




LVD TEST REPORT

Applicant: BRAYTRON S.R.L.
Address of Applicant: B.DUL IULIU MANIU, NR.616, CORP B, ETAJ 1 SECTOR 6,
061129, BUCHAREST, ROMANIA

Equipment Under Test (EUT)

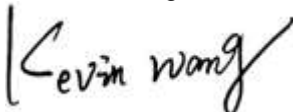
Product Name: LED EXIT LAMP
Brand Name: 
Model No.: Please refer to page 5

Applicable standards: EN 60598-2-22:2014+A1:2020
EN 60598-1:2015+A1:2018

Date of sample receipt: April 30, 2021
Date of Test: April 30, 2021 To June 15, 2021
Date of report issued: June 17, 2021
Test Result : PASS

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EU Declaration of Conformity and compliance with all relevant EU Directives.

Authorized Signature



Kevin Wang
Laboratory Manager





TEST REPORT
EN 60598-2-22
Luminaires
Part 2: Particular requirements
Section 22: Luminaires for emergency lighting

Report Reference No.: EBO2104195-E462

Tested by (name + signature).....: Bernie Xia *Bernie Xia*

Approved by (name + signature): Kevin Wang *Kevin Wang*

Date of issue.....: June 17, 2021

Testing Laboratory: Shenzhen EBO Testing Center

Address.....: Building A, Qinye Business Center , Xin'an Sixth Road, 82th District, Bao'an, Shenzhen, China.



Total number of pages.....: 36 pages(not including attachments)

Applicant's name: BRAYTRON S.R.L.

Address.....: B.DUL IULIU MANIU, NR.616, CORP B, ETAJ 1 SECTOR 6, 061129, BUCHAREST, ROMANIA

Manufacturer's name.....: DEMGRUP INTERNATIONAL LIGHTING LIMITED

Address.....: UNIT D 16/F, ONE CAPITAL PLACE, 18 LUARD ROAD, WAN CHAI, HONG KONG

Test specification:

Standard: EN 60598-2-22:2014+A1:2020
 used in conjunction with EN 60598-1:2015+A1:2018

Test procedure.....: LVD

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

Test item description.....: LED EXIT LAMP

Trade Mark: **Braytron**

Model/Type reference.....: Please refer to page 5

Test Model No.: BC14-00900

Ratings.....: AC220-240V, 50/60Hz or DC3.7V, 2.2AH lithium battery

Summary of testing:

Testing location:

Shenzhen EBO Testing Center
Building A, Qinye Business Center , Xin'an Sixth Road, 82th District, Bao'an, Shenzhen, China.

Tests performed (name of test and test clause):

- EN 60598-2-22:2014
- EN 60598-1:2015+A1:2018
- EN 62031:2008+A1:2013+A2:2015
- EN 62493:2015

The submitted samples were found to comply with the requirements of above specification.

The submitted samples were found to comply with requirement EN 62493:2015 without testing. because they are LED-light source technology

Summary of compliance with National Differences:

Compliance with the National requirements of CENELEC common modification.

Copy of marking plates:



Remark:

1. The marking plates of the other models are of the same pattern.



Test item particulars :	
Classification of Installation and Use :	Fixed
Supply Connection	Terminal block
Protection class	Class II
Ddegree of protection	IP 20
Range of Ambient Temperatures	0C -40C
ta.....	40C
Possible test case verdicts:	
- test case does not apply to the test object..... :	N (N)
- test object does meet the requirement	P (Pass)
- test object does not meet the requirement	F (Fail)
Testing :	
Date of receipt of test item..... :	April 30, 2021
Date(s) of performance of tests..... :	April 30, 2021 To June 15, 2021
General remarks:	
<p>The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory. "(see Enclosure #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report.</p> <p>Throughout this report a point is used as the decimal separator.</p> <p>This document is issued by the company under its General Conditions of Service accessible at www.ebotest.com. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.</p> <p>Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.</p> <p>Unless otherwise stated: (a) the results shown in this document refer only to the sample(s) tested and (b) such sample(s) are retained for 1 month. This document cannot be reproduced except in full, without prior approval of the company.</p>	
General product information: Emergency Lights for indoor and outdoor use.	



Model No.:

BC14-00900	BC14-01100	BC14-01120	BC01-00130
BC01-00330	BC01-00430	BC04-00134	BC04-00234
BC03-00130	BC03-00121	BC03-00137	BC03-00141
BC03-00151	BC03-00177	BC03-00187	BC14-001X0
BC14-002X0	BC14-003X0	BC14-004X0	BC14-005X0
BC14-006X0	BC14-007X0	BC14-008X0	BC14-009X0
BC14-010X0	BC14-011X0	BC14-012X0	BC14-013X0
BC14-014X0	BC14-015X0	BC14-016X0	BC14-017X0
BC14-018X0	BC14-019X0	BC14-020X0	BC14-021X0
BC14-022X0	BC14-023X0	BC14-024X0	

X=0,1,2,3,4,5,6,7,8,9

Remark: All models are identical in the same PCB layout, interior structure and electrical circuits. The only differences are the model name and appearance color for commercial purpose.




EN 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict

22.4 (0)	GENERAL TEST REQUIREMENTS		—
22.4 (0.1)	Information for luminaire design considered	Standard Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
22.4 (0.3)	More sections applicable	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
22.4 (-)	Part provide normal lighting, test according relevant part of IEC 60598-2	IEC/EN 60598-2-2	P
22.4 (-)	Adjacent part fulfils relevant part of this part 2		P
22.4 (-)	Self-contained portable emergency luminaires, requirements according Annex E	(see Annex E)	N

22.5 (2)	CLASSIFICATION		—
22.5 (2.2)	Type of protection	Class II	—
22.5 (2.3)	Degree of protection	IP65	—
22.5 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
22.5 (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"/>	—
22.5 (-)	Classified as luminaire suitable for direct mounting on normally flammable surfaces		P
22.5 (-)	Classification code according Annex B	(see Annex B)	P

22.6 (3)	MARKING		—
22.6 (3.2)	Mandatory markings		P
	Position of the marking		P
	Format of symbols/text		P
22.6 (3.3)	Additional information		P
	Language of instructions	English	P
22.6 (3.3.1)	Combination luminaires		N
22.6 (3.3.2)	Nominal frequency in Hz	50/60Hz	P
22.6 (3.3.3)	Operating temperature		N
22.6 (3.3.4)	Symbol or warning notice		N
22.6 (3.3.5)	Wiring diagram		N



EN 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
22.6 (3.3.6)	Special conditions		N
22.6 (3.3.7)	Metal halide lamp luminaire – warning		N
22.6 (3.3.8)	Limitation for semi-luminaires		N
22.6 (3.3.9)	Power factor and supply current		N
22.6 (3.3.10)	Suitability for use indoors		P
22.6 (3.3.11)	Luminaires with remote control		N
22.6 (3.3.12)	Clip-mounted luminaire – warning		N
22.6 (3.3.13)	Specifications of protective shields		N
22.6 (3.3.14)	Symbol for nature of supply		P
22.6 (3.3.15)	Rated current of socket outlet		N
22.6 (3.3.16)	Rough service luminaire		N
22.6 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments		N
22.6 (3.3.18)	Non-ordinary luminaires with PVC cable		N
22.6 (3.3.19)	Protective conductor current in instruction if applicable		N
22.6 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N
22.6 (3.3.21)	Non replaceable and non-user replaceable light sources information provided	Non-user replaceable light sources	P
	Cautionary symbol		N
22.6 (3.3.22)	Controllable luminaires, classification of insulation provided		N
22.6 (3.4)	Test with water		P
	Test with hexane		P
	Legible after test		P
	Label attached		P
22.6.1 (-)	Supply voltage	220-240VAC	P
22.6.2 (-)	Classification according to annex B		P



EN 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict

22.6.3 (-)	Correct replacement lamp		P
22.6.4 (-)	Range of ambient temperatures	ta: 40°C; range : 0°C -40°C	P
22.6.5 (-)	Fuse ratings and/or indicator lamps		N
22.6.6 (-)	Facilities to simulate normal supply failure		P
22.6.7 (-)	Marked with correct battery replacement		P
	Non-replaceable batteries		N
22.6.8 (-)	Battery marked with date of manufacture		P
	Space provided on battery label		P
22.6.9 (-)	Correct lamp replacement for combined emergency luminaires		N
	Green dot with min 5 mm diameter		N
	Instruction leaflet 22.6.10 – 22.6.12 and 22.6.14 – 22.6.16		P
22.6.10 (-)	Replacement of battery or luminaire		P
22.6.11 (-)	Details of test facilities		N
22.6.12 (-)	Details of connection leads		N
22.6.14 (-)	Details of device which changes the mode of operation		P
22.6.15 (-)	Photometric data available according 22.17		P
22.6.16 (-)	Any normal preparation procedure		P
22.6.17 (-)	Marking in 22.6.1, 22.6.2, 22.6.7 and 22.6.20 visible on installed luminaire		P
	Marking in 22.6.5, 22.6.7 and 22.6.9 visible during maintenance		P
22.6.18 (-)	Provided with warning if intended for external plug and socket connections		P
22.6.19 (-)	Instruction leaflet specifies if lamp and/or battery is/are non-replaceable	The LED lamp is non-user replaceable; The battery is replaceable	N
22.6.20 (-)	Marking if luminaire mounted on lighting track systems		N
	Photometric data in instruction leaflet		N

22.7 (4)	CONSTRUCTION		—
22.7 (4.2)	Components replaceable without difficulty		P
22.7 (4.3)	Wireways smooth and free from sharp edges		P
22.7 (4.4)	Lampholders		N
22.7 (4.4.1)	Integral lampholder		N
22.7 (4.4.2)	Wiring connection		N



EN 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
22.7 (4.4.3)	Lampholder for end-to-end mounting		N
22.7 (4.4.4)	Positioning		N
	- pressure test (N)		—
	After test the lampholder comply with relevant standard sheets and show no damage		N
	After test on single-capped lampholder the lampholder have not moved from its position and show no permanent deformation		N
	- bending test (N)		—
	After test the lampholder have not moved from its position and show no permanent deformation		N
22.7 (4.4.5)	Peak pulse voltage		N
22.7 (4.4.6)	Centre contact		N
22.7 (4.4.7)	Parts in rough service luminaires resistant to tracking		N
22.7 (4.4.8)	Lamp connectors		N
22.7 (4.4.9)	Caps and bases correctly used		N
22.7 (4.4.10)	Light source for lampholder or connection according IEC 60061 not connected another way		N
22.7 (4.5)	Starter holders		N
	Starter holder in luminaires other than class II		N
	Starter holder class II construction		N
22.7 (4.6)	Terminal blocks		N
	Tails		N
	Unsecured blocks		N
22.7 (4.7)	Terminals and supply connections		P
22.7 (4.7.1)	Contact to metal parts		N
22.7 (4.7.2)	Test 8 mm live conductor		P
	Test 8 mm earth conductor		N
22.7 (4.7.3)	Terminals for supply conductors		P
22.7 (4.7.3.1)	Welded method and material		N



EN 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
	- stranded or solid conductor		N
	- spot welding		N
	- welding between wires		N
	- Type Z attachment		N
	- mechanical test according to 15.8.2		N
	- electrical test according to 15.9		N
	- heat test according to 15.9.2.3 and 15.9.2.4		N
22.7 (4.7.4)	Terminals other than supply connection		P
22.7 (4.7.5)	Heat-resistant wiring/sleeves		N
22.7 (4.7.6)	Multi-pole plug		N
	- test at 30 N		N
22.7 (4.8)	Switches		N
	- adequate rating		N
	- adequate fixing		N
	- polarized supply		N
	- compliance with IEC 61058-1 for electronic switches		N
22.7 (4.9)	Insulating lining and sleeves		N
22.7 (4.9.1)	Retainment		N
	Method of fixing		—
22.7 (4.9.2)	Insulated linings and sleeves:		N
	Resistant to a temperature > 20 °C to the wire temperature or		N
	a) & c) Insulation resistance and electric strength		N
	b) Ageing test. Temperature (°C)		N
22.7 (4.10)	Double or reinforced insulation		P
22.7 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		P
	Safe installation fixed luminaires		P
	Capacitors and switches		N
	Interference suppression capacitors according to IEC 60384-14		N



EN 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
22.7 (4.10.2)	Assembly gaps:		N
	- not coincidental		N
	- no straight access with test probe		N
22.7 (4.10.3)	Retention of insulation:		P
	- fixed		N
	- unable to be replaced; luminaire inoperative		P
	- sleeves retained in position		N
	- lining in lampholder		N
22.7 (4.11)	Electrical connections and current-carrying parts		P
22.7 (4.11.1)	Contact pressure		P
22.7 (4.11.2)	Screws:		N
	- self-tapping screws		N
	- thread-cutting screws		N
22.7 (4.11.3)	Screw locking:		N
	- spring washer		N
	- rivets		N
22.7 (4.11.4)	Material of current-carrying parts		P
22.7 (4.11.5)	No contact to wood or mounting surface		P
22.7 (4.11.6)	Electro-mechanical contact systems		P
22.7 (4.12)	Screws and connections (mechanical) and glands		P
22.7 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		N
	Torque test: torque (Nm); part.....:	1.2Nm; screw fixing enclosure	P
	Torque test: torque (Nm); part.....:		N
	Torque test: torque (Nm); part.....:		N
22.7 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N



EN 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
22.7 (4.12.4)	Locked connections:		N
	- fixed arms; torque (Nm)		N
	- lampholder; torque (Nm)		N
	- push-button switches; torque 0,8 Nm.....		N
22.7 (4.12.5)	Screwed glands; force (Nm)		N
22.7 (4.13)	Mechanical strength		P
22.7 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm)		N
	- other parts; energy (Nm)	Enclosure; 0.35Nm	P
	1) live parts		P
	2) linings		N
	3) protection		P
	4) covers		P
22.7 (4.13.3)	Straight test finger		N
22.7 (4.13.4)	Rough service luminaires		N
	- IP54 or higher		N
	a) fixed		N
	b) hand-held		N
	c) delivered with a stand		N
	d) for temporary installations and suitable for mounting on a stand		N
22.7 (4.13.6)	Tumbling barrel		N
22.7 (4.14)	Suspensions, fixings and means of adjusting		P
22.7 (4.14.1)	Mechanical load:		P
	A) four times the weight		P
	B) torque 2,5 Nm		N
	C) bracket arm; bending moment (Nm).....		N
	D) load track-mounted luminaires		N
	E) clip-mounted luminaires, glass-shelve. Thickness (mm)		N



EN 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
	Metal rod. diameter (mm)		N
	Fixed luminaire or independent control gear without fixing devices		N
22.7 (4.14.2)	Load to flexible cables		N
	Mass (kg)		—
	Stress in conductors (N/mm ²)		N
	Mass (kg) of semi-luminaire		—
	Bending moment (Nm) of semi-luminaire		N
22.7 (4.14.3)	Adjusting devices:		N
	- flexing test; number of cycles		N
	- strands broken.....		N
	- electric strength test afterwards		N
22.7 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N
22.7 (4.14.5)	Guide pulleys		N
22.7 (4.14.6)	Strain on socket-outlets		N
22.7 (4.15)	Flammable materials		P
	- glow-wire test 650°C	See Test Table 22.16 (13.3.2)	P
	- spacing ≥30 mm		N
	- screen withstanding test of 13.3.1		N
	- screen dimensions		N
	- no fiercely burning material		P
	- thermal protection		N
	- electronic circuits exempted		N
22.7 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		N
	a) construction		N
	b) temperature sensing control		N
	c) surface temperature		N
22.7 (4.16)	Luminaires for mounting on normally flammable surfaces		N



EN 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
	No lamp control gear	Electronic lamp control gear is exempted from this requirement	N
22.7 (4.16.1)	Lamp control gear spacing:		N
	- spacing 35 mm		N
	- spacing 10 mm		N
22.7 (4.16.2)	Thermal protection:		N
	- in lamp control gear		N
	- external		N
	- fixed position		N
	- temperature marked lamp control gear		N
22.7 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	N
22.7 (4.17)	Drain holes		N
	Clearance at least 5 mm		N
22.7 (4.18)	Resistance to corrosion		N
22.7 (4.18.1)	- rust-resistance		N
22.7 (4.18.2)	- season cracking in copper		N
22.7 (4.18.3)	- corrosion of aluminium		N
22.7 (4.19)	Igniters compatible with ballast		N
22.7 (4.20)	Rough service vibration		N
22.7 (4.21)	Protective shield		N
22.7 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N
	Shield of glass if tungsten halogen lamps		N
22.7 (4.21.2)	Particles from a shattering lamp not impair safety		N
22.7 (4.21.3)	No direct path		N
22.7 (4.21.4)	Impact test on shield		N



EN 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
	Glow-wire test on lamp compartment..... :	See Test Table 22.16 (13.3.2)	N
22.7 (4.22)	Attachments to lamps not cause overheating or damage		N
22.7 (4.23)	Semi-luminaires comply Class II		N
22.7 (4.24)	Photobiological hazards		P
22.7 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		N
22.7 (4.24.2)	Retinal blue light hazard		P
	Luminaires with E_{thr} :		P
	a) Fixed luminaires	RG0	P
	- distance x m, borderline between RG1 and RG2 .. :		N
	- marking and instruction according 3.2.23		N
	b) Portable and handheld luminaires		N
	- marking according 3.2.23 if RG1 exceeded at 200 mm according to IEC/TR 62778		N
	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
22.7 (4.25)	Mechanical hazard		P
	No sharp point or edges		P
22.7 (4.26)	Short-circuit protection		N
22.7 (4.26.1)	Adequate means of uninsulated accessible SELV parts		N
22.7 (4.26.2)	Short-circuit test with test chain according 4.26.3		N
	Test chain not melt through		N
	Test sample not exceed values of Table 12.1 and 12.2		N
22.7 (4.27)	Terminal blocks with integrated screwless earthing contacts		N
	Test according Annex V		N
	Pull test of terminal fixing (20 N)		N
	After test, resistance < 0,05 Ω		N
	Pull test of mechanical connection (50 N)		N
	After test, resistance < 0,05 Ω		N



EN 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
	Voltage drop test, resistance < 0,05 Ω		N
22.7 (4.28)	Fixing of thermal sensing control		N
	Not plug-in or easily replaceable type		N
	Reliably kept in position		N
	No adhesive fixing if UV radiations from a lamp can degrade the fixing		N
	Not outside the luminaire enclosure		N
	Test of adhesive fixing:		N
	Max. temperature on adhesive material (°C)		—
	100 cycles between t min and t max		N
	Temperature sensing control still in position		N
22.7 (4.29)	Luminaires with non-replaceable light source		N
	Not possible to replace light source		N
	Live part not accessible after parts have been opened by hand or tools		N
22.7 (4.30)	Luminaires with non-user replaceable light source		N
	If protective cover provide protection against electric shock and marked with “caution, electric shock risk” symbol:		N
	Minimum two fixing means		N
22.7 (4.31)	Insulation between circuits		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
22.7 (4.31.1)	SELV circuits		P
	Used SELV source		P
	Voltage ≤ ELV		P
	Insulating of SELV circuits from LV supply	Reinforced	P
	Insulating of SELV circuits from other non SELV circuits		N
	Insulating of SELV circuits from FELV		N
	Insulating of SELV circuits from other SELV circuits		N



EN 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
	SELV circuits insulated from accessible parts according Table X.1		P
	Plugs not able to enter socket-outlets of other voltage systems		P
	Socket outlets does not admit plugs of other voltage systems		P
	Plugs and socket-outlets does not have protective conductor contact		P
22.7 (4.31.2)	FELV circuits		N
	Used FELV source		N
	Voltage \leq ELV		N
	Insulating of FELV circuits from LV supply		N
	FELV circuits insulated from accessible parts according Table X.1		N
	Plugs not able to enter socket-outlets of other voltage systems		N
	Socket outlets does not admit plugs of other voltage systems		N
	Socket-outlets does not have protective conductor contact		N
22.7 (4.31.3)	Other circuits		N
	Other circuits insulated from accessible parts according Table X.1		N
	Class II construction with equipotential bonding for protection against indirect contacts with live parts:		N
	- conductive parts are connected together		N
	- test according 7.2.3 of above		N
	- conductive part not cause an electric shock in case of an insulation fault		N
	- equipotential bonding in master/slave applications		N
	- master luminaire provided with terminal for accessible conductive parts of slave luminaires		N
	- slave luminaire constructed as class I		N
22.7 (4.32)	Overvoltage protective devices		N
	Comply with IEC 61643-11		N
	External to controlgear and connected to earth:		N
	- only in fixed luminaires		N



EN 60598-2-22			
Clause	Requirement + Test	Result - Remark	Verdict
	- only connected to protective earth		N
22.7 (-)	Luminaire with automatic testing system complies with IEC 62034		N
	Specific items according IEC 61347-2-7 Annex K		N
22.7.1 (-)	No glow starters in circuit in start of or during the emergency mode		N
22.7.2 (-)	Lamp control gears comply with relevant part 2 of IEC 61347	IEC/EN 61347-2-7	P
22.7.3 (-)	Protective device disconnect luminaire in case of failure		P
22.7.4 (-)	Impact test min. 0,35 Nm		P
22.7.5 (-)	Circuit separation (self-contained lum.)		P
22.7.6 (-)	Circuit separation (centrally supplied lum.)		N
22.7.7 (-)	Charging device		P
	Indicator lamp and colour	Green	P
22.7.8 (-)	Battery meet requirements in Annex A	(see Annex A)	P
	Battery designed to provide duration for at least four years		P
	Battery only for emergency function		P
22.7.10 (-)	No switch in self-contained emergency luminaire between battery and emergency lighting lamps		P
	No switch in self-contained and central supplied emergency luminaire isolating emergency circuits from mains supply		N
	Installation according IEC 60364-5-56		P
22.7.11 (-)	Failure of lamp(s) not impair operation of the battery		P
22.7.12 (-)	Batteries in self-contained emergency luminaire comply with cl. 23 of IEC 61347-2-7 if applicable		P
22.7.13 (-)	No influence in emergency mode in self-contained emergency luminaire by short-circuit, contact to earth or interruption in normal supply wiring		P
22.7.14 (-)	Self-contained emergency luminaire with remote inhibiting and/or rest mode meet requirements of clause 25 of IEC 61347-2-7		N
22.7.19 (-)	Lamp voltage in self-contained emergency luminaire with tungsten filament lamps not exceed 1,05 rated voltage		N
22.7.20 (-)	Battery in self-contained emergency luminaire according manufacturers specification and Annex A		P
22.7.21 (-)	Batteries and chargers within self-contained emergency luminaire or in remote box		P



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Clause	Requirement + Test	Result - Remark	Verdict

22.7.22 (-)	Remote box in self-contained emergency luminaire comply with same requirements as for the luminaire		N
22.7.23 (-)	Locking system for emergency luminaire on track system used for display lighting requires aid of tool		N

22.8 (11)	CREEPAGE DISTANCES AND CLEARANCES		—
22.8 (11.2)	Creepage distances and clearances	See Table 22.8 (11.2)	P
	Working voltage (V)	220-240VAC	—
	Rated pulse voltage (kV)	—	—
	Voltage form	Sinusoidal <input checked="" type="checkbox"/> Non-sinusoidal <input type="checkbox"/>	—
	PTI	< 600 <input checked="" type="checkbox"/> ≥ 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"/>	—

22.9 (7)	PROVISION FOR EARTHING		—
22.9 (7.2.1 + 7.2.3)	Accessible metal parts		P
	Metal parts in contact with supporting surface		P
	Resistance < 0,5 Ω	0.011Ω	P
	Self-tapping screws used		N
	Thread-forming screws		N
	Thread-forming screw used in a groove		N
	Earth makes contact first		N
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N
	Protective earthing of the luminaire not via built-in control gear		N
22.9 (7.2.2 + 7.2.3)	Earth continuity in joints, etc.		P
22.9 (7.2.4)	Locking of clamping means		P
	Compliance with 4.7.3		P
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N



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Clause	Requirement + Test	Result - Remark	Verdict

22.9 (7.2.5)	Earth terminal integral part of connector socket		P
22.9 (7.2.6)	Earth terminal adjacent to mains terminals		P
22.9 (7.2.7)	Electrolytic corrosion of the earth terminal		P
22.9 (7.2.8)	Material of earth terminal		P
	Contact surface bare metal		N
22.9 (7.2.10)	Class II luminaire for looping-in		N
	Double or reinforced insulation to functional earth		N
22.9 (7.2.11)	Earthing core coloured green-yellow		P
	Length of earth conductor		P

22.10 (14)	SCREW TERMINALS		—
	Separately approved; component list	(see Annex 1)	N
	Part of the luminaire	(see Annex 3)	N

22.10 (15)	SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS		—
	Separately approved; component list	(see Annex 1)	N
	Part of the luminaire	(see Annex 4)	N

22.11 (5)	EXTERNAL AND INTERNAL WIRING		—
22.11 (5.2)	Supply connection and external wiring		P
22.11 (5.2.1)	Means of connection	Terminal block	P
	Outdoor luminaire has not PVC insulated external wiring if not class III or SELV ≤ 25 V a.c./60 V d.c. or protected from outdoor environment		N
22.11 (5.2.2)	Type of cable		N
	Nominal cross-sectional area (mm ²)		N
	Cables equal to IEC 60227 or IEC 60245		N
22.11 (5.2.3)	Type of attachment, X, Y or Z		N
22.11 (5.2.5)	Type Z not connected to screws		N



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Clause	Requirement + Test	Result - Remark	Verdict
22.11 (5.2.6)	Cable entries:		N
	- suitable for introduction		N
	- adequate degree of protection		N
22.11 (5.2.7)	Cable entries through rigid material have rounded edges		N
22.11 (5.2.8)	Insulating bushings:		N
	- suitably fixed		N
	- material in bushings		N
	- material not likely to deteriorate		N
	- tubes or guards made of insulating material		N
22.11 (5.2.9)	Locking of screwed bushings		N
22.11 (5.2.10)	Cord anchorage:		N
	- covering protected from abrasion		N
	- clear how to be effective		N
	- no mechanical or thermal stress		N
	- no tying of cables into knots etc.		N
	- insulating material or lining		N
22.11 (5.2.10.1)	Cord anchorage for type X attachment:		N
	a) at least one part fixed		N
	b) types of cable		N
	c) no damaging of the cable		N
	d) whole cable can be mounted		N
	e) no touching of clamping screws		N
	f) metal screw not directly on cable		N
	g) replacement without special tool		N
	Glands not used as anchorage		N
	Labyrinth type anchorages		N
22.11 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		N
22.11 (5.2.10.3)	Tests:		N
	- impossible to push cable; unsafe		N
	- pull test: 25 times; pull (N)..... :		N



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Clause	Requirement + Test	Result - Remark	Verdict
	- torque test: torque (Nm)		N
	- displacement ≤ 2 mm		N
	- no movement of conductors		N
	- no damage of cable or cord		N
	- function independent of electrical connection		N
22.11 (5.2.11)	External wiring passing into luminaire		N
22.11 (5.2.12)	Looping-in terminals		N
22.11 (5.2.13)	Wire ends not tinned		N
	Wire ends tinned: no cold flow		N
22.11 (5.2.14)	Mains plug same protection		N
	Class III luminaire plug		N
	No unsafe compatibility		N
22.11 (5.2.16)	Appliance inlets (IEC 60320)		N
	Installation couplers (IEC 61535)		N
	Other appliance inlet or connector according relevant IEC standard		N
22.11 (5.2.17)	No standardized interconnecting cables properly assembled		N
22.11 (5.2.18)	Used plug in accordance with		N
	- IEC 60083		N
	- other standard		N
22.11 (5.3)	Internal wiring		P
22.11 (5.3.1)	Internal wiring of suitable size and type		P
	Through wiring		N
	- not delivered/ mounting instruction		N
	- factory assembled		N
	- socket outlet loaded (A)		N
	- temperatures	(see Annex 2)	N
	Green-yellow for earth only		N
22.11 (5.3.1.1)	Internal wiring connected directly to fixed wiring		N



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Clause	Requirement + Test	Result - Remark	Verdict
	Cross-sectional area (mm ²)		N
	Insulation thickness		N
	Extra insulation added where necessary		N
22.11 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		P
	Adequate cross-sectional area and insulation thickness		P
22.11 (5.3.1.3)	Double or reinforced insulation for class II		N
22.11 (5.3.1.4)	Conductors without insulation		N
22.11 (5.3.1.5)	SELV current-carrying parts		N
22.11 (5.3.1.6)	Insulation thickness other than PVC or rubber		N
22.11 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		N
	Joints, raising/lowering devices		N
	Telescopic tubes etc.		N
	No twisting over 360°		P
22.11 (5.3.3)	Insulating bushings:		N
	- suitable fixed		N
	- material in bushings		N
	- material not likely to deteriorate		N
	- cables with protective sheath		N
22.11 (5.3.4)	Joints and junctions effectively insulated		N
22.11 (5.3.5)	Strain on internal wiring		N
22.11 (5.3.6)	Wire carriers		N
22.11 (5.3.7)	Wire ends not tinned		P
	Wire ends tinned: no cold flow		N
22.11.1 (-)	Permanently connected		N



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Clause	Requirement + Test	Result - Remark	Verdict

22.12 (8)	PROTECTION AGAINST ELECTRIC SHOCK		—
22.12 (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
	Basic insulated parts not accessible with Ø 50 mm probe from outside, other types of luminaires		P
	Lampholders and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements		N
	Basic insulation only accessible under lamp or starter replacement		N
	Protection in any position		P
	Double-ended tungsten filament lamp		N
	Insulation lacquer not reliable		N
	Double-ended high pressure discharge lamp		N
	Relevant warning according to 3.2.18 fitted to the luminaire		N
22.12 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N
22.12 (8.2.3.a)	Class II luminaire:		N
	- basic insulated metal parts not accessible during starter or lamp replacement		N
	- basic insulation not accessible other than during starter or lamp replacement		N
	- glass protective shields not used as supplementary insulation		N
22.12 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		N
22.12 (8.2.3.c)	SELV circuits with exposed current carrying parts:		N
	Ordinary luminaire:		N
	- touch current		N
	- no-load voltage		N
	Other than ordinary luminaire:		N
	- nominal voltage		N
22.12 (8.2.4)	Portable luminaire have protection independent of supporting surface		N



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Clause	Requirement + Test	Result - Remark	Verdict

22.12 (8.2.5)	Compliance with the standard test finger or relevant probe		N
22.12 (8.2.6)	Covers reliably secured		P
22.12 (8.2.7)	Discharging of capacitors $\geq 0,5 \mu\text{F}$		N
	Portable plug connected luminaire with capacitor		N
	Other plug connected luminaire with capacitor		P
	Discharge device on or within capacitor		N
	Discharge device mounted separately		N

22.13 (12)	ENDURANCE TEST AND THERMAL TEST		—
22.13 (-)	If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 22.14		—
22.13 (12.3)	Endurance test:		P
	- mounting-position	As in normal use	—
	- test temperature (°C).....	50°C	—
	- total duration (h)	390h	—
	- supply voltage: Un factor; calculated voltage (V) ...	240V	—
	- lamp used	LED	—
22.13 (12.3.2)	After endurance test:		P
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N
	- marking legible		P
	- no cracks, deformation etc.		P
22.13 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
22.13 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	P
22.13 (12.6)	Thermal test (failed lamp control gear condition):		N
22.13 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A)		—
	- case of abnormal conditions		—
	- electronic lamp control gear		N



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Clause	Requirement + Test	Result - Remark	Verdict
	- measured winding temperature (°C): at 1,1 Un		—
	- measured mounting surface temperature (°C) at 1,1 Un		N
	- calculated mounting surface temperature (°C)		N
	- track-mounted luminaires		N
22.13 (12.6.2)	Temperature sensing control		N
	- case of abnormal conditions		—
	- thermal link		N
	- manual reset cut-out		N
	- auto reset cut-out		N
	- measured mounting surface temperature (°C).....		N
	- track-mounted luminaires		N
22.13 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N
22.13 (12.7.1)	Luminaire without temperature sensing control		N
22.13 (12.7.1.1)	Luminaire with fluorescent lamp ≤ 70W		N
	Test method 12.7.1.1 or Annex W		—
	Test according to 12.7.1.1:		N
	- case of abnormal conditions		—
	- Ballast failure at supply voltage (V)		—
	- Components retained in place after the test		N
	- Test with standard test finger after the test		N
	Test according to Annex W:		N
	- 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 22.16 (13.2.1)	N
22.13 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		N
	- case of abnormal conditions		—
	- measured winding temperature (°C): at 1,1 Un		—



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Clause	Requirement + Test	Result - Remark	Verdict

	- 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 22.16 (13.2.1)	N
22.13 (12.7.1.3)	Luminaire with short circuit proof transformers ≤ 10 VA		N
	- case of abnormal conditions		—
	- Components retained in place after the test		N
	- Test with standard test finger after the test		N
22.13 (12.7.2)	Luminaire with temperature sensing control		N
	- 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 22.16 (13.2.1)	N
22.13.1 (-)	Endurance test for self-contained luminaire		P
	Operate satisfactory during 50 supply switching		P
22.13.2 (-)	Thermal test 12.4 to 12.5 in IEC 60598-1	(see Annex 2)	P
22.13.3 (-)	Condition of tests		—
22.13.4 (-)	Battery discharge		—
22.13.5 (-)	Reduced temperature		—
22.13.6 (-)	Additional thermal test	(see Annex 2)	P
22.13.7 (-)	Provide Vmin according Clause 20 of IEC 61347-2-7 at the end of operation		P

22.14 (9)	RESISTANCE TO DUST AND MOISTURE		—
22.14 (-)	If IP > IP 20 the order of tests as specified in clause 22.12		P
22.14 (9.2)	Tests for ingress of dust, solid objects and moisture:		—
	- classification according to IP	IP65	—
	- mounting position during test	As in normal use	—
	- fixing screws tightened; torque (Nm).....:		—
	- tests according to clauses	9.2.0	—



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Clause	Requirement + Test	Result - Remark	Verdict
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		N
	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		N
	d) i) For luminaires without drain holes – no water entry		N
	d) ii) For luminaires with drain holes – no hazardous water entry		N
	e) no water in watertight luminaire		N
	f) no contact with live parts (IP2X)		N
	f) no entry into enclosure (IP3X and IP4X)		N
	f) no contact with live parts (IP3X and IP4X)		N
	g) no trace of water on part of lamp requiring protection from splashing water		P
	h) no damage of protective shield or glass envelope		N
22.14 (9.3)	Humidity test 48 h	25%; 93%R.H.; 48h	P

22.15 (10)	INSULATION RESISTANCE AND ELECTRIC STRENGTH		—
22.15 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø		—
	Insulation resistance (MΩ)		—
	SELV		P
	- between current-carrying parts of different polarity :		N
	- between current-carrying parts and mounting surface	100MΩ (required 1MΩ)	P
	- between current-carrying parts and metal parts of the luminaire	100MΩ (required 1MΩ)	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts		N
	- Insulation bushings as described in Section 5		N
	Other than SELV		P
	- between live parts of different polarity.....	100MΩ (required 2MΩ)	P
	- between live parts and mounting surface	100MΩ (required 4MΩ)	P
	- between live parts and metal parts	100MΩ (required 4MΩ)	P



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Clause	Requirement + Test	Result - Remark	Verdict

	- between live parts of different polarity through action of a switch.....:		N
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts.....:		N
	- Insulation bushings as described in Section 5		N
22.15 (10.2.2)	Electric strength test		P
	Dummy lamp		N
	Luminaires with ignitors after 24 h test		N
	Luminaires with manual ignitors		N
	Test voltage (V)		N
	SELV		P
	- between current-carrying parts of different polarity :		N
	- 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
	- Insulation bushings as described in Section 5		N
	Other than SELV		P
	- between live parts of different polarity.....:	1480	P
	- between live parts and mounting surface	2960V	P
	- between live parts and metal parts	2960V	P
	- between live parts of different polarity through action of a switch.....:		N
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts.....:		N
	- Insulation bushings as described in Section 5		N
22.15 (10.3)	Touch current (mA).....:	0.05mA (limit 0.7mA)	P
	Protective conductor current (mA).....:	0.56mA (limit 3.5mA)	P

22.16 (13)	RESISTANCE TO HEAT, FIRE AND TRACKING		—
22.16 (13.2.1)	Ball-pressure test.....:	See Test Table 22.16 (13.2.1)	P



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Clause	Requirement + Test	Result - Remark	Verdict
22.16 (13.3.1)	Needle-flame test (10 s)	See Test Table 22.16 (13.3.1)	P
22.16 (13.3.2)	Glow-wire test (650°C)	See Test Table 22.16 (13.3.2)	P
22.16 (13.4)	Proof tracking test (IEC 60112)	See Test Table 22.16 (13.4)	N
22.16 (-)	Glow-wire test (850°C) if applicable	Battery connector; LED lamp enclosure	P
	Glow-wire test (850°C) or fire resistant cable if applicable		N
22.17 (-)	PHOTOMETRIC DATA		—
22.17.1 (-)	Intensity distribution data available	See attachment No.6	P
	At least 50% of level declared photometric data 5 s after failure of supply		P
	100% of level declared photometric data if high-risk task-area lighting 0,5 s after failure of supply		N
	Photometric measurements according CIE 121 SP1		P
	All values at least minimum declared data		P
22.17.4 (-)	Colour-rendering index		N
22.17.5 (-)	Internally illuminated emergency safety sign meet requirements of ISO 30061		N
	Luminance of permanently illuminated safety sign meet requirements of ISO 3864-1 and ISO 3864-4		N
	Luminance measurements according Annex C	(see Annex C)	N
22.18 (-)	CHANGEOVER OPERATION		—
	Changeover device comply with Clause 21 of IEC 61347-2-7		N
22.19 (-)	HIGH TEMPERATURE OPERATION		—
	Operation at 70°C		P
	Relative light outputs		P
22.20 (-)	BATTERY CHARGERS FOR SELF-CONTAINED EMERGENCY LUMINAIRES		—
	Devices for recharging batteries comply with Clause 22 of IEC 61347-2-7		P
22.21	TEST DEVICES FOR EMERGENCY OPERATION		—
22.21.1 (-)	Self-contained luminaire provided with test facility		P
22.21.2 (-)	Remote testing device not influence proper function of safety illumination		N
22.21.3 (-)	Indicators colour according IEC 60073		P



22.8 (11.2)	TABLES: Creepage distances and clearances						P
Table 11.1	Minimum distances (mm) for a.c. (50/60 Hz) sinusoidal voltages						P
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	<u>1.2</u>	1.6	2.5	5	8	10	
Measured different polarities of live parts (L/N)	—	—	5.8	—	—	—	
Measured two ends of fuse link (F1)	—	—	3.1	—	—	—	
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 primary to secondary under Y1 on PCB	—	—	6.9	—	—	—	
Measured primary to secondary track on PCB	—	—	6.9	—	—	—	
Measured transformer (T1) core to secondary pin	—	—	5.6	—	—	—	
Measured live parts to accessible parts.	—	—	5.6	—	—	—	
Clearances							
Required basic insulation	0,2	0.8	<u>1.5</u>	3	4	5.5	
Measured	—	—	—	—	—	—	
Required supplementary insulation	-	0.8	1.5	3	4	5.5	
Measured different polarities of live parts (L/N)	—	—	5.8	—	—	—	
Measured two ends of fuse link (F1)	—	—	3.1	—	—	—	
Required reinforced insulation	-	1.6	3	6	8	11	
Measured primary to secondary under Y1 on PCB	—	—	6.9	—	—	—	
Measured primary to secondary track on PCB	—	—	6.9	—	—	—	
Measured transformer (T1) core to secondary pin	—	—	5.6	—	—	—	
Measured live parts to accessible parts.	—	—	5.6	—	—	—	
Table 11.2	Minimum distances (mm) for non-sinusoidal pulse voltages						N



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	—	—	—	—	—	—	—

Remark: Approved controlgear used, and no values are specified for working voltages below 60 V d.c. as the test voltage of 500V is considered sufficient.

22.16 (13.2.1)	TABLE: Ball Pressure Test of Thermoplastics				P
Allowed impression diameter (mm)				2mm	—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)		Impression diameter (mm)	
LED module PCB	Various	125		1.2	
LED driver PCB	Various	125		1.2	
Transformer bobbin	Zhongshan Ledtimes Lighting Co., Ltd.	125		1.2	

22.16 (13.3.1)	TABLE: Needle-flame test (IEC 60695-11-5)				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
LED module PCB	Various	10	No	0	Pass
LED driver PCB	Various	10	No	0	Pass
Transformer bobbin	Zhongshan Ledtimes Lighting Co., Ltd.	10	No	0	Pass

22.16 (13.3.2)	TABLE: Glow-wire test (IEC 60695-2-11)				P
Glow wire temperature				650°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
Acrylic Panel	LG CHEM HUIZHOU PETROCHEMICAL CO., LTD.	30	No	0	Pass
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).....					No



Supplementary information:

22.16 (13.4)	TABLE: Proof tracking test (IEC 60112)			N
Test voltage PTI		175 V		—
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens		Verdict
—	—	—	—	—

	Annex A: Batteries for self-contained emergency luminaires			—
A.1	Type of batteries			N
A.2	Battery conform to relevant standard			N
	Luminaire operate within specific tolerances			N
A.3	Battery capacity			N
A.4	Sealed nickel cadmium batteries			N
A.4.1	Battery conform to IEC 61951-1			N
A.4.2.a	Maximum surface temperature of the battery °C			N
A.4.2.b	Maximum overcharge rate 0,08 C ₅ A			N
A.4.2.c	Minimum ambient temperature of the cells 5 °C			N
A.4.2.d	Maximum discharge rates			N
A.5	Sealed nickel metal-hydride batteries			N
A.5.1	Battery conform to IEC 61951-2			N
A.5.2.a	Maximum case temperature of the battery °C			N
A.5.2.b	Maximum overcharge rate 0,08 C ₅ A			N
A.5.2.c	Minimum ambient temperature of the cells 5 °C			N
A.5.2.d	Maximum discharge rates			N
A.6	Valve regulated lead acid batteries			N
A.6.1	Battery conform to relevant part of IEC 60869-21 or IEC 61056-1			N
A.6.2.a	Maximum surface temperature of the battery °C			N
A.6.2.b	Maximum recharge current 0,4 C ₂₀			N
A.6.2.c	Maximum discharge rates			N
A.6.2.d	Maximum r.m.s. ripple current 0,1 C ₂₀			N
A.6.2.e	Minimum ambient temperature of the cells 5 °C			N
A.7	Ambient temperature of the cells measured after 48 h			N
A.8	Alternative operating parameters and evidence if operating outside limits in A.4 and A.5			N
A.9	Battery only replaced by a competent person			N



Annex B: Luminaire classification						—
Classified and marked according Annex B	X	0	A	120	P	

Annex C: Luminance measurements				—
C.1	Contrast measurements			N
C.2	On site photometric tests			N
	according to Annex C of ISO 3864-4			N
	Measured values not less than specified in this standard			N

Annex E: Requirements for self-contained portable emergency luminaires				—
E.5	Classification of luminaires			N
	Base unit and portable emergency luminaires with mains-voltage supplied integrated charger of Class I or Class II			N
	Self-contained portable emergency luminaire without integrated mains-voltage supplied charger of Class III			N
E.5.1	Classified according construction			—
E.5.1.a	Control unit contained in the self-contained portable emergency luminaire	Yes <input type="checkbox"/>	No <input type="checkbox"/>	—
E.5.1.b	Part of the control unit remains in the base unit	Yes <input type="checkbox"/>	No <input type="checkbox"/>	—
E.5.2	Classified according operation			—
E.5.2.a	Automatic initiation with manual control	Yes <input type="checkbox"/>	No <input type="checkbox"/>	—
E.5.2.b	Automatic initiation with automatic control	Yes <input type="checkbox"/>	No <input type="checkbox"/>	—
E.5.2.c	Manual control	Yes <input type="checkbox"/>	No <input type="checkbox"/>	—
E.5.3	Classified according photometric performance			—
	Distribution measured according IEC TR 61341			N
E.5.3.a	Narrow beam angels not greater than 15°			N
E.5.3.b	Medium beam angels between 15° and 25°			N
E.5.3.c	Wide beam angels greater than 25°			N
E.5.3.d	Variable beam angels – state the range of angels			N
E.6	Marking			N
E.6.1	Marking visible after installation			N
	Marking on both parts if separate charging device			N
	Class II symbol only on the charger if separate charging device			N
E.6.2	Instruction for electrical, mechanical and use according classification			N
E.6.3	Warning notice on both parts to return the luminaire to base unit for recharging after use			N



E.6.4	Instruction with photometric data		N
E.7	Construction		N
E.7.1	Control unit completely contained in the luminaire or part of the control unit in the base unit		N
E.7.2	Mechanical strength tests according 4.13 of IEC 60598-1		N
	Mechanical strength tests according 4.13.4 of IEC 60598-1 of portable section		N
E.7.3	Base unit permanently connected to unswitched supply		N
E.7.4	Integral manual switch used to switch the unit between inhibit mode and emergency mode and vice versa		N
	Recharging before supply voltage reach 0,85 times nominal value		N
E.7.5	Integral over current protection device connected immediately after the terminals connecting to the supply		N
E.7.6	Power supply connection between the luminaire and its base unit made without a tool		N
	Connecting devices according relevant standard		N
E.7.7	No access to live parts during or after connection or disconnection		N
E.7.8	Supply cable disconnected from the portable part before use		N
E.7.9	Connection between the portable part and the charger mechanically interlocked to prevent incorrect polarised connection		N
E.7.10	At least two independent replaceable lamps if incandescent lamps		N
E.7.11	Colour rendering index of any emergency lamps R_a 40 or better		N
E.7.12	Audible and/or visible warning on re-instatement of normal supply		N
E.7.13	Failure of the mains supply the luminaire operate in emergency mode or an indicator identify the location of the luminaire		N
	Load $\leq 0,01C5/h$ of the battery if indicator is used		N
E.7.14	Indicator give warning of low battery capacity remaining		N
E.7.15	Adequate stability		N
	Test at an angle of 15° to the horizontal		N
E.7.16	Adequate stability to illuminate the task area on non-horizontal surface		N
	Test at an angle of 15° to the horizontal		N



E.8	Changeover operation		N
	Requirements according 22.7.10 excluded if integral manual switch		N
	Design avoid switching of charger whilst holding the luminaire		N
E.9	High temperature operation		—
	Ambient temperature of 40°C in Clause 22.19		—
E.10	Thermal test		—
	Test made with portable part either placed on dull black painted wooden floor or rest against a dull black painted wooden wall		—



Object/Part No.	code	Manufacturer/ Trademark	Type/Model	Technical Data	Standard	Mark(s) of Conformity
Transformer	B.	Zhongshan Ledtimes Lighting Co., Ltd.	LT-EPC13-9860K	Class B	IEC 61347-1; IEC 61347-2-7	Tested with appliance
Optocoupler	B	EVERLIGHT	EL357	CTR: 50~600% at If=5mA, VCE=5V	EN 60747-5-2	VDE 132249
Connector	B	DEGSON	DG126-5.0	300V, 10A	DIN EN 60998-1 DIN EN 60998-2-2	VDE
PCB	B	KINGBOARD LAMINATES HOLDINGS LTD.	KB-3151C	V-0, 130°C	-	UL E123995
Insulation Enclosure	B	LG CHEM HUIZHOU PETROCHEMICAL CO., LTD.	AF312C	V-0, 80°C	-	UL E476284
Fuse	B	Dongguan Chevron Electronics Technology Co., Ltd.	3.15A/250V	3.15A/250V	IEC/EN 60127-1; IEC/EN 60127-3;	VDE 40036523
LED	B	Leining Photoelectric	LN-5730JCCW D-8012-S-H	VF: 3.0-3.4V If: 150mA	IEC TR 62778	CE

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12	P
	Type reference : BC14-00900	—
	Lamp used : LED	—
	Lamp control gear used : BC14-00900	—
	Mounting position of luminaire : As in normal use	—
	Supply wattage (W)..... : 5W	—
	Supply current (A) :	—
	Calculated power factor :	—
	Table: measured temperatures corrected for ta = 40°C:	P
	- abnormal operating mode :	—



	- test 1: rated voltage	240V	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage.....	1.06x240V=254.4V	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage		—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage.....		—
	Through wiring or looping-in wiring loaded by a current of A during the test		—

Temperature measurements, (°C)

Part	Clause 12.4 – normal				Clause 12.5 – abnormal	
	test 1	test 2	test 3	limit	test 4	limit
Condition:	—	1	2	—	—	—
LED module PCB	—	60.2	55.7	—	130	—
Subject lighted (10cm)	—	41.2	41.8	—	90	—
Enclosure outside	—	45.7	44.9	—	Ref.	—
Mounting surface	—	43.1	47.7	—	90	—
Lead wire of L/N	—	43.8	44.5	—	105	--
PCB near U3	—	65.4	62.2	—	130	--
C1 body	—	64.5	62.2	—	105	--
Transformer(T1) coil	—	82.3	76.9	—	110	--

Supplementary information:
 1 normal supply and fully-discharged battery is charged.
 2 Emergency mode and fully-charged battery is discharged.
 3 For abnormal heating test, after removal of the short-circuited link, reconnection of battery and the luminaires continue to function as intended.

ANNEX 3	Screw terminals (part of the luminaire)	N
(14)	SCREW TERMINALS	N
(14.2)	Type of terminal	—
	Rated current (A).....	—
(14.3.2.1)	One or more conductors	N
(14.3.2.2)	Special preparation	N
(14.3.2.3)	Terminal size	N
	Cross-sectional area (mm ²)	—
(14.3.3)	Conductor space (mm).....	N
(14.4)	Mechanical tests	N
(14.4.1)	Minimum distance	N



(14.4.2)	Cannot slip out		N
(14.4.3)	Special preparation		N
(14.4.4)	Nominal diameter of thread (metric ISO thread) :		N
	External wiring		N
	No soft metal		N
(14.4.5)	Corrosion		N
(14.4.6)	Nominal diameter of thread (mm) :		N
	Torque (Nm)..... :		N
(14.4.7)	Between metal surfaces		N
	Lug terminal		N
	Mantle terminal		N
	Pull test; pull (N)..... :		N
(14.4.8)	Without undue damage		N

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



	Voltage drop (mV) after 10th alt. 25th cycle (4 samples)		N
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples)		N
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples)		N
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples)		N
(15.6)	Terminals external wiring		N
	Terminal size and rating		N
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N)		N
	Pull test pin or tab terminals (4 samples); pull (N)		N

(15.6.3.1)	TABLE: Contact resistance test										N
	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										N
	Voltage drop after 10th alt. 25th cycle										N
	Max. allowed voltage drop (mV).....										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)	—	—	—	—	—	—	—	—	—	—	
	Voltage drop after 50th alt. 100th cycle										N
	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										N
	Max. allowed voltage drop (mV).....										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)	—	—	—	—	—	—	—	—	—	—	
	Continued ageing: voltage drop after 50th alt. 100th cycle										N
	Max. allowed voltage drop (mV).....										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)	—	—	—	—	—	—	—	—	—	—	
Supplementary information:											



**ATTACHMENT TO TEST REPORT IEC 60598-2-22
 EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES**

Luminaires
 Part 2: Particular requirements
 Section 22: Luminaires for emergency lighting

Differences according to	EN 60598-2-22:2014+A1:2020 EN 60598-1:2015+A1:2018
Annex Form No.	EU_GD_IEC60598_2_22E
Master Annex Form	2020-11
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	GENELEC COMMON MODIFICATIONS (EN)	—
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22.6 (3)	MARKING	—
22.6 (3.3.101)	For luminaires not supplied with terminal block: Adequate warning on the package	N

22.7 (4)	CONSTRUCTION	—
22.7 (4.11.6)	Electro-mechanical contact systems	P

22.11 (5)	EXTERNAL AND INTERNAL WIRING	—
22.11 (5.2.1)	Connecting leads	N
	- without a means for connection to the supply	N
	- terminal block specified	N
	- relevant information provided	N
	- compliance with 4.6, 4.7.1, 4.7.2, 4.10.1, 11.2, 12 and 13.2 of Part 1	N
22.11 (5.2.2)	Cables equal to EN 50525	P
	Replace table 5.1 – Supply cord	P

22.13 (12)	ENDURANCE TEST AND THERMAL TEST	—
22.13 (12.4.2c)	Thermal test (normal operation) see footnote c to table 12.2 relating to unsleeved fixed wiring	P

ZB	ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)	—
(3.3)	DK: power supply cords of class I luminaires with label	N
(4.5.1)	DK: socket-outlets	N
(5.2.1)	CY, DK, FI, SE, GB: type of plug	N
22.6.18 (-) 22.11.1 (-)	FR: Permanent fittings	P
22.6.15 (-) 22.17.1 (-)	FR: Photometric characteristics of products are only based on the “rated lumen output”	P

ZC	ANNEX ZC, NATIONAL DEVIATIONS (EN)	—
(4 & 5)	FR: Shuttered socket-outlets 10/16A	N
	GB: Requirements according to United Kingdom Building Regulation	N



TEST REPORT EN 62031 LED modules for general lighting – Safety specifications
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4	GENERAL REQUIREMENTS	—
4.4	Integral modules tested assembled in the luminaire	P
4.5	Independent modules complies with requirements in IEC 60598-1	N

5	GENERAL TEST REQUIREMENTS	—
5.5	SELV-operated LED modules comply with Annex I of IEC 61347-2-13	(see Annex 1) N
	General conditions for tests in Annex A	(see Annex A) P

6	CLASSIFICATION	—
	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.	—

7	MARKING	N
	Requirements not applicable to the evaluated product.	—

8	TERMINALS	—
	Screw terminals according section 14 of IEC 60598-1:	N
	Separately approved; component list	(see Annex 2) N
	Part of the luminaire	(see Annex 3) N
	Screwless terminals according section 15 of IEC 60598-1:	N
	Separately approved; component list	(see Annex 2) N
	Part of the luminaire	(see Annex 4) N
	Connectors according IEC 60838-2-2:	N
	Separately approved; component list	(see Annex 2) N

9 (9)	PROVISION FOR PROTECTIVE EARTHING	N
	Requirements not applicable to the evaluated product.	—

10 (10)	PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS	N
	Requirements not applicable to the evaluated product.	—

11 (11)	MOISTURE RESISTANCE AND INSULATION	—
	After storage 48 h at 91-95% relative humidity and 20-30 °C measuring of insulation resistance with d.c. 500 V (MΩ):	P
	For basic insulation ≥ 2 MΩ : 100MΩ	P
	For double or reinforced insulation ≥ 4 MΩ :	N



	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1		N
--	--	--	---

12 (12)	ELECTRIC STRENGTH		—
	Immediately after clause 11 electric strength test for 1 min		P
	Basic insulation for SELV, test voltage 500 V		P
	Working voltage ≤ 50 V, test voltage 500 V		P
	Working voltage > 50 V ≤ 1000 V, test voltage (V):		N
	Basic insulation, 2U + 1000 V		N
	Supplementary insulation, 2U + 1000 V		N
	Double or reinforced insulation, 4U + 2000 V		N
	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

13 (14)	FAULT CONDITIONS		—
- (14)	When operated under fault conditions the controlgear:		N
	- does not emit flames or molten material		N
	- does not produce flammable gases		N
	- protection against accidental contact not impaired		N
	Thermally protected controlgear does not exceed the marked temperature value		N
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected	(see appended table)	N
- (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
	Creepage distances on printed boards less than specified in clause 16 in Part 1 provided with coating according to IEC 60664-3		N
- (14.2)	Short-circuit or interruption of semiconductor devices	(see appended table)	N
- (14.3)	Short-circuit across insulation consisting of lacquer, enamel or textile	(see appended table)	N
- (14.4)	Short-circuit across electrolytic capacitors	(see appended table)	N
- (14.5)	After the tests has been carried out on three samples:		N
	The insulation resistance ≥ 1 MΩ		N
	No flammable gases		N
	No accessible parts have become live		N
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		N
- (14.6)	Relevant fault condition tests with high-power supply		—
13.2	Module withstands overpower condition >15 min.		P
	Module with automatic protective device or power limiter, test performed 15 min. at limit.		N
	During the tests, tissue paper, spread below module, does not ignite		P



15	CONSTRUCTION	—
	Wood, cotton, silk, paper and similar fibrous material not used as insulation	P

16	CREEPAGE DISTANCES AND CLEARANCES	—
	Creepage and distances and clearances in compliance with IEC 60598-1	P
	Working voltage (V): MAX 5VDC	—
	Voltage form Sinusoidal <input type="checkbox"/> Non-sinusoidal <input checked="" type="checkbox"/>	—
	PTI < 600 <input checked="" type="checkbox"/> ≥ 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"/>	—
	Rated pulse voltage (kV).....:	—
	(1) Current-carrying parts of different polarity: cr (mm); cl (mm) :	N
	(2) Current-carrying parts and accessible parts: cr (mm); cl (mm).....: No values are specified for working voltage below 60VDC as the test voltage 500V is considered sufficient.	N
	(3) Parts becoming live due to breakdown of basic insulation and metal parts: cr (mm); cl (mm).....:	N
	(4) Outer surface of cable where it is clamped and metal parts: cr (mm); cl (mm).....:	N
	(6) Current-carrying parts and supporting surface: cr (mm); cl (mm).....: No values are specified for working voltage below 60VDC as the test voltage 500V is considered sufficient.	N

17 (17)	SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS	—
	Screws, current-carrying parts and connections in compliance with IEC 60598-1 (clause numbers between parentheses refer to IEC 60598-1)	P

18 (18)	RESISTANCE TO HEAT, FIRE AND TRACKING	—
	Resistance to Heat, Fire and Tracking in compliance with IEC 61347-1 (clause numbers between parentheses refer to IEC 61347-1)	N
(18.1)	Ball-pressure test:	N
	- part tested; temperature (°C).....:	N
(18.2)	Test of printed boards	N
	- part tested.....:	N
(18.3)	Glow-wire test (650°C):	N
	- part tested.....:	N
(18.4)	Needle flame test (10 s):	N
	- part tested.....:	N
(18.5)	Tracking test:	N
	- part tested.....:	N

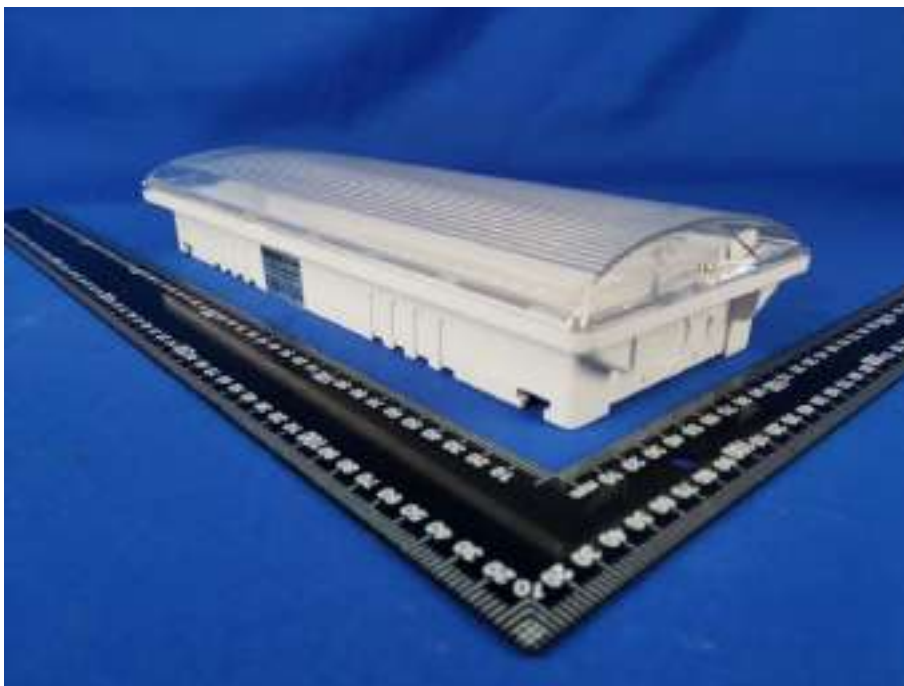
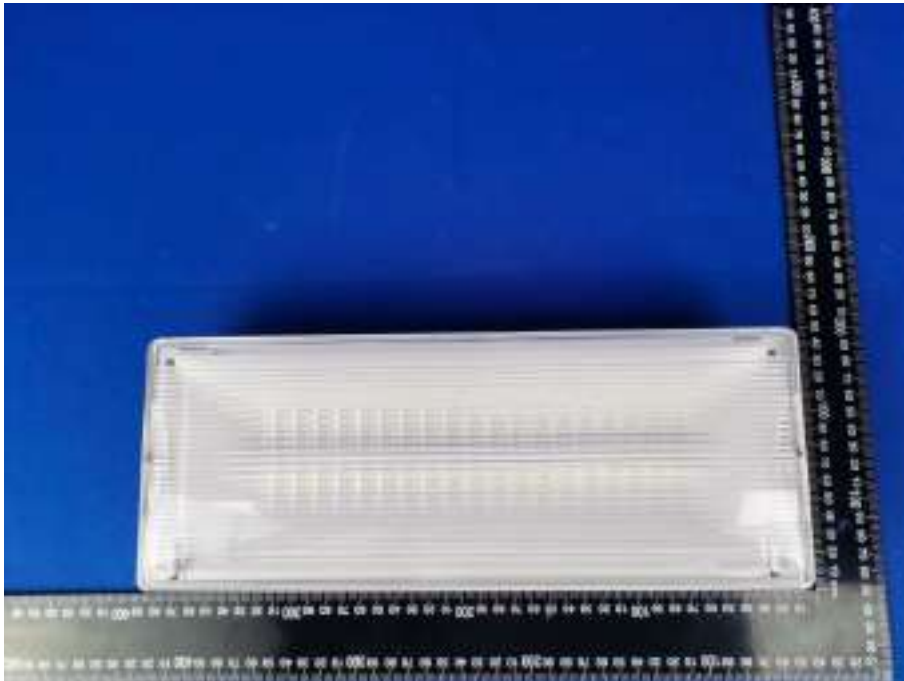
19 (19)	RESISTANCE TO CORROSION	—
	Rust protection:	N
	- test according 4.18.1 of IEC 60598-1	N
	- adequate varnish on the outer surface	N

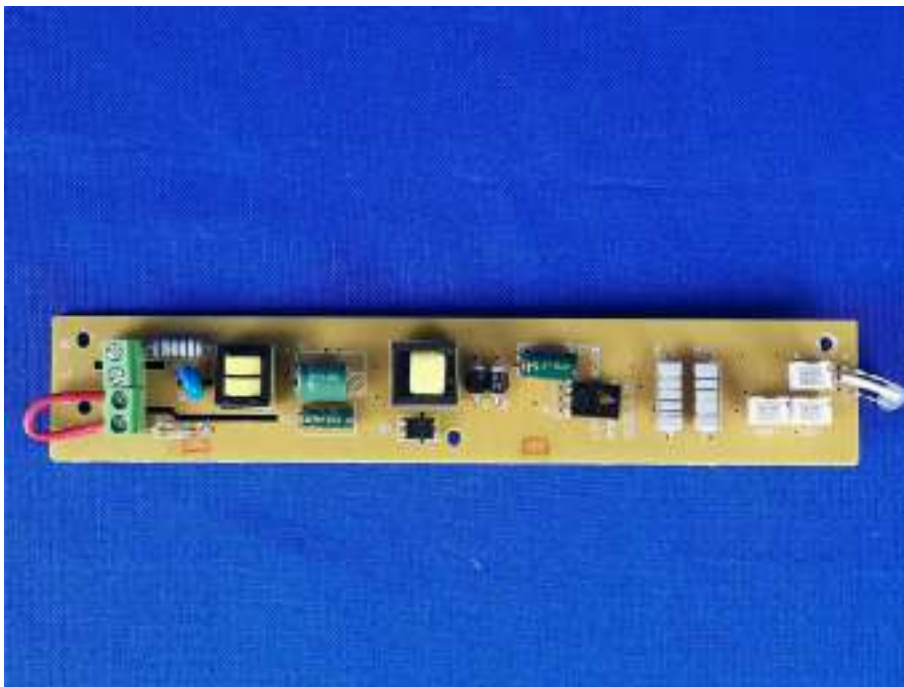


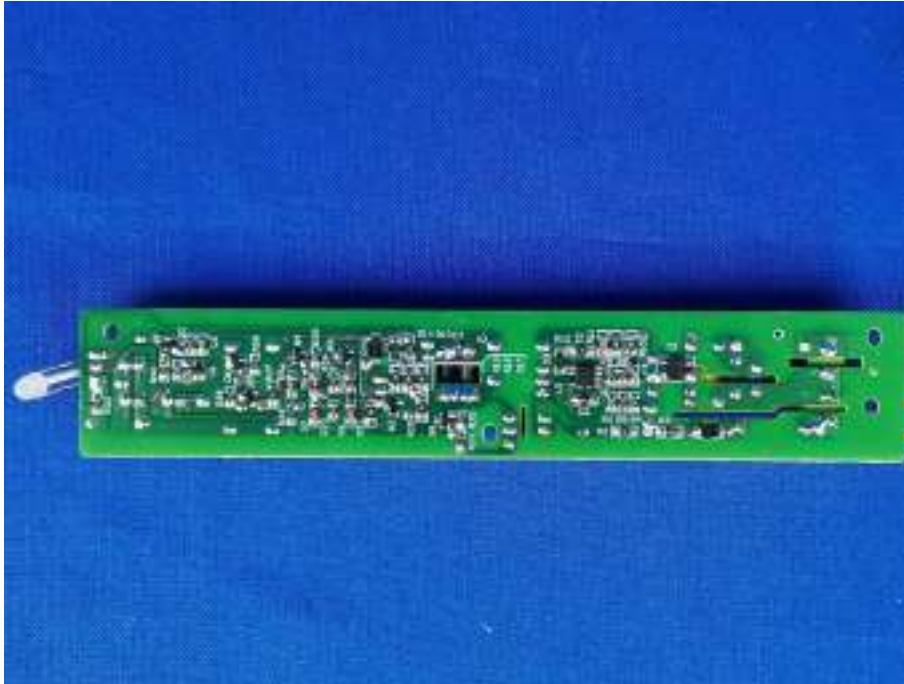
20	INFORMATION FOR LUMINAIRE DESIGN	N
	Information in Annex D	—
21	HEAT MANAGEMENT	—
21.1	General	N
	Exchangeability is safeguarded by cap or base	N
21.2	Heat-conducting foil and paste	N
	Heat-conducting foil delivered with the module if necessary	N
21.4	Construction	N
	Electrical connection and mechanical holding are separate	N
A	ANNEX A - TESTS	—
	All tests performed in accordance with the advice given in Annex H of IEC 61347-1, if applicable	P
ANNEX 1	SELV-operated LED modules	—
	Requirement not applicable to the evaluated product.	N



Attachment – Photos







(EBO authenticate the photo on original report only)
*** End of Report ***