Test Report issued under the responsibility of:

TEST REPORT
IEC 60598-2-21
Part 2: Particular requirements
Section 21: Rope Lights

Report Number. .....:	GZES210301330901
Date of issue.....:	2021-07-29
Total number of pages	42
Name of Testing Laboratory preparing the Report.....:	SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch
Applicant's name.....:	Blueview Elec-optic Tech Co., Ltd.
Address .....:	1000, Section 2, 2nd Konggang Road, Southwest Aviation Industrial Development Zone, Chengdu, Sichuan, China
Test specification:	
Standard .....:	IEC 60598-2-21:2014 used in conjunction with IEC 60598-1:2014, AMD1:2017
Test procedure .....:	CB Scheme
Non-standard test method .....:	N/A
Test Report Form No.....:	IEC60598_2_21B
Test Report Form(s) Originator ....:	DEKRA Certification B.V.
Master TRF .....:	2020-01-31

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.
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Test item description..... :	Sealed lighting chain (LED Neon Rope)
Trade Mark..... :	**Blueview**
Original Product/Equipment Manufacturer..... :	Blueview Elec-optic Tech Co., Ltd. 1000, Section 2, 2nd Konggang Road, Southwest Aviation Industrial Development Zone, Chengdu, Sichuan, China
Branding Manufacturer(s)..... :	
Model/Type reference..... :	N2-4, NSFXXXX, NSRXXXX Remark: X=0-9 or A-Z
Ratings..... :	Input: 12 V d.c.; IP68; Class III; ta=60 °C; N2-4: 9,6 W; NSFXXXX, NSRXXXX: 14,4 W (Remark: X=0-9 or A-Z.)

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):

☒	**CB Testing Laboratory:**	SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch	
Testing location/ address.....:		198 Kezhu Road, Science City, Economic & Technology Development Area, Guangzhou, Guangdong, China	
Tested by (name, function, signature).....:		Ivan Zhang / Project engineer	Ivan Zhang
Approved by (name, function, signature)...:		Mon Liang / Reviewer	Mon Liang
☐	**Testing procedure: CTF Stage 1:**	N/A	
Testing location/ address.....:			
Tested by (name, function, signature).....:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: CTF Stage 2:**	N/A	
Testing location/ address.....:			
Tested by (name + signature) .....:			
Witnessed by (name, function, signature)..:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: CTF Stage 3:**	N/A	
☐	**Testing procedure: CTF Stage 4:**	N/A	
Testing location/ address.....:			
Tested by (name, function, signature).....:			
Witnessed by (name, function, signature)..:			
Approved by (name, function, signature)...:			
Supervised by (name, function, signature) :			

List of Attachments (including a total number of pages in each attachment):

Attachment 1: Additional requirement of IEC 62031 (Total: 4 pages)

Attachment 2 Photo documentations (Total: 4 pages)

Summary of testing:

1. The submitted samples were found to be compliance with the standard IEC 60598-2-21: 2014, IEC 60598-1: 2014 + A1: 2017.
2. The LED module has been tested according to the standard IEC 62031: 2018, and test result was positive.
3. Photobiological hazard measurements have been tested according to Technical report IEC/TR 62778:2014 (Ed 2). According to the test results, Blue light hazard of the product belongs to RG0 and therefore no markings are required on the product or in the instructions.
4. The model NSR0615 was selected to performed full tests, as it has the maximum consumption power, other models are construction checked.

Tests performed (name of test and test clause):	**Testing location:**
21.6 Marking 21.7 Construction 21.8 Creepage distances and clearances 21.11 External and internal wiring 21.12 Protection against electric shock 21.13 Endurance tests and thermal tests 21.14 Resistance to dust, solid objects and moisture 21.15 Insulation resistance and electric strength 21.16 Resistance to heat, fire and tracking	198 Kezhu Road, Science City, Economic & Technology Development Area, Guangzhou, Guangdong, China

Summary of compliance with National Differences (List of countries addressed):

N/A

Statement concerning the uncertainty of the measurement systems used for the tests
(may be required by the product standard or client)

☐ **Internal procedure used for type testing through which traceability of the measuring uncertainty has been established:**

Procedure number, issue date and title:

Calculations leading to the reported values are on file with the NCB and testing laboratory that conducted the testing.

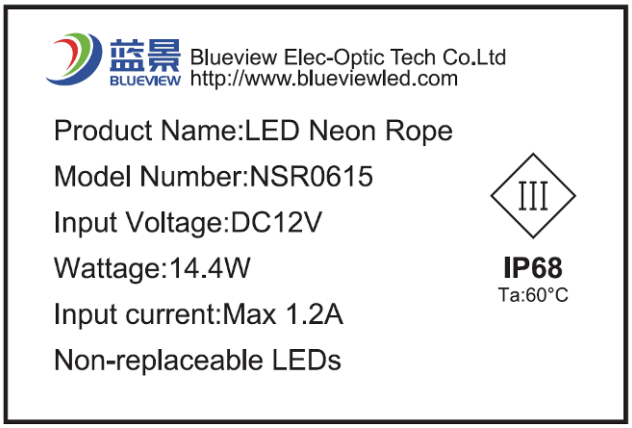
☒ **Statement not required by the standard used for type testing**

(Note: When IEC or ISO standard requires a statement concerning the uncertainty of the measurement systems used for tests, this should be reported above. The informative text in parenthesis should be delete in both cases after selecting the applicable option)

Copy of marking plate:

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

Representative:



Attached on the power cord

Remark:

1. The height of graphical symbols and CE logo were not less than 5 mm;
2. The height of letters and numerals were not less than 2 mm;
3. The WEEE symbol shall not be less than 7 mm;
4. According to the standard, warning and text required by the standard should be written in the official language(s) of the country in which the appliance is to be sold. The applicant should ensure that the samples in future production fulfill the requirement.
5. As declared by the applicant, the importer (and manufacturer, if it is different)'s name, registered trade name or registered trade mark and the postal address will be marked on the products before being place on the market. The contact details shall be in a language easily understood by end-users and market surveillance authorities;
6. Marking on the packaging or in a document accompanying the electrical equipment is only acceptable if it is not possible to place such markings on the product.
7. Other models have similar label as above, just different in model No. and wattage consumption.

Test item particulars .....:	
Classification of installation and use.....:	Fixed
Supply Connection .....:	Input wire
.....:	
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..... :	2021-03-12
Date (s) of performance of tests ..... :	2021-03-12 to 2021-04-08

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 60598-1.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....:	☐ **Yes** ☒ **Not applicable**

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies)..... : Same as manufacturer

General product information:

1. The seal light chain, connected to an independent LED driver via DC connector, non-replaceable LED used, IP68, Class III.
2. The submitted luminaire should be used with LED Driver certified with standard IEC 61347-2-13, with suitable output ratings. And the length of the cable between the plug and the rope light shall be not less than 1,5 m.
3. All the models have the same electrical connecting, diagram circuit, PCB layout and mechanical construction except the consumption power.

   NSFXXXX series are identical, just model no. is different.

   NSRXXXX series are identical, just model no. is different.

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict

21.4 (0)	**GENERAL TEST REQUIREMENTS**		
21.4 (0.3)	More sections applicable .....:	Yes ☐ No ☒ Section/s:	—
21.4 (0.5)	Components	(see Annex 1)	—
21.4 (0.7)	**Information for luminaire design in light sources standards**		—
21.4 (0.7.2)	Light source safety standard .....:	IEC 62031	—
	Luminaire design in the light source safety standard		P

21.5 (2)	**CLASSIFICATION**		
21.5 (2.2)	Type of protection .....:	Class III	P
21.5 (2.3)	Degree of protection .....:	IP68	P
21.5 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces .....:	Yes ☒ No ☐	—
21.5 (2.5)	Luminaire for normal use .....:	Yes ☒ No ☐	—
	Luminaire for rough service .....:	Yes ☐ No ☒	—
21.5.2 (-)	Class II or Class III		P
21.5.3 (-)	Rope lights for outdoor use shall be IP44 or higher		P

21.6 (3)	**MARKING**		
21.6 (3.2)	Mandatory markings		P
	Position of the marking		P
	Format of symbols/text		P
21.6 (3.3)	Additional information		P
	Language of instructions		P
21.6 (3.3.1)	Combination luminaires		N/A
21.6 (3.3.2)	Nominal frequency in Hz		N/A
21.6 (3.3.3)	Operating temperature		N/A
21.6 (3.3.4)	Symbol or warning notice		N/A
21.6 (3.3.5)	Wiring diagram		N/A
21.6 (3.3.6)	Special conditions		N/A
21.6 (3.3.7)	Metal halide lamp luminaire – warning		N/A
21.6 (3.3.8)	Limitation for semi-luminaires		N/A
21.6 (3.3.9)	Power factor and supply current		N/A

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict
21.6 (3.3.10)	Suitability for use indoors		P
21.6 (3.3.11)	Luminaires with remote control		N/A
21.6 (3.3.12)	Clip-mounted luminaire – warning		N/A
21.6 (3.3.13)	Specifications of protective shields		N/A
21.6 (3.3.14)	Symbol for nature of supply		P
21.6 (3.3.15)	Rated current of socket outlet		N/A
21.6 (3.3.16)	Rough service luminaire		N/A
21.6 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments	type Z	P
21.6 (3.3.18)	Non-ordinary luminaires with PVC cable		N/A
21.6 (3.3.19)	Protective conductor current in instruction if applicable		N/A
21.6 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N/A
21.6 (3.3.21)	Non replaceable and non-user replaceable light sources information provided	Non replaceable LEDs	P
	Cautionary symbol		N/A
21.6 (3.3.22)	Controllable luminaires, classification of insulation provided		N/A
20.6 (3.3.23)	Luminaire without controlgear provided with necessary information for selection of appropriate component		P
20.6 (3.3.24)	If not supplied with terminal block, information on the packaging		N/A
21.6 (3.4)	Test with water		P
	Test with hexane		P
	Legible after test		P
	Label attached		P
21.6.2 (-)	**Rope light marking**		**P**
	Rated voltage and wattage marked on the rope light		P
	Durable non-removable label if information on the cable		P

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict
21.6.3 (-)	**Rope light and packing marking**		**N/A**
	Marking if only for indoor use		N/A
21.6.4 (-)	**Marking on the packing or instructions**		**P**
	Marking a) – e)		P
21.7 (4)	**CONSTRUCTION**		
21.7 (4.2)	Components replaceable without difficulty		P
21.7 (4.3)	Wireways smooth and free from sharp edges		P
21.7 (4.4)	**Lampholders**		**N/A**
21.7 (4.4.1)	Integral lampholder		N/A
21.7 (4.4.2)	Wiring connection		N/A
21.7 (4.4.3)	Lampholder for end-to-end mounting		N/A
21.7 (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
21.7 (4.4.5)	Peak pulse voltage		N/A
21.7 (4.4.6)	Centre contact		N/A
21.7 (4.4.7)	Parts in rough service luminaires resistant to tracking		N/A
21.7 (4.4.8)	Lamp connectors		N/A
21.7 (4.4.9)	Caps and bases correctly used		N/A
21.7 (4.4.10)	Light source for lampholder or connection according IEC 60061 not connected another way		N/A
21.7 (4.5)	**Starter holders**		**N/A**
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A
21.7 (4.7)	**Terminals and supply connections**		**P**
21.7 (4.7.1)	Contact to metal parts		N/A
21.7 (4.7.2)	Test 8 mm live conductor		N/A

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict
	Test 8 mm earth conductor		N/A
21.7 (4.7.3)	Terminals for supply conductors		N/A
21.7 (4.7.3.1)	Welded method and material		N/A
	- stranded or solid conductor		N/A
	- spot welding		N/A
	- welding between wires		N/A
	- Type Z attachment		N/A
	- mechanical test according to 15.6.2		N/A
	- electrical test according to 15.6.3		N/A
	- heat test according to 15.6.2.3 and 15.6.2.4		N/A
21.7 (4.7.4)	Terminals other than supply connection		P
21.7 (4.7.5)	Heat-resistant wiring/sleeves		N/A
21.7 (4.7.6)	Multi-pole plug		N/A
	- test at 30 N		N/A
21.7 (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
21.7 (4.9)	**Insulating lining and sleeves**		**N/A**
21.7 (4.9.1)	Retainment		N/A
	Method of fixing.....:		N/A
21.7 (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
21.7 (4.10)	**Double or reinforced insulation**		**N/A**
21.7 (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

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict
	Interference suppression capacitors according to IEC 60384-14		N/A
21.7 (4.10.2)	Assembly gaps:		N/A
	- not coincidental		N/A
	- no straight access with test probe		N/A
21.7 (4.10.3)	Retainment of insulation:		N/A
	- fixed		N/A
	- unable to be replaced; luminaire inoperative		N/A
	- sleeves retained in position		N/A
	- lining in lampholder		N/A
21.7 (4.10.4)	Protective impedance device		N/A
	Double or reinforced insulation bridged by appropriate and at least two resistors or two Y2 capacitors or one Y1 capacitor		N/A
	Y1 or Y2 capacitors comply with IEC 60384-14		N/A
	Resistors comply with test (a) in 14.1 of IEC 60065		N/A
21.7 (4.11)	**Electrical connections and current-carrying parts**		**P**
21.7 (4.11.1)	Contact pressure		P
21.7 (4.11.2)	Screws:		N/A
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
21.7 (4.11.3)	Screw locking:		N/A
	- spring washer		N/A
	- rivets		N/A
21.7 (4.11.4)	Material of current-carrying parts		P
21.7 (4.11.5)	No contact to wood or mounting surface		P
21.7 (4.11.6)	Electro-mechanical contact systems		N/A
21.7 (4.12)	**Screws and connections (mechanical) and glands**		**N/A**

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict
21.7 (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
21.7 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
21.7 (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
21.7 (4.12.5)	Screwed glands; force (Nm) .....:		N/A
21.7 (4.13)	**Mechanical strength**		**P**
21.7 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm).....:		N/A
	- other parts; energy (Nm).....:	End cover; Body; 0,5	P
	1) live parts		N/A
	2) linings		N/A
	3) protection		P
	4) covers		P
21.7 (4.13.3)	Straight test finger		N/A
21.7 (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
21.7 (4.13.6)	Tumbling barrel		N/A
21.7 (4.14)	**Suspensions, fixings and means of adjusting**		**P**

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict

21.7 (4.14.1)	Mechanical load:		P
	A) four times the weight	4 x 0,115kg=0,46 kg	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-shelve. Thickness (mm) .....:		N/A
	Metal rod. diameter (mm) .....:		N/A
	Fixed luminaire or independent control gear without fixing devices		N/A
21.7 (4.14.2)	Load to flexible cables		N/A
	Mass (kg) .....:		—
	Stress in conductors (N/mm²) .....:		N/A
	Mass (kg) of semi-luminaire .....:		N/A
	Bending moment (Nm) of semi-luminaire .....:		N/A
21.7 (4.14.3)	Adjusting devices:		N/A
	- flexing test; number of cycles.....:		N/A
	- strands broken .....:		N/A
	- electric strength test afterwards		N/A
21.7 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N/A
21.7 (4.14.5)	Guide pulleys		N/A
21.7 (4.14.6)	Strain on socket-outlets		N/A
21.7 (4.15)	**Flammable materials**		**P**
	- glow-wire test 650°C .....:	See Test Table 21.16 (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

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Clause	Requirement + Test	Result - Remark	Verdict
21.7 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		N/A
	a) construction		N/A
	b) temperature sensing control		N/A
	c) surface temperature		N/A
21.7 (4.16)	**Luminaires for mounting on normally flammable surfaces**		**P**
	No lamp control gear .....:	(compliance with Section 12)	P
21.7 (4.16.1)	Lamp control gear spacing:		N/A
	- spacing 35 mm		N/A
	- spacing 10 mm		N/A
21.7 (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
21.7 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	N/A
21.7 (4.17)	**Drain holes**		**N/A**
	Clearance at least 5 mm		N/A
21.7 (4.18)	**Resistance to corrosion**		**P**
21.7 (4.18.1)	- rust-resistance		N/A
21.7 (4.18.2)	- season cracking in copper		P
21.7 (4.18.3)	- corrosion of aluminium		N/A
21.7 (4.19)	Ignitors compatible with ballast		N/A
21.7 (4.20)	Rough service vibration		N/A
21.7 (4.21)	**Protective shield**		**N/A**
21.7 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N/A
	Shield of glass if tungsten halogen lamps		N/A
21.7 (4.21.2)	Particles from a shattering lamp not impair safety		N/A

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict
21.7 (4.21.3)	No direct path		N/A
21.7 (4.21.4)	Impact test on shield		N/A
	Glow-wire test on lamp compartment.....:	See Test Table 21.16 (13.3.2)	N/A
21.7 (4.22)	Attachments to lamps not cause overheating or damage		N/A
21.7 (4.23)	Semi-luminaires comply Class II		N/A
21.7 (4.24)	**Photobiological hazards**		**P**
21.7 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		N/A
21.7 (4.24.2)	Retinal blue light hazard		P
	Class of risk group assessed according to IEC/TR 62778 .....:	RG0	—
	Luminaires with E_{thr} :		N/A
	a) Fixed luminaires		N/A
	- distance x m, borderline between RG1 and RG2 ..:		N/A
	- marking and instruction according 3.2.23		N/A
	b) Portable and handheld luminaires		N/A
	- marking according 3.2.23 if RG1 exceeded at 200 mm according to IEC/TR 62778		N/A
	Portable luminaires for children IEC 60598-2-10 and Mains socket outlet nightlights IEC 60598-2-12 not exceed RG1 at 200 mm according to IEC/62778		N/A
21.7 (4.25)	**Mechanical hazard**		**P**
	No sharp point or edges		P
21.7 (4.26)	**Short-circuit protection**		**N/A**
21.7 (4.26.1)	Adequate means of uninsulated accessible SELV parts		N/A
21.7 (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
21.7 (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

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict
	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
21.7 (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
21.7 (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	No live parts	N/A
21.7 (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
21.7 (4.31)	**Insulation between circuits**		**N/A**
	Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3		N/A
	Controllable luminaires requiring same level of insulation for all components, the insulation between control terminals and LV supply fulfil requirements according 4.31.1 – 4.31.3		N/A
21.7 (4.31.1)	SELV circuits		N/A
	Used SELV source		N/A
	Voltage ≤ ELV		N/A
	Insulating of SELV circuits from LV supply		N/A
	Insulating of SELV circuits from other non SELV circuits		N/A
	Insulating of SELV circuits from FELV		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Insulating of SELV circuits from other SELV circuits		N/A
	SELV 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
	Plugs and socket-outlets does not have protective conductor contact		N/A
21.7 (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
21.7 (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
	- test according 7.2.3		N/A
	- conductive part not cause an electric shock in case of an insulation fault		N/A
	- equipotential bonding in master/slave applications		N/A
	- master luminaire provided with terminal for accessible conductive parts of slave luminaires		N/A
	- slave luminaire constructed as class I		N/A
21.7 (4.32)	**Overvoltage protective devices**		**N/A**
	Comply with IEC 61643-11		N/A
	External to controlgear and connected to earth:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- only in fixed luminaires		N/A
	- only connected to protective earth		N/A
21.7.2 (-)	**Terminal blocks**		**N/A**
	Clause 4.6 of IEC 60598-1 referring to terminal blocks does not apply		**—**
21.7.3 (-)	**Terminals and supply connections**		**N/A**
	Comply with Annex A		N/A
21.7.4 (-)	**Control units**		**N/A**
	Forming an integral part enclosed in non-flammable insulating material tested according 21.16		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		N/A
21.7.5 (-)	**Mechanical strength**		**P**
	a) Rigid rope lights		N/A
	1) Pull test: force 60 N		N/A
	2) Torque test: torque 0,15 Nm		N/A
	b) Flexible rope lights		P
	1) Pull test: force 60 N		P
	2) Torque test: torque 0,15 Nm		P
	3) Cylinder 150 mm @ 10 times at 25 °C ± 2 °C		N/A
	For rope lights having an IP number over X0 Additionally: Cylinder 150 mm @ 10 times at -15 °C ± 2 °C		P
	4) Mandrel of between 4 and 5 times the diameter of test piece		P
	c) Impact test at low temperature of -15 °C ± 5 °C		P

21.8 (11)	**CREEPAGE DISTANCES AND CLEARANCES**		
21.8 (11.2.1)	Impulse withstand category (Normal category II)	Category II ☐ Category III ☐	—
	Category III according Annex U		N/A
	Protected against pollution, reduced creepage and clearance according Annex P of IEC 61347-1		N/A
1.7 (11.2.2)	Creepage distances for frequency up to 30 kHz	See Test Table 1.7 (11.2) I	N/A
	Creepage distances for frequency over 30 kHz:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- Controlgear marked with $\hat{U}_{OUT}$ and f_{UOUT} according IEC 61347-1, clause 7.1, item w	See Test Table 1.7 (11.2) II	N/A
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 1.7 (11.2) II	N/A
1.7 (11.2.3)	Clearances for frequency up to 30 kHz	See Test Table 1.7 (11.2) I	N/A
	Clearances distances for frequency over 30 kHz:		N/A
	- Controlgear marked with U_P	See Test Table 1.7 (11.2) II	N/A
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 1.7 (11.2) II	N/A
21.10 (14)	**SCREW TERMINALS**		
	Separately approved; component list	(see Annex 1)	N/A
	Part of the luminaire	(see Annex 3)	N/A
21.10 (15)	**SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS**		
	Separately approved; component list .....:	(see Annex 1)	N/A
	Part of the luminaire .....:	(see Annex 4)	N/A
21.11 (5)	**EXTERNAL AND INTERNAL WIRING**		
21.11 (5.2)	**Supply connection and external wiring**		**P**
21.11 (5.2.1)	Means of connection .....:	Input wire	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/A
21.11 (5.2.2)	Type of cable.....:	Replaced by 21.11.2	—
	Nominal cross-sectional area (mm²) .....:	Replaced by 21.11.2	—
	Cables equal to IEC 60227 or IEC 60245	Replaced by 21.11.2	—
21.11 (5.2.3)	Type of attachment, X, Y or Z		P
21.11 (5.2.5)	Type Z not connected to screws		P
21.11 (5.2.6)	Cable entries:		P
	- suitable for introduction		P
	- adequate degree of protection		P

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Clause	Requirement + Test	Result - Remark	Verdict
21.11 (5.2.7)	Cable entries through rigid material have rounded edges		P
21.11 (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
21.11 (5.2.9)	Locking of screwed bushings		N/A
21.11 (5.2.10)	Cord anchorage:		P
	- covering protected from abrasion		P
	- clear how to be effective		P
	- no mechanical or thermal stress		P
	- no tying of cables into knots etc.		P
	- insulating material or lining		P
21.11 (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
21.11 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		P
21.11 (5.2.10.3)	Tests:		P
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N) .....:	60	P
	- torque test: torque (Nm) .....:	0,25	P
	- displacement ≤ 2 mm		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- no movement of conductors		P
	- no damage of cable or cord		P
	- function independent of electrical connection		P
21.11 (5.2.11)	External wiring passing into luminaire		P
21.11 (5.2.12)	Looping-in terminals		N/A
21.11 (5.2.13)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		P
21.11 (5.2.14)	Mains plug same protection		N/A
	Class III luminaire plug		N/A
	No unsafe compatibility		N/A
21.11 (5.2.16)	Appliance inlets (IEC 60320)		N/A
	Installation couplers (IEC 61535)		N/A
	Other appliance inlet or connector according relevant IEC standard		N/A
21.11 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
21.11 (5.2.18)	Used plug in accordance with		N/A
	- IEC 60083		N/A
	- other standard		N/A
21.11 (5.3)	**Internal wiring**		**N/A**
21.11 (5.3.1)	Internal wiring of suitable size and type		N/A
	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
21.11 (5.3.1.1)	Internal wiring connected directly to fixed wiring		N/A
	Cross-sectional area (mm²) .....:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Insulation thickness		N/A
	Extra insulation added where necessary		N/A
21.11 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		N/A
	Adequate cross-sectional area and insulation thickness		N/A
21.11 (5.3.1.3)	Double or reinforced insulation for class II		N/A
21.11 (5.3.1.4)	Conductors without insulation		N/A
21.11 (5.3.1.5)	SELV current-carrying parts		N/A
21.11 (5.3.1.6)	Insulation thickness other than PVC or rubber		N/A
21.11 (5.3.2)	Sharp edges etc.		N/A
	No moving parts of switches etc.		N/A
	Joints, raising/lowering devices		N/A
	Telescopic tubes etc.		N/A
	No twisting over 360°		N/A
21.11 (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
21.11 (5.3.4)	Joints and junctions effectively insulated		N/A
21.11 (5.3.5)	Strain on internal wiring		N/A
21.11 (5.3.6)	Wire carriers		N/A
21.11 (5.3.7)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		N/A
21.11 (5.4)	**Test to determine suitability of conductors having a reduced cross-sectional area**		**N/A**

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Clause	Requirement + Test	Result - Remark	Verdict
	Under test the temperature of the luminaire wiring insulation not exceed the limits stated in Table 12.2	(see Annex 2)	N/A
	No damage to luminaire wiring after test		N/A
21.11.2 (-)	**Cables for rope lights**		**P**
	Type of cable..... :	PVC wire: 2464	P
	Cables not lighter than IEC 60227 or IEC 60245 for class II rope lights		N/A
	Cables not lighter than insulation according to 5.3.1 of part 1 for class III rope lights		P
	Nominal cross-sectional area (mm²) ..... :	18 AWG	P
	Mechanical properties according 4.14.1 and 4.14.2 of part 1		N/A
21.11.3 (-)	**Cord anchorage test**		**N/A**
	Pull test 30 N 25 times on single-core cable		N/A
21.11.4 (-)	**Plugs and cable length**		**N/A**
	Splash-proof plug or permanent connection if for outdoor use		N/A
	Length of the cable between the plug and the connection to the rope light not less than 1,5 m		N/A
21.11.5 (-)	**Maximum length of extendable class II rope lights**		**N/A**
	Maximum length 100 m for 0,5 mm² cable		N/A
	Maximum length 150 m for 0,75 mm² cable		N/A

21.12 (8)	**PROTECTION AGAINST ELECTRIC SHOCK**		
21.12 (8.2.1)	Live parts not accessible		N/A
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	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
21.12 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N/A
21.12 (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
21.12 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		N/A
21.12 (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
	- touch current if applicable (mA) .....:		N/A
	Other than ordinary luminaire:		N/A
	- nominal voltage .....:		N/A
	Class III luminaire only for connection to SELV		N/A
	Class III luminaire not provided with means for protective earthing		N/A
21.12 (8.2.4)	Portable luminaire have protection independent of supporting surface		N/A
21.12 (8.2.5)	Compliance with the standard test finger or relevant probe		N/A
21.12 (8.2.6)	Covers reliably secured		N/A
21.12 (8.2.7)	Discharging of capacitors $\geq$ 0,5 μF		N/A
	Portable plug connected luminaire with capacitor		N/A
	Other plug connected luminaire with capacitor		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Discharge device on or within capacitor		N/A
	Discharge device mounted separately		N/A

21.13 (12)	**ENDURANCE TEST AND THERMAL TEST**		
21.13.1 (-)	If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 21.14		—
21.13 (12.3)	**Endurance test:**		P
	- mounting-position .....:	As normal use	—
	- test temperature (°C) .....:	70	—
	- total duration (h) .....:	240	—
	- supply voltage: Un factor; calculated voltage (V) ...:	1,1 Un = 264 V	—
	- lamp used .....:	Non replaceable LEDs	—
21.13 (12.3.2)	After endurance test:		P
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N/A
	- marking legible		P
	- no cracks, deformation etc.		P
21.13 (12.4)	**Thermal test (normal operation)**	**(see Annex 2)**	**P**
21.13 (12.5)	**Thermal test (abnormal operation)**	**(see Annex 2)**	**P**
21.13 (12.6)	**Thermal test (failed lamp control gear condition):**		**N/A**
21.13 (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

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Clause	Requirement + Test	Result - Remark	Verdict
21.13 (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
21.13 (12.7)	**Thermal test (failed lamp control gear in plastic luminaires):**		**N/A**
21.13 (12.7.1)	Luminaire without temperature sensing control		N/A
21.13 (12.7.1.1)	Luminaire with fluorescent lamp ≤ 70W		N/A
	Test method 12.7.1.1 or Annex W .....:		—
	Test according to 12.7.1.1:		N/A
	- case of abnormal conditions .....:		—
	- Ballast failure at supply voltage (V) .....:		—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
	Test according to Annex W:		N/A
	- case of abnormal conditions .....:		—
	- measured winding temperature (°C): at 1,1 Un .....:		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un .....:		—
	- calculated temperature of fixing point/exposed part (°C) .....:		—
	Ball-pressure test..... :	See Table 21.16 (13.2.1)	N/A
21.13 (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) .....:		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Ball-pressure test.....:	See Table 21.16 (13.2.1)	N/A
21.13 (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
21.13 (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 21.16 (13.2.1)	N/A
21.13.2 (-)	**Test voltage**		**P**
	Provision of 12.3.1 d) of part 1 and if class III rope lights 1,1 x rated voltage of transformer/convertor		—
	Provision of 12.4.1 d) of part 1 and if class III rope lights 1,06 x rated voltage of transformer/convertor		—
21.13.3 (-)	**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

21.14 (9)	**RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE**		
21.14 (-)	If IP > IP 20 the order of tests as specified in clause 21.13		—
21.14 (9.2)	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP.....:	IP68	—
	- mounting position during test.....:	As normal use	—
	- fixing screws tightened; torque (Nm).....:	—	—
	- tests according to clauses .....:	The clause 9.2.2 & 9.2.9 of IEC 60598-1	—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		N/A
	b) no talcum in dust-tight luminaire		P

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Clause	Requirement + Test	Result - Remark	Verdict
	c) no trace of water on current-carrying parts or on insulation where it could become a hazard		P
	c) i) For luminaires without drain holes – no water entry		P
	c) ii) For luminaires with drain holes – no hazardous water entry		N/A
	d) no water in watertight luminaire		N/A
	e) no contact with live parts (IP 2X)		N/A
	e) no entry into enclosure (IP 3X and IP 4X)		N/A
	e) no contact with live parts (IP3X and IP4X)		N/A
	f) no trace of water on part of lamp requiring protection from splashing water		N/A
	g) no damage of protective shield or glass envelope		P
21.14 (9.3)	Humidity test 48 h	25 °C; 93% Rh	P

21.15 (10)	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		
21.15 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø .....:	Covered by metal foil	—
	Insulation resistance (MΩ).....:	As below	—
	SELV		P
	- between current-carrying parts of different polarity:	> 20 MΩ	P
	- between current-carrying parts and mounting surface .....:	> 20 MΩ	P
	- between current-carrying parts and metal parts of the luminaire.....:		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts .....:	> 20 MΩ	P
	- 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

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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
21.15 (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) .....:	As below	P
	SELV		P
	- between current-carrying parts of different polarity:	500 V	P
	- between current-carrying parts and mounting surface .....:	500 V	P
	- between current-carrying parts and metal parts of the luminaire.....:		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts .....:	500 V	P
	- 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
21.15 (10.3)	Touch current or protective conductor current (mA).:		N/A

21.16 (13)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		
21.16 (13.2.1)	Ball-pressure test.....:	See Test Table 21.16 (13.2.1)	N/A
21.16 (13.3.1)	Needle-flame test (10 s) .....:	See Test Table 21.16 (13.3.1)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
21.16 (13.3.2)	Glow-wire test (650°C).....:	See Test Table 21.16 (13.3.2)	P
21.16 (13.4)	Proof tracking test (IEC 60112).....:	See Test Table 21.16 (13.4)	P
20.16 (-)	Flexible pipes of rope lights in compliance with IEC 60811-508		P

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Clause	Requirement + Test	Result - Remark	Verdict

21.8 (11.2)	TABLE I: Creepage distances and clearances							N/A
	Minimum distances (mm) for a.c. up to 30 kHz sinusoidal voltages							
	Applicable part of IEC 60598-1 Table 11.1.A*, 11.1.B* and 11.2*							
	Insulation type **	Measured clearance	Required		Measured creepage	Required		
			clearance	*Table		creepage	*Table	
Distance 1:	—	—	—	—	—	—	—	
Working voltage (V) ..... :								—
PTI ..... :					< 600 ☐	≥ 600 ☐		—
Pulse voltage or U_P if applicable (kV) ..... :					—			—
Supplementary information: Measured at L&N								
Distance 2:	—	—	—	—	—	—	—	
Working voltage (V) ..... :					—			—
PTI ..... :					< 600 ☐	≥ 600 ☐		—
Pulse voltage or U_P if applicable (kV) ..... :					—			—
Supplementary information: Measured at live part to accessible part								
Distance 3:	—	—	—	—	—	—	—	
Working voltage (V) ..... :					—			—
PTI ..... :					< 600 ☐	≥ 600 ☐		—
Pulse voltage or U_P if applicable (kV) ..... :					—			—
Supplementary information: Measured at live part to mounting surface								

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

21.8 (11.2)	TABLE II: Creepage distances and clearances						N/A
Minimum distances (mm) for a.c. higher than 30 kHz sinusoidal voltages							
Applicable part of IEC 61347-1 Table 7 and 8* or IEC 60664-4 Table 1 and 2							
Distances	Insulation type **	Measured clearance	Required		Measured creepage	Required	
			clearance	*Table		creepage	*Table
Distance 1:							
Working voltage (V) ..... :							—
Frequency if applicable (kHz) ..... :							—
PTI ..... :					< 600 ☐	≥ 600 ☐	—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :							—

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:							
Distance 2:							
Working voltage (V) ..... :							—
Frequency if applicable (kHz) ..... :							—
PTI ..... :	< 600 ☐ ≥ 600 ☐						—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :							—
Supplementary information:							
Distance 3:							
Working voltage (V) ..... :							—
Frequency if applicable (kHz) ..... :							—
PTI ..... :	< 600 ☐ ≥ 600 ☐						—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :							—
Supplementary information:							

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

21.16 (13.2.1)	**TABLE: Ball Pressure Test of Thermoplastics**		**N/A**
Allowed impression diameter (mm) .....:	≤ 2		—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)
—	—	—	—
Supplementary information: —			

21.16 (13.3.1)	**TABLE: Needle-flame test (IEC 60695-11-5)**				N/A
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
—	—	—	—	—	—
Supplementary information: —					

21.16 (13.3.2)	**TABLE: Glow-wire test (IEC 60695-2-11)**	**P**
Glow wire temperature .....:	650°C	—

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict

Object/ Part No./ Material	Manufacturer/ trademark	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
Plastic enclosure	Shenzhen Sisun Silicone Technology Co,. Ltd.	No	0	P
End cover	Dongguan Yutian Silicone Techonology Co. Ltd.	No	0	P
Any flame or glowing of the sample extinguished within 30 s of withdrawing the glow-wire, and any burning or molten drop did not ignite the underlying parts (Yes/No).....:				Yes
Supplementary information: —				

21.16 (13.4)	**TABLE: Proof tracking test (IEC 60112)**				**P**
Test voltage PTI .....:		175 V			—
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens			Verdict
Plastic enclosure	Shenzhen Sisun Silicone Technology Co,. Ltd.	pass	pass	pass	P
End cover	Dongguan Yutian Silicone Techonology Co. Ltd.	pass	pass	pass	P
—	—	—	—	—	—
Supplementary information: —					

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX A	**Requirements for interconnecting connectors for use in rope lights**		
	This Annex A consist relevant requirements and modifications of IEC 61984		**N/A**
5.2	**Classification according to protection against electric shock**		**N/A**
	Only enclosed connectors		N/A
5.3	**Classification according to the style of connector**		**N/A**
	Only free connectors		N/A
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 rope lights		N/A
6.9.1	**Polarisation**		**N/A**
	Improper connection of mating parts is prevented		N/A
	No unsafe compatibility between connectors for class II and class III rope lights of the same manufacturer		N/A
	Male part of class III rope lights 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 rope light is placed on the market		N/A
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 rope light, other than ordinary, provided with sealing device securely fixed to the coupler		N/A
6.13	**Dielectric strength**		**N/A**
	Test according clause 21.15 of this standard		N/A
6.14.2	**Electrical endurance (CBC)**		**N/A**
	Meet the specified breaking capacity		N/A

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict
	Number of cycles 50		—
	Test according 7.3.5		N/A
6.14.3	**Bendings (non-rewirable connectors)**		**N/A**
	Meet the specified number of bendings		N/A
	Number of cycles 1000		—
	Test according 7.3.10		N/A
6.17	**Cable clamp**		**N/A**
	Test according clause 21.11.3 of this standard		N/A

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 1	TABLE: Critical components information					P
Object / part No.	**Code**	**Manufacturer/ trademark**	**Type / model**	**Technical data**	**Standard**	**Mark(s) of conformity[1)]**
LED (for NSFXXXX & NSRXXXX)	B	Shenzhen Runlite Technology Co., Ltd.	2835	V_F: 1,8 V-12 V; I_F: 100-500 mA; Tc: 2700-10000 K	IEC 62031: 2018	Tested with appliance
	D	Shenzhen HSG Electronics Co., Ltd.	2835	V_F: 1,8 V-12 V; I_F: 100-500 mA; Tc:2700-10000 K	IEC 62031: 2018	Tested with appliance
	D	Jiangxi Elite Semiconductors Technology Co, Ltd.	2835	V_F: 1,8 V-12 V; I_F: 100-500 mA; Tc: 2700-10000 K	IEC 62031: 2018	Tested with appliance
LED for N2-4	B	Shenzhen Runlite Technology Co., Ltd.	3014	V_F: 1,8 V-12 V; I_F: 100-500 mA; Tc: 2700-10000 K	IEC 62031: 2018	Tested with appliance
	D	Shenzhen HSG Electronics Co., Ltd.	3014	V_F: 1,8 V-12 V; I_F: 100-500 mA; Tc:2700-10000 K	IEC 62031: 2018	Tested with appliance
	D	Jiangxi Elite Semiconductors Technology Co, Ltd.	3014	V_F: 1,8 V-12 V; I_F: 100-500 mA; Tc: 2700-10000 K	IEC 62031: 2018	Tested with appliance
Input wire	B	Shenzhen Jieshuo Wire & Cable Co., Ltd.	2464	PVC wire; 18 AWG; 80 °C	IEC 60598-2-21: 2014 IEC 60598-1: 2014 + A1: 2017	UL E491472 & tested with appliance
Plastic enclosure	B	Shenzhen Sisun Silicone Technology Co,. Ltd.	XS1110-A	HB; 105 °C	IEC 60598-2-21: 2014 IEC 60598-1: 2014 + A1: 2017	UL E332810 & Tested with appliance
End cover	B	Dongguan Yutian Silicone Techonology Co. Ltd.	TY651	HB; 150 °C; Silicone rubber	IEC 60598-2-21: 2014 IEC 60598-1: 2014 + A1: 2017	UL E207571 +tested with appliance

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:

[1)] Provided evidence ensures the agreed level of compliance. See OD-CB2039.

The codes above have the following meaning:

A - The component is replaceable with another one, also certified, with equivalent characteristics

B - The component is replaceable if authorised by the test house

C - Integrated component tested together with the appliance

D - Alternative component

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	**TABLE: Temperature measurements, thermal tests of Section 12**		P
	Type reference .....:	NSR0615	—
	Lamp used.....:	Non-replaceable LEDs	—
	Lamp control gear used .....:	—	—
	Mounting position of luminaire.....:	As normal use	—
	Supply wattage (W) .....:	13,02	—
	Supply current (A).....:	0,987	—
	Calculated power factor .....:	—	—
	Table: measured temperatures corrected for ta = 60 °C:		P
	- abnormal operating mode .....:	—	—
	- test 1: rated voltage .....:	—	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage.....:	1,1 x 12 V = 13,2 V	—
	- 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	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Input wire	60,0	—	65,6	—	90	—	—
Input wire by clamped	60,0	—	68,8	—	75	—	—
End cover	60,0	—	70,1	—	Ref.	—	—
LED	60,0	—	77,6	—	90	—	—
Plastic enclosure	60,0	—	83,2	—	Ref.	—	—
Lighted objects (0,1 m)	60,0	—	83,0	—	90	—	—
Mounting surface	60,0	—	65,5	—	90	—	—

Supplementary information: —

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 3	**Screw terminals (part of the luminaire)**		
(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 (mm²) .....:		—
(14.3.3)	Conductor space (mm) .....:		N/A
(14.4)	Mechanical tests		N/A
(14.4.1)	Minimum distance		N/A
(14.4.2)	Cannot slip out		N/A
(14.4.3)	Special preparation		N/A
(14.4.4)	Nominal diameter of thread (metric ISO thread) .....:	M	N/A
	External wiring		N/A
	No soft metal		N/A
(14.4.5)	Corrosion		N/A
(14.4.6)	Nominal diameter of thread (mm).....:		N/A
	Torque (Nm).....:		N/A
(14.4.7)	Between metal surfaces		N/A
	Lug terminal		N/A
	Mantle terminal		N/A
	Pull test; pull (N).....:		N/A
(14.4.8)	Without undue damage		N/A

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 4	**Screwless terminals (part of the luminaire)**		
(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
(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

IEC 60598-2-21			
Clause	Requirement + Test	Result - Remark	Verdict
	Terminal size and rating		N/A
15.6.2	Mechanical tests		P
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) .....:		N/A
(15.6.2.2)	Pull test pin or tab terminals (4 samples); pull (N) .....:		N/A
(15.6.3)	Electrical tests		N/A
	Tests according 15.6.3.1 + 15.6.3.2 in IEC 60598-1		N/A

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

- - - - End of main report - - - -

Attachment 1: Additional test of IEC 62031: 2018			
Clause	Requirement + Test	Result - Remark	Verdict
4	**GENERAL REQUIREMENTS**		
4.2	Classification		
	Built-in module .....:	Yes ☐ No ☒	—
	Independent module.....:	Yes ☐ No ☒	—
	Integral module .....:	Yes ☒ No ☐	—
4.6	Independent modules comply with requirements in IEC 60598-1:2014/AMD1:2017		N/A
4.8	Modules with integrated controlgear providing SELV comply with requirements according to IEC 61347-1:2015/AMD1:2017 clause L.5 to L.11.	(see Annex 1)	N/A
6	**MARKING**		**N/A**
7	**TERMINALS**		**N/A**
8 (9)	**EARTHING**		**N/A**
9 (10)	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**		**N/A**
10 (11)	**MOISTURE RESISTANCE AND INSULATION**		
	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 .....:	20 MΩ	P
	For double or reinforced insulation ≥ 4 MΩ .....:		N/A
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1		N/A
11 (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/A
	Basic insulation, 2U + 1000 V		N/A
	Supplementary insulation, 2U + 1000 V		N/A
	Double or reinforced insulation, 4U + 2000 V		N/A
	No flashover or breakdown		P

Attachment 1: Additional test of IEC 62031: 2018			
Clause	Requirement + Test	Result - Remark	Verdict
	Solid or thin sheet insulation for double or reinforced insulation fulfil the requirements in Annex N in IEC 61347-1		N/A
12 (14)	**FAULT CONDITIONS**		
- (14.1)	When operated under fault conditions the controlgear:		P
	- does not emit flames or molten material		P
	- does not produce flammable gases		P
	- protection against accidental contact not impaired		P
	Thermally protected controlgear does not exceed the marked temperature value		N/A
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected		N/A
- (14.2)	Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (after any reduction in 14.2 - 14.5)		N/A
- (14.3)	Short-circuit or interruption of semiconductor devices		P
- (14.4)	Short-circuit across insulation consisting of lacquer, enamel or textile		N/A
- (14.5)	Short-circuit across electrolytic capacitors		N/A
	Short-circuit or interruption of SPDs		N/A
- (14.6)	After the tests has been carried out on three samples:		P
	The insulation resistance ≥ 1 MΩ ..... :	20 MΩ	P
	No flammable gases		P
	No accessible parts have become live		P
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		P
- (14.7)	Relevant fault condition tests with high-power a.c. supply and in turn to a d.c. supply		—
12.2	**Overpower condition**		**P**
	Module withstands overpower condition >15 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
14 (15)	**CONSTRUCTION**		
- (15.1)	**Wood, cotton, silk, paper and similar fibrous material**		**P**

Attachment 1: Additional test of IEC 62031: 2018			
Clause	Requirement + Test	Result - Remark	Verdict
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P
- (15.2)	**Printed circuits**		**N/A**
	Printed circuits used as internal connections complies with clause 14		N/A
15 (16)	**CREEPAGE DISTANCES AND CLEARANCES**		**N/A**
16 (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)		—
(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
	Torque test: torque (Nm); part.....:		N/A
	Torque test: torque (Nm); part.....:		N/A
(4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
(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
17 (18)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		**N/A**

Attachment 1: Additional test of IEC 62031: 2018			
Clause	Requirement + Test	Result - Remark	Verdict
18	**RESISTANCE TO CORROSION**		**N/A**
20	**HEAT MANAGEMENT**		**N/A**
22	**PHOTOBIOLOGICAL SAFETY**		
22.1	**UV radiation**		**P**
	Luminous radiation not exceed 2mW/klm		P
22.2	**Blue light hazard**		**P**
	Assessed according to IEC TR 62778	RG0	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**
12 (14)	**TABLE: tests of fault conditions**		
Part	**Simulated fault**		**Hazard**
LED	Opened circuit; no damage, recoverable when removed the fault		NO
LED	Opened circuit; no damage, recoverable when removed the fault		NO
Input	Short-circuited		NO
(A)	**ANNEX A - TEST TO ESTABLISH WHETHER A CONDUCTIVE PART IS A LIVE PART WHICH MAY CAUSE AN ELECTRIC SHOCK**		**N/A**
ANNEX 1	**LED MODULES WITH INTEGRAL CONTROLGEAR PROVIDING SELV**		**N/A**

- - - End of attachment 1 - - -

Attachment 2: Photo documentations

Details of: General view for NSR0615 (NSRXXXX series), similar as NSFXXXX

View:

[x] general

[ ] front

[ ] rear

[ ] right

[ ] left

[ ] top

[ ] bottom

Details of: Connection wire view for NSR0615 (NSRXXXX series), similar as NSFXXXX

View:

[x] general

[ ] front

[ ] rear

[ ] right

[ ] left

[ ] top

[ ] bottom

Attachment 2: Photo documentations

Details of: End cover view for NSR0615 (NSRXXXX series), similar as NSFXXXX

View:

[ ] general

[ ] front

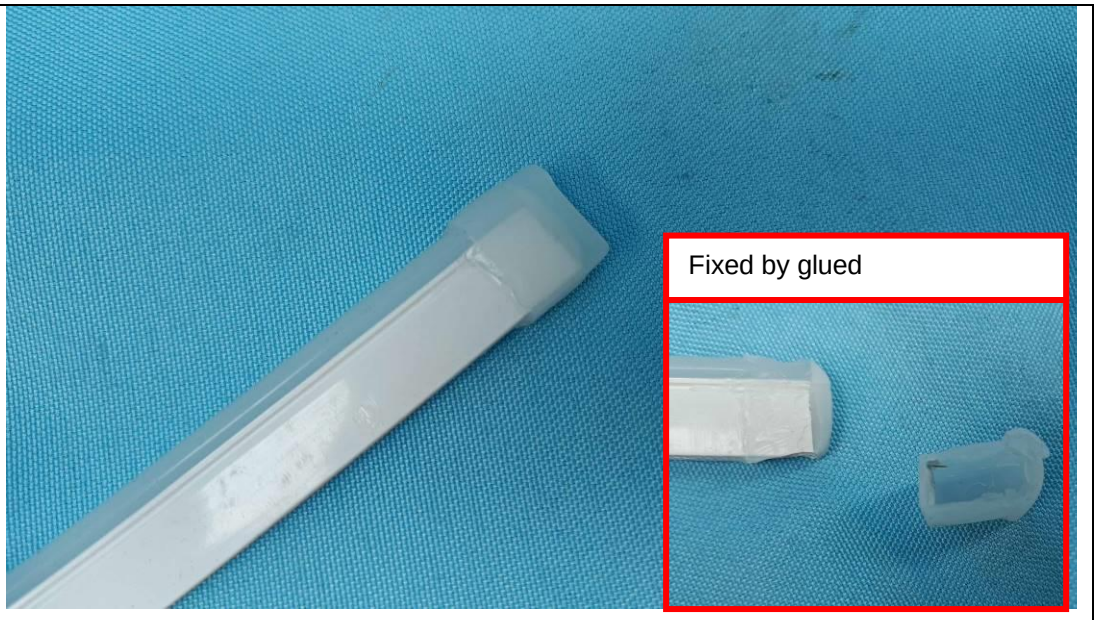
[ ] rear

[ ] right

[ ] left

[ ] top

[x] bottom



Details of: LED view for NSR0615 (NSRXXXX series), same as NSFXXXX

View:

[x] general

[ ] front

[ ] rear

[ ] right

[ ] left

[ ] top

[ ] bottom

Attachment 2: Photo documentations

Details of: General view for N2-4

View:

[x] general

[ ] front

[ ] rear

[ ] right

[ ] left

[ ] top

[ ] bottom

Details of: Connection wire for N2-4

View:

[x] general

[ ] front

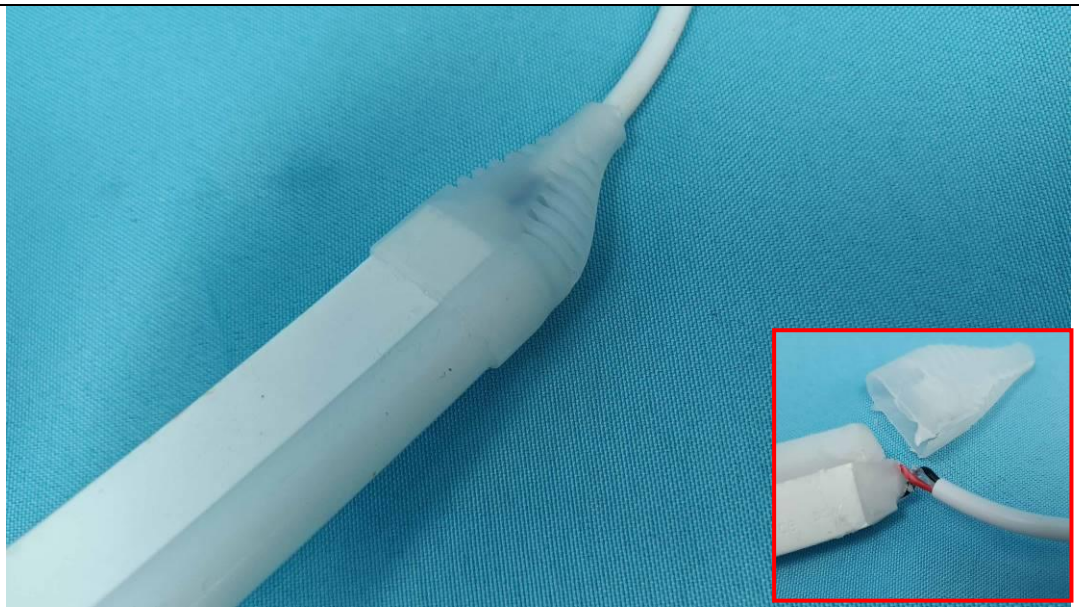
[ ] rear

[ ] right

[ ] left

[ ] top

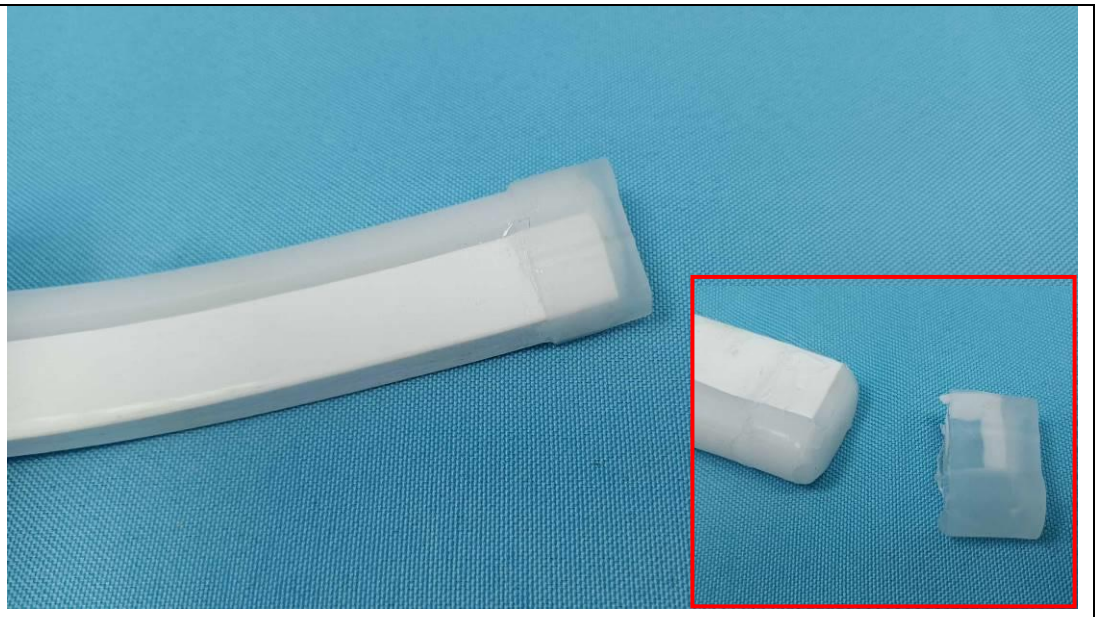
[ ] bottom



Attachment 2: Photo documentations

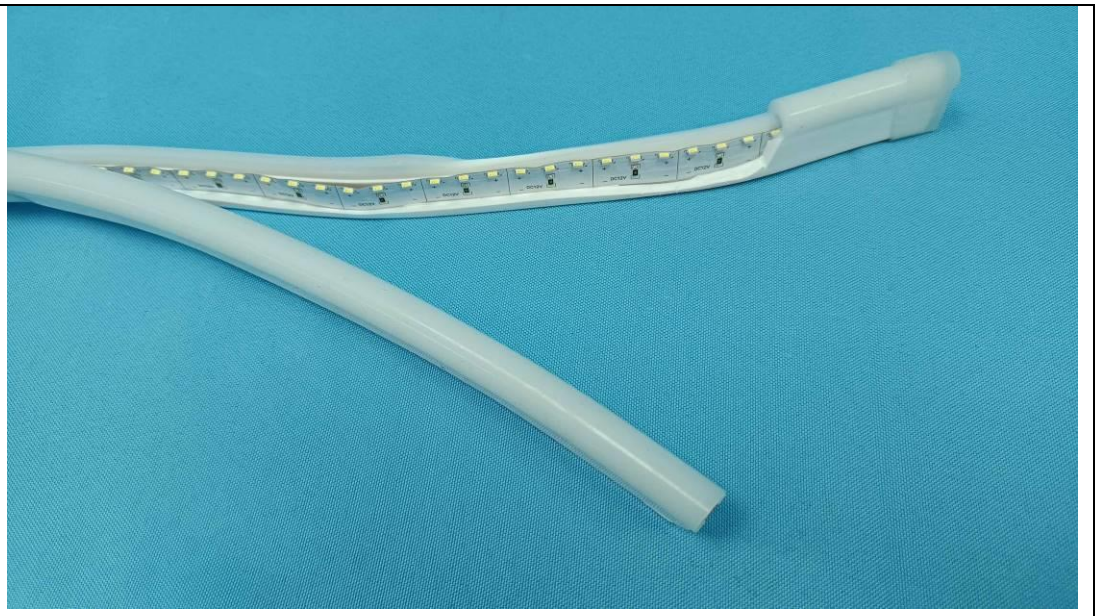
Details of: End cover view for N2-4

View:
[x] general
[ ] front
[ ] rear
[ ] right
[ ] left
[ ] top
[ ] bottom



Details of: LED view for N2-4

View:
[x] general
[ ] front
[ ] rear
[ ] right
[ ] left
[ ] top
[ ] bottom



- - - End of attachment 2 - - -