

 LVD TEST REPORT

On Behalf of
TAIZHOU TAILI LIGHTING CO., LTD.

Product Name:	Christmas light
Brand Name:	N/A
Model Number:	C, D, B, W, D/C
Prepared For:	TAIZHOU TAILI LIGHTING CO., LTD.
Address:	Unit 2, 2nd floor, NO.11 Building, Caideg Park, Dongcheng, Linhai, Zhejiang, CN
Prepared By:	Shenzhen SiCT Technology Co., Ltd.
Address:	202, Building 3, No.111, Huanguan Middle Road, Songyuanxia Community, Guanhu Street, Longhua District, Shenzhen, Guangdong, China
Test Date	September 6-17, 2022
Date of Report	September 17, 2022
Report No.:	XK2209012100S

TEST REPORT
EN 60598-2-20
Luminaires
Part 2: Particular requirements
Section 20: Lighting Chains

Report Number _____ : XK22090121005

Tested by (name) _____ : Smile Xu

Compiled by (name) _____ : Nina Li

Approved by (name) _____ : Andy Wang

Date of issue _____ : September 17, 2022



Name of Testing Laboratory preparing the Report _____ : Shenzhen SICT Technology Co., Ltd.
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Applicant's name _____ : TAIZHOU TAILI LIGHTING CO., LTD.

Address _____ : Unit 2, 2nd floor, NO.11 Building, Gaideg Park, Dongcheng, Linhai, Zhejiang, CN

Test specification:

Standard _____ : EN 60598-2-20:2015
 EN 60598-1:2015+A1:2018

Test procedure _____ : Type test

Non-standard test method _____ : N/A

Test Report Form No. _____ : IEC60598_2_20E

Test Report Form(s) Originator _____ : Intertek Semko AB

Master TRF _____ : 2019-06

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Test item description _____: Christmas light
 Trade Mark _____: N/A
 Manufacturer _____: Linhai Lailiao Lighting Co., Ltd.
 No. 198, Houyang Village, Dongcheng Town, Linhai City, Taizhou
 City, Zhejiang Province
 Model/Type reference _____: C, D, B, W, D/C
 Ratings _____: Input: DC31V, 6W

Copy of marking plate:

The artwork below may be only a draft.



Test item particulars _____:	
Classification of installation and use _____:	Class III
Supply Connection _____:	LED Driver
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 _____:	September 6-17, 2022
Date (s) of performance of tests _____:	September 17, 2022
General remarks:	
*(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 ☐ comma / ☐ point is used as the decimal separator. Clause numbers between brackets refer to clauses in IEC 60598-2-20	
General product information:	
Fixed LED light for indoor and outdoor use, IP degree according IEC 60529 is IP44	

IEC/EN 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
20.4 (2)	GENERAL TEST REQUIREMENTS		—
20.4 (2.1)	Information for luminaire design considered.....:	Yes ☒ No ☐	—
20.4 (2.3)	More sections applicable.....:	Yes ☐ No ☒	—

20.5 (2)	CLASSIFICATION		—
20.5 (2.2)	Type of protection.....:	Class III	—
20.5 (2.3)	Degree of protection.....:	IP44	—
20.5 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces.....:	Yes ☒ No ☐	—
20.5 (2.5)	Luminaire for normal use.....:	Yes ☒ No ☐	—
	Luminaire for rough service.....:	Yes ☐ No ☒	—
20.5.2 (-)	Class II or Class III	Class III	P
20.5.3 (-)	Lighting chains for outdoor use shall have a protective index IP44 or higher	IP44	P

20.6 (3)	MARKING		—
20.6 (3.2)	Mandatory markings		P
	Position of the marking	On the cable near DC connector	P
	Format of symbols/text		P
20.6 (3.3)	Additional information		P
	Language of instructions	English	P
20.6 (3.3.1)	Combination luminaires		N/A
20.6 (3.3.2)	Nominal frequency in Hz		N/A
20.6 (3.3.3)	Operating temperature		N/A
20.6 (3.3.4)	Symbol or warning notice		N/A
20.6 (3.3.5)	Wiring diagram		N/A
20.6 (3.3.6)	Special conditions		N/A
20.6 (3.3.7)	Metal halide lamp luminaire – warning		N/A
20.6 (3.3.8)	Limitation for semi-luminaires		N/A
20.6 (3.3.9)	Power factor and supply current		N/A
20.6 (3.3.10)	Suitability for use indoors		N/A
20.6 (3.3.11)	Luminaires with remote control		N/A

IEC/EN 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
20.6 (3.3.12)	Clip-mounted luminaire – warning		N/A
20.6 (3.3.13)	Specifications of protective shields		N/A
20.6 (3.3.14)	Symbol for nature of supply	---	P
20.6 (3.3.15)	Rated current of socket outlet		N/A
20.6 (3.3.16)	Rough service luminaire		N/A
20.6 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments		N/A
20.6 (3.3.18)	Non-ordinary luminaires with PVC cable		N/A
20.6 (3.3.19)	Protective conductor current in instruction if applicable		N/A
20.6 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N/A
20.6 (3.3.21)	Non-replaceable and non-user replaceable light sources information provided	Non-replaceable light sources	P
	Cautionary symbol		N/A
20.6 (3.3.22)	Controllable luminaires, classification of insulation provided		N/A
20.6 (3.4)	Test with water		P
	Test with hexane		P
	Legible after test		P
	Label attached		P
20.6.2 (-)	Lighting chain marking		P
	Rated voltage and wattage marked on the chain		P
	Durable non-removable label if information on the cable		P
20.6.3 (-)	Lighting chain and packing marking		N/A
	Marking if only for indoor use		N/A
20.6.4 (-)	Marking on the packing or instructions		P
	Marking a) – f)		P
20.7 (4)	CONSTRUCTION		—
20.7 (4.2)	Components replaceable without difficulty		N/A
20.7 (4.3)	Wireways smooth and free from sharp edges		P
20.7 (4.4)	Lampholders		N/A

IEC/EN 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
20.7 (4.4.1)	Integral lampholder		N/A
20.7 (4.4.2)	Wiring connection		N/A
20.7 (4.4.3)	Lampholder for end-to-end mounting		N/A
20.7 (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
20.7 (4.4.5)	Peak pulse voltage		N/A
20.7 (4.4.6)	Centre contact		N/A
20.7 (4.4.7)	Parts in rough service luminaires resistant to tracking		N/A
20.7 (4.4.8)	Lamp connectors		N/A
20.7 (4.4.9)	Caps and bases correctly used		N/A
20.7 (4.4.10)	Light source for lampholder or connection according IEC 60061 not connected another way		N/A
20.7 (4.5)	Starter holders		N/A
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A
20.7 (4.6)	Terminal blocks		N/A
	Tails		N/A
	Unsecured blocks		N/A
20.7 (4.7)	Terminals and supply connections		P
20.7 (4.7.1)	Contact to metal parts		N/A
20.7 (4.7.2)	Test 8 mm live conductor		N/A
	Test 8 mm earth conductor		N/A
20.7 (4.7.3)	Terminals for supply conductors		P
20.7 (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

IEC/EN 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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
20.7 (4.7.4)	Terminals other than supply connection		P
20.7 (4.7.5)	Heat-resistant wiring/sleeves		N/A
20.7 (4.7.6)	Multi-pole plug		N/A
	- test at 50 N		N/A
20.7 (4.8)	Switches		N/A
	- adequate rating		N/A
	- adequate fixing		N/A
	- polarized supply		N/A
	- compliance with IEC 61058-1 for electronic switches		N/A
20.7 (4.9)	Insulating lining and sleeves		N/A
20.7 (4.9.1)	Retainment		N/A
	Method of fixing _____:		N/A
20.7 (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
20.7 (4.10)	Double or reinforced insulation		N/A
20.7 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		N/A
	Safe installation fixed luminaires		N/A
	Capacitors and switches		N/A
	Interference suppression capacitors according to IEC 60384-14		N/A
20.7 (4.10.2)	Assembly gaps:		N/A
	- not coincidental		N/A
	- no straight access with test probe		N/A
20.7 (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

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Clause	Requirement + Test	Result - Remark	Verdict
	- lining in lampholder		N/A
20.7 (4.11)	Electrical connections and current-carrying parts		P
20.7 (4.11.1)	Contact pressure		P
20.7 (4.11.2)	Screws:		N/A
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
20.7 (4.11.3)	Screw locking:		N/A
	- spring washer		N/A
	- rivets		N/A
20.7 (4.11.4)	Material of current-carrying parts		P
20.7 (4.11.5)	No contact to wood or mounting surface		P
20.7 (4.11.6)	Electro-mechanical contact systems		P
20.7 (4.12)	Screws and connections (mechanical) and glands		N/A
20.7 (4.12.1)	Screws not made of soft metal		N/A
	Screws of insulating material		N/A
	Torque test: torque (Nm); part _____:		N/A
	Torque test: torque (Nm); part _____:		N/A
	Torque test: torque (Nm); part _____:		N/A
20.7 (4.12.2)	Screws with diameter ≤ 3 mm screwed into metal		N/A
20.7 (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
20.7 (4.12.5)	Screwed glands; force (Nm) _____:		N/A
20.7 (4.13)	Mechanical strength		P
20.7 (4.13.1)	Impact tests:		N/A
	- fragile parts; energy (Nm) _____:		N/A
	- other parts; energy (Nm) _____:		N/A

IEC/EN 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
	1) live parts		N/A
	2) linings		N/A
	3) protection		N/A
	4) covers		N/A
20.7 (4.13.3)	Straight test finger		N/A
20.7 (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
20.7 (4.13.6)	Tumbling barrel		N/A
20.7 (4.14)	Suspensions, fixings and means of adjusting		P
20.7 (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
	E) clip-mounted luminaires, glass-shelf; Thickness (mm) _____:		N/A
	Metal rod; diameter (mm) _____:		N/A
	Fixed luminaire or independent control gear without fixing devices		N/A
20.7 (4.14.2)	Load to flexible cables		P
	Mass (kg) _____:	0.253	—
	Stress in conductors (N/mm ²) _____:	1.06	P
	Mass (kg) of semi-luminaire _____:		—
	Bending moment (Nm) of semi-luminaire _____:		N/A
20.7 (4.14.3)	Adjusting devices:		N/A
	- flexing test; number of cycles _____:		N/A
	- strands broken _____:		N/A

IEC/EN 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
	- electric strength test afterwards		N/A
20.7 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N/A
20.7 (4.14.5)	Guide pulleys		N/A
20.7 (4.14.6)	Strain on socket-outlets		N/A
20.7 (4.15)	Flammable materials		P
	- glow-wire test 650°C.....: See Test Table 1.15 (13.3.2)		P
	- spacing >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
20.7 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		N/A
	a) construction	Electronic lamp control gear exempted from this requirement	N/A
	b) temperature sensing control		N/A
	c) surface temperature		N/A
20.7 (4.16)	Luminaires for mounting on normally flammable surfaces		P
	No lamp control gear.....: Electronic controlgear is exempted from this requirement.		P
20.7 (4.16.1)	Lamp control gear spacing:		N/A
	- spacing 35 mm		N/A
	- spacing 10 mm		N/A
20.7 (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
20.7 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	N/A
20.7 (4.17)	Drain holes		N/A

IEC/EN 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
	Clearance at least 5 mm		N/A
20.7 (4.18)	Resistance to corrosion		P
20.7 (4.18.1)	- rust-resistance		N/A
20.7 (4.18.2)	- season cracking in copper		P
20.7 (4.18.3)	- corrosion of aluminium		N/A
20.7 (4.19)	Igniters compatible with ballast		N/A
20.7 (4.20)	Rough service vibration		N/A
20.7 (4.21)	Protective shield		N/A
20.7 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N/A
	Shield of glass if tungsten halogen lamps		N/A
20.7 (4.21.2)	Particles from a shattering lamp not impair safety		N/A
20.7 (4.21.3)	No direct path		N/A
20.7 (4.21.4)	Impact test on shield		N/A
	Glow-wire test on lamp compartment	See Test Table 1.15 (13.3.2)	N/A
20.7 (4.22)	Attachments to lamps not cause overheating or damage		P
20.7 (4.23)	Semi-luminaires comply Class II		N/A
20.7 (4.24)	Photobiological hazards		N/A
20.7 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		N/A
20.7 (4.24.2)	Retinal blue light hazard		N/A
	Luminaires with E_{av} :		N/A
	a) Fixed luminaires		N/A
	- distance x m, borderline between RG1 and RG2 ...:		N/A
	- marking and instruction according 3.2.23		N/A
	b) Portable and handheld luminaires	RG1	N/A
	- marking according 3.2.23 if RG1 exceeded at 200 mm according to IEC/TR 62778		N/A
	Portable luminaires for children IEC 60598-2-10 and Mains socket outlet nightlights IEC 60598-2-12 not exceed RG1 at 200 mm according to IEC 62778		N/A
20.7 (4.25)	Mechanical hazard		P

IEC/EN 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
	No sharp point or edges		P
20.7 (4.26)	Short-circuit protection		N/A
20.7 (4.26.1)	Adequate means of uninsulated accessible SELV parts		N/A
20.7 (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
20.7 (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 Ω		N/A
	Pull test of mechanical connection (50 N)		N/A
	After test, resistance < 0.05 Ω		N/A
	Voltage drop test, resistance < 0.05 Ω		N/A
20.7 (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 (°C) _____:		—
	100 cycles between t min and t max		N/A
	Temperature sensing control still in position		N/A
20.7 (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		N/A
20.7 (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
	Minimum two fixing means		N/A
20.7 (4.31)	Insulation between circuits		P
	Circuits insulated from L/V supply fulfil requirements according 4.31.1 – 4.31.3		P

IEC/EN 60335-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
	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
20.7 (4.31.1)	SELV circuits		P
	Used SELV source		P
	Voltage ≤ ELV		P
	Insulating of SELV circuits from LV supply		P
	Insulating of SELV circuits from other non SELV circuits		P
	Insulating of SELV circuits from FELV		N/A
	Insulating of SELV circuits from other SELV circuits		N/A
	SELV circuits insulated from accessible parts according Table X.1		P
	Plugs not able to enter socket-outlets of other voltage systems		P
	Socket-outlets does not admit plugs of other voltage systems		P
	Plugs and socket-outlets does not have protective conductor contact		P
20.7 (4.31.2)	FELV circuits		N/A
	Used FELV source		N/A
	Voltage ≤ 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
20.7 (4.31.3)	Other circuits		N/A
	Other circuits insulated from accessible parts according Table X.1		N/A
	Class II construction with equipotential bonding for protection against indirect contacts with live parts:		N/A
	- conductive parts are connected together		N/A

IEC/EN 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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
20.7 (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
20.7.2 (-)	Lampholders		N/A
	Tested as part of the lighting chain if non-standardised lampholders		N/A
	E5, E10, E14 and E27 according IEC 60338		N/A
	Bayonet according IEC 61184		N/A
	Insulating piercing terminals only if SELV circuit or permanent non-reversible connections in class II chain		N/A
	Maximum voltage used for E5, E10 and small lampholders		N/A
	Body of insulating material		N/A
20.7.3 (-)	Terminal blocks		N/A
	Clause 4.6 of IEC 60598-1 referring to terminal blocks does not apply		—
20.7.4 (-)	Terminals and supply connections		P
	Comply with Annex A		P
20.7.5 (-)	Gaskets		N/A
	Gasket weather resistant if outdoor use		N/A
	Gasket remains in place and fit tightly		N/A
20.7.6 (-)	Mechanical strength		P
	Mechanical strength requirements of 4.13 of part 1 or 15 of IEC 61184		P
	Accessories comply with 4.13.6 of part 1		P
20.7.7 (-)	Lamp bridging devices		N/A
	Protection against electric shock and fire will not be impaired by bridging lamp filaments		N/A
20.7.8 (-)	Control units		P

IEC/EN 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
	Forming an integral part enclosed in non-flammable insulating material tested according 20.16		N/A
	Securely fixed to the cable		N/A
	Electronic control device comply with IEC 61347-2-11		N/A
	LED driver comply with IEC 61347-2-13		P
20.7.9 (-)	Lamp rotation		N/A
	Bulb and lamp cap of push-in lamps will not rotate with a torque of 0,025 Nm		N/A
20.7.10 (-)	Lamp insertion/withdrawal force		P
	Pull force up to 3 N for push-in lamps		N/A
	Push-in force up to 3 N for push-in lamps		N/A
	Pull out force of between 3 N and 10 N for push-in lamps		N/A
	Pull test 10N for non-replaceable lamps		P
20.7.11 (-)	Lamp mechanical requirements		N/A
	Impact test of 0,2 Nm on lamps of Class II chain:		N/A
	a) non-removable lamps		N/A
	b) non-standardized lamps		N/A

20.8 (11)	CREEPAGE DISTANCES AND CLEARANCES		—
20.8 (11.2)	Creepage distances and clearances _____:	No values are specified for working voltage below 60VDC as the test voltage of 500V is considered sufficient.	N/A
	Working voltage (V) _____:	31V ~	—
	Rated pulse voltage (kV) _____:	—	—
	Voltage form _____:	Sinusoidal ☐ Non-sinusoidal ☒	—
	PTI _____:	< 600 ☒ ≥ 600 ☐	—
	Impulse withstand category (Normal category II) (Category III Annex U)	Category II ☒ Category III ☐	—

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

IEC/EN 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
20.10 (15)	SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS		—
	Separately approved: component list _____:	(see Annex 1)	N/A
	Part of the luminaire _____:	(see Annex 4)	N/A
20.11 (5)	EXTERNAL AND INTERNAL WIRING		—
20.11 (5.2)	Supply connection and external wiring		P
20.11 (5.2.1)	Means of connection _____:	SELV plug (for luminaires)	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		P
20.11 (5.2.2)	Type of cable _____:		N/A
	Nominal cross-sectional area (mm ²) _____:		N/A
	Cables equal to IEC 60227 or IEC 60245		N/A
20.11 (5.2.3)	Type of attachment, X, Y or Z		N/A
20.11 (5.2.5)	Type Z not connected to screws		N/A
20.11 (5.2.6)	Cable entries:		N/A
	- suitable for introduction		N/A
	- adequate degree of protection		N/A
20.11 (5.2.7)	Cable entries through rigid material have rounded edges		N/A
20.11 (5.2.8)	Insulating bushings:		N/A
	- suitably fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- tubes or guards made of insulating material		N/A
20.11 (5.2.9)	Locking of screwed bushings		N/A
20.11 (5.2.10)	Cord anchorage:		N/A
	- covering protected from abrasion		N/A
	- clear how to be effective		N/A
	- no mechanical or thermal stress		N/A
	- no tying of cables into knots etc.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- insulating material or lining		N/A
20.11 (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
20.11 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		N/A
20.11 (5.2.10.3)	Tests:		N/A
	- impossible to push cable; unsafe		N/A
	- pull test: 25 times; pull (N) _____:		N/A
	- torque test: torque (Nm) _____:		N/A
	- displacement ≤ 2 mm		N/A
	- no movement of conductors		N/A
	- no damage of cable or cord		N/A
	- function independent of electrical connection		N/A
20.11 (5.2.11)	External wiring passing into luminaire		N/A
20.11 (5.2.12)	Looping-in terminals		N/A
20.11 (5.2.13)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		N/A
20.11 (5.2.14)	Mains plug same protection:		N/A
	Class III luminaire plug		P
	No unsafe compatibility		P
20.11 (5.2.16)	Appliance inlets (IEC 60320)		N/A
	Installation couplers (IEC 61535)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Other appliance inlet or connector according relevant IEC standard		N/A
20.11 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
20.11 (5.2.18)	Used plug in accordance with		N/A
	- IEC 60083		N/A
	- other standard		N/A
20.11 (5.3)	Internal wiring		P
20.11 (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
	- temperatures: (see Annex 2)		N/A
	Green-yellow for earth only		N/A
20.11 (5.3.1.1)	Internal wiring connected directly to fixed wiring		N/A
	Cross-sectional area (mm ²):		N/A
	Insulation thickness		N/A
	Extra insulation added where necessary		N/A
20.11 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		P
	Adequate cross-sectional area and insulation thickness		P
20.11 (5.3.1.3)	Double or reinforced insulation for class II		N/A
20.11 (5.3.1.4)	Conductors without insulation		N/A
20.11 (5.3.1.5)	SELV current-carrying parts		P
20.11 (5.3.1.6)	Insulation thickness other than PVC or rubber		N/A
20.11 (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

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Clause	Requirement + Test	Result - Remark	Verdict
	No twisting over 360°		P
20.11 (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
20.11 (5.3.4)	Joints and junctions effectively insulated		N/A
20.11 (5.3.5)	Strain on internal wiring		P
20.11 (5.3.6)	Wire carriers		N/A
20.11 (5.3.7)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		N/A
20.11.3 (-)	Cables for lighting chains		P
	Type of cable _____ : _____	PVC insulated cable (Class III lighting chain)	P
	Cables not lighter than IEC 60227 or IEC 60245 for class II chain		N/A
	Cables not lighter than insulation according to 5.3.1 of part 1 for class III chain		P
	Nominal cross-sectional area (mm²) _____ : _____	0,15mm²	P
	Mechanical properties according 4.14.1 and 4.14.2 of part 1		P
20.11.3 (-)	Cord anchorage test		P
	Pull test 30 N 25 times on single-core cable	30N	P
20.11.4 (-)	Plugs and cable length		P
	Splash-proof plug or permanent connection if for outdoor use	IP65	P
	Length of the cable between the plug and first lamp or lampholder not less than 1,5 m		P
20.11.5 (-)	Maximum length of extendable class II lighting chains		N/A
	- 100 m for systems using 0,5 mm² cable		N/A
	- 150 m for systems using 0,75 mm² cable		N/A
20.12 (8)	PROTECTION AGAINST ELECTRIC SHOCK		—
20.12 (8.2.1)	Live parts not accessible		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Basic insulated parts not used on the outer surface without appropriate protection		N/A
	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		N/A
	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		N/A
	Double-ended tungsten filament lamp		N/A
	Insulation lacquer not reliable		N/A
	Double-ended high pressure discharge lamp		N/A
	Relevant warning according to 3.2.18 fitted to the luminaire		N/A
20.12 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N/A
20.12 (8.2.3.a)	Class II luminaire:		N/A
	- basic insulated metal parts not accessible during starter or lamp replacement		N/A
	- basic insulation not accessible other than during starter or lamp replacement		N/A
	- glass protective shields not used as supplementary insulation		N/A
20.12 (8.2.3.b)	EC lampholder of metal in class I luminaires shall be earthed		N/A
20.12 (8.2.3.c)	SELV circuits with exposed current carrying parts:		N/A
	Ordinary luminaire:		N/A
	- touch current		N/A
	- no-load voltage		N/A
	Other than ordinary luminaire:		N/A
	- nominal voltage		N/A
20.12 (8.2.4)	Portable luminaire have protection independent of supporting surface		N/A
20.12 (8.2.5)	Compliance with the standard test finger or relevant probe		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
20.12 (8.2.6)	Covers reliably secured		N/A
20.12 (8.2.7)	Discharging of capacitors $\geq 0.5 \mu F$		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
20.12.3 (-)	Divisible plug		N/A
	Divisible plug in compliance with Figure 1		N/A
	Parts of the connector do not separate with a pull force of 10 N		N/A
20.12.3 (-)	Electrification of decorations		N/A
	Test with flat probe		N/A
20.12.4 (-)	Contact of push-in lampholders		N/A
	Lampholder contacts in push-in lampholders is reliably secured		N/A
	Contacts move maximum 0.8 mm during the endurance test		N/A
20.12.5 (-)	Blanking plugs		N/A
	Blanking plugs provided if chain designed to be used without lamp in every lampholder		N/A

20.13 (12)	ENDURANCE TEST AND THERMAL TEST		—
20.13 (-)	If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 20.14		—
20.13 (12.3)	Endurance test:		P
	- mounting-position	As in normal operation	—
	- test temperature (°C).....	55	—
	- total duration (h).....	240	—
	- supply voltage: Un factor, calculated voltage (V) ...	264 (Tested with a specified LED driver)	—
	- lamp used	LED	—
20.13 (12.3.2)	After endurance test:		P
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- marking legible		P
	- no cracks, deformation etc.		N/A
20.13 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
20.13 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	N/A
20.13 (12.6)	Thermal test (failed lamp control gear condition):		N/A
20.13 (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
	- calculated mounting surface temperature (°C) _____:		N/A
	- track-mounted luminaires		N/A
20.13 (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
20.13 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N/A
20.13 (12.7.1)	Luminaire without temperature sensing control		N/A
20.13 (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

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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 20.15 (13.2.1)	N/A
20.13 (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.....:		—
	- calculated temperature of fixing point/exposed part (°C).....:		—
	Ball-pressure test.....:	See Table 20.15 (13.2.1)	N/A
20.13 (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
20.13 (12.7.2)	Luminaire with temperature sensing control		N/A
	- thermal link.....:	Yes ☐ No ☐	—
	- manual reset cut-out.....:	Yes ☐ No ☐	—
	- auto reset cut-out.....:	Yes ☐ No ☐	—
	- case of abnormal conditions.....:		—
	- highest measured temperature of fixing point/exposed part (°C).....:		—
	Ball-pressure test.....:	See Table 20.15 (13.2.1)	N/A
20.13.2 (-)	Test voltage		P
	Provision of 12.3.1 d) of part 1 and if class III chain 1,1 x rated voltage of transformer/converter	254V	—
	Provision of 12.4.1 d) of part 1 and if class III chain 1,05 x rated voltage of transformer/converter	254.4V	—
20.13.3 (-)	Lamp bridging devices		N/A
	Lamp bridging not cause temperature which impair safety		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Temperature of lampholders and cables not exceed values in Table 12.1 when bridging device operate successively on each lamp		N/A
20.13.4 (-)	Short-circuit test of rectifier		N/A
	No emission of flames or molten material or production of flammable gases and no live parts accessible when short-circuit output of the rectifier		N/A

20.14 (9)	RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE		—
	If IP > IP 20 the order of tests as specified in clause 20.13		P
20.14 (9.2)	Tests for ingress of dust, solid objects and moisture:		—
	- classification according to IP _____ -	IP65	—
	- mounting position during test _____ -	As in normal operation	—
	- fixing screws tightened; torque (Nm) _____ -	—	—
	- tests according to clauses _____ -	Clause 9.2.0 and Clause 9.2.5	—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		P
	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		P
	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
	e) no water in watertight luminaire		N/A
	f) no contact with live parts (IP 2X)		N/A
	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
20.14 (9.3)	Humidity test 48 h	25°C; 93% R.H.	P

20.15 (10)	INSULATION RESISTANCE AND ELECTRIC STRENGTH		—
20.15 (-)	Metal foil procedure	The metal foil completely wrapped over the lampholder and the lamp.	—

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Clause	Requirement + Test	Result - Remark	Verdict
20.15 (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/A
	- 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/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 _____:		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
20.15 (10.2.2)	Electric strength test		P
	Dummy lamp		N/A
	Luminaires with ignitors after 24 h test		N/A
	Luminaires with manual ignitors		N/A
	Test voltage (V) _____:		—
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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.....:		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
20.15 (10.3)	Touch current or protective-conductor current (mA):		N/A

20.16 (13)	RESISTANCE TO HEAT, FIRE AND TRACKING		—
20.16 (13.2.1)	Ball-pressure test.....:	See Test Table 20.16 (13.2.1)	P
20.16 (13.3.1)	Needle-flame test (10 s).....:	See Test Table 20.16 (13.3.1)	P
20.16 (13.3.2)	Glow-wire test (650°C).....:	See Test Table 20.16 (13.3.2)	P
20.16 (13.4)	Proof tracking test (IEC 60112).....:		N/A
20.16 (-)	Edison lampholders according cl. 20 of IEC 60238		N/A
20.16 (-)	Bayonet lampholders according cl. 19 of IEC 61184		N/A

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Clause	Requirement + Test	Result + Remark	Verdict

20.8 (11.2)	TABLE5: Creepage distances and clearances						N/A.
Table 11.1	Minimum distances (mm) for a.c. (50/60 Hz) sinusoidal voltages						N/A.
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		--	--	--	--	--	--
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		--	--	--	--	--	--
Clearances							
Required basic insulation		0,2	0,8	1,5	3	4	5,5
Measured		--	--	--	--	--	--
Required supplementary insulation		-	0,8	1,5	3	4	5,5
Measured		--	--	--	--	--	--
Required reinforced insulation		-	1,6	3	6	8	11
Measured		--	--	--	--	--	--
Table 11.2	Minimum distances (mm) for non-sinusoidal pulse voltages						N/A.
Rated pulse voltage (peak kV)		2,0	2,5	3,0	4,0	5,0	6,0
Required clearances		1,5	1,5	2	3	4	5,5
Measured		--	--	--	--	--	--
Rated pulse voltage (peak kV)		10	12	15	20	25	30
Required clearances		11	14	18	25	33	40
Measured		--	--	--	--	--	--
Rated pulse voltage (peak kV)		50	60	80	100	-	-
Required clearances		75	90	130	170	-	-
Measured		--	--	--	--	-	-

IEC/EN 60695-2-20				
Clause	Requirement + Test		Result - Remark	Verdict
20.16 (13.2.1)	TABLE: Ball Pressure Test of Thermoplastics			P
Allowed impression diameter (mm) _____: 2.0mm				—
Object/ Part No./ Material		Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)
Plastic enclosure		—	125	1,3mm
Supplementary information: —				

20.16 (13.3.1)	TABLE: Needle-flame test (IEC 60695-11-5)				P
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ts): (s)	Ignition of specified layer Yes/No	Duration of burning (tb): (s)	Verdict
DC connector	—	10	No	0	P
Supplementary information: —					

20.16 (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 (ts): (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict	
Plastic enclosure	---	30	No	0	P	
Any flame or glowing of the sample extinguished within 30 s of withdrawing the glow-wire, and any burning or molten drop did not ignite the underlying parts (Yes/No)_____					No	
Supplementary information:---						

20.16 (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:—					

IEC/EN 60598-2-20			
Clause	Requirement + Test	Result - Remark	Verdict
ANNEX A	Requirements for interconnecting connectors for use in lighting chains		P
	This Annex A consist relevant requirements and modifications of IEC 61984		P
5.2	Classification according to protection against electric shock		P
	Only enclosed connectors		P
5.3	Classification according to the style of connector		P
	Only free connectors		P
5.4	Classification according to additional characteristics of connectors		N/A
	According b), d), e), f), h), and j)		N/A
6.2.1	Identification		N/A
	According a) and b)		N/A
6.4.1	Non accessibility of live parts		N/A
	Test with test finger on class II chain		N/A
6.9.1	Polarisation		P
	Improper connection of mating parts is prevented		P
	No unsafe compatibility between connectors for class II and class III chains of the same manufacturer		P
	Male part of class III chains not make contact in the female contact of low voltage connectors (e.g. IEC 60320)		N/A
	Manufacturer designed connectors, no unsafe compatibility with systems according IEC 60320 and IEC 60906 and national domestic plug and socket-outlet systems in the country where the chain is placed on the market		P
6.9.3	Connection of conductors		N/A
	Cross sectional area of the contact making part of the interconnecting coupler not less than the corresponding conductor in the interconnected cable		N/A
6.10	Design of a CBC		N/A
	Adequate breaking capacity		N/A
	Female part at the end of the chain, other than ordinary, provided with sealing device securely fixed to the coupler		N/A
6.13	Dielectric strength		P
	Test according clause 20.15 of this standard		P
6.14.2	Electrical endurance (CBC)		N/A
	Meet the specified breaking capacity		N/A
	Number of cycles 50		—
	Test according 7.3.8		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
6.14.3	Bendings (non-rewirable connectors)		P
	Meet the specified number of bendings		P
	Number of cycles 1000	1000cycles	—
	Test according 7.3.9		P
6.17	Cable clamp		P
	Test according clause 20.11.3 of this standard		P

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Clause	Requirement + Test	Result - Remark	Verdict
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Appendix 1: Critical components information

Component Name	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity
LED drive	Zhongshan MLS Photoelectric CO., LTD	MLS-D31V6WG3C K-IP44	Input: 220-240V~ 50/60Hz, Output: 31VDC,6W	EN61347-2-13	CE
Internal wire and connecting wire	Various	Various	105 °C, 500V/ac, 24AWG min.	UL 758	UL
Plastic enclosure	SABIC INNOVATIVE PLASTICS US L C	945(GG)	PC, rated V-0, 120°C, min.1.5mm thickness	—	UL E41513
PCB	DONGGUAN LIANGXIN ELECTRONIC CO., LTD	LX-D	V-0, 130°C	ZPMV2 UL 796	UL E315942
LED	Mingguang	LED-6W	Input DC3-1V 6W	EN55015	CE

Supplementary information:

1) Provided evidence ensures the agreed level of compliance. See GD-CB2039.

The codes above have the following meaning:

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

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Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12		P				
	Type reference..... :	C	—				
	Lamp used..... :	LED	—				
	Lamp control gear used..... :	MLS-D31V8W/G3CK-IP44	—				
	Mounting position of luminaire..... :	As in normal operation	—				
	Supply wattage (W)..... :		—				
	Supply current (A)..... :	—	—				
	Calculated power factor..... :		—				
	Table: measured temperatures corrected for $t_a = 45\text{ }^{\circ}\text{C}$:		P				
	- abnormal operating mode..... :		—				
	- test 1: rated voltage..... :		—				
	- test 2: 1,05 times rated voltage or 1,05 times rated wattage..... :	1,05x 240V=254.4V	—				
	- test 3: Load on wiring to socket-outlet, 1,05 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, ($^{\circ}\text{C}$)							
Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
LED surface	25	—	43,7	—	Ref.	—	—
Lampholder contacts	25	—	45,7	—	Ref.	—	—
lead wire	25	—	47,6	—	90	—	—
Mounting surface	25	—	35,7	—	90	—	—
Accessible part	25	—	41,2	—	Ref.	—	—
Tc of LED Driver	25	—	49.2	—	75	—	—
Supplementary information: --							

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Clause	Requirement + Test	Result - Remark	Verdict

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

ANNEX 4	Screwless terminals (part of the luminaire)		N/A
(15)	SCREWLESS TERMINALS		N/A
(15.2)	Type of terminal _____ :		—
	Rated current (A) _____ :		—
(15.3.1)	Material		N/A
(15.3.2)	Clamping		N/A
(15.3.3)	Stop		N/A
(15.3.4)	Unprepared conductors		N/A
(15.3.5)	Pressure on insulating material		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
(15.3.6)	Clear connection method		N/A
(15.3.7)	Clamping independently		N/A
(15.3.8)	Fixed in position		N/A
(15.3.10)	Conductor size		N/A
	Type of conductor		N/A
(15.5)	Terminals and connections for internal wiring		N/A
(15.5.1)	Mechanical tests		N/A
(15.5.1.1.1)	Pull test spring-type terminals (4 N, 4 samples) _____ :		N/A
(15.5.1.1.2)	Pull test pin or tab terminals (4 N, 4 samples) _____ :		N/A
	Insertion force not exceeding 50 N		N/A
(15.5.1.2)	Permanent connections: pull-off test (20 N)		N/A
(15.5.2)	Electrical tests		N/A
	Voltage drop (mV) after 1 h (4 samples) _____ :		N/A
	Voltage drop of two inseparable joints		N/A
	Number of cycles:		—
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples) _____ :		N/A
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples) _____ :		N/A
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples) _____ :		N/A
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples) _____ :		N/A
(15.6)	Terminals and connections for external wiring		N/A
(15.6.1)	Conductors		N/A
	Terminal size and rating		N/A
15.6.2	Mechanical tests		N/A
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) _____ :		N/A
(15.6.2.2)	Pull test pin or tab terminals (4 samples); pull (N) _____ :		N/A
(15.6.3)	Electrical tests		N/A
	Tests according 15.6.3.1 + 15.6.3.2 in IEC 60598-1		N/A

IEC/EN 60998-2-20										
Clause	Requirement + Test								Result - Remark	Verdict
(15.6.3.1) (15.6.3.2)	TABLE: Contact resistance test / Heating tests									N/A
	Voltage drop (mV) after 1 h									---
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)	---	---	---	---	---	---	---	---	---	---
	Voltage drop of two inseparable joints									
	Voltage drop after 10th alt. 25th cycle									N/A
	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/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									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 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)	---	---	---	---	---	---	---	---	---	---
Supplementary information:										

Appendix 1

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Clause	Requirement + Test	Result - Remark	Verdict
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TEST REPORT

EN 60931

LED modules for general lighting – Safety specifications

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/A

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

6	CLASSIFICATION	—
	Built-in module _____ : Yes ☐ No ☒	—
	Independent module _____ : Yes ☐ No ☒	—
	Integral module _____ : Yes ☒ No ☐	—
	For Integral module; Note to 1.2.1 in IEC 60598-1 applies.	—

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

8	TERMINALS	N/A
	Screw terminals according section 14 of IEC 60598-1:	N/A
	Separately approved; component list	(see Annex 2) N/A
	Part of the luminaire	(see Annex 3) N/A
	Screwless terminals according section 15 of IEC 60598-1:	N/A
	Separately approved; component list	(see Annex 2) N/A
	Part of the luminaire	(see Annex 4) N/A
	Connectors according IEC 60638-2-2:	N/A
	Separately approved; component list	(see Annex 2) N/A

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

Appendix 1

EN 60931			
Clause	Requirement + Test	Result - Remark	Verdict
10 (10)	PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS		N/A
	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 (M1):		P
	For basic insulation $\geq 2 \text{ M}\Omega$ _____ : $100 \text{ M}\Omega$		P
	For double or reinforced insulation $\geq 4 \text{ M}\Omega$ _____ :		N/A
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1		N/A
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 $\leq 50 \text{ V}$, test voltage 500 V		N/A
	Working voltage $> 50 \text{ V} \leq 1000 \text{ V}$, test voltage (V):		N/A
	Basic insulation, $2U + 1000 \text{ V}$		N/A
	Supplementary insulation, $2U + 1000 \text{ V}$		N/A
	Double or reinforced insulation, $4U + 2000 \text{ V}$		N/A
	No flashover or breakdown		P
	Solid or thin sheet insulation for double or reinforced insulation fulfil the requirements in Annex N in IEC 61347-1		N/A
13 (14)	FAULT CONDITIONS		—
- (14)	When operated under fault conditions the controlgear:		N/A
	- does not emit flames or molten material		N/A
	- does not produce flammable gases		N/A
	- protection against accidental contact not impaired		N/A
	Thermally protected controlgear does not exceed the marked temperature value		N/A
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected	(see appended table)	N/A
- (14.1)	Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (except between live parts and accessible metal parts)	(see appended table)	N/A

Appendix 1

EN 60931			
Clause	Requirement + Test	Result - Remark	Verdict
	Creepage distances on printed boards less than specified in clause 16 in Part 1 provided with coating according to IEC 60664-3		N/A
- (14.2)	Short-circuit or interruption of semiconductor devices	(see appended table)	N/A
- (14.3)	Short-circuit across insulation consisting of lacquer, enamel or textile	(see appended table)	N/A
- (14.4)	Short-circuit across electrolytic capacitors	(see appended table)	N/A
- (14.5)	After the tests has been carried out on three samples:		N/A
	The insulation resistance $\geq 1 \text{ M}\Omega$ _____;		N/A
	No flammable gases		N/A
	No accessible parts have become live		N/A
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		N/A
- (14.6)	Relevant fault condition tests with high-power supply		N/A
13.2	Overpower condition		P
	Module withstands overpower condition $>15 \text{ min.}$		P
	Module with automatic protective device or power limiter, test performed 15 min. at limit.		N/A
	No fire, smoke or flammable gas is produced		P
	Molten material does not ignite tissue paper, spread below the module		P
15	CONSTRUCTION		—
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P
16 (16)	CREEPAGE DISTANCES AND CLEARANCES		—
- (16)	Creepage and distances and clearances in compliance with IEC 61347-1		N/A
	Insulating lining of metallic enclosures		N/A
	Basic insulation on printed boards tested according to clause 14		N/A
	Distances subjected to both sinusoidal voltage as non-sinusoidal pulses not less than value in Table 16		N/A
	Creepage distances not less than minimum clearance		N/A
16 (-)	Conductive accessible parts in compliance with applicable parts of IEC 60598-1	No values are specified for working voltage below 60VDC as the electric strength test voltage of 500V is considered sufficient.	N/A

Appendix 1

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Clause	Requirement + Test	Result - Remark	Verdict
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17 (17)	SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS		—
	Cl. 17 refer to Cl. 17 of IEC 61347-1 which refer to Cl. 4.11 and 4.12 of IEC 60598-1 (clause numbers between parentheses refer to IEC 60598-1)		P
(4.11)	Electrical connections		P
(4.11.1)	Contact pressure		P
(4.11.2)	Screws:		N/A
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
(4.11.3)	Screw locking:		N/A
	- spring washer		N/A
	- rivets		N/A
(4.11.4)	Material of current-carrying parts		P
(4.11.5)	No contact to wood or mounting surface		P
(4.11.6)	Electro-mechanical contact systems		N/A
(4.12)	Mechanical connections and glands		N/A
(4.12.1)	Screws not made of soft metal		N/A
	Screws of insulating material		N/A
	Torque test: torque (Nm): part _____ :		N/A
(4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
(4.12.4)	Locked connections:		N/A
	- fixed arms; torque (Nm) _____ :		N/A
	- lampholder; torque (Nm) _____ :		N/A
	- push-button switches; torque 0,8 Nm _____ :		N/A
(4.12.5)	Screwed glands; force (Nm) _____ :		N/A

18 (18)	RESISTANCE TO HEAT, FIRE AND TRACKING		—
- (18.1)	Ball-pressure test _____ :	See Test Table 18 (18.1)	N/A
- (18.3)	Glow-wire test (650°C) _____ :	See Test Table 18 (18.3)	N/A
- (18.4)	Needle-flame test (10 s) _____ :	See Test Table 18 (18.4)	N/A
- (18.5)	Proof tracking test _____ :	See Test Table 18 (18.5)	N/A

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

Appendix 1

EN 62931			
Clause	Requirement + Test	Result - Remark	Verdict
20	INFORMATION FOR LUMINAIRE DESIGN		—
	Information in Annex D (informative)		—
21	HEAT MANAGEMENT		—
21.1	General		N/A
	Exchangeability is safeguarded by cap or base		N/A
21.2	Heat-conducting foil and paste		N/A
	Heat-conducting foil delivered with the module if necessary		N/A
22	PHOTOBIOLOGICAL SAFETY		—
22.1	UV radiation		N/A
	Luminous radiation not exceed 2mW/km		N/A
22.2	Blue light hazard		P
	Assessed according to IEC TR 62778	Rg1	P
22.3	Infrared radiation		N/A
	Requirements for infrared radiation when required		N/A
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		—
	Requirements not applicable to the evaluated product.		N/A

Appendix 2
Photo documentation





■■■■■■ END OF REPORT ■■■■■■