



**TEST REPORT**  
**IEC 60598-2-2**  
**Luminaires**  
**Part 2: Particular requirements**  
**Section 2: Recessed luminaires**

**Report Number.** ..... : 083-1882203-000

**Date of issue** ..... : 2018-08-08

**Total number of pages** ..... : 43

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

**Applicant's name** ..... : **La-Luce di Marletta SNC**

**Address** ..... : **Via Archimede, 365, 97100, Ragusa, Italy**

**Test specification:**

**Standard** ..... : IEC 60598-2-2:2011 (Third Edition) used in conjunction with IEC 60598-1:2014 (Eighth Edition)

**Test procedure** ..... : CB Scheme

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

**Test Report Form No.** ..... : IEC60598\_2\_2D

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

**Master TRF**..... : 2014-09

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<b>Test item description .....</b>	LED Panel Light	
<b>Trade Mark.....</b>	Panel	
<b>Manufacturer .....</b>	Same as applicant	
<b>Model/Type reference .....</b>	see model list	
<b>Ratings .....</b>	200-240V~; 50/60Hz; Class I; IP44 Details see model list	
<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
<input type="checkbox"/>	<b>Associated CB Testing Laboratory:</b>	
<b>Testing location/ address .....</b>		N/A
<b>Tested by (name, function, signature) .....</b>		Jiani WANG, Project Engineer
<b>Approved by (name, function, signature) ..</b>		Huidong ZHANG, Project Manager
<input type="checkbox"/>	<b>Testing procedure: TMP/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: WMT/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: SMT/CTF Stage 3 or 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



<p><b>List of Attachments (including a total number of pages in each attachment):</b></p> <p>Requirement of IEC 62031:2008/A2:2014 have been evaluated and found to be met by testing. Please refer to appendix 1.</p> <p>EMF requirements of IEC 62493:2015 deemed to comply with the Van der Hoofden test without testing. Please refer to appendix 2.</p> <p>Requirements for photobiological safety for LED are considered in IEC 62471:2006. Please refer to appendix 3.</p>	
<p><b>Summary of testing:</b></p> <p>All applicable hazards are covered by the harmonized</p>	
<p><b>Test performed (name of test and test clause):</b></p> <p>Unless otherwise specified, Complete tests are performed on FT-PL66-W60 which is rated highest wattage and contains all components</p> <p>Visual check and endurance test are applied on other models</p> <p>The test results comply with the requirements</p>	<p><b>Testing location:</b></p> <p>TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch No. 1999, Duhui Road, Shanghai, 201108, P. R. China</p>
<p><b>Summary of compliance with National Differences:</b></p> <p><b>List of countries addressed N/A</b></p> <p>The deviation between EN 60598-2-2: 2012 used in conjunction with EN 60598-1:2015 and IEC 60598-2-2:2011 (Third Edition) used in conjunction with IEC 60598-1:2014 (Eighth Edition) is taken into account</p> <p><input checked="" type="checkbox"/> <b>The product fulfils the requirements of EN 60598-2-2:2012 used in conjunction with EN 60598-1:2015</b></p>	
<p><b>Copy of marking plate:</b></p> <p>(See Construction Data form for electrical equipment and machinery)</p>	

Test item particulars .....: LED Panel Light	
Classification of installation and use.....: Class I	
Supply Connection .....: Connecting leads .....:	
Possible test case verdicts: - 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)	
Testing ..... :	
Date of receipt of test item..... : 2019-07-26	
Date (s) of performance of tests ..... : 2019-07-29 to 2019-08-02	
General remarks:	
<p>“(See Enclosure #)” refers to additional information appended to the report.  “(See appended table)” refers to a table appended to the report.  Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator.</p> <p>Remark 1:  The following contents are included and as appendix of this test report:  • Test report IEC 60598-2-2:2011 (Third Edition) used in conjunction with IEC 60598-1:2014 (Eighth Edition)  • Appendix 1: Additional requirements of IEC 62031:2008/A2:2014  • Appendix 2: Additional requirements of IEC 62493:2015  • Appendix 3: Additional requirements of IEC 62471:2006  • Appendix 4: Additional requirements of IEC/TR 62778:2014  • Appendix 5: Photographs</p>	
Manufacturer's Declaration per sub-clause 4.2.5 of IEC 02:	
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	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies)..... : La-Luce di Marletta SNC Via Archimede, 365, 97100, Ragusa, Italy	
General product information: The products covered in this test report are recessed luminaires. All the products are the same construction, only the shape is difference.	



**Model list**

<b>Model</b>	<b>Wattage(W)</b>	<b>LED Driver</b>	<b>Size(mm)</b>
PANEL LL-PNL60-24W	24	ED-SC-II 36W1200I	595x595
PANEL LL-PNL60-2W8	28	ED-SC-II 36W1200I	595x595
PANEL LL-PNL60-30W	30	ED-SC-II 36W1200I	595x595
PANEL LL-PNL60-36W	36	ED-SC-II 36W1200I	595x595
PANEL LL-PNL60-40W	40	ED-SC-II 40W1200I	595x595
PANEL LL-PNL60-42W	42	ED-SC-II 40W1200I	595x595
PANEL LL-PNL60-45W	45	ED-SC-II 40W1200I	595x595
PANEL LL-PNL60-50W	50	ED-SC-II 40W1200I	595x595
PANEL LL-PNL60-60W	60	ED-SC-II 60W1200I	595x595
PANEL LL-PNL120-36W	36	ED-SC-II 36W1200I	1195x295
PANEL LL-PNL120-40W	40	ED-SC-II 36W1200I	1195x295
PANEL LL-PNL120-48W	48	ED-SC-II 50W1200I	1195x295
PANEL LL-PNL120-60W	60	ED-SC-II 60W1200I	1195x295

IEC60598_2_2D			
Clause	Requirement + Test	Result - Remark	Verdict

2.3 (0)	GENERAL TEST REQUIREMENTS		P
2.3 (0.1)	Information for luminaire design considered .....	Standard IEC 6247 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	—
2.3 (0.3)	More sections applicable .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—

2.4 (2)	CLASSIFICATION		P
2.5 (2.2)	Type of protection .....	Class I	—
2.5 (2.3)	Degree of protection .....	IP44	—
2.5 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
2.5 (2.5)	Luminaire for normal use .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Luminaire for rough service .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—

2.6 (3)	MARKING		P
2.6 (3.2)	Mandatory markings		P
	Position of the marking		P
	Format of symbols/text		P
2.6 (3.3)	Additional information		P
	Language of instructions		P
2.6 (3.3.1)	Combination luminaires		P
2.6 (3.3.2)	Nominal frequency in Hz		P
2.6 (3.3.3)	Operating temperature		N/A
2.6 (3.3.4)	Symbol or warning notice		N/A
2.6 (3.3.5)	Wiring diagram		N/A
2.6 (3.3.6)	Special conditions		N/A
2.6 (3.3.7)	Metal halide lamp luminaire – warning		N/A
2.6 (3.3.8)	Limitation for semi-luminaires		N/A
2.6 (3.3.9)	Power factor and supply current		N/A
2.6 (3.3.10)	Suitability for use indoors		N/A
2.6 (3.3.11)	Luminaires with remote control		N/A
2.6 (3.3.12)	Clip-mounted luminaire – warning		N/A
2.6 (3.3.13)	Specifications of protective shields		N/A
2.6 (3.3.14)	Symbol for nature of supply		P
2.6 (3.3.15)	Rated current of socket outlet		N/A

IEC60598_2_2D			
Clause	Requirement + Test	Result - Remark	Verdict
2.6 (3.3.16)	Rough service luminaire		N/A
2.6 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments		P
2.6 (3.3.18)	Non-ordinary luminaires with PVC cable		N/A
2.6 (3.3.19)	Protective conductor current in instruction if applicable		N/A
2.6 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N/A
2.6 (3.3.21)	Non replaceable and non-user replaceable light sources information provided		P
	Cautionary symbol		N/A
2.6 (3.3.22)	Controllable luminaires, classification of insulation provided		N/A
2.6 (3.4)	Test with water		P
	Test with hexane		P
	Legible after test		P
	Label attached		P

2.7 (4)	CONSTRUCTION		P
2.7 (4.2)	Components replaceable without difficulty		P
2.7 (4.3)	Wireways smooth and free from sharp edges		P
2.7 (4.4)	Lampholders		N/A
2.7 (4.4.1)	Integral lampholder		N/A
2.7 (4.4.2)	Wiring connection		N/A
2.7 (4.4.3)	Lampholder for end-to-end mounting		N/A
2.7 (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
2.7 (4.4.5)	Peak pulse voltage		N/A
2.7 (4.4.6)	Centre contact		N/A

IEC60598_2_2D			
Clause	Requirement + Test	Result - Remark	Verdict
2.7 (4.4.7)	Parts in rough service luminaires resistant to tracking		N/A
2.7 (4.4.8)	Lamp connectors		N/A
2.7 (4.4.9)	Caps and bases correctly used		N/A
2.7 (4.4.10)	Light source for lampholder or connection according IEC 60061 not connected another way		N/A
<b>2.7 (4.5)</b>	<b>Starter holders</b>		<b>N/A</b>
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A
<b>2.7 (4.6)</b>	<b>Terminal blocks</b>		<b>P</b>
	Tails		P
	Unsecured blocks		N/A
<b>2.7 (4.7)</b>	<b>Terminals and supply connections</b>		<b>P</b>
2.7 (4.7.1)	Contact to metal parts		N/A
2.7 (4.7.2)	Test 8 mm live conductor		N/A
	Test 8 mm earth conductor		N/A
2.7 (4.7.3)	Terminals for supply conductors		P
2.7 (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 15.8.2		N/A
	- electrical test according to 15.9		N/A
	- heat test according to 15.9.2.3 and 15.9.2.4		N/A
2.7 (4.7.4)	Terminals other than supply connection		P
2.7 (4.7.5)	Heat-resistant wiring/sleeves		N/A
2.7 (4.7.6)	Multi-pole plug		N/A
	- test at 30 N		N/A
<b>2.7 (4.8)</b>	<b>Switches</b>		<b>N/A</b>
	- adequate rating		N/A
	- adequate fixing		N/A
	- polarized supply		N/A
	- compliance with IEC 61058-1 for electronic switches		N/A

IEC60598_2_2D			
Clause	Requirement + Test	Result - Remark	Verdict
2.7 (4.9)	Insulating lining and sleeves		N/A
2.7 (4.9.1)	Retainment		N/A
	Method of fixing .....		—
2.7 (4.9.2)	Insulated linings and sleeves:		N/A
	Resistant to a temperature > 20 °C to the wire temperature or		N/A
	a) & c) Insulation resistance and electric strength		N/A
	b) Ageing test. Temperature (°C) .....		N/A
2.7 (4.10)	Double or reinforced insulation		P
2.7 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation	Certificated Class II LED driver	P
	Safe installation fixed luminaires		N/A
	Capacitors and switches		N/A
	Interference suppression capacitors according to IEC 60384-14		N/A
2.7 (4.10.2)	Assembly gaps:		N/A
	- not coincidental		N/A
	- no straight access with test probe		N/A
2.7 (4.10.3)	Retainment of insulation:		N/A
	- fixed		N/A
	- unable to be replaced; luminaire inoperative		N/A
	- sleeves retained in position		N/A
	- lining in lampholder		N/A
2.7 (4.11)	Electrical connections and current-carrying parts		P
2.7 (4.11.1)	Contact pressure		P
2.7 (4.11.2)	Screws:		N/A
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
2.7 (4.11.3)	Screw locking:		N/A
	- spring washer		N/A
	- rivets		N/A
2.7 (4.11.4)	Material of current-carrying parts		P
2.7 (4.11.5)	No contact to wood or mounting surface		P
2.7 (4.11.6)	Electro-mechanical contact systems		N/A
2.7 (4.12)	Screws and connections (mechanical) and glands		P

IEC60598_2_2D			
Clause	Requirement + Test	Result - Remark	Verdict
2.7 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		N/A
	Torque test: torque (Nm); part.....:	Enclosure: 1,2Nm	P
	Torque test: torque (Nm); part.....:		N/A
	Torque test: torque (Nm); part.....:		N/A
2.7 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
2.7 (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
2.7 (4.12.5)	Screwed glands; force (Nm).....:		N/A
<b>2.7 (4.13)</b>	<b>Mechanical strength</b>		<b>P</b>
2.7 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm).....:		N/A
	- other parts; energy (Nm).....:	All enclosure: 0,35Nm	P
	1) live parts		P
	2) linings		N/A
	3) protection		P
	4) covers		P
2.7 (4.13.3)	Straight test finger		P
2.7 (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
2.7 (4.13.6)	Tumbling barrel		N/A
<b>2.7 (4.14)</b>	<b>Suspensions, fixings and means of adjusting</b>		<b>P</b>
2.7 (4.14.1)	Mechanical load:		P
	A) four times the weight		P
	B) torque 2,5 Nm		N/A
	C) bracket arm; bending moment (Nm).....:		N/A
	D) load track-mounted luminaires		N/A

IEC60598_2_2D			
Clause	Requirement + Test	Result - Remark	Verdict
	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
2.7 (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 .....		—
	Bending moment (Nm) of semi-luminaire .....		N/A
2.7 (4.14.3)	Adjusting devices:		N/A
	- flexing test; number of cycles.....		N/A
	- strands broken .....		N/A
	- electric strength test afterwards		N/A
2.7 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N/A
2.7 (4.14.5)	Guide pulleys		N/A
2.7 (4.14.6)	Strain on socket-outlets		N/A
2.7 (4.15)	Flammable materials		P
	- glow-wire test 850°C.....	See Test Table 2.16 (13.3.2)	P
	- spacing $\geq 30$ mm		N/A
	- screen withstanding test of 13.3.1		N/A
	- screen dimensions		N/A
	- no fiercely burning material		P
	- thermal protection		N/A
	- electronic circuits exempted		N/A
2.7 (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
2.7 (4.16)	Luminaires for mounting on normally flammable surfaces		P
	No lamp control gear .....	(compliance with Section 12)	N/A
2.7 (4.16.1)	Lamp control gear spacing:		N/A
	- spacing 35 mm		N/A
	- spacing 10 mm		N/A



IEC60598_2_2D			
Clause	Requirement + Test	Result - Remark	Verdict
2.7 (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
2.7 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	N/A
2.7 (4.17)	Drain holes		N/A
	Clearance at least 5 mm		N/A
2.7 (4.18)	Resistance to corrosion		N/A
2.7 (4.18.1)	- rust-resistance		N/A
2.7 (4.18.2)	- season cracking in copper		N/A
2.7 (4.18.3)	- corrosion of aluminium		N/A
2.7 (4.19)	Igniters compatible with ballast		N/A
2.7 (4.20)	Rough service vibration		N/A
2.7 (4.21)	Protective shield		N/A
2.7 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N/A
	Shield of glass if tungsten halogen lamps		N/A
2.7 (4.21.2)	Particles from a shattering lamp not impair safety		N/A
2.7 (4.21.3)	No direct path		N/A
2.7 (4.21.4)	Impact test on shield		N/A
	Glow-wire test on lamp compartment .....	See Test Table 2.16 (13.3.2)	N/A
2.7 (4.22)	Attachments to lamps not cause overheating or damage		N/A
2.7 (4.23)	Semi-luminaires comply Class I		N/A
2.7 (4.24)	Photobiological hazards		P
2.7 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		N/A
2.7 (4.24.2)	Retinal blue light hazard		P
	Luminaires with $E_{thr}$ :		P
	a) Fixed luminaires		P
	- distance x m, borderline between RG1 and RG2...	RG0	P
	- 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

IEC60598_2_2D			
Clause	Requirement + Test	Result - Remark	Verdict
	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
2.7 (4.25)	Mechanical hazard		P
	No sharp point or edges		P
2.7 (4.26)	Short-circuit protection		N/A
2.7 (4.26.1)	Adequate means of uninsulated accessible SELV parts		N/A
2.7 (4.26.2)	Short-circuit test with test chain according 4.26.3		N/A
	Test chain not melt through		N/A
	Test sample not exceed values of Table 12.1 and 12.2		N/A
2.7 (4.27)	Terminal blocks with integrated screwless earthing contacts		N/A
	Test according Annex V		N/A
	Pull test of terminal fixing (20 N)		N/A
	After test, resistance < 0,05 $\Omega$		N/A
	Pull test of mechanical connection (50 N)		N/A
	After test, resistance < 0,05 $\Omega$		N/A
	Voltage drop test, resistance < 0,05 $\Omega$		N/A
2.7 (4.28)	Fixing of thermal sensing control		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 ( $^{\circ}\text{C}$ ) ..... :		—
	100 cycles between t min and t max		N/A
	Temperature sensing control still in position		N/A
2.7 (4.29)	Luminaires with non-replaceable light source		P
	Not possible to replace light source		P
	Live part not accessible after parts have been opened by hand or tools		P
2.7 (4.30)	Luminaires with non-user replaceable light source		N/A
	If protective cover provide protection against electric shock and marked with "caution, electric shock risk" symbol:		N/A

IEC60598_2_2D			
Clause	Requirement + Test	Result - Remark	Verdict
	Minimum two fixing means		N/A
2.7 (4.31)	Insulation between circuits		N/A
	Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3		N/A
	Controllable luminaires requiring same level of insulation for all components, the insulation between control terminals and LV supply fulfil requirements according 4.31.1 – 4.31.3		N/A
2.7 (4.31.1)	SELV circuits		P
	Used SELV source		P
	Voltage $\leq$ ELV		P
	Insulating of SELV circuits from LV supply	Certificated SELV driver	P
	Insulating of SELV circuits from other non SELV circuits		N/A
	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
2.7 (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
2.7 (4.31.3)	Other circuits		P
	Other circuits insulated from accessible parts according Table X.1		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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 of above		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
2.7 (4.32)	Overvoltage protective devices		N/A
	Comply with IEC 61643-11		N/A
	External to controlgear and connected to earth:		N/A
	- only in fixed luminaires		N/A
	- only connected to protective earth		N/A

2.8 (11)	CREEPAGE DISTANCES AND CLEARANCES		P
2.8 (11.2)	Creepage distances and clearances .....	See Table 1.7 (11.2)	N/A
	Working voltage (V) .....	Input: 200-240V	—
	Rated pulse voltage (kV).....	N/A	—
	Voltage form.....	Sinusoidal <input checked="" type="checkbox"/> Non- <input type="checkbox"/>	—
	PTI .....	$\leq 600$ <input checked="" type="checkbox"/> $\geq 600$ <input type="checkbox"/>	—
	Impulse withstand category (Normal category II)(Category III Annex U)	Category II <input checked="" type="checkbox"/> Category III <input type="checkbox"/>	—

2.9 (7)	PROVISION FOR EARTHING		
2.9 (7.2.1 + 7.2.3)	Accessible metal parts		N/A
	Metal parts in contact with supporting surface		N/A
	Resistance $< 0,5 \Omega$ .....		N/A
	Self-tapping screws used		N/A
	Thread-forming screws		N/A
	Thread-forming screw used in a groove		N/A
	Earth makes contact first		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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
2.9 (7.2.2 + 7.2.3)	Earth continuity in joints, etc.		N/A
2.9 (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
2.9 (7.2.5)	Earth terminal integral part of connector socket		N/A
2.9 (7.2.6)	Earth terminal adjacent to mains terminals		N/A
2.9 (7.2.7)	Electrolytic corrosion of the earth terminal		N/A
2.9 (7.2.8)	Material of earth terminal		N/A
	Contact surface bare metal		N/A
2.9 (7.2.10)	Class II luminaire for looping-in		N/A
	Double or reinforced insulation to functional earth		N/A
2.9 (7.2.11)	Earthing core coloured green-yellow		N/A
	Length of earth conductor		N/A
2.10 (14)	SCREW TERMINALS		N/A
	Separately approved; component list .....	(see Annex 1)	N/A
	Part of the luminaire .....	(see Annex 3)	N/A
2.10 (15)	SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS		P
	Separately approved; component list .....	(see Annex 1)	N/A
	Part of the luminaire .....	(see Annex 4)	P
2.11 (5)	EXTERNAL AND INTERNAL WIRING		
2.11 (5.2)	Supply connection and external wiring		P
2.11 (5.2.1)	Means of connection.....	Connecting leads	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
2.11 (5.2.2)	Type of cable.....	Certificated LED driver with supply cord	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Nominal cross-sectional area (mm <sup>2</sup> ).....:	Certificated LED driver with supply cord	P
	Cables equal to IEC 60227 or IEC 60245		N/A
2.11 (5.2.3)	Type of attachment, X, Y or Z		P
2.11 (5.2.5)	Type Z not connected to screws		P
2.11 (5.2.6)	Cable entries:		P
	- suitable for introduction		P
	- adequate degree of protection		P
2.11 (5.2.7)	Cable entries through rigid material have rounded edges		P
2.11 (5.2.8)	Insulating bushings:		P
	- suitably fixed		P
	- material in bushings		P
	- material not likely to deteriorate		P
	- tubes or guards made of insulating material		P
2.11 (5.2.9)	Locking of screwed bushings		N/A
2.11 (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
2.11 (5.2.10.1)	Cord anchorage for type X attachment:		N/A
	a) at least one part fixed		N/A
	b) types of cable		N/A
	c) no damaging of the cable		N/A
	d) whole cable can be mounted		N/A
	e) no touching of clamping screws		N/A
	f) metal screw not directly on cable		N/A
	g) replacement without special tool		N/A
	Glands not used as anchorage		N/A
	Labyrinth type anchorages		N/A
2.11 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		P

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Clause	Requirement + Test	Result - Remark	Verdict
2.11 (5.2.10.3)	Tests:		P
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N) .....: 30		P
	- torque test: torque (Nm).....: 0,08		P
	- displacement $\leq 2$ mm		P
	- no movement of conductors		P
	- no damage of cable or cord		P
	- function independent of electrical connection		P
2.11 (5.2.11)	External wiring passing into luminaire		P
2.11 (5.2.12)	Looping-in terminals		N/A
2.11 (5.2.13)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		P
2.11 (5.2.14)	Mains plug same protection		N/A
	Class III luminaire plug		N/A
	No unsafe compatibility		N/A
2.11 (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
2.11 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
2.11 (5.2.18)	Used plug in accordance with		N/A
	- IEC 60083		N/A
	- other standard		N/A
2.11 (5.3)	Internal wiring		P
2.11 (5.3.1)	Internal wiring of suitable size and type		P
	Through wiring		N/A
	- not delivered/ mounting instruction		N/A
	- factory assembled		N/A
	- socket outlet loaded (A) .....:		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	- temperatures.....:	(see Annex 2)	N/A
	Green-yellow for earth only		N/A
2.11 (5.3.1.1)	Internal wiring connected directly to fixed wiring		N/A
	Cross-sectional area (mm <sup>2</sup> ) .....		N/A
	Insulation thickness		N/A
	Extra insulation added where necessary		N/A
2.11 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		P
	Adequate cross-sectional area and insulation thickness		P
2.11 (5.3.1.3)	Double or reinforced insulation for class II		N/A
2.11 (5.3.1.4)	Conductors without insulation		N/A
2.11 (5.3.1.5)	SELV current-carrying parts		P
2.11 (5.3.1.6)	Insulation thickness other than PVC or rubber		N/A
2.11 (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
2.11 (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
2.11 (5.3.4)	Joints and junctions effectively insulated		N/A
2.11 (5.3.5)	Strain on internal wiring		N/A
2.11 (5.3.6)	Wire carriers		N/A
2.11 (5.3.7)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		P
2.12 (8)	PROTECTION AGAINST ELECTRIC SHOCK		P
2.12 (8.2.1)	Live parts not accessible		P

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Clause	Requirement + Test	Result - Remark	Verdict
	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
2.12 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N/A
2.12 (8.2.3.a)	Class II luminaire:		P
	- basic insulated metal parts not accessible during starter or lamp replacement		N/A
	- basic insulation not accessible other than during starter or lamp replacement	Certificated LED driver	P
	- glass protective shields not used as supplementary insulation		N/A
2.12 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		N/A
2.12 (8.2.3.c)	SELV circuits with exposed current carrying parts:		P
	Ordinary luminaire:		P
	- touch current .....	0,03mA	P
	- no-load voltage.....	Max 42Vdc	P
	Other than ordinary luminaire:		N/A
	- nominal voltage .....		N/A
2.12 (8.2.4)	Portable luminaire have protection independent of supporting surface		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
2.12 (8.2.5)	Compliance with the standard test finger or relevant probe		P
2.12 (8.2.6)	Covers reliably secured		P
2.12 (8.2.7)	Discharging of capacitors $\geq 0,5 \mu\text{F}$		N/A
	Portable plug connected luminaire with capacitor		N/A
	Other plug connected luminaire with capacitor		N/A
	Discharge device on or within capacitor		N/A
	Discharge device mounted separately		N/A
2.13 (12)	ENDURANCE TEST AND THERMAL TEST		P
2.13.1 (-)	If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified 4.13		—
2.13 (12.3)	Endurance test:		P
	- mounting-position .....	Recessed mounting	—
	- test temperature (°C) .....	35°C	—
	- total duration (h) .....	240h	—
	- supply voltage: Un factor; calculated voltage (V) ..	1;1 x 240V=264V	—
	- lamp used .....	Integral LED module	—
2.13 (12.3.2)	After endurance test:		P
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		P
	- marking legible		P
	- no cracks, deformation etc.		P
2.13 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
2.13 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	P
2.13 (12.6)	Thermal test (failed lamp control gear condition):		N/A
2.13 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A) .....		—
	- case of abnormal conditions .....		—
	- electronic lamp control gear		N/A
	- measured winding temperature (°C): at 1,1 Un ....		—
	- measured mounting surface temperature (°C) at 1,1 Un .....		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- calculated mounting surface temperature (°C) ..... :		N/A
	- track-mounted luminaires		N/A
2.13 (12.6.2)	Temperature sensing control		N/A
	- case of abnormal conditions ..... :		—
	- thermal link		N/A
	- manual reset cut-out		N/A
	- auto reset cut-out		N/A
	- measured mounting surface temperature (°C)..... :		N/A
	- track-mounted luminaires		N/A
2.13 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N/A
2.13 (12.7.1)	Luminaire without temperature sensing control		N/A
2.13 (12.7.1.1)	Luminaire with fluorescent lamp ≤ 70W		N/A
	Test method 12.7.1.1 or Annex W ..... :		—
	Test according to 12.7.1.1:		N/A
	- case of abnormal conditions ..... :		—
	- Ballast failure at supply voltage (V) ..... :		—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
	Test according to Annex W:		N/A
	- case of abnormal conditions ..... :		—
	- measured winding temperature (°C): at 1,1 Un ..... :		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un ..... :		—
	- calculated temperature of fixing point/exposed part (°C) ..... :		—
	Ball-pressure test..... :	See Table 2.16 (13.2.1)	N/A
2.13 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		N/A
	- case of abnormal conditions ..... :		—
	- measured winding temperature (°C): at 1,1 Un ..... :		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un ..... :		—

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Clause	Requirement + Test	Result - Remark	Verdict
	- calculated temperature of fixing point/exposed part (°C) .....		—
	Ball-pressure test.....	See Table 2.16 (13.2.1)	
2.13 (12.7.1.3)	Luminaire with short circuit proof transformers ≤ 10 VA		N/A
	- case of abnormal conditions .....		—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
2.13 (12.7.2)	Luminaire with temperature sensing control		N/A
	- thermal link.....	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- manual reset cut-out.....	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- auto reset cut-out .....	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- case of abnormal conditions .....		—
	- highest measured temperature of fixing point/ exposed part (°C): .....		—
	Ball-pressure test:.....	See Table 2.16 (13.2.1)	N/A
2.13.1 (-)	Wiring, for connection to the supply, not reach unsafe temperature		N/A
	- measured temperature of the cable (°C) .....		N/A

2.14 (9)	RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE		P
2.14 (-)	If IP > IP 20 the order of tests as specified in clause 2.12		P
2.14 (9.2)	Tests for ingress of dust, solid objects and moisture:		—
	- classification according to IP.....	IP44	—
	- mounting position during test.....	Recessed mounting	—
	- fixing screws tightened; torque (Nm).....	N/A	—
	- tests according to clauses .....	9.2.0	—
	- electric strength test afterwards		N/A
	a) no deposit in dust-proof luminaire		N/A
	b) no talcum in dust-tight luminaire		N/A
	c) no trace of water on current-carrying parts or on insulation where it could become a hazard		N/A
	d) i) For luminaires without drain holes – no water entry		N/A
	d) ii) For luminaires with drain holes – no hazardous water entry		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	e) no water in watertight luminaire		N/A
	f) no contact with live parts (IP 2X)		P
	f) no entry into enclosure (IP 3X and IP 4X)		N/A
	f) no contact with live parts (IP3X and IP4X)		N/A
	g) no trace of water on part of lamp requiring protection from splashing water		N/A
	h) no damage of protective shield or glass envelope		N/A
2.14 (9.3)	Humidity test 48 h		P
2.15 (10)	INSULATION RESISTANCE AND ELECTRIC STRENGTH		P
2.15 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by metal rod of mm Ø .....	covered by metal foil	—
	Insulation resistance (MΩ) .....		—
	SELV		P
	- between current-carrying parts of different polarity :		N/A
	- between current-carrying parts and mounting surface .....	>19 MΩ	P
	- between current-carrying parts and metal parts of the luminaire.....	>19 MΩ	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage accessible metal parts .....		N/A
	- Insulation bushings as described in Section 5 .....		N/A
	Other than SELV		N/A
	- between live parts of different polarity .....	Cerficated LED driver	N/A
	- between live parts and mounting surface .....		N/A
	- between live parts and metal parts.....		N/A
	- 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 accessible metal parts .....		N/A
	- Insulation bushings as described in Section 5 .....		N/A
2.15 (10.2.2)	Electric strength test		P
	Dummy lamp		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Luminaires with ignitors after 24 h test		N/A
	Luminaires with manual ignitors		N/A
	Test voltage (V) .....		N/A
	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		N/A
	- between live parts of different polarity .....		N/A
	- between live parts and mounting surface .....	Cerficated LED driver	N/A
	- between live parts and metal parts.....		N/A
	- between live parts of different polarity through action of a switch .....		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts .....		N/A
	- Insulation bushings as described in Section 5 .....		N/A
2.15 (10.3)	Touch current or protective conductor current (mA):	0,03 mA	P

<b>2.16 (13)</b>	<b>RESISTANCE TO HEAT, FIRE AND TRACKING</b>		<b>P</b>
2.16 (13.2.1)	Ball-pressure test.....	See Test Table 2.16 (13.2.1)	P
2.16 (13.3.1)	Needle-flame test (10 s) .....	See Test Table 2.16 (13.3.1)	N/A
2.16 (13.3.2)	Glow-wire test (850°C) .....	See Test Table 2.16 (13.3.2)	P
2.16 (13.4)	Proof tracking test (IEC 60112).....	See Test Table 2.16 (13.4)	N/A



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Clause	Requirement + Test	Result - Remark	Verdict

2.8 (11.2)	TABLES: Creepage distances and clearances						P	
Table 11.1	Minimum distances (mm) for a.c. (50/60 Hz) sinusoidal voltages							
RMS working voltage (V) not exceeding		50	150	250	500	750	1000	
Creepage distances								
Required basic insulation, PTI ≥ 600		0,6	0,8	1,5	3	4	5,5	
Measured		--	--	--	--	--	--	
Required basic insulation, PTI < 600		1,2	1,6	2,5	5	8	10	
Measured		--	--	4	--	--	--	
Required supplementary insulation PTI ≥ 600		-	0,8	1,5	3	4	5,5	
Measured		--	--	--	--	--	--	
Required supplementary insulation PTI < 600		-	1,6	2,5	5	8	10	
Measured		--	--	--	--	--	--	
Required reinforced insulation		-	3,2	5	6	8	11	
Measured		--	--	6	--	--	--	
Clearances								
Required basic insulation		0,2	0,8	1,5	3	4	5,5	
Measured		--	--	4	--	--	--	
Required supplementary insulation		-	0,8	1,5	3	4	5,5	
Measured		--	--	--	--	--	--	
Required reinforced insulation		-	1,6	3	6	8	11	
Measured		--	--	6	--	--	--	
Table 11.2	Minimum distances (mm) for non-sinusoidal pulse voltages							
Rated pulse voltage (peak kV)		2,0	2,5	3,0	4,0	5,0	6,0	8,0
Required clearances		1,0	1,5	2	3	4	5,5	8
Measured		--	--	--	--	--	--	--
Rated pulse voltage (peak kV)		10	12	15	20	25	30	40
Required clearances		11	14	18	25	33	40	60
Measured		--	--	--	--	--	--	--
Rated pulse voltage (peak kV)		50	60	80	100	-	-	-
Required clearances		75	90	130	170	-	-	-
Measured		--	--	--	--	--	--	--

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Clause	Requirement + Test	Result - Remark	Verdict

2.16 (13.2.1)	TABLE: Ball Pressure Test of Thermoplastics			P
Allowed impression diameter (mm) .....:		2		—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	
Lens	See Annex 1	75	0,8	
Supplementary information:				

2.16 (13.3.1)	<b>TABLE: Needle-flame test (IEC 60695-11-5)</b>				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:					

2.16 (13.3.2)	<b>TABLE: Glow-wire test (IEC 60695-2-11)</b>				<b>P</b>
<b>Glow wire temperature .....</b>		850°C			—
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
Lens	See Annex 1	30s	No	12s	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).....:					
Supplementary information:					

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Clause	Requirement + Test		Result - Remark	
2.16 (13.4)	TABLE: Proof tracking test (IEC 60112)			N/A
Test voltage PTI .....		175 V		—
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens		Verdict
Supplementary information:				

ANNEX 1		TABLE: Critical components information				
Object / part No.	Code	Manufacturer /trademark	Type / model	Technical data	Standard	Mark(s) of conformity <sup>1)</sup>
LED Driver	B	Shenzhen Ledfriend Optoelectronics Co., Ltd	ED-SC-II 36W1200I	Input:220-240V~, 50/60Hz; Output: 27-42VDC,	IEC 61347-1 IEC 61347-2-13	TUV SUD/ N8A1512740 50042
Alternative	B	Shenzhen Ledfriend Optoelectronics Co., Ltd	ED-SC-II 40W1200I	300mA Input:220-240V 50/60Hz; Output: 24-36VDC 580mA	IEC 61347-1 IEC 61347-2-13	TUV SUD/ N8A1512740 50042
Alternative	B	Shenzhen Ledfriend Optoelectronics Co., Ltd	ED-SC-II 48W1200I	Input:220-240V 50/60Hz; Output: 27-42VDC 580mA	IEC 61347-1 IEC 61347-2-13	TUV SUD/ N8A1512740 50042
Alternative	B	Shenzhen Ledfriend Optoelectronics Co., Ltd	ED-SC-II 60W1200I	Input:220-240V 50/60Hz; Output: 27-42VDC 850mA	IEC 61347-1 IEC 61347-2-13	TUV SUD/ N8A1512740 50042
Alternative	B	Shenzhen Ledfriend Optoelectronics Co., Ltd	ED-SC-II 36W1400I	Input:220-240V 50/60Hz; Output: 27-42VDC 1200mA	IEC 61347-1 IEC 61347-2-13	TUV SUD/ N8A1512740 50042
Alternative	B	Shenzhen Ledfriend Optoelectronics Co., Ltd	ED-SC-II 40W1400I	Input:100-240V 50/60Hz; Output: 27-40VDC 1500mA	IEC 61347-1 IEC 61347-2-13	TUV SUD/ N8A1512740 50042

IEC60598_2_2D						
Clause	Requirement + Test			Result - Remark		Verdict
External cable	B	TONGXIANG YUANHUA ELECTRIC CO LTD	UL1015	20AWG	IEC 61347-1 IEC 61347-2- 13	Tested with appliance
Internal wire	B	TONGXIANG YUANHUA ELECTRIC CO LTD	UL1332	24AWG	IEC 61347-1 IEC 61347-2- 13	Tested with appliance
Lamp shade	B	JIANGXI SHENG HUI OPTICAL TECHNOLGY LIMITED COMPANY	LDF3580-800	564.5*564.5	IEC 60598-1 IEC 60598-2-2	Tested with appliance
LED	B	SHENZHEN GLORY SKY OPTOELECTR ONIC CO.,LTD	4014	60MA,3.2V	IEC 62471	Tested with appliance
<b>Supplementary information:</b> 1) Provided evidence ensures the agreed level of compliance. See OD-CB2039. The codes above have the following meaning: <b>A</b> - The component is replaceable with another one, also certified, with equivalent characteristics <b>B</b> - The component is replaceable if authorised by the test house <b>C</b> - Integrated component tested together with the appliance <b>D</b> - Alternative component						

IEC60598_2_2D							
Clause	Requirement + Test				Result - Remark		Verdict
ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12						P
	Type reference .....				:LL-PNL60-30W		—
	Lamp used.....				:Integral LED module		—
	Lamp control gear used .....				:Original		—
	Mounting position of luminaire.....				:Recessed mounting		—
	Supply wattage (W) .....				:30,5		—
	Supply current (A).....				:0,132		—
	Calculated power factor .....				:0,95		—
	Table: measured temperatures corrected for ta = 25 °C:						P
	- abnormal operating mode .....				Short-circuit output of LED driver		—
	- test 1: rated voltage .....				N/A		—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage.....				254,4V		—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage .....				N/A		—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage.....				264V		—
	Through wiring or looping-in wiring loaded by a current of A during the test .....				N/A		—
Temperature measurements, (°C)							
Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Lamp cover (Front frosted)	25	--	36,8	--	90	--	--
Lamp cover (Back)	25	--	43,2	--	80	--	--
Lamp frame	25	--	45,1	--	90	--	--
Input wire of LED Driver	25	--	32,6	--	90	--	--
Output wire of LED Driver	25	--	39,0	--	90	--	--
LED Driver surface(Tc.)	25	56,8	--	--	85	29,6	85
Connector	25	--	29,4	--	90	--	--
Mounting surface	25	--	45,8	--	90	26,1	130
Supplementary information:							

IEC60598_2_2D			
Clause	Requirement + Test	Result - Remark	Verdict
<b>ANNEX 3</b>	<b>Screw terminals (part of the luminaire)</b>		<b>N/A</b>
<b>(14)</b>	<b>SCREW TERMINALS</b>		<b>N/A</b>
<b>(14.2)</b>	Type of terminal..... :		—
	Rated current (A)..... :		—
<b>(14.3.2.1)</b>	One or more conductors		<b>N/A</b>
<b>(14.3.2.2)</b>	Special preparation		<b>N/A</b>
<b>(14.3.2.3)</b>	Terminal size		<b>N/A</b>
	Cross-sectional area (mm <sup>2</sup> )..... :		—
<b>(14.3.3)</b>	Conductor space (mm) ..... :		<b>N/A</b>
<b>(14.4)</b>	<b>Mechanical tests</b>		<b>N/A</b>
<b>(14.4.1)</b>	Minimum distance		<b>N/A</b>
<b>(14.4.2)</b>	Cannot slip out		<b>N/A</b>
<b>(14.4.3)</b>	Special preparation		<b>N/A</b>
<b>(14.4.4)</b>	Nominal diameter of thread (metric ISO thread) ....	<b>M</b>	<b>N/A</b>
	External wiring		<b>N/A</b>
	No soft metal		<b>N/A</b>
<b>(14.4.5)</b>	Corrosion		<b>N/A</b>
<b>(14.4.6)</b>	Nominal diameter of thread (mm)..... :		<b>N/A</b>
	Torque (Nm)..... :		<b>N/A</b>
<b>(14.4.7)</b>	Between metal surfaces		<b>N/A</b>
	Lug terminal		<b>N/A</b>
	Mantle terminal		<b>N/A</b>
	Pull test; pull (N) ..... :		<b>N/A</b>
<b>(14.4.8)</b>	Without undue damage		<b>N/A</b>

<b>ANNEX 4</b>	<b>Screwless terminals (part of the luminaire)</b>		<b>P</b>
<b>(15)</b>	<b>SCREWLESS TERMINALS</b>		<b>P</b>
<b>(15.2)</b>	Type of terminal.....:	<b>Screwless</b>	—
	Rated current (A).....:	<b>2A</b>	—
<b>(15.3.1)</b>	Material		<b>P</b>
<b>(15.3.2)</b>	Clamping		<b>P</b>
<b>(15.3.3)</b>	Stop		<b>P</b>
<b>(15.3.4)</b>	Unprepared conductors		<b>N/A</b>

IEC60598_2_2D			
Clause	Requirement + Test	Result - Remark	Verdict
(15.3.5)	Pressure on insulating material		P
(15.3.6)	Clear connection method		P
(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) .....4		P
	Insertion force not exceeding 50 N		P
(15.5.1.2)	Permanent connections: pull-off test (20 N)		N/A
(15.5.2)	Electrical tests		P
	Voltage drop (mV) after 1 h (4 samples).....:		P
	Voltage drop of two inseparable joints		P
	Number of cycles:		—
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples) .....:	8,7; 8,2; 8,3; 8,8	P
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples) .....:		N/A
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples).....:	10,2; 10,3; 11,1; 9,8	P
	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
	Pull test pin or tab terminals (4 samples); pull (N) .....:		N/A



IEC60598_2_2D											
Clause	Requirement + Test					Result - Remark				Verdict	
(15.6.3.1)	TABLE: Contact resistance test										P
	Voltage drop (mV) after 1 h										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Voltage drop of two inseparable joints										P
	Voltage drop after 10th alt. 25th cycle										P
	Max. allowed voltage drop (mV).....					:8,7; 8,2; 8,3; 8,8					—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Voltage drop after 50th alt. 100th cycle										N/A
	Max. allowed voltage drop (mV).....					:					—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Continued ageing: voltage drop after 10th alt. 25th cycle										P
	Max. allowed voltage drop (mV).....					:10,2; 10,3; 11,1; 9,8					—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Continued ageing: voltage drop after 50th alt. 100th cycle										N/A
	Max. allowed voltage drop (mV).....					:					—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)										N/A	
										N/A	
Supplementary information:											

Appendix 1: Additional requirements of IEC 62031:2008/A1:2014			
Clause	Requirement + Test	Result - Remark	Verdict
<b>6</b>	<b>CLASSIFICATION</b>		<b>P</b>
	Built-in module .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Independent module .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Integral module .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	For Integral module; Note to 1.2.1 in IEC 60598-1 applies.		<b>P</b>
<b>13.2</b>	<b>Module withstands overpower condition &gt;15 min. 150% rated voltage, thermally stabilised</b>		<b>P</b>
	Module with automatic protective device or power limiter, test performed 15 min. at limit.		<b>N/A</b>
	During the tests, tissue paper, spread below module, does not ignite		<b>P</b>
<b>14</b>	<b>TABLE: tests of fault conditions</b>		<b>P</b>
<b>Part</b>	<b>Simulated fault</b>		<b>Hazard</b>
<b>Single LED</b>	<b>Short-circuited: no work recoverable</b>		<b>No</b>

Appendix 2: Additional requirements of IEC 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		<b>P</b>
<b>4.2</b>	<b>Unintentional radiating part of lighting equipment</b>		<b>P</b>
<b>4.2.2</b>	<b>Lighting equipment deemed to comply with the Van der Hoofden test without testing</b>		<b>P</b>
	1) electronic controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	2) incandescent-lamp technology	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	3) LED-light-source technology	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	4) OLED-light-source technology	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	5) high-pressure discharge lamp LED-light-source technologies	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	6) low-pressure discharge lamp technologies with exposure distance $\geq 50$ cm	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	7) independent auxiliary	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Not fulfil any of 1-7 above subject to 4.2.3		—
<b>4.2.3</b>	<b>Applications of limits</b>		<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>

Appendix 3: Additional requirements of IEC 62471:2006			
Clause	Requirement + Test	Result - Remark	Verdict

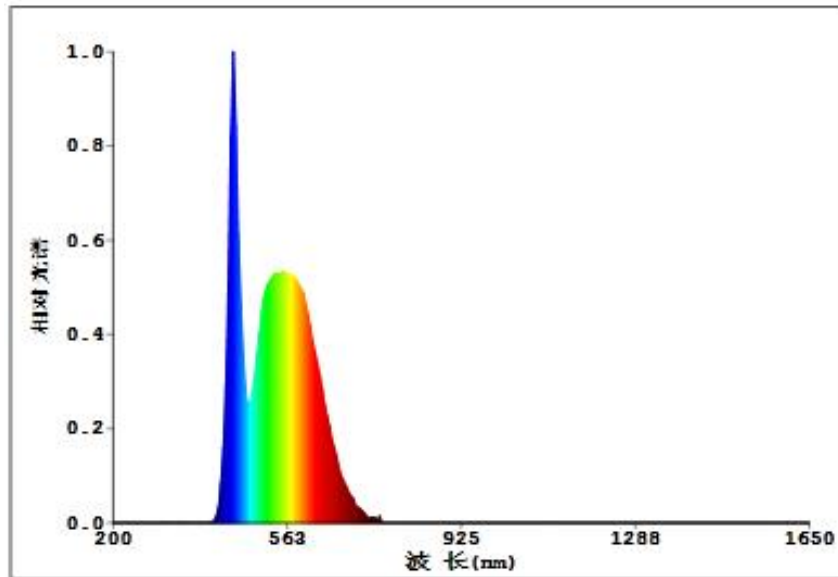
Table 6.1		Emission limits for risk groups of continuous wave lamps 4014							P
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	$E_s$	$Wm^{-2}$	0,001	$4,8 \times 10^{-6}$	0,003	---	0,03	---
Near UV		$E_{UVA}$	$Wm^{-2}$	10	$5,3 \times 10^{-4}$	33	---	100	---
Blue light	$B(\lambda)$	$L_B$	$Wm^{-2} sr^{-1}$	100	0,14	10000	---	4000000	---
Blue light, small source	$B(\lambda)$	$E_B$	$Wm^{-2}$	1,0*	$4,4 \times 10^{-1}$	1,0	---	400	---
Retinal thermal	$R(\lambda)$	$L_R$	$Wm^{-2} sr^{-1}$	$28000/\alpha$	18	$28000/\alpha$	---	$71000/\alpha$	---
Retinal thermal, weak visual stimulus**	$R(\lambda)$	$L_{IR}$	$Wm^{-2} sr^{-1}$	$6000/\alpha$	0	$6000/\alpha$	---	$6000/\alpha$	---
IR radiation, eye		$E_{IR}$	$Wm^{-2}$	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									

Furthermore  
Remarks:

1. Product information

LED	Manufacture	LED
	SHENZHEN GLORY SKY OPTOELECTRONIC CO.,LTD	4014; 60mA, 3,2V

2. Spectral Distribution:



Appendix 4: Requirements of IEC/TR 62778: 2014			
Clause	Requirement + Test	Result - Remark	Verdict
<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		<b>P</b>
	Use of only true luminance/radiance values		<b>P</b>
	In case of luminaire: The light source is operated in the luminaire under similar conditions as when tested as a component		<b>P</b>
	In case $E_{thr}$ value for RG2 was established the peak value was derived from angular light distribution		<b>N/A</b>
<b>7.2</b>	<b>Conditions for the radiance measurement</b>		<b>P</b>
	Standard condition applied (200mm distance, 0,011rad field of view)		<b>P</b>
	Non-standard condition applied		<b>P</b>
<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		<b>N/A</b>
	Evaluation done based on highest luminance		<b>N/A</b>
	Evaluation done based on CCT value		<b>N/A</b>
<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	<b>N/A</b>
	$E_{thr}$ of LED package applies to array		<b>N/A</b>
<b>8</b>	<b>RISK GROUP CLASSIFICATION</b>		<b>P</b>
	Risk group achieved:		<b>P</b>
	-- Risk Group 0 unlimited		<b>P</b>
	-- Risk Group 1 unlimited		<b>N/A</b>
	- $E_{thr}$ ..... (lx) : Distance to reach RG1 ..... (m) :		<b>N/A</b>

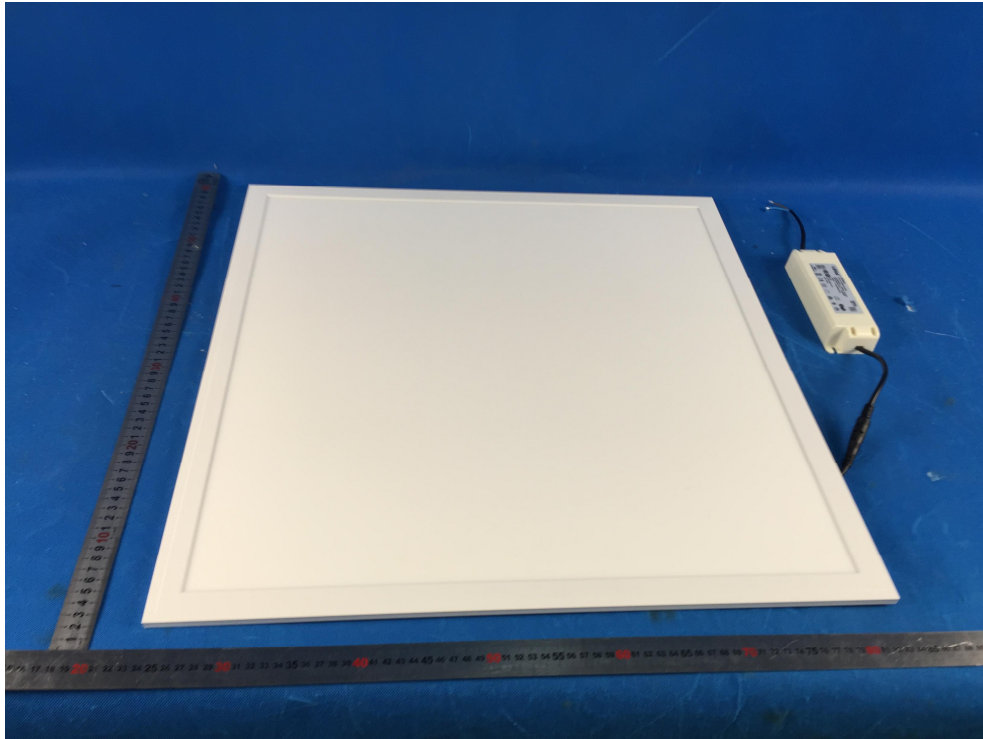
## Appendix 4: Requirements of IEC/TR 62778: 2014

Clause	Requirement + Test	Result - Remark	Verdict
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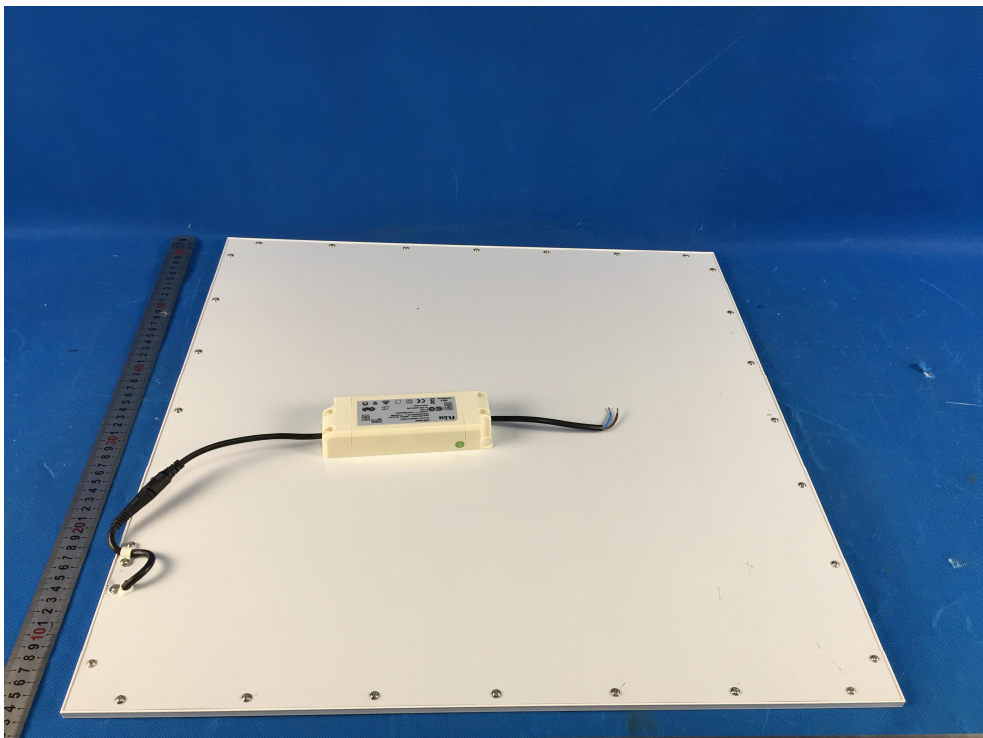
	<b>TABLE: Spectroradiometric measurement</b>			<b>P</b>
	Measurement performed on:	<input type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input checked="" type="checkbox"/> Luminaire		
	Model number .....	LL-PNL60-30W		
	Test voltage (V) .....	230		—
	Test current (mA) .....	250		—
	Test frequency (Hz) .....	50		—
	Ambient, t (°C) .....	25		—
	Measurement distance .....	<input checked="" 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	6166	
x/y colour coordinates			/	
Blue light hazard radiance	L <sub>B</sub>	W/(m <sup>2</sup> sr <sup>1</sup> )	4	
Blue light hazard irradiance	E <sub>B</sub>	W/m <sup>2</sup>	3,661	
Luminance	L	cd/m <sup>2</sup>	4.911x10 <sup>3</sup>	
Illuminance	E	lx	7047	
Supplementary information:				

## Appendix 5: Photographs

Clause	Requirement + Test	Result - Remark	Verdict
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Overview (Model: LL-PNL06-30W)



Backview



## Appendix 5: Photographs

Clause	Requirement + Test	Result - Remark	Verdict
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LED driver



Connector

## Appendix 5: Photographs

Clause	Requirement + Test	Result - Remark	Verdict
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Cord anchorage

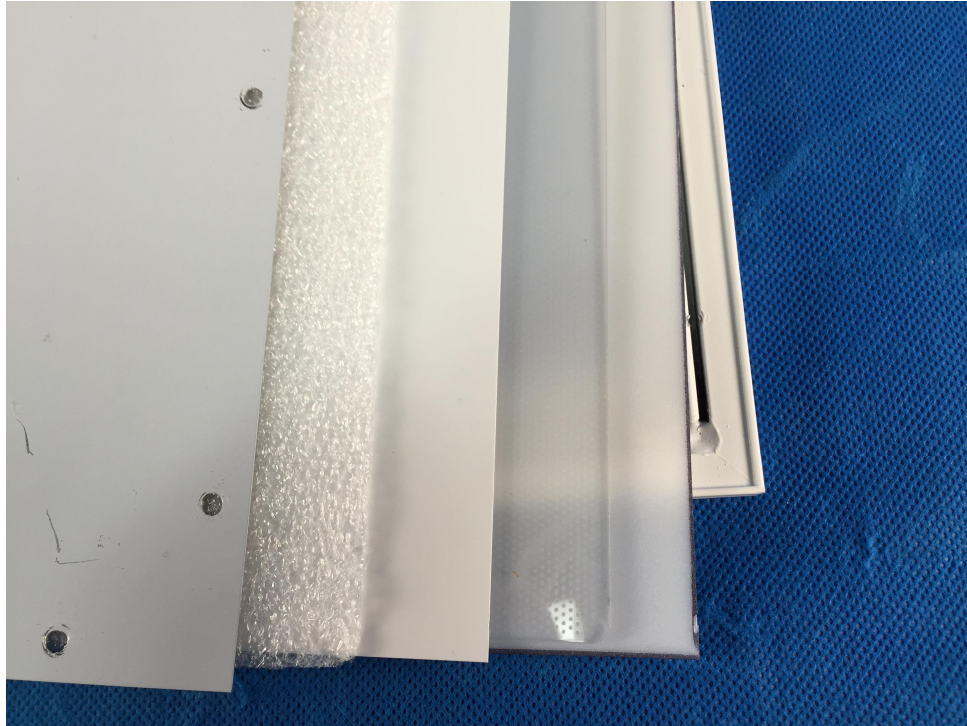


LED module



## Appendix 5: Photographs

Clause	Requirement + Test	Result - Remark	Verdict
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Lens