light small source	$E_B = \sum E_\lambda \cdot B(\lambda) \cdot \Delta\lambda$	300 – 700	$\leq 100$ >100	< 0,011	100/t 1,0	
Eye IR	$E_{IR} = \sum E_\lambda \cdot \Delta\lambda$	780 – 3000	$\leq 1000$ >1000	1,4 (80)	18000/t <sup>0,75</sup> 100	
Skin thermal	$E_H = \sum E_\lambda \cdot \Delta\lambda$	380 – 3000	< 10	2π sr	20000/t <sup>0,75</sup>	

<b>Table 5.5</b>	Summary of the ELs for the retina (radiance based values)					
Hazard Name	Relevant equation	Wavelength range nm	Exposure duration sec	Field of view radians	EL in terms of constant radiance $W \cdot m^{-2} \cdot sr^{-1}$	
Blue light	$L_B = \sum L_\lambda \cdot B(\lambda) \cdot \Delta\lambda$	300 – 700	0,25 – 10 10-100 100-10000 $\geq 10000$	$0,011 \cdot \sqrt{(t/10)}$ 0,011 $0,0011 \cdot \sqrt{t}$ 0,1	$10^6/t$ $10^6/t$ $10^6/t$ 100	
Retinal thermal	$L_R = \sum L_\lambda \cdot R(\lambda) \cdot \Delta\lambda$	380 – 1400	< 0,25 0,25 – 10	0,0017 $0,011 \cdot \sqrt{(t/10)}$	$50000/(\alpha \cdot t^{0,25})$ $50000/(\alpha \cdot t^{0,25})$	
Retinal thermal (weak visual stimulus)	$L_{IR} = \sum L_\lambda \cdot R(\lambda) \cdot \Delta\lambda$	780 – 1400	> 10	0,011	6000/α	

Appendix 4: Additional requirements of EN 62471:2008			
Clause	Requirement + Test	Result - Remark	Verdict

<b>Table 6.1</b>		Emission limits for risk groups of continuous wave lamps (EL-SL18LA-160 with LUMILEDS 5050 (If: 800 mA))							
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	$E_s$	$W \cdot m^{-2}$	0,001	$4,39 \times 10^{-5}$	0,003	---	0,03	---
Near UV		$E_{UVA}$	$W \cdot m^{-2}$	10	$3,038 \times 10^{-3}$	33	---	100	---
Blue light	$B(\lambda)$	$L_B$	$W \cdot m^{-2} \cdot sr^{-1}$	100	$2,124 \times 10$	10000	---	4000000	---
Blue light, small source	$B(\lambda)$	$E_B$	$W \cdot m^{-2}$	1,0*	$2,521 \times 10^{-1}$	1,0	---	400	---
Retinal thermal	$R(\lambda)$	$L_R$	$W \cdot m^{-2} \cdot sr^{-1}$	$28000/\alpha$	$1,192 \times 10^3$	$28000/\alpha$	---	$71000/\alpha$	---
Retinal thermal, weak visual stimulus**	$R(\lambda)$	$L_{IR}$	$W \cdot m^{-2} \cdot sr^{-1}$	$6000/\alpha$	$3,757 \times 10^0$	$6000/\alpha$	---	$6000/\alpha$	---
IR radiation, eye		$E_{IR}$	$W \cdot m^{-2}$	100	0	570	---	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 Remark: EL-SL18LA-160 with LUMILEDS 5050 is RG0.									

Appendix 4: Additional requirements of EN 62471:2008			
Clause	Requirement + Test	Result - Remark	Verdict

Table 6.1 Emission limits for risk groups of continuous wave lamps (EL-SL18LA-160 with LUMILEDS 5050 (If:160 mA))									
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	$E_s$	$W \cdot m^{-2}$	0,001	$1,1 \times 10^{-4}$	0,003	---	0,03	---
Near UV		$E_{UVA}$	$W \cdot m^{-2}$	10	$8,6 \times 10^{-4}$	33	---	100	---
Blue light	$B(\lambda)$	$L_B$	$W \cdot m^{-2} \cdot sr^{-1}$	100	19	10000	---	4000000	---
Blue light, small source	$B(\lambda)$	$E_B$	$W \cdot m^{-2}$	1,0*	N/A ( $\alpha=0,061$ )	1,0	---	400	---
Retinal thermal	$R(\lambda)$	$L_R$	$W \cdot m^{-2} \cdot sr^{-1}$	$28000/\alpha$	$1,4 \times 10^3$	$28000/\alpha$	---	$71000/\alpha$	---
Retinal thermal, weak visual stimulus**	$R(\lambda)$	$L_{IR}$	$W \cdot m^{-2} \cdot sr^{-1}$	$6000/\alpha$	$9,8 \times 10^{-1}$	$6000/\alpha$	---	$6000/\alpha$	---
IR radiation, eye		$E_{IR}$	$W \cdot m^{-2}$	100	0	570	---	3200	---

Appendix 4: Additional requirements of EN 62471:2008			
Clause	Requirement + Test	Result - Remark	Verdict

\* 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

Remark: EL-SL18LA-160 with LUMILEDS 5050 is RG0.

**Table 6.1** Emission limits for risk groups of continuous wave lamps (EL-SL58(S)-60 with LUMILEDS LUXEON 3030)

Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	$E_s$	$W \cdot m^{-2}$	0,001	$2,233 \times 10^{-5}$	0,003	---	0,03	---
Near UV		$E_{UVA}$	$W \cdot m^{-2}$	10	$8,247 \times 10^{-4}$	33	---	100	---
Blue light	$B(\lambda)$	$L_B$	$W \cdot m^{-2} \cdot sr^{-1}$	100	$1,536 \times 10$	10000	---	4000000	---
Blue light, small source	$B(\lambda)$	$E_B$	$W \cdot m^{-2}$	1,0*	$2,432 \times 10^{-1}$	1,0	---	400	---
Retinal thermal	$R(\lambda)$	$L_R$	$W \cdot m^{-2} \cdot sr^{-1}$	$28000/\alpha$	$4,909 \times 10^2$	$28000/\alpha$	---	$71000/\alpha$	---
Retinal thermal, weak visual stimulus**	$R(\lambda)$	$L_{IR}$	$W \cdot m^{-2} \cdot sr^{-1}$	$6000/\alpha$	$1,015 \times 10^0$	$6000/\alpha$	---	$6000/\alpha$	---
IR radiation, eye		$E_{IR}$	$W \cdot m^{-2}$	100	0	570	---	3200	---

Appendix 4: Additional requirements of EN 62471:2008			
Clause	Requirement + Test	Result - Remark	Verdict

\* 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

Remark: EL-SL58(S)-60 with LUMILEDS LUXEON 3030 is RG0.

Table 6.1 Emission limits for risk groups of continuous wave lamps (EL-SL68(S)-50 with LUMILEDS LUXEON 3030)									
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	$E_s$	$W \cdot m^{-2}$	0,001	$5,86 \times 10^{-5}$	0,003	---	0,03	---
Near UV		$E_{UVA}$	$W \cdot m^{-2}$	10	$1,23 \times 10^{-3}$	33	---	100	---
Blue light	$B(\lambda)$	$L_B$	$W \cdot m^{-2} \cdot sr^{-1}$	100	21,35	10000	---	4000000	---
Blue light, small source	$B(\lambda)$	$E_B$	$W \cdot m^{-2}$	1,0*	N/A ( $\alpha=0,1$ )	1,0	---	400	---
Retinal thermal	$R(\lambda)$	$L_R$	$W \cdot m^{-2} \cdot sr^{-1}$	$28000/\alpha$	352,5	$28000/\alpha$	---	$71000/\alpha$	---
Retinal thermal, weak visual stimulus**	$R(\lambda)$	$L_{IR}$	$W \cdot m^{-2} \cdot sr^{-1}$	$6000/\alpha$	1,184	$6000/\alpha$	---	$6000/\alpha$	---

Appendix 4: Additional requirements of EN 62471:2008									
Clause	Requirement + Test					Result - Remark		Verdict	
IR radiation, eye		$E_{IR}$	$W \cdot m^{-2}$	100	0	570	---	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 Remark: EL-SL68(S)-50 with LUMILEDS LUXEON 3030 is RG0.									
<b>Table 6.1</b>	Emission limits for risk groups of continuous wave lamps (EL-SL18LA-160 with CREE, INC. chips of CX series)								
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	$E_s$	$W \cdot m^{-2}$	0,001	$3,5 \times 10^{-5}$	0,003	---	0,03	---
Near UV		$E_{UVA}$	$W \cdot m^{-2}$	10	$1,1 \times 10^{-3}$	33	---	100	---
Blue light	$B(\lambda)$	$L_B$	$W \cdot m^{-2} \cdot sr^{-1}$	100	17	10000	---	4000000	---
Blue light, small source	$B(\lambda)$	$E_B$	$W \cdot m^{-2}$	1,0*	(N/A) $\alpha = 0,055$	1,0	---	400	---
Retinal thermal	$R(\lambda)$	$L_R$	$W \cdot m^{-2} \cdot sr^{-1}$	$28000/\alpha$	$2,7 \times 10^3$	$28000/\alpha$	---	$71000/\alpha$	---

Appendix 4: Additional requirements of EN 62471:2008									
Clause	Requirement + Test					Result - Remark		Verdict	
Retinal thermal, weak visual stimulus**	R( $\lambda$ )	L <sub>IR</sub>	W•m <sup>-2</sup> •sr <sup>-1</sup>	6000/ $\alpha$	2,8	6000/ $\alpha$	---	6000/ $\alpha$	---
IR radiation, eye		E <sub>IR</sub>	W•m <sup>-2</sup>	100	0	570	---	3200	---
<p>* Small source defined as one with <math>\alpha &lt; 0,011</math> radian. Averaging field of view at 10000 s is 0,1 radian.</p> <p>** Involves evaluation of non-GLS source</p> <p>Remark: EL-SL18LA-160 with CREE, INC. chips of CX series is RG0.</p>									

Table 6.1 Emission limits for risk groups of continuous wave lamps (EL-SL18LA-160 with OSRAM chips)									
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	S <sub>UV</sub> ( $\lambda$ )	E <sub>s</sub>	W•m <sup>-2</sup>	0,001	1,1 x10 <sup>-4</sup>	0,003	---	0,03	---
Near UV		E <sub>UVA</sub>	W•m <sup>-2</sup>	10	8,6 x10 <sup>-4</sup>	33	---	100	---
Blue light	B( $\lambda$ )	L <sub>B</sub>	W•m <sup>-2</sup> •sr <sup>-1</sup>	100	19	10000	---	4000000	---
Blue light, small source	B( $\lambda$ )	E <sub>B</sub>	W•m <sup>-2</sup>	1,0*	(N/A) $\alpha = 0,061$	1,0	---	400	---



Appendix 4: Additional requirements of EN 62471:2008			
Clause	Requirement + Test	Result - Remark	Verdict

Table 6.1 Emission limits for risk groups of continuous wave lamps (EL-SL18LA-160 with OSRAM chips)									
Retinal thermal	R( $\lambda$ )	L <sub>R</sub>	W•m <sup>-2</sup> •sr <sup>-1</sup>	28000/ $\alpha$	1,4 x 10 <sup>3</sup>	28000/ $\alpha$	---	71000/ $\alpha$	---
Retinal thermal, weak visual stimulus**	R( $\lambda$ )	L <sub>IR</sub>	W•m <sup>-2</sup> •sr <sup>-1</sup>	6000/ $\alpha$	0,98	6000/ $\alpha$	---	6000/ $\alpha$	---
IR radiation, eye		E <sub>IR</sub>	W•m <sup>-2</sup>	100	0	570	---	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 Remark: EL-SL18LA-160 with OSRAM chips is RG0.									

Table 6.1 Emission limits for risk groups of continuous wave lamps (EL-SL10(1)-80 with CREE, INC. chips of XTE)									
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	S <sub>UV</sub> ( $\lambda$ )	E <sub>s</sub>	W•m <sup>-2</sup>	0,001	2,162 x10 <sup>-5</sup>	0,003	---	0,03	---
Near UV		E <sub>UVA</sub>	W•m <sup>-2</sup>	10	3,232 x10 <sup>-4</sup>	33	---	100	---
Blue light	B( $\lambda$ )	L <sub>B</sub>	W•m <sup>-2</sup> •sr <sup>-1</sup>	100	97,65	10000	---	4000000	---

Appendix 4: Additional requirements of EN 62471:2008									
Clause	Requirement + Test					Result - Remark		Verdict	
Blue light, small source	B( $\lambda$ )	$E_B$	$W \cdot m^{-2}$	1,0*	(N/A) $\alpha = 0,1$	1,0	---	400	---
Retinal thermal	R( $\lambda$ )	$L_R$	$W \cdot m^{-2} \cdot sr^{-1}$	$28000/\alpha$	$1,31 \times 10^3$	$28000/\alpha$	---	$71000/\alpha$	---
Retinal thermal, weak visual stimulus**	R( $\lambda$ )	$L_{IR}$	$W \cdot m^{-2} \cdot sr^{-1}$	$6000/\alpha$	1,147	$6000/\alpha$	---	$6000/\alpha$	---
IR radiation, eye		$E_{IR}$	$W \cdot m^{-2}$	100	0	570	---	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 Remark: EL-SL10(1)-80 with CREE, INC. chips of XTE is RG0.									

Table 6.1 Emission limits for risk groups of continuous wave lamps (EL-SL10(1)-80 with CLU048 chips)									
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	$E_s$	$W \cdot m^{-2}$	0,001	---	0,003	$2,182 \times 10^{-5}$	0,03	---
Near UV		$E_{UVA}$	$W \cdot m^{-2}$	10	---	33	$4,732 \times 10^{-4}$	100	---

Appendix 4: Additional requirements of EN 62471:2008									
Clause	Requirement + Test				Result - Remark			Verdict	
Blue light	B( $\lambda$ )	L <sub>B</sub>	W•m <sup>-2</sup> •sr <sup>-1</sup>	100	---	10000	163,8	4000000	---
Blue light, small source	B( $\lambda$ )	E <sub>B</sub>	W•m <sup>-2</sup>	1,0*	---	1,0	(N/A) $\alpha = 0,1$	400	---
Retinal thermal	R( $\lambda$ )	L <sub>R</sub>	W•m <sup>-2</sup> •sr <sup>-1</sup>	28000/ $\alpha$	---	28000/ $\alpha$	2,076 x 10 <sup>3</sup>	71000/ $\alpha$	---
Retinal thermal, weak visual stimulus**	R( $\lambda$ )	L <sub>IR</sub>	W•m <sup>-2</sup> •sr <sup>-1</sup>	6000/ $\alpha$	---	6000/ $\alpha$	4,302 x 10 <sup>-1</sup>	6000/ $\alpha$	---
IR radiation, eye		E <sub>IR</sub>	W•m <sup>-2</sup>	100	---	570	0	3200	---
<p>* Small source defined as one with <math>\alpha &lt; 0,011</math> radian. Averaging field of view at 10000 s is 0,1 radian.</p> <p>** Involves evaluation of non-GLS source</p> <p>Remark: EL-SL10(1)-80 with CLU048 chips is RG1.</p>									

Appendix 4: Additional requirements of EN 62471:2008			
Clause	Requirement + Test	Result - Remark	Verdict

Table 6.1 Emission limits for risk groups of continuous wave lamps (EL-SL68(L)-240 with CREE chips)									
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	$E_s$	$W \cdot m^{-2}$	0,001	---	0,003	$6,826 \times 10^{-5}$	0,03	---
Near UV		$E_{UVA}$	$W \cdot m^{-2}$	10	---	33	0	100	---
Blue light	$B(\lambda)$	$L_B$	$W \cdot m^{-2} \cdot sr^{-1}$	100	---	10000	$3,454 \times 10^2$	4000000	---
Blue light, small source	$B(\lambda)$	$E_B$	$W \cdot m^{-2}$	1,0*	---	1,0	(N/A) $\alpha = 0,0889$	400	---
Retinal thermal	$R(\lambda)$	$L_R$	$W \cdot m^{-2} \cdot sr^{-1}$	$28000/\alpha$	---	$28000/\alpha$	$4,008 \times 10^3$	$71000/\alpha$	---
Retinal thermal, weak visual stimulus**	$R(\lambda)$	$L_{IR}$	$W \cdot m^{-2} \cdot sr^{-1}$	$6000/\alpha$	---	$6000/\alpha$	$4,833 \times 10^0$	$6000/\alpha$	---
IR radiation, eye		$E_{IR}$	$W \cdot m^{-2}$	100	---	570	0	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 Remark: EL-SL68(L)-240 with CREE chips is RG1.									

Appendix 4: Additional requirements of EN 62471:2008			
Clause	Requirement + Test	Result - Remark	Verdict

<b>ATTACHMENT TO TEST REPORT IEC 62471</b> <b>EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES</b> <b>PHOTOBIOLOGICAL SAFETY OF LAMPS AND LAMPS SYSTEMS</b>	
<b>Differences according to</b> .....	EN 62471:2008
<b>Attachment Form No.</b> .....	EU_GD_IEC62471A
<b>Attachment Originator</b> .....	IMQ S.p.A.
<b>Master Attachment</b> .....	2009-07
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	<b>CENELEC COMMON MODIFICATIONS (EN)</b>		
<b>4</b>	<b>EXPOSURE LIMITS</b>		
	Contents of the whole Clause 4 of IEC 62471:2006 moved into a new informative Annex ZB		¾
	Clause 4 replaced by the following:		
	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	P
4.1	General		
	First paragraph deleted		¾

Appendix 4: Additional requirements of EN 62471:2008			
Clause	Requirement + Test	Result - Remark	Verdict

Table 6.1		Emission limits for risk groups of continuous wave lamps (based on EU Directive 2006/25/EC) (EL-SL18LA-160 with LUMILEDS 5050 (If: 800 mA))							
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	$E_s$	$W \cdot m^{-2}$	0,001	$4,39 \times 10^{-5}$	---	---	---	---
Near UV		$E_{UVA}$	$W \cdot m^{-2}$	0,33	$3,038 \times 10^{-3}$	---	---	---	---
Blue light	$B(\lambda)$	$L_B$	$W \cdot m^{-2} \cdot sr^{-1}$	100	$2,124 \times 10$	10000	---	4000000	---
Blue light, small source	$B(\lambda)$	$E_B$	$W \cdot m^{-2}$	0,01*	$2,521 \times 10^{-1}$	1,0	---	400	---
Retinal thermal	$R(\lambda)$	$L_R$	$W \cdot m^{-2} \cdot sr^{-1}$	$28000/\alpha$	$1,192 \times 10^3$	$28000/\alpha$	---	$71000/\alpha$	---
Retinal thermal, weak visual stimulus**	$R(\lambda)$	$L_{IR}$	$W \cdot m^{-2} \cdot sr^{-1}$	$545000$ $0,0017 \leq \alpha \leq 0,011$	N/A				
				$6000/\alpha$ $0,011 \leq \alpha \leq 0,1$	$3,757 \times 10^0$				
IR radiation, eye		$E_{IR}$	$W \cdot m^{-2}$	100	0	570	---	3200	---

Appendix 4: Additional requirements of EN 62471:2008			
Clause	Requirement + Test	Result - Remark	Verdict

\* 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.

Remark: EL-SL18LA-160 with LUMILEDS 5050 is RG0.

Appendix 4: Additional requirements of EN 62471:2008			
Clause	Requirement + Test	Result - Remark	Verdict

Table 6.1 Emission limits for risk groups of continuous wave lamps (based on EU Directive 2006/25/EC) (EL-SL18LA-160 with LUMILEDS 5050 (If: 160 mA))									
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	$E_s$	$W \cdot m^{-2}$	0,001	$1,1 \times 10^{-4}$	---	---	---	---
Near UV		$E_{UVA}$	$W \cdot m^{-2}$	0,33	$8,6 \times 10^{-4}$	---	---	---	---
Blue light	$B(\lambda)$	$L_B$	$W \cdot m^{-2} \cdot sr^{-1}$	100	19	10000	---	4000000	---
Blue light, small source	$B(\lambda)$	$E_B$	$W \cdot m^{-2}$	0,01*	N/A ( $\alpha=0,061$ )	1,0	---	400	---
Retinal thermal	$R(\lambda)$	$L_R$	$W \cdot m^{-2} \cdot sr^{-1}$	$28000/\alpha$	$1,4 \times 10^3$	$28000/\alpha$	---	$71000/\alpha$	---
Retinal thermal, weak visual stimulus**	$R(\lambda)$	$L_{IR}$	$W \cdot m^{-2} \cdot sr^{-1}$	545000 $0,0017 \leq \alpha \leq 0,011$	N/A				
				$6000/\alpha$ $0,011 \leq \alpha \leq 0,1$	$9,8 \times 10^{-1}$				



Appendix 4: Additional requirements of EN 62471:2008									
Clause	Requirement + Test					Result - Remark		Verdict	
IR radiation, eye		$E_{IR}$	$W \cdot m^{-2}$	100	0	570	---	3200	---
<p>* Small source defined as one with <math>\alpha &lt; 0,011</math> radian. Averaging field of view at 10000 s is 0,1 radian.</p> <p>** Involves evaluation of non-GLS source</p> <p>NOTE The action functions: see Table 4.1 and Table 4.2</p> <p>The applicable aperture diameters: see 4.2.1</p> <p>The limitations for the angular subtenses: see 4.2.2</p> <p>The related measurement condition 5.2.3 and the range of acceptance angles: see Table 5.5.</p> <p>Remark: EL-SL18LA-160 with LUMILEDS 5050 is RG0.</p>									

Appendix 4: Additional requirements of EN 62471:2008			
Clause	Requirement + Test	Result - Remark	Verdict

Table 6.1		Emission limits for risk groups of continuous wave lamps (based on EU Directive 2006/25/EC) (EL-SL58(S)-60 with LUMILEDS LUXEON 3030)							
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	$E_s$	$W \cdot m^{-2}$	0,001	$2,233 \times 10^{-5}$	---	---	---	---
Near UV		$E_{UVA}$	$W \cdot m^{-2}$	0,33	$8,247 \times 10^{-4}$	---	---	---	---
Blue light	$B(\lambda)$	$L_B$	$W \cdot m^{-2} \cdot sr^{-1}$	100	$1,536 \times 10$	10000	---	4000000	---
Blue light, small source	$B(\lambda)$	$E_B$	$W \cdot m^{-2}$	0,01*	$2,432 \times 10^{-1}$	1,0	---	400	---
Retinal thermal	$R(\lambda)$	$L_R$	$W \cdot m^{-2} \cdot sr^{-1}$	$28000/\alpha$	$4,909 \times 10^2$	$28000/\alpha$	---	$71000/\alpha$	---
Retinal thermal, weak visual stimulus**	$R(\lambda)$	$L_{IR}$	$W \cdot m^{-2} \cdot sr^{-1}$	$545000$ $0,0017 \leq \alpha \leq 0,011$	N/A				
				$6000/\alpha$ $0,011 \leq \alpha \leq 0,1$	$1,015 \times 10^0$				
IR radiation, eye		$E_{IR}$	$W \cdot m^{-2}$	100	0	570	---	3200	---

Appendix 4: Additional requirements of EN 62471:2008			
Clause	Requirement + Test	Result - Remark	Verdict

\* 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.

Remark: EL-SL58(S)-60 with LUMILEDS LUXEON 3030 is RG0.

Appendix 4: Additional requirements of EN 62471:2008			
Clause	Requirement + Test	Result - Remark	Verdict

Table 6.1		Emission limits for risk groups of continuous wave lamps (based on EU Directive 2006/25/EC) (EL-SL58(S)-60 with LUMILEDS LUXEON 3030)							
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	$E_s$	$W \cdot m^{-2}$	0,001	$5,86 \times 10^{-5}$	---	---	---	---
Near UV		$E_{UVA}$	$W \cdot m^{-2}$	0,33	$1,23 \times 10^{-3}$	---	---	---	---
Blue light	$B(\lambda)$	$L_B$	$W \cdot m^{-2} \cdot sr^{-1}$	100	21,35	10000	---	4000000	---
Blue light, small source	$B(\lambda)$	$E_B$	$W \cdot m^{-2}$	0,01*	N/A ( $\alpha=0,1$ )	1,0	---	400	---
Retinal thermal	$R(\lambda)$	$L_R$	$W \cdot m^{-2} \cdot sr^{-1}$	$28000/\alpha$	352,5	$28000/\alpha$	---	$71000/\alpha$	---
Retinal thermal, weak visual stimulus**	$R(\lambda)$	$L_{IR}$	$W \cdot m^{-2} \cdot sr^{-1}$	545000 $0,0017 \leq \alpha \leq 0,011$	N/A				
				$6000/\alpha$ $0,011 \leq \alpha \leq 0,1$	1,184				

Appendix 4: Additional requirements of EN 62471:2008									
Clause	Requirement + Test					Result - Remark		Verdict	
IR radiation, eye		$E_{IR}$	$W \cdot m^{-2}$	100	0	570	---	3200	---
<p>* Small source defined as one with <math>\alpha &lt; 0,011</math> radian. Averaging field of view at 10000 s is 0,1 radian.</p> <p>** Involves evaluation of non-GLS source</p> <p>NOTE The action functions: see Table 4.1 and Table 4.2</p> <p>The applicable aperture diameters: see 4.2.1</p> <p>The limitations for the angular subtenses: see 4.2.2</p> <p>The related measurement condition 5.2.3 and the range of acceptance angles: see Table 5.5.</p> <p>Remark: EL-SL58(S)-60 with LUMILEDS LUXEON 3030 is RG0.</p>									

Appendix 4: Additional requirements of EN 62471:2008			
Clause	Requirement + Test	Result - Remark	Verdict

Table 6.1 Emission limits for risk groups of continuous wave lamps (based on EU Directive 2006/25/EC) (EL-SL18LA-160 with CREE, INC. chips of CX series)									
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	$E_s$	$W \cdot m^{-2}$	0,001	$3,5 \times 10^{-5}$	---	---	---	---
Near UV		$E_{UVA}$	$W \cdot m^{-2}$	0,33	$1,1 \times 10^{-3}$	---	---	---	---
Blue light	$B(\lambda)$	$L_B$	$W \cdot m^{-2} \cdot sr^{-1}$	100	17	10000	---	4000000	---
Blue light, small source	$B(\lambda)$	$E_B$	$W \cdot m^{-2}$	0,01*	(N/A) $\alpha = 0,055$	1,0	---	400	---
Retinal thermal	$R(\lambda)$	$L_R$	$W \cdot m^{-2} \cdot sr^{-1}$	$28000/\alpha$	$2,7 \times 10^3$	$28000/\alpha$	---	$71000/\alpha$	---
Retinal thermal, weak visual stimulus**	$R(\lambda)$	$L_{IR}$	$W \cdot m^{-2} \cdot sr^{-1}$	545000 $0,0017 \leq \alpha \leq 0,011$	N/A				
				$6000/\alpha$ $0,011 \leq \alpha \leq 0,1$	2,8				

Appendix 4: Additional requirements of EN 62471:2008									
Clause	Requirement + Test					Result - Remark		Verdict	
IR radiation, eye		$E_{IR}$	$W \cdot m^{-2}$	100	0	570	---	3200	---
<p>* Small source defined as one with <math>\alpha &lt; 0,011</math> radian. Averaging field of view at 10000 s is 0,1 radian.</p> <p>** Involves evaluation of non-GLS source</p> <p>NOTE The action functions: see Table 4.1 and Table 4.2</p> <p>The applicable aperture diameters: see 4.2.1</p> <p>The limitations for the angular subtenses: see 4.2.2</p> <p>The related measurement condition 5.2.3 and the range of acceptance angles: see Table 5.5.</p> <p>Remark: EL-SL18LA-160 with CREE, INC. chips of CX series is RG0.</p>									

Appendix 4: Additional requirements of EN 62471:2008			
Clause	Requirement + Test	Result - Remark	Verdict

Table 6.1 Emission limits for risk groups of continuous wave lamps (based on EU Directive 2006/25/EC) (EL-SL18LA-160 with OSRAM chips)									
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	$E_s$	$W \cdot m^{-2}$	0,001	$1,1 \times 10^{-4}$	---	---	---	---
Near UV		$E_{UVA}$	$W \cdot m^{-2}$	0,33	$8,6 \times 10^{-4}$	---	---	---	---
Blue light	$B(\lambda)$	$L_B$	$W \cdot m^{-2} \cdot sr^{-1}$	100	19	10000	---	4000000	---
Blue light, small source	$B(\lambda)$	$E_B$	$W \cdot m^{-2}$	0,01*	(N/A) $\alpha = 0,061$	1,0	---	400	---
Retinal thermal	$R(\lambda)$	$L_R$	$W \cdot m^{-2} \cdot sr^{-1}$	$28000/\alpha$	$1,4 \times 10^3$	$28000/\alpha$	---	$71000/\alpha$	---
Retinal thermal, weak visual stimulus**	$R(\lambda)$	$L_{IR}$	$W \cdot m^{-2} \cdot sr^{-1}$	545000 $0,0017 \leq \alpha \leq 0,011$	N/A				
				$6000/\alpha$ $0,011 \leq \alpha \leq 0,1$	0,98				



Appendix 4: Additional requirements of EN 62471:2008									
Clause	Requirement + Test					Result - Remark		Verdict	
IR radiation, eye		$E_{IR}$	$W \cdot m^{-2}$	100	0	570	---	3200	---
<p>* Small source defined as one with <math>\alpha &lt; 0,011</math> radian. Averaging field of view at 10000 s is 0,1 radian.</p> <p>** Involves evaluation of non-GLS source</p> <p>NOTE The action functions: see Table 4.1 and Table 4.2</p> <p>The applicable aperture diameters: see 4.2.1</p> <p>The limitations for the angular subtenses: see 4.2.2</p> <p>The related measurement condition 5.2.3 and the range of acceptance angles: see Table 5.5.</p> <p>Remark: EL-SL18LA-160 with OSRAM chips is RG0.</p>									

Appendix 4: Additional requirements of EN 62471:2008			
Clause	Requirement + Test	Result - Remark	Verdict

Table 6.1		Emission limits for risk groups of continuous wave lamps (based on EU Directive 2006/25/EC) (EL-SL10(1)-80 with CREE, INC. chips of XTE)							
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	$E_s$	$W \cdot m^{-2}$	0,001	$2,162 \times 10^{-5}$	---	---	---	---
Near UV		$E_{UVA}$	$W \cdot m^{-2}$	0,33	$3,232 \times 10^{-4}$	---	---	---	---
Blue light	$B(\lambda)$	$L_B$	$W \cdot m^{-2} \cdot sr^{-1}$	100	97,65	10000	---	4000000	---
Blue light, small source	$B(\lambda)$	$E_B$	$W \cdot m^{-2}$	0,01*	(N/A) $\alpha = 0,1$	1,0	---	400	---
Retinal thermal	$R(\lambda)$	$L_R$	$W \cdot m^{-2} \cdot sr^{-1}$	$28000/\alpha$	$1,31 \times 10^3$	$28000/\alpha$	---	$71000/\alpha$	---
Retinal thermal, weak visual stimulus**	$R(\lambda)$	$L_{IR}$	$W \cdot m^{-2} \cdot sr^{-1}$	545000 $0,0017 \leq \alpha \leq 0,011$	N/A				
				$6000/\alpha$ $0,011 \leq \alpha \leq 0,1$	1,147				

Appendix 4: Additional requirements of EN 62471:2008									
Clause	Requirement + Test					Result - Remark		Verdict	
IR radiation, eye		$E_{IR}$	$W \cdot m^{-2}$	100	0	570	---	3200	---
<p>* Small source defined as one with <math>\alpha &lt; 0,011</math> radian. Averaging field of view at 10000 s is 0,1 radian.</p> <p>** Involves evaluation of non-GLS source</p> <p>NOTE The action functions: see Table 4.1 and Table 4.2</p> <p>The applicable aperture diameters: see 4.2.1</p> <p>The limitations for the angular subtenses: see 4.2.2</p> <p>The related measurement condition 5.2.3 and the range of acceptance angles: see Table 5.5.</p> <p>Remark: EL-SL10(1)-80 with CREE, INC. chips of XTE is RG0.</p>									

Appendix 4: Additional requirements of EN 62471:2008			
Clause	Requirement + Test	Result - Remark	Verdict

Table 6.1 Emission limits for risk groups of continuous wave lamps (based on EU Directive 2006/25/EC) (EL-SL10(1)-80 with CLU048 chips)									
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	$E_s$	$W \cdot m^{-2}$	0,001	$2,182 \times 10^{-5}$	---	---	---	---
Near UV		$E_{UVA}$	$W \cdot m^{-2}$	0,33	$4,732 \times 10^{-4}$	---	---	---	---
Blue light	$B(\lambda)$	$L_B$	$W \cdot m^{-2} \cdot sr^{-1}$	100	---	10000	163,8	4000000	---
Blue light, small source	$B(\lambda)$	$E_B$	$W \cdot m^{-2}$	0,01*	---	1,0	(N/A) $\alpha = 0,1$	400	---
Retinal thermal	$R(\lambda)$	$L_R$	$W \cdot m^{-2} \cdot sr^{-1}$	$28000/\alpha$	---	$28000/\alpha$	$2,076 \times 10^3$	$71000/\alpha$	---
Retinal thermal, weak visual stimulus**	$R(\lambda)$	$L_{IR}$	$W \cdot m^{-2} \cdot sr^{-1}$	545000 $0,0017 \leq \alpha \leq 0,011$	N/A				
				$6000/\alpha$ $0,011 \leq \alpha \leq 0,1$	$4,302 \times 10^{-1}$				

Appendix 4: Additional requirements of EN 62471:2008									
Clause	Requirement + Test					Result - Remark		Verdict	
IR radiation, eye		$E_{IR}$	$W \cdot m^{-2}$	100	---	570	0	3200	---
<p>* Small source defined as one with <math>\alpha &lt; 0,011</math> radian. Averaging field of view at 10000 s is 0,1 radian.</p> <p>** Involves evaluation of non-GLS source</p> <p>NOTE The action functions: see Table 4.1 and Table 4.2</p> <p>The applicable aperture diameters: see 4.2.1</p> <p>The limitations for the angular subtenses: see 4.2.2</p> <p>The related measurement condition 5.2.3 and the range of acceptance angles: see Table 5.5.</p> <p>Remark: EL-SL10(1)-80 with CLU048 chips is RG1.</p>									

Appendix 4: Additional requirements of EN 62471:2008			
Clause	Requirement + Test	Result - Remark	Verdict

Table 6.1 Emission limits for risk groups of continuous wave lamps (based on EU Directive 2006/25/EC) (EL-SL68(L)-240 with CREE chips)									
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	$E_s$	$W \cdot m^{-2}$	0,001	---	---	---	---	---
Near UV		$E_{UVA}$	$W \cdot m^{-2}$	0,33	---	---	---	---	---
Blue light	$B(\lambda)$	$L_B$	$W \cdot m^{-2} \cdot sr^{-1}$	100	---	10000	(N/A) $\alpha = 0,0889$	4000000	---
Blue light, small source	$B(\lambda)$	$E_B$	$W \cdot m^{-2}$	0,01*	---	1,0	$4,008 \times 10^3$	400	---
Retinal thermal	$R(\lambda)$	$L_R$	$W \cdot m^{-2} \cdot sr^{-1}$	$28000/\alpha$	---	$28000/\alpha$	(N/A) $\alpha = 0,0889$	$71000/\alpha$	---
Retinal thermal, weak visual	$R(\lambda)$	$L_{IR}$	$W \cdot m^{-2} \cdot sr^{-1}$	$545000$ $0,0017 \leq \alpha \leq 0,011$	N/A				

Appendix 4: Additional requirements of EN 62471:2008									
Clause		Requirement + Test			Result - Remark				Verdict
stimulus**				$\frac{6000}{\alpha}$ $0,011 \leq \alpha \leq 0,1$	$4,833 \times 10^0$				
IR radiation, eye		E <sub>IR</sub>	W•m <sup>-2</sup>	100	---	570	0	3200	---
<p>* Small source defined as one with <math>\alpha &lt; 0,011</math> radian. Averaging field of view at 10000 s is 0,1 radian.</p> <p>** Involves evaluation of non-GLS source</p> <p>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.</p> <p>Remark: EL-SL68(L)-240 with CREE chips chips is RG1.</p>									

Appendix 5: Additional requirements of EN 62493:2015			
Clause	Requirement + Test	Result - Remark	Verdict
<b>4</b>	<b>LIMITS</b>		<b>P</b>
<b>4.1</b>	<b>General</b>		<b>P</b>
	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		<b>P</b>
<b>4.2</b>	<b>Unintentional radiating part of lighting equipment</b>		<b>P</b>
4.2.2	Lighting equipment deemed to comply with the Van der Hoofden test without testing		<b>P</b>
	1) electronic controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<b>3/4</b>
	2) incandescent-lamp technology	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<b>3/4</b>
	3) LED-light-source technology	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<b>3/4</b>
	4) OLED-light-source technology	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<b>3/4</b>
	5) high-pressure discharge lamp LED-light-source technologies	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<b>3/4</b>
	6) low-pressure discharge lamp technologies with exposure distance $\geq 50$ cm	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<b>3/4</b>
	7) independent auxiliary	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<b>3/4</b>
	Not fulfil any of 1-7 above subject to 4.2.3		<b>3/4</b>
4.2.3	Applications of limits		<b>N/A</b>
	Not fulfil any of 1-7 in 4.2.2 but the compliance factor $F$ is $\leq 1$		<b>N/A</b>
<b>4.3</b>	<b>Intentional radiating part of lighting equipment</b>		<b>N/A</b>
	Comply with one of methods in Clause 7 if intentional radiator		<b>N/A</b>
<b>5</b>	<b>GENERAL</b>		<b>N/A</b>
<b>6</b>	<b>MEASUREMENT PROCEDURE FOR THE VAN DER HOOFDEN TEST</b>		<b>N/A</b>
<b>7</b>	<b>ASSESSMENT PROCEDURE INTENTIONAL RADIATORS</b>		<b>N/A</b>



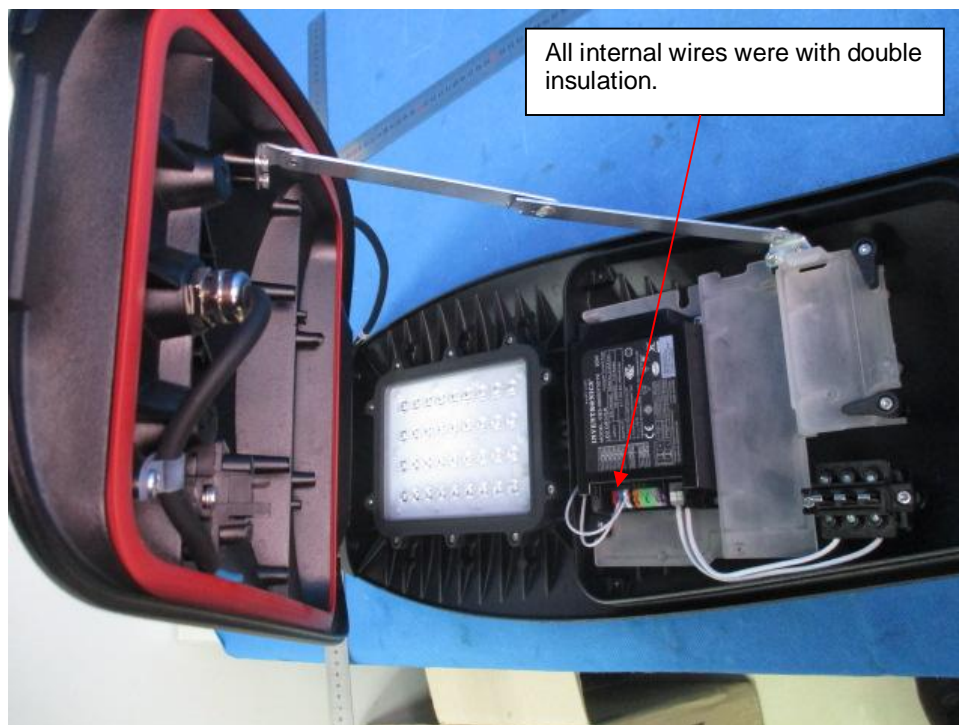
**Appendix 6: Photograph**



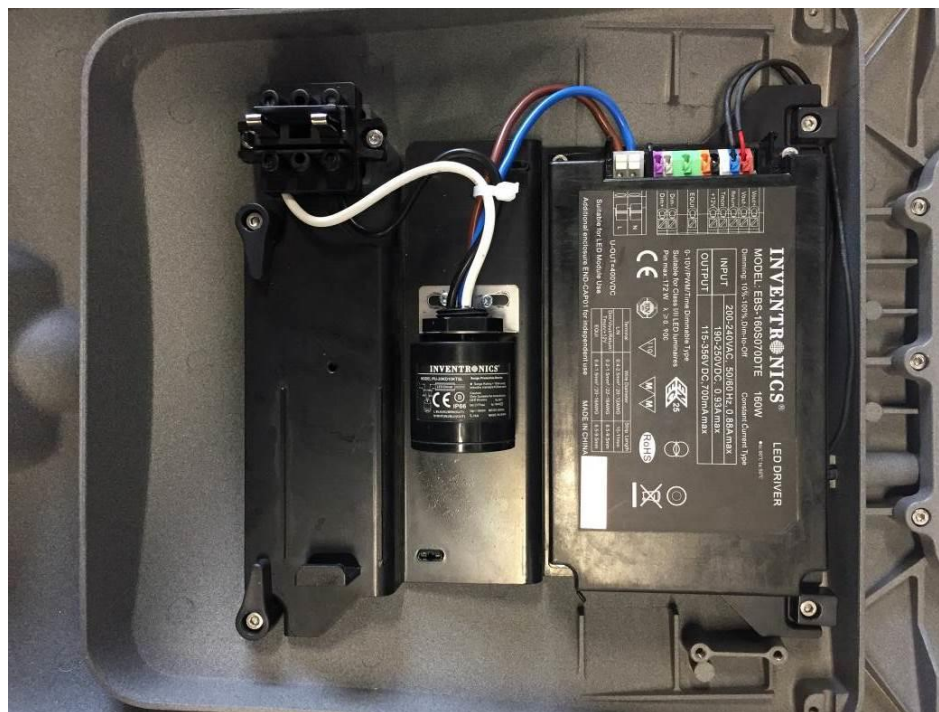
EL-SL18LA series



Back-side

**Appendix 5: Photograph**

Internal construction

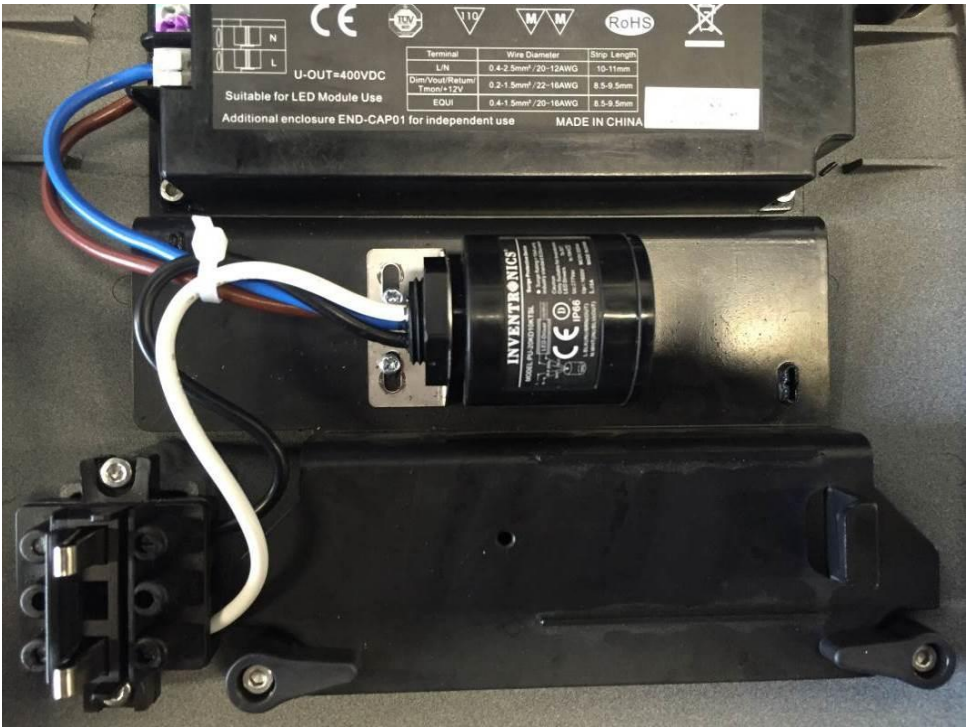


Internal construction

Appendix 5: Photograph



LED driver



SPD



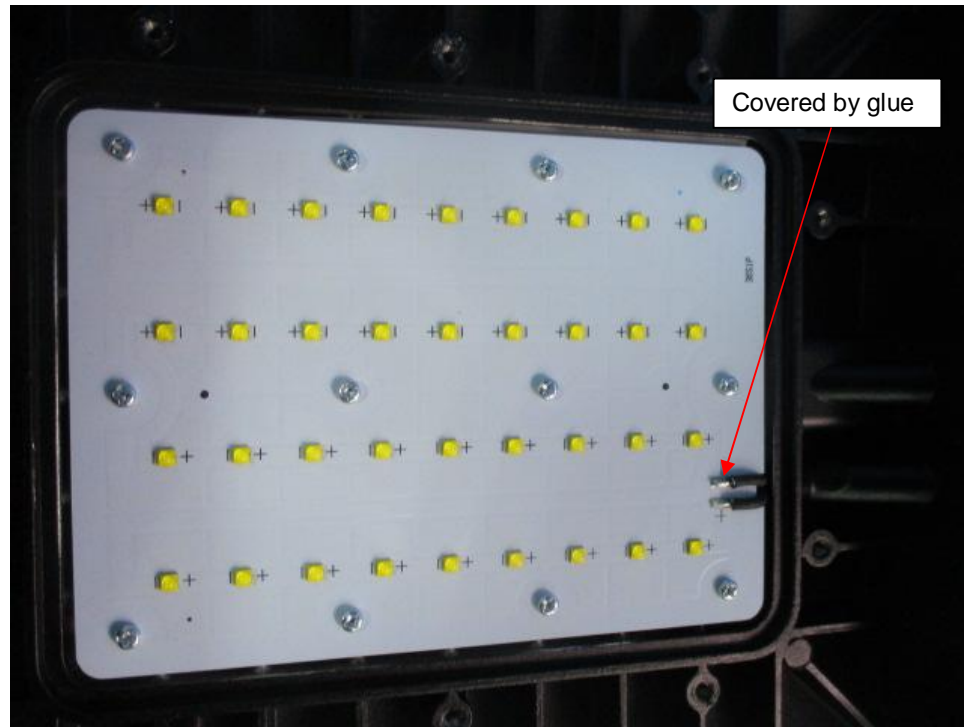
**Appendix 5: Photograph**



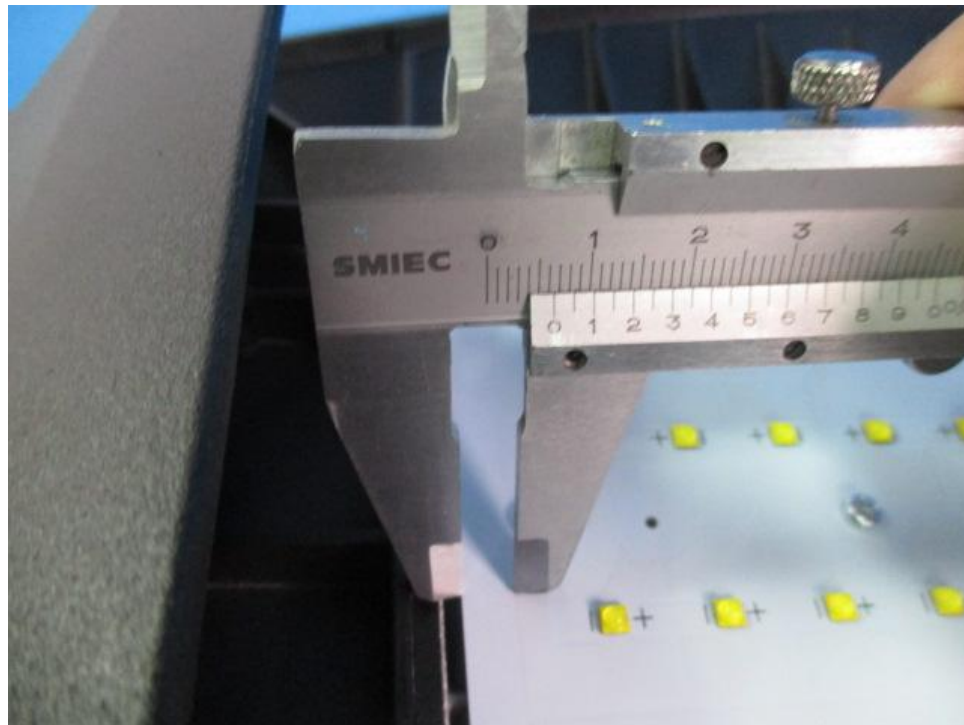
Switch



Gland

**Appendix 5: Photograph**

LED module



LED module

**Appendix 5: Photograph**



EL-SL18MA-80; EL-SL18MA-50; EL-SL18MA-60; EL-SL18MA-70



EL-SL18MA-30; EL-SL18MA-20; EL-SL18MA-40

### Appendix 5: Photograph



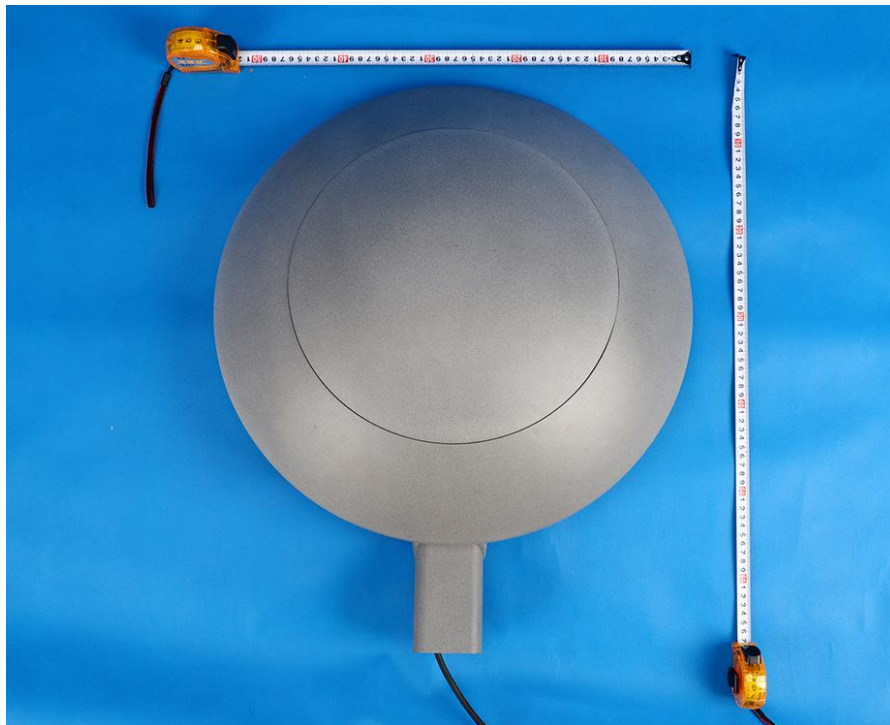
LED driver



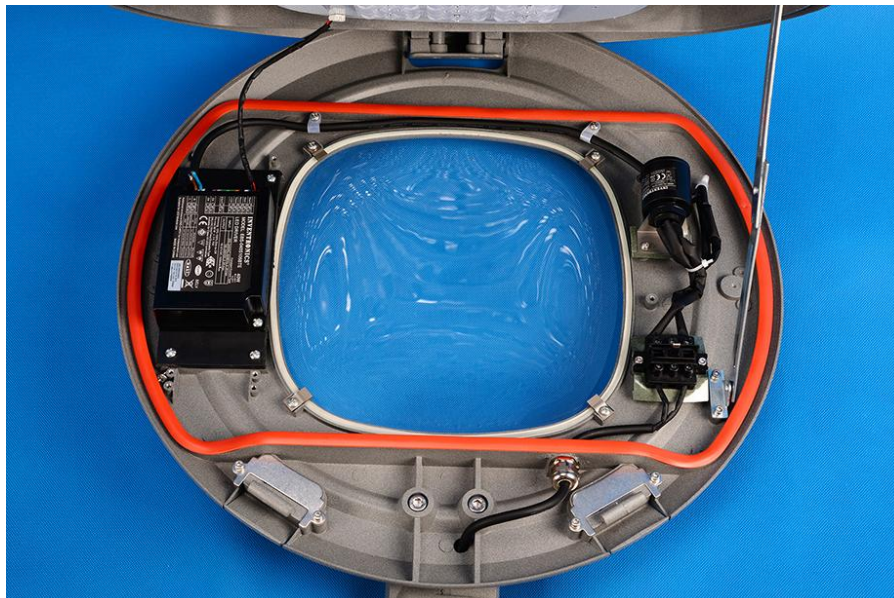
EL-SL58 series



**Appendix 5: Photograph**



Back-side



Internal construction



**Appendix 5: Photograph**



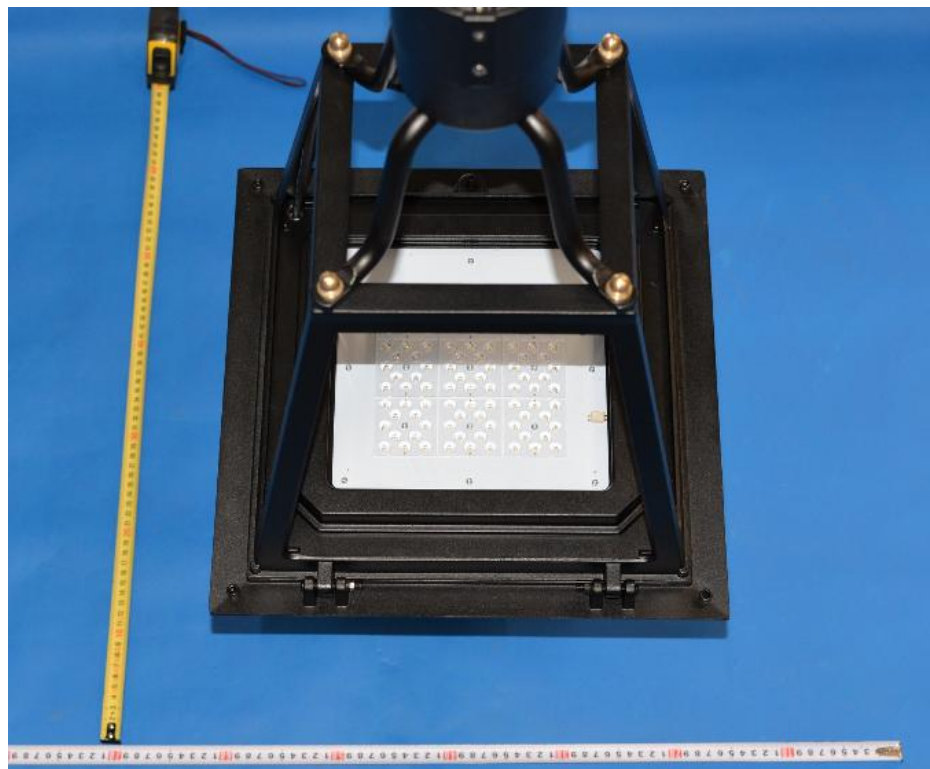
EL-SL68 series



Internal construction

**Appendix 5: Photograph**

EL-GL01 series



EL-GL01 series

**Appendix 5: Photograph**

EL-SL10(1) series



EL-SL10(2) series

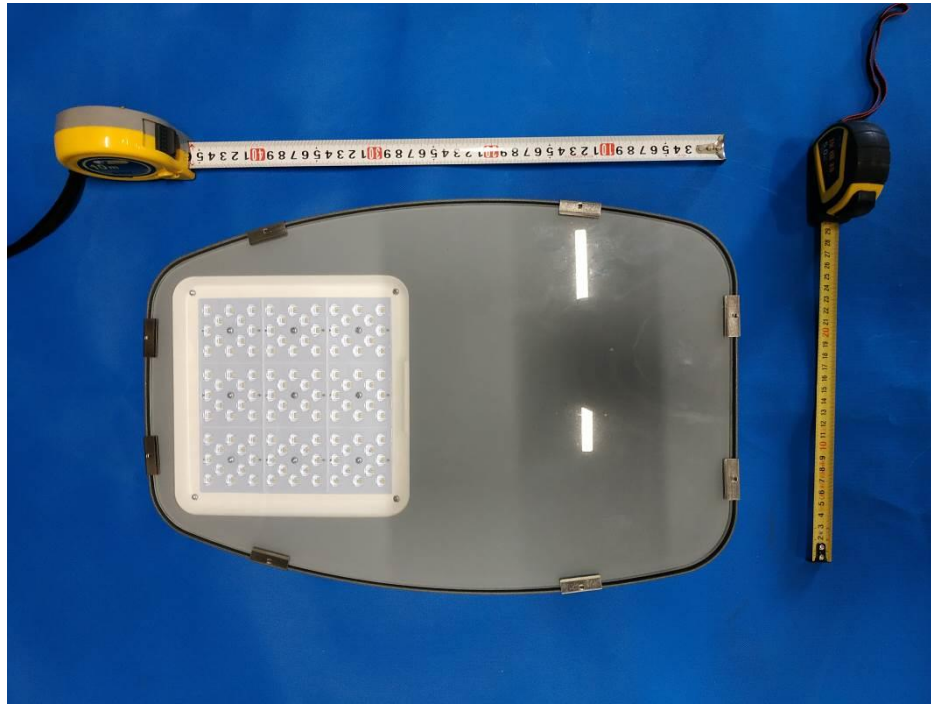


**Appendix 5: Photograph**

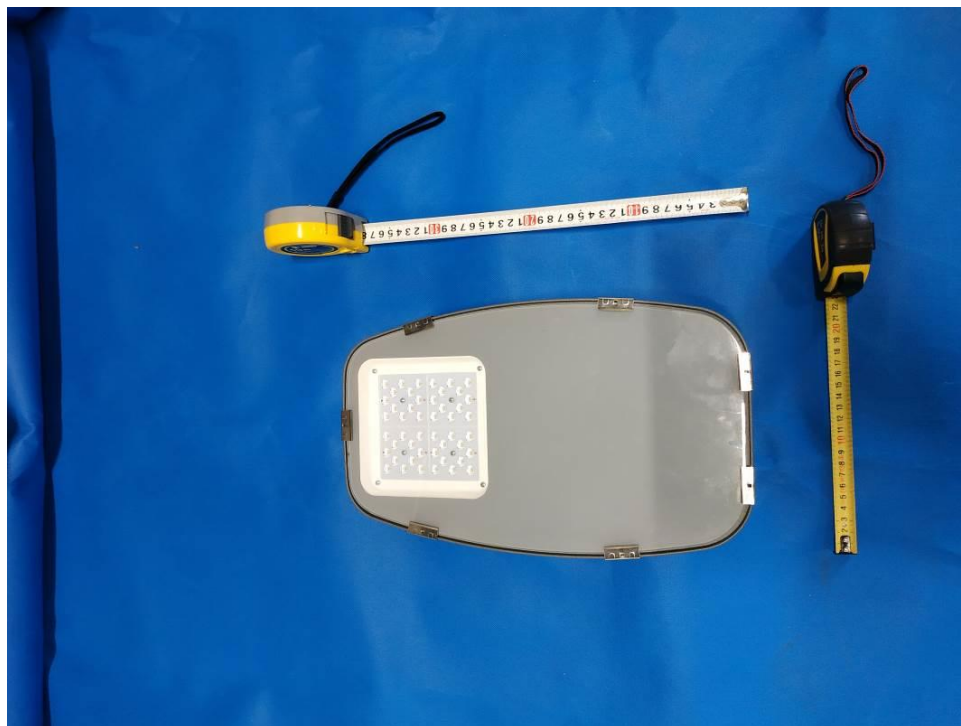
EL-SL10(3) series



EL-SL11(L) series

**Appendix 5: Photograph**

EL-SL11(S) series



EL-SL11(M) series