



Safety Test Report

Report No.: HB-090E-0545/16

Product : Flow Table Lamp , Stage Floor Lamp
Momento Table Lamp , Acrobat lamp

Model/Type : See model list

Brand Name : Normann Copenhagen

Applicant : Normann Copenhagen Aps

Application No. : 2016102802

Date of Issue : Nov. 24, 2016

Standards : EN 60598-2-4: 1997
EN 60598-1: 2015
EN 62031: 2008+A1: 2013+A2: 2015
EN 62471: 2008
EN 62493: 2015

Zhongshan Bontek Compliance Testing Laboratory Co., Ltd.

Tongyi Industrial Zone Dongxing East Road, Guzhen Town
Zhongshan City, Guangdong Province, China

<p align="center">TEST REPORT EN 60598-2-4 Luminaires Part 2: Particular requirements Section Four – Portable general purpose luminaires</p>	
Report No.	HB-090E-0545/16
Application No.	2016102802
Testing Laboratory	Zhongshan Bontek Compliance Testing Laboratory Co., Ltd..
Address	Tongyi Industrial Zone Dongxing east Road, Guzhen Town, Zhongshan City, Guangdong Province, China
Applicant's name	Normann Copenhagen Aps
Address	Østerbrogade 70, 2100 Copenhagen, Denmark
<p>Test specification:</p> <p>Standard</p> <p>Test procedure</p> <p>Non-standard test method . :</p>	
Standard	EN 60598-2-4: 1997 used in conjunction with EN 60598-1: 2015
Test procedure	CE-LVD
Non-standard test method . :	--
Test Report Form No.	HB-4L-090E-2
TRF Originator	LTS
Master TRF	2015-10
Test item description	Flow Table Lamp , Stage Floor Lamp Momento Table Lamp , Acrobat lamp
Trade Mark	NORMANN COPENHAGEN
Model/Type reference	See model list
Ratings	See model list

Summary of testing:

The submitted appliances fulfilled the requirements of specific standard.

- EN 60598-2-4:1997
- EN 60598-1: 2015
- EN 62031: 2008+A1:2013+A2:2015
- EN 62471: 2008

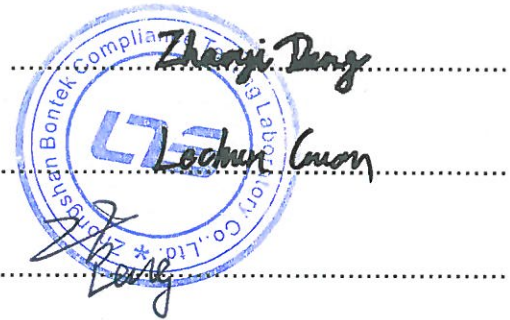
The products are found to comply with EN 62493:2015, please see the report HB-079E-0345/16 for details

Tested by (signature): Zhaoyi Deng

Reviewed by (signature).....: Lechun Guan

Approved by (signature): ZhaoFu Peng

Date of issue: Nov. 24, 2016



General remarks:

The test results presented in this report relate only to the object tested.

This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

"(see Appendix #)" refers to additional information appended to the report.

"(see appended table #)" refers to a table appended to the report.

Throughout this report a point is used as the decimal separator.

Clause numbers between brackets refer to clauses in EN 60598-1.

Main report

Page 1 to 32 for EN 60598-2-4 test report

Attachment 1:

Page 33 to 36 for EN 62031 test report.

Attachment 2:

Page 37 to 46 for EN 62471 test report.

Attachment 3:

Page 47 to 54 for product photographs.

Test item particulars:

Equipment mobility : Portable

Operating condition : ta: 25°C

Class of equipment..... : Class III

Degree of protection : IP20

Mass of equipment : 3.03kg

Supply connect : DC outlet

Possible test case verdicts:

-test case does not apply to the test object..... : N (not applicable)

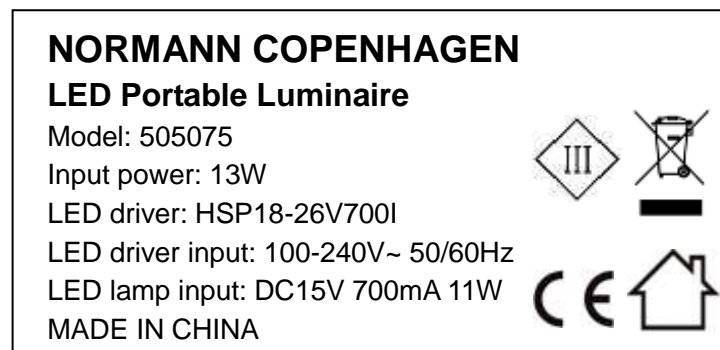
-test object does meet the requirement..... : P (Pass)

-test object does not meet the requirement..... : F (Fail)

Testing:

Date of receipt of test item..... : Oct. 28, 2016

Date (s) of performance of tests : Oct. 28 to Nov. 14, 2016

Copy of marking plate:


Location: Attached on bottom of the lamp base.

Remark: All model labels are same except the model name and power

General product information:

1. The products are class III LED portable luminaires, IP20, for indoor used only, supply by certified class II independent SELV LED driver.
2. All models have similar construction, only difference with appearance, power and model of LED driver.
There are 3 types of LED driver according to different circuit diagram and PCB layout.
3. Full tests were performed on 502124, 505055 and 505075.
4. Construction check was performed on all models.
5. For more details, see model list below.

Model list:

No.	Model	Power	LED module	LED driver	PCB of LED driver	Remark		
1	505053	7W	SMD 2835 5C6B	HSP7-25V350I Input: 100-240V, 50/60Hz, Output: DC3-25V, 350mA	1	Table lamp		
2	505054							
3	505055							
4	505062	7W	SMD 2835 5C6B					
5	505063							
6	505064							
7	505065							
8	505074	13W	SMD 2835 5C12B	HSP18-26V700I Input: 100-240V, 50/60Hz, Output: DC12-26V, 700mA	2	Floor lamp		
9	505075							
10	505076							
11	505077							
12	502122	8W	SMD 2835 3C26B	HSP12-12V Input: 100-240V, 50/60Hz, Output: 12VDC, 0-1000mA	3	Table lamp		
13	502123							
14	502124							
15	502125							

EN 60598-2-4			
Clause	Requirement + Test	Result - Remark	Verdict

4.2 (0)	GENERAL TEST REQUIREMENTS		P
4.2 (0.3.1)	Information for luminaire design considered	Standard Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
4.2 (0.3.2)	More sections applicable	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
4.4 (2)	CLASSIFICATION		P
4.4 (2.2)	Type of protection (Class 0 excluded).....	Class III	—
4.4 (2.3)	Degree of protection	IP20	—
4.4 (2.4)	Luminaire designed for standing on table	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Luminaire suitable for normally flammable surfaces	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Luminaire suitable to be covered by insulating material	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
4.4 (2.5)	Luminaire for normal use	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Luminaire for rough service	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—

4.5 (3)	MARKING		P
4.5 (3.2)	Marking shall be visible on the outside of the luminaire or behind a cover.	On the base	P
	Marking shall be visible during installation.		P
	Marking shall be visible after the installation.		P
4.5 (3.3)	Additional information		P
	Language of instructions	English	P
4.5 (3.3.1)	Combination luminaires		N
4.5 (3.3.2)	Nominal frequency in Hz	DC for class III LED lamp, 50/60Hz for class II LED driver	P
4.5 (3.3.3)	Operating temperature	25°C	N
4.5 (3.3.4)	Symbol or warning notice		N
4.5 (3.3.5)	Wiring diagram		N
4.5 (3.3.6)	Special conditions		N
4.5 (3.3.7)	Metal halide lamp luminaire - warming		N
4.5 (3.3.8)	Limitation for semi-luminaires		N
4.5 (3.3.9)	Power factor and the supply current		P
4.5 (3.3.10)	Suitability for use "indoors"		P
4.5 (3.3.11)	Luminaires with remote control gear		N
4.5 (3.3.12)	A warning for clip-mounted luminaire		N

EN 60598-2-4			
Clause	Requirement + Test	Result - Remark	Verdict
4.5 (3.3.13)	The specifications of all protective shields		N
4.5 (3.3.14)	Symbol for nature of supply	~ for LED driver == for LED lamp	P
4.5 (3.3.15)	The rated current of socket outlet	2.5A	P
4.5 (3.3.16)	The information about rough service luminaire		N
4.5 (3.3.17)	The mounting instructions for type Y, type Z and some type X attachments	Type Y	P
4.5 (3.3.18)	Information about non-ordinary luminaires with PVC supply cord		N
4.5 (3.3.19)	Instruction for the protective conductor current in		N
4.5 (3.3.20)	Information to advise the correct installation for wall mounted and adjustable luminaires.		N
4.5 (3.3.21)	Non-replaceable and non-user replaceable light sources information provided		P
	Cautionary symbol		N
4.5 (3.3.22)	Controllable luminaires, classification of insulation provided		N
4.5 (3.4)	Test of marking		P
	Test with water	Rubbing with water for 15s	P
	Test with hexane	Rubbing with petroleum spirit for 15s	P
	Legible after test	Still legible	P
	Label attached	No curling	P

4.6 (4)	CONSTRUCTION		P
4.6 (4.2)	Components replaceable without difficulty		P
4.6 (4.3)	Wireways smooth and free from sharp edges		P
4.6 (4.4)	Lampholders		N
4.6 (4.4.1)	Integral lampholder		N
4.6 (4.4.2)	Wiring connection		N
4.6 (4.4.3)	Lampholder for end-to-end mounting		N
4.6 (4.4.4)	Positioning		N
	- pressure test (N)		N
	- bending test (N)		N
4.6 (4.4.5)	Peak pulse voltage		N
4.6 (4.4.6)	Centre contact point		N
4.6 (4.4.7)	Parts incorporated in rough service luminaires resistance to tracking		N

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Clause	Requirement + Test	Result - Remark	Verdict
4.6 (4.4.8)	Lamp connectors		N
4.6 (4.4.9)	Caps and bases shall be correctly used		N
1.6 (4.4.10)	Light source for lampholder or connection according to IEC 60061 not connected another way		N
4.6 (4.5)	Starter holders		N
	Starter holder in luminaires other than class II		N
	Starter holder of class II construction		N
4.6 (4.6)	Terminal blocks		N
	Connecting leads (tails)		N
	Unsecured terminal blocks		N
4.6 (4.7)	Terminals and supply connections		N
4.6 (4.7.1)	Contact to metal parts		N
4.6 (4.7.2)	Test 8mm live conductor		N
	Test 8mm earth conductor		N
4.6 (4.7.3)	Terminals for supply conductor.		N
4.6 (4.7.3.1)	Welding method and material		N
	- stranded or solid conductor		N
	- spot welding		N
	- Welding between wires		N
	- Type Z attachment		N
	- mechanical test according to 15.6.2		N
	- electrical test according to 15.6.3		N
	- heat test according to 15.6.3.2.3 and 15.6.3.2.4		N
4.6 (4.7.4)	Terminals other than supply connection		N
4.6 (4.7.5)	Heat-resisting wiring/sleeves		N
4.6 (4.7.6)	Multi-pole plug and socket		N
	- test at 30 N		N
4.6 (4.8)	Switches:		P
	- adequate rating and fixing		P
	- Switches in flexible cables or cords and switched lampholders shall not be used in non-ordinary luminaires.		N
	- polarized supply		P
	- compliance with 61058-1 for electronic switches		P
4.6 (4.9)	Insulating lining and sleeves		N
4.6 (4.9.1)	Retainment		N

EN 60598-2-4			
Clause	Requirement + Test	Result - Remark	Verdict
4.6 (4.9.2)	Insulated linings and sleeves		N
	a) & c) Insulation resistance and electric strength		N
	b) Ageing test. Temperature (°C)		N
4.6 (4.10)	Double and reinforced insulation		N
4.6 (4.10.1)	For metal encased class II luminaires, contact between: - mounting surfaces and parts with basic insulation only, - accessible metal parts and basic insulation shall be prevented.		N
	The wiring includes internal and external wiring of the luminaire, and fixing wiring of the installation.		N
	Degree of protection against electric shock of class II shall not be impaired.		N
	The interference suppression capacitors shall comply with the requirements according to IEC 60384-14 and the method of their connection shall be in accordance with 8.6 of IEC 60065.		N
4.6 (4.10.2)	Assembly gaps greater than 0.3 mm:		N
	- neither be coincidental with any gap in basic insulation, nor be straight access to live parts		N
	- Openings larger than 0.3 mm in double or in reinforced insulation shall be so designed that live parts cannot be touched with the conical pin of test probe 13.		N
	The required degree of protection against electric shock shall be in accordance with the IP classification of the luminaire.		N
4.6 (4.10.3)	Retainment of insulation		N
	- either be fixed so that they cannot be removed without being seriously damaged;		N
	- or be unable to be replaced in an incorrect position		N
	The sleeving and lining shall be retained in position by positive means		N
4.6 (4.11)	Electrical connections and current-carrying parts		P
4.6 (4.11.1)	Contact pressure		P
4.6 (4.11.2)	Screws:		N
	- self-tapping screws		N
	- thread-cutting screws		N
	- at least two self-tapping screws		N

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Clause	Requirement + Test	Result - Remark	Verdict
4.6 (4.11.3)	Screws and rivets shall be locked against loosening		N
	- Spring washers		N
	- rivets		N
4.6 (4.11.4)	Material of current-carrying parts	Copper	P
4.6 (4.11.5)	No direct contact with the mounting surface or wood.		P
4.6 (4.11.6)	Electro-mechanical contact systems		P
	After the test, the samples shall show		P
	- no wear impairing their further use;		P
	- no deterioration of enclosures or barriers		P
	- no loosening of electrical or mechanical connections		P
4.6 (4.12)	Screws and connections (mechanical) and glands		P
4.6 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		P
	Torque test: torque (Nm); part	Screw for cord anchorage: 0.5Nm	P
	Torque test: torque (Nm); part		N
4.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N
4.6 (4.12.4)	Locked connections		N
	- fixed arms: torque (Nm)		N
	- lampholder: torque (Nm);		N
	- push-button switches: torque 0.8 Nm		N
4.6 (4.12.5)	Torque test of screwed glands, and after the test, the luminaire and glands shall show no damage.		N
4.6 (4.13)	Mechanical strength		P
4.6 (4.13.1)	Impact test:		P
	- fragile parts: energy (Nm);		N
	- other parts: energy (Nm);	0.5Nm	P
	a) live parts		P
	b) linings		N
	c) protection		P
	d) covers		P
4.6 (4.13.3)	Straight test finger.	30N	P
4.6 (4.13.4)	Rough service luminaires		N
	- IP54 or higher		N
	a) fixed		N

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Clause	Requirement + Test	Result - Remark	Verdict
	b) hand-held		N
	c) delivered with a stand		N
	d) for temporary installations and suitable for mounting on a stand		N
4.6 (4.13.6)	Tumbling barrel		N
4.6 (4.14)	Suspensions and means of adjustment		N
4.6 (4.14.1)	Mechanical suspension shall have adequate factors of safety.		N
	A) suspended luminaires: four times the weight:		N
	B) rigid suspension luminaires: torque 2.5 Nm:		N
	C) rigid suspension brackets: bracket arm; bending moment(Nm)		N
	D) load track-mounted luminaires:		N
	E) clip-mounted luminaires, glass-shelve. Thickness(mm)		N
4.6 (4.14.2)	Load to flexible cables		N
	Mass (kg)		N
	Stress in conductors (N/mm ²)		N
	Semi-luminaire – mass (kg).....		N
	Semi-luminaire – bending moment (Nm)		N
4.6 (4.14.3)	Adjusting devices:		P
	- flexing test; number of cycles.....	1500	P
	- strands broken	0	P
	- electric strength test afterwards		P
4.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N
4.6 (4.14.5)	Guide pulleys		N
4.6 (4.14.6)	Strain on socket-outlets		N
4.6 (4.15)	Flammable materials		P
4.6 (4.15.1)	- glow-wire test 650 °C		P
	- spacing ≥ 30 mm		N
	- screen withstanding test of 13.3.1		N
	- screen dimensions		N
	- no fiercely burning material		P
	- thermal protection		N
	- electronic circuits exempted		N
4.6 (4.15.2)	Luminaires made of thermoplastic material shall withstand temperature rises.		N
	a) construction		N

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Clause	Requirement + Test	Result - Remark	Verdict
	b) temperature sensing control		N
	c) surface temperature.		N
4.6 (4.16)	Luminaires for mounting on normally flammable surfaces		P
	Luminaires classified as suitable for mounting on a normally flammable surface shall comply with one of the following requirements of 4.16.1, 4.16.2, or 4.16.3.		N
4.6 (4.16.1)	Lamp control gear spacing:		N
	- spacing 10 mm		N
	- spacing 35 mm		N
4.6 (4.16.2)	Thermal protection:		N
	- in lamp control gear		N
	- external		N
	- fixed position		N
	- temperature marked lamp control gear		N
4.6 (4.16.3)	"F" curve measured		N
4.6 (4.17)	Drain holes		N
	Clearance at least 5mm		N
4.6 (4.18)	Resistance to corrosion:		N
4.6 (4.18.1)	- resistant to rust		N
4.6 (4.18.2)	- resistant to stress corrosion		N
4.6 (4.18.3)	- resistant to corrosion		N
4.6 (4.19)	Ignitors compatible with ballast		N
4.6 (4.20)	Rough service vibration		N
4.6 (4.21)	Protective shield:		N
4.6 (4.21.1)	Shield fitted		N
4.6 (4.21.2)	Particles from a shattering lamp cannot impair safety		N
4.6 (4.21.3)	No direct path		N
4.6 (4.21.4)	Impact test on shield		N
4.6 (4.22)	Attachments to lamps		N
4.6 (4.23)	Semi-luminaires comply class II		N
4.6 (4.24)	Photobiological hazards		P
4.6 (4.24.1)	UV radiation for tungsten halogen lamps and metal halide lamps (Annex P)		N
4.6 (4.24.2)	Retinal blue light hazard	RG0	P
	Luminaires with Ethr		N
	a) fixed luminaries		N

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Clause	Requirement + Test	Result - Remark	Verdict
	- distance xm, borderline between RG1 and RG2		N
	- marking and instruction according 3.2.23		N
	b) portable and handheld luminaires		N
	- marking according to 3.2.23 if TG1 exceeded at 200mm according to IEC/TR 62778		N
	Portable luminaires for children IEC 60598-2-10 and mains socket outlet nightlights IEC 60598-2-12 not exceed RG1 at 200mm according to IEC/TR 62778		N
4.6 (4.25)	No sharp point or edges		P
4.6 (4.26)	Short-circuit protection:		N
4.6 (4.26.1)	Uninsulated accessible SELV parts		N
4.6 (4.26.2)	Short-circuit test		N
4.6 (4.26.3)	Test chain according to Figure 29		N
4.6 (4.27)	Terminal blocks with integrated screwless earthing contacts		N
4.6 (4.28)	Fixing of thermal sensing control		N
	Non plug-in or easily replaceable type		N
	Reliably kept in position		N
	No adhesive fixing if UV radiations from a lamp can degrade the fixing		N
	Not outside the luminaire enclosure		N
	Test of adhesive fixing		N
4.6 (4.29)	Luminaires with non-replaceable light source		N
	Not possible after parts have been opened by hand or tools		N
4.6 (4.30)	Luminaires with non-user replaceable light source		N
	If protective cover provide protection against electric shock and marked with "caution, electric shock risk" symbol, minimum two fixing means		N
4.6 (4.31)	Insulation between circuits		P
	Circuits insulated from LV supply fulfil 4.31.1-4.31.3		P
	Controllable luminaires requiring same level of insulation for all components, the insulation between control terminals and LV supply fulfil 4.31.1-4.31.3		N
4.6 (4.31.1)	SELV circuits		P
	Sources used to supply SELV circuits		P
	Voltage not higher the limits of ELV		P

EN 60598-2-4			
Clause	Requirement + Test	Result - Remark	Verdict

	Insulation from LV supply, non SELV circuits, FELV circuits, SELV circuits and accessible conductive parts		P
	Plugs and socket-outlets in SELV systems		P
4.6 (4.31.2)	FELV circuits		N
	Sources used to supply FELV circuits		N
	Voltage not higher the limits of ELV		N
	Insulation from LV supply, FELV circuits, SELV circuits and accessible conductive parts		N
	Plugs and socket-outlets in FELV systems		N
4.6 (4.31.3)	Other circuits		N
	Insulation between circuits in accordance with the requirements in table X.1		N
	Equipotential bonding used in class II construction to protect against indirect contacts with live parts:		N
	- all conductive parts are connected together		N
	- test in 7.2.3 to check reliability		N
	- accessible conductive parts cannot cause electric shock in case of insulation fault		N
	- for master/slave applications, equipotential bonding used to prevent dangerous voltages		N
4.6 (4.32)	Overvoltage protective devices		N
	Comply with IEC 61643-11		N
	External to controlgear and connected to earth:		N
	- only in fixed luminaires, and		N
	- only connected to protective earth		N
4.6.1	Insulation of flexible cable shall not be damage		P
4.6.2	Wiring shall be fixed		P
4.6.3	Portable luminaire shall have adequate stability Luminaires which are fasten by clamps or similar devices are not subjected to this test.		P
4.6.4	Candlestick luminaires shall be provided with a switch		N
4.6.5	Requirement of E5 and E10 lampholder about rated voltage and rated wattage		N

4.7 (11)	CREEPAGE DISTANCES AND CLEARANCES		P
	Working voltage (V).....:	<60V DC	—
	Voltage form	Sinusoidal <input type="checkbox"/>	—

EN 60598-2-4			
Clause	Requirement + Test	Result - Remark	Verdict

		Non-sinusoidal <input checked="" type="checkbox"/>	
	PTI	< 600 <input checked="" type="checkbox"/> > 600 <input type="checkbox"/>	—
	Impulse withstand category (Normal category II) (Category III Annex U)	Category II <input checked="" type="checkbox"/> Category III <input type="checkbox"/>	—
	Rated pulse voltage (kV)	—	—
	(1) Live parts of different polarity:	Not required	P
	(2) Live parts and accessible metal parts:	Not required	P
	(3) Parts becoming live due to the breakdown of basic insulation and metal parts: cr (mm); cl (mm)		N
	(4) Outer surface of a flexible cord or cable and an accessible metal part: cr (mm); cl (mm)		N
	(5) Not used		—
	(6) Current-carrying parts and supporting surface:	Not required	P

4.8 (7.2)	PROVISION FOR EARTHING		N
4.8 (7.2.1 + 7.2.3)	Accessible metal parts		N
	Metal parts in contact with supporting surface		N
	Resistance < 0.5 Ω		N
	Two self-tapping screws used		N
	Thread-forming screws		N
	Thread forming screw used in a grove		N
	Earth makes contact first		N
	Build-in controlgear earthing by fixing		N
	Luminaire not earthing by build-in controlgear		N
4.8 (7.2.2 + 7.2.3)	Earth continuity in joints etc.		N
4.8 (7.2.4)	Locking of clamping means		N
	Compliance with 4.7.3		N
4.8 (7.2.5)	Earth terminal integral part of connector socket.		N
4.8 (7.2.6)	Earth terminal adjacent to mains terminals		N
4.8 (7.2.7)	Electrolytic corrosion of the earth terminal		N
4.8 (7.2.8)	Material of earth terminal and the screw.		N
	Contact surface shall be bare metal.		N
4.8 (7.2.10)	Class II luminaire for looping-in		N
	Double and reinforced insulation to functional		N

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Clause	Requirement + Test	Result - Remark	Verdict

	earth		
4.8 (7.2.11)	Earthing core coloured green-yellow.		N
	Length of earth conductor		N

4.9 (14)	SCREW TERMINALS		N
	General requirements and basic principles		N
	Mechanical tests of different screws		N
4.9 (15)	SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS		N
	General requirements		N
	General instructions on tests		N
	Terminal and connections for internal wiring		N

4.10 (5)	EXTERNAL AND INTERNAL WIRING		P
4.10	Exception of this clause:		N
	1) a requirement of cord anchorage does not apply to table lamps of glass or ceramic material		N
	2) the mass of luminaires < 1kg, rated current ≤ 2.5A, length of flexible cable ≤ 2m, cross-sectional area of cable ≥ 0.5mm ²		N
4.10 (5.2)	Supply connection and other external wiring		P
4.10 (5.2.1)	Means of connection	DC outlet	P
	Connecting leads (EN)		N
	- without a means for connection to the supply		N
	- terminal block specified		N
	- relevant information provided		N
	- compliance with 4.6, 4.7.1, 4.7.2, 4.10.1, 11.2, 12 and 13.2 of part 1		N
4.10 (5.2.2)	Type of cable.....	See annex 1	P
	Cable equal to HD21 S2 or HD22 S2 (EN)	Equal to IEC 60227	P
	Nominal cross-sectional area (mm ²)	See annex 1	P
4.10 (5.2.3)	Type of attachment, X, Y, or Z	Type Y	P
4.10 (5.2.5)	Type Z not connected to screws		N
4.10 (5.2.6)	Cable entries:		P
	- suitable for introduction		P
	- adequate degree of protection		P
4.10 (5.2.7)	Cable entries through rigid material shall have		P

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Clause	Requirement + Test	Result - Remark	Verdict
	smoothly rounded edges		
4.10 (5.2.8)	Insulating bushings:		N
	- suitably fixed		N
	- material in bushings		N
	- material not likely to deteriorate		N
	- tubes or guards made of insulating material		N
4.10 (5.2.9)	Locking of screwed bushing	No screwed bushing	N
4.10 (5.2.10)	Cord anchorage:		P
	- covering protected from abrasion		P
	- clear how to be effective		P
	- no mechanical or thermal stress		P
	- no tying of cable or cord into knots etc.		P
	- insulating material or lining		P
4.10 (5.2.10.1)	Cord anchorage for type X attachment:		N
	a) at least one part fixed		N
	b) types of cord		N
	c) no damaging of the cable		N
	d) whole cable can be mounted		N
	e) no touching of clamping screws		N
	f) metal screw not directly on cable		N
	g) replacement without special tool		N
	Glands not used as anchorage		N
	Labyrinth type anchorages		N
4.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment	Type Y	P
4.10 (5.2.10.3)	Tests:		P
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N).....: 60		P
	- torque test: torque (Nm): 0.15		P
	- displacement ≤ 2 mm		P
	- no noticeable movement of conductors		P
	- no damage of cable or cord		P
4.10 (5.2.11)	External wiring passing into luminaire		P
4.10	Looping-in terminals		N

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Clause	Requirement + Test	Result - Remark	Verdict
(5.2.12)			
4.10 (5.2.13)	Wire ends not tinned		N
	Wire end tinned: no cold flow		P
4.10 (5.2.14)	Mains plug same protection		N
	Class III luminaire plug		P
4.10 (5.2.16)	Appliance inlets (IEC 60320)		N
	Appliance couplers of class II type		N
4.10 (5.2.17)	No standardized interconnecting cables properly assembled		N
4.10 (5.2.18)	Used plug in accordance with		N
	- IEC 60083		N
	- other standard		N
4.10 (5.3)	Internal wiring		P
4.10 (5.3.1)	Internal wiring of a suitable size and type	See annex 1	P
	Through wiring		N
	- not delivered/ mounting instruction		N
	- factory assembled		N
	- socket outlet loaded (A)		N
	- temperatures.....		N
	Green-yellow for earth only		N
4.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		N
	Cross-sectional area (mm ²).....		N
	Insulation thickness		N
	Extra insulation added where necessary		N
4.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		P
	Adequate cross-sectional area and insulation thickness		P
4.10 (5.3.1.3)	Double or reinforced insulation for class II		N
4.10 (5.3.1.4)	Conductors without insulation		N
4.10 (5.3.1.5)	SELV current-carrying parts		P

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Clause	Requirement + Test	Result - Remark	Verdict
4.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		N
4.10 (5.3.2)	Sharp edges etc.;		P
	No moving parts of switches etc.;		P
	Joints, raising/lowering devices		N
	Telescopic tubes etc.		N
	No twisting over 360 °		P
4.10 (5.3.3)	Insulating bushing		N
	- suitable fixed		N
	- material in bushing		N
	- material not likely to deteriorate		N
	- cable with protective sheath		N
4.10 (5.3.4)	Joints and junctions effectively insulated		N
4.10 (5.3.5)	Strain on internal wiring.		P
4.10 (5.3.6)	Wire carriers		N
4.10 (5.3.7)	Wire end not tinned		N
	Wire end tinned: no cold flow		P

4.11 (8)	PROTECTION AGAINST ELECTRIC SHOCK		P
4.11 (8.2.1)	Live parts not accessible		P
	Basic insulated parts not used on the outer surface without appropriate protection		P
	Protection in any position		P
	Double-ended tungsten filament lamp		N
	Insulation lacquer not reliable		P
	Double-ended high pressure discharge lamp		N
	Relevant warning according to 3.2.18 fitted to the luminaire		N
4.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position		P
4.11 (8.2.3)	Class II luminaire:		N
	- basic insulated metal parts not accessible during starter or lamp replacement		N
	- basic insulation not accessible other than during starter or lamp replacement		N
	- glass protective shields not used as supplementary insulation		N
	Class I luminaire with BC lampholder		N

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Clause	Requirement + Test	Result - Remark	Verdict

	Class III luminaire only connect to a SELV source		P
4.11 (8.2.4)	Portable luminaire:		P
	- protection independent of supporting surface		P
	- terminal block completely covered		N
4.11 (8.2.5)	Compliance with standard test finger or relevant probe	every possible position: 10 N	P
4.11 (8.2.6)	Covers reliably secured		P
4.11 (8.2.7)	Discharging of capacitors $\geq 0.5\mu\text{F}$		N
	Portable plug connected luminaire with capacitor		N
	Other plug connected luminaire with capacitor		N
	Discharge device on or within capacitor		N
	Discharge device mounted separately		N
4.11.1	Class I luminaires with bayonet base shall either		N
	1) lamp cap is not accessible, or		N
	2) earthed metal lampholder		N

4.12 (12)	ENDURANCE TEST AND THERMAL TEST		P
4.12 (12.3)	Endurance test:		P
	- mounting-position	As normal used	—
	- test temperature ($^{\circ}\text{C}$).....	35 $^{\circ}\text{C}$	—
	- total duration (h)	240h	—
	- supply voltage: Un factor; calculated voltage (V)	264V	—
	- lamp used	LED	—
4.12 (12.3.2)	After endurance test:		P
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N
	- marking legible		P
	- no cracks, deformation etc.		P
4.12 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
4.12 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	P
4.12 (12.6)	Thermal test (failed in lamp control gear):		N
4.12 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A)		N

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Clause	Requirement + Test	Result - Remark	Verdict
	- case of abnormal conditions		N
	- electronic lamp control gear		N
	- measured mounting surface temperature (°C) at 1,1 times rated voltage		N
	- calculated mounting surface temperature (°C)		N
	- track-mounted luminaires		N
4.12 (12.6.2)	Temperature sensing control		N
	- case of abnormal conditions		—
	- thermal link		N
	- manual reset cut-out		N
	- auto reset cut-out		N
	- measure mounting surface temperature (°C)		N
	- track-mounted luminaires		N
4.12 (12.7)	Thermal test in regard to fault conditions in lamp control gear or electronic device incorporated in thermoplastic luminaires		N
4.12 (12.7.1)	Test for luminaire without temperature sensing control		N
4.12(12.7.1.1)	Test for luminaire incorporating ballast(s) of fluorescent lamps with a lamp load ≤ 70W		N
	Test method 12.7.1.1 or Annex W		—
	Test according to 12.7.1.1:		N
	- The ballast under test shall be supplied directly at 1.1 times the rated supply voltage, in normal operation with the relevant lamp (s) in the circuit (up to the end of the test).		—
	- The supply voltage to the ballast under test shall be increased by 20 % of the rated supply voltage and left for a period of 15 min.		—
	- If no failure of the ballast occurs during the period, the supply voltage to the ballast under test shall be increased repeatedly in steps of 10 % of the rated supply voltage at 15 min intervals until ballast failure occurs.		N
	- After the ballast failure, the luminaire shall be allowed to cool to ambient temperature.		N
	Annex W provides an alternative method to the tests. The reference is given in 12.7.1.1		N
4.12 (12.7.1.2)	Test for luminaires incorporating discharge lamp, fluorescent lamps (> 70W), transformer of power > 10 VA		N

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Clause	Requirement + Test	Result - Remark	Verdict

	- 20% of the lamp circuits in the luminaire and not less than one lamp circuit shall be subjected to abnormal conditions		N
	- The circuit which have the most thermal influence on the fixing point and exposed parts shall be chosen and other lamp circuits shall be operated at rated voltage under normal conditions.		N
	- The circuit subjected to abnormal conditions, shall be operated at 0, 9, 1, 0 and 1,1 times the rated voltage.		N
4.12 (12.7.1.3)	Test for luminaires with inherently short-circuit proof transformer of power ≤ 10 VA		N
	- The fault test shall be carried out to small transformers with power up to 10 VA; at the end of the first period of 4 h, the secondary winding shall be short circuited.		N
	- The short circuit shall be allowed to continue until transformer failure occurs;		N
4.12 (12.7.2)	Test for luminaires with temperature sensing control internal/external to the ballast or transformer		N
	- The circuits subjected to abnormal conditions shall be operated with a slowly and steadily increasing current through the windings, until the temperature sensing control operates.		N
	- Time intervals and increments in current shall be such that the thermal equilibrium between winding temperatures and temperature of fixing points and most thermally exposed parts is achieved as far as practicable.		N
	- For luminaires fitted out with manual-reset thermal cut-outs, the test shall be repeated six times, allowing 30 min intervals between tests. At the end of each 30 min interval, the cut-out shall be reset.		N

4.13 (9)	RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE		P
4.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP.....:	IP20	—
	- mounting position during test.....:	As normal use	—
	- fixing screws tightened; torque (Nm)		—
	- tests according to clauses.....:	Clause 9.2.0	—
	- electric strength test afterwards:		P

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Clause	Requirement + Test	Result - Remark	Verdict
	a) no deposit in dust-proof luminaire		N
	b) no talcum in dust-tight luminaire		N
	c) no trace of water on current-carrying parts or SELV parts		N
	d) i) For luminaires without drain holes – no water entry		N
	d) ii) For luminaires with drain holes – can drain effectively, no hazardous water entry		N
	e) no water in watertight luminaire		N
	f) i)no contact with live parts (IP 2X)		P
	f) ii)no entry into enclosure (IP 3X and IP 4X)		N
	f) iii)no contact with live parts (IP3X and IP4X)		N
	g) no trace of water on part of lamp requiring protection from splashing water		N
	h) no damage of a protective shield or glass envelope		N
4.13 (9.3)	Humidity test 48 h	25°C; 93%	P

4.14 (10)	INSULATION RESISTANCE AND ELECTRIC STRENGTH		P
4.14 (10.2.1)	Insulation resistance test		P
	SELV:		P
	- between current-carrying parts of different polarity		N
	- between current-carrying parts and the mounting surface	> 100MΩ	P
	- between current-carrying parts and metal parts of the luminaire	> 100MΩ	P
	- between outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts	> 100MΩ	P
	- insulation bushing as described in section 5 ..		N
	Other than SELV:		P
	- between live parts of different polarity	Approved LED driver	P
	- between live parts and mounting surface	Approved LED driver	P
	- between live parts and metal parts	Approved LED driver	P
	- between live parts of different polarity through action of a switch		N
	- between outer surface of a flexible cord or cable where it is clamped in a cord anchorage		N

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Clause	Requirement + Test	Result - Remark	Verdict

	and accessible metal parts.....:		
	- insulation bushing as described in section 5 ..:		N
4.14 (10.2.2)	Electric strength test		P
	Dummy lamp		N
	Luminaires with ignitors after 24 h test		N
	Luminaires with manual ignitors		N
	Test voltage (V) of insulation of parts of SELV:		P
	- between current-carrying parts of different polarity		N
	- between current-carrying parts and the mounting surface	500V	P
	- between outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts	500V	P
	- insulation bushing as described in section 5 ..:		N
	Other than SELV:		P
	- between live parts of different polarity	Approved LED driver	P
	- between live parts and mounting surface	Approved LED driver	P
	- between live parts and metal parts	Approved LED driver	P
	- between live parts of different polarity through action of a switch		N
	- between outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts		N
	- insulation bushing as described in section 5 ..:		N
4.14 (10.3)	Leakage current (mA).....:		N

4.15 (13)	RESISTANCE TO HEAT, FIRE AND TRACKING		P
4.15 (13.2.1)	Ball-pressure test:		P
	- part tested; temperature (°C)	DC outlet, 125°C, 0.7mm	P
	- part tested; temperature (°C)		N
4.15 (13.3.1)	Needle flame test (10 s):		P
	- part tested	DC outlet, no ignition	P
	- part tested		N
4.15 (13.3.2)	Glow-wire test (650 °C):		N

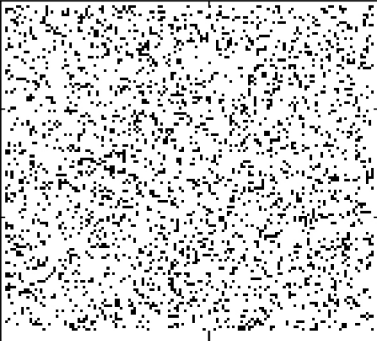
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Clause	Requirement + Test	Result - Remark	Verdict
	- part tested		N
	- part tested		N
4.15 (13.4)	Resistance to tracking		N
1.15 (13.4.1)	- part tested		N

EN 60598-2-4			
Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX 1: components	P
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object/part No.	code	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity
LED driver for 505053, 505054, 505055, 505062, 505063, 505064, 505065	B			Input: 100-240V, 50/60Hz Output: 3-25VDC 350mA (independent)	EN 61347-2-13 EN 61347-1	TUV SUD B 15 09 73485 054
LED driver for 505074, 505075, 505076, 505077	B			Input: 100-240V, 50/60Hz Output: 12-26VDC 700mA (independent)	EN 61347-2-13 EN 61347-1	TUV SUD B 15 09 73485 054
LED driver for 502122, 502123, 502124, 502125	B			Input: 100-240V, 50/60Hz Output: 12VDC, 0-1000mA (independent)	EN 61347-2-13 EN 61347-1	TUV SUD Z2 16 05 73485 073
DC outlet	B,C			AC 250V, 2.5A	EN 60598-1	Test with appliance
External wire	B			2x0.75mm ²	EN 50525-2-11	VDE 40022346
Switch for series 5021xx	B			250V, 2A	EN 61058-1 EN 61058-2-1	CE
Touch switch system for series 5050xx	B			Rated: DC5-30V, Max 2A, Load: Max 60W	EN 61347-2-11 EN 61347-1	CE
Internal wire	B			1x0.5mm ²	VDE 0281-5	VDE 40036731

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Clause	Requirement + Test	Result - Remark	Verdict

Close-end connector	B		300V, 125°C, 22-18AWG	--	UL E113650
Heat shrinkable tube	B		300V, 125°C	--	UL E209436
LED chip for all models	B,C		$I_F = 60\text{mA}$, $V_F = 3.0\text{-}3.1\text{V}$, $P_{MAX} = 0.2\text{W}$	--	Test with application

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

EN 60598-2-4			
Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX 2: temperature measurements, thermal tests of Section 12	P
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	Type reference	502124	—
	Lamp used	LED	—
	Lamp control gear used	HSP12-12V	—
	Mounting position of luminaire	as normal use	—
	Supply wattage (W)	8.34	—
	Supply current (A)	0.043	—
	Calculated power factor	0.752	—
	Table: measured temperatures corrected for $t_a=25^{\circ}\text{C}$:		P
	- abnormal operating mode	Still stable at 15°	—
	- test 1: rated power	--	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage	$1.06 \times 240 = 254.4\text{V}$	—
	- 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 ($^{\circ}\text{C}$) of part	Clause 12.4 – normal				Clause 12.5 – abnormal	
	test 1	test 2	test 3	limit	test 4	limit
Tc of LED driver	-	41.7	-	80	-	-
DC outlet	-	31.5	-	Ref	-	-
Switch	-	27.8	-	55	-	-
Internal wire near LED module	-	39.0	-	90	-	-
PCB of LED module	-	42.3	-	Ref	-	-
LED package	-	48.3	-	Ref	-	-
Plastic enclosure	-	38.6	-	70	-	-
Mounting surface	-	25.9	-	90	-	-

	Type reference	505075	—
	Lamp used	LED	—
	Lamp control gear used	HSP18-26V700I	—

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Clause	Requirement + Test	Result - Remark	Verdict

	Mounting position of luminaire.....:	as normal use	—
	Supply wattage (W)	See below	—
	Supply current (A)	See below	—
	Calculated power factor	See below	—
	Table: measured temperatures corrected for ta=25°C:		P
	- abnormal operating mode	Over turn	—
	- test 1: rated power.....:	--	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage	1.06 × 240 = 254.4V, I = 0.099A, P = 13.08W, PF = 0.525	—
	- 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	1.1 × 240 = 264V, I = 0.101A, P = 13.26W, PF = 0.511	—
	Through wiring or looping-in wiring loaded by a current of A during the test	--	—

temperature (°C) of part	Clause 12.4 – normal				Clause 12.5 – abnormal	
	test 1	test 2	test 3	limit	test 4	limit
Tc of LED driver	-	43.9	-	80	-	-
DC outlet	-	34.2	-	Ref	-	-
External wire	-	28.6	-	90	-	-
Touch switch	-	31.3	-	55	-	-
Internal wire near LED module	-	48.5	-	90	49.5	165
PCB of LED module	-	48.5	-	Ref	-	-
LED package	-	57.3	-	Ref	-	-
Plastic enclosure	-	33.4	-	70	-	-
Mounting surface	-	25.4	-	90	25.2	130
Lighting object	-	-	-	-	38.9	175

	Type reference	505055	—
	Lamp used	LED	—
	Lamp control gear used	HSP7-25V350I	—
	Mounting position of luminaire.....:	as normal use	—
	Supply wattage (W)	7.14	—

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Clause	Requirement + Test	Result - Remark	Verdict

	Supply current (A)	0.052	—
	Calculated power factor	0.531	—
	Table: measured temperatures corrected for $t_a=25^{\circ}\text{C}$:		P
	- abnormal operating mode	Still stable at 15°	—
	- test 1: rated power	--	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage	$1.06 \times 240 = 254.4\text{V}$	—
	- 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 ($^{\circ}\text{C}$) of part	Clause 12.4 – normal				Clause 12.5 – abnormal	
	test 1	test 2	test 3	limit	test 4	limit
Tc of LED driver	-	51.7	-	80	-	-
DC outlet	-	31.9	-	Ref	-	-
External wire	-	27.2	-	90	-	-
Touch switch	-	25.6	-	55	-	-
Internal wire near LED module	-	48.2	-	90	-	-
PCB of LED module	-	49.5	-	Ref	-	-
LED package	-	62.1	-	Ref	-	-
Metallic enclosure	-	46.6	-	60	-	-
Mounting surface	-	25.3	-	90	-	-
Ambient	-	25.0	-	25	-	-

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Clause	Requirement + Test	Result - Remark	Verdict

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

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Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX 4: screwless terminals (part of the luminaire)		N
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(15)	SCREWLESS TERMINALS		N
(15.2)	Type of terminal..... :		—
	Rated current (A)..... :		—
(15.3.1)	Material		N
(15.3.2)	Clamping		N
(15.3.3)	Stop		N
(15.3.4)	Unprepared conductors		N
(15.3.5)	Pressure on insulating material		N
(15.3.6)	Clear connection method		N
(15.3.7)	Clamping independently		N
(15.3.8)	Fixed in position		N
(15.3.10)	Conductor size		N
	Type of conductor		N
(15.5.1)	Terminals internal wiring		N
(15.5.1.1)	Pull test spring-type terminals (4 N, 4 samples).....:		N
(15.5.1.2)	Pull test pin or tab terminals (4 N, 4 samples).....:		N
	Insertion force not exceeding 50 N		N
	Permanent connections: pull-off test (20 N)		N
(15.5.2)	Electrical tests		N
	Voltage drop (mV) after 1 h (4 samples)..... :		N
	Voltage drop of two inseparable joints		N
	Number of cycles :		—
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples)..... :		N
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples)..... :		N
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples) :		N
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples) :		N
(15.6)	Terminals external wiring		N
	Terminal size and rating		N
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) :		N

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Clause	Requirement + Test								Result - Remark		Verdict
	Pull test pin or tab terminals (4 samples); pull (N)										N
(15.6.3)	Contact resistance test										N
	Voltage drop (mV) after 1 h										N
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Voltage drop of two inseparable joints										N
	Voltage drop after 10th alt. 25th cycle										N
	Max. allowed voltage drop (mV).....										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Voltage drop after 50th alt. 100th cycle										N
	Max. allowed voltage drop (mV).....										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Continued ageing: voltage drop after 10th alt. 25th cycle										N
	Max. allowed voltage drop (mV).....										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Continued ageing: voltage drop after 50th alt. 100th cycle										N
	Max. allowed voltage drop (mV).....										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											

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Clause	Requirement + Test	Result - Remark	Verdict
4	GENERAL REQUIREMENTS		P
4.4	Integral modules treated as part of luminaires defined in clause 0.5 of IEC 60598-1		P
4.5	Independent modules comply with requirements in IEC 60598-1		N
5	GENERAL TEST REQUIREMENTS		N
5.5	SELV-operated LED modules comply with Annex I of IEC 61347-2-13		N
6	CLASSIFICATION		—
	Built-in module: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		—
	Independent module: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		—
	Integral module: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		—
	For Integral module; Note to 1.2.1 in IEC 60598-1 applies.		—
7	MARKING		N
8	TERMINALS		N
9(9)	PROVISIONS FOR PROTECTIVE EARTHING		N
10 (10)	PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS		N
11 (11)	MOISTURE RESISTANCE AND INSULATION		P
	After storage 48 h at 91-95% relative humidity and 20-30 °C measuring of insulation resistance with d.c. 500 V (MΩ):		P
	≥ 2 MΩ for basic insulation: > 100 MΩ (between input and mounting surface)		P
	-between live parts and outer metal parts		N
	-between live parts and control terminals		N
	≥ 4 MΩ for double or reinforced insulation between live parts and the body		N
12 (12)	ELECTRONIC STRENGTH		P
	Immediately after clause 11 electric strength test for 1 min		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Basic insulation for SELV, test voltage 500 V	Between input and mounting surface	P
	Working voltage ≤ 50 V, test voltage 500 V		N
	Working voltage > 50 V, ≤ 1000 V, test voltage (V):		N
	-Basic insulation, $2U + 1000$ V		N
	-Supplementary insulation, $2U + 1000$ V		N
	-Double or reinforced insulation, $4U + 2000$ V		N
	No flashover or breakdown		P

13	FAULT CONDITIONS		P
13.1	When operated under fault conditions, the LED module:		N
	- does not emit flames or molten material		N
	- does not produce flammable gases		N
	- protection against accidental contact shall not be impaired		N
	Fault conditions: capacitors, resistors or inductors not complying with a relevant standard shall be short-circuited or disconnected	(see appended table)	N
	Thermally protected controlgear does not exceed the marked temperature value		N
- (14.1)	Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (except between live parts and accessible metal parts)	(see appended table)	N
	Distances on printed boards provided with coating according to IEC 60664-3I		N
- (14.2)	Short-circuit or interruption of semiconductor devices	(see appended table)	N
- (14.3)	Short-circuit across insulation consisting of lacquer, enamel or textile	(see appended table)	N
- (14.4)	Short-circuit across electrolytic capacitors	(see appended table)	N
- (14.5)	Compliance by operating the LED module at the rated supply voltage, with the lamp(s) connected and the lamp controlgear case at t_c		—
	After the tests, the insulation resistance with d.c. 500 V (M Ω) are ≥ 1 M Ω		N
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		N
	Temperature declared thermally protected controlgear fulfill the requirements in Annex C of IEC61347-1		N

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Clause	Requirement + Test	Result - Remark	Verdict
- (14.6)	Relevant fault condition tests with high-power supply		—
13.2(-)	Module withstands overpower condition >15 min.		P
	Module with automatic protective device or power limiter, test performed 15 min. at limit.		N
	During the tests, tissue paper, spread below module, does not ignite		P
14	CONFORMITY TESTING DURING MANUFACTURE		N
15	CONSTRUCTION		P
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P
16	CREEPAGE DISTANCES AND CLEARANCES		N
	Creepage distances and clearances according to Table 3 and 4 of EN 61347-1, as appropriate	Less than 60Vdc	N
	Printed boards see clause 14 of EN 61347-1		N
	Insulating lining of metallic enclosures		N
17 (17)	SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS		N
	Screws, current-carrying parts and connections in compliance with IEC 60598-1		N
18 (18)	RESISTANCE TO HEAT, FIRE AND TRACKING		N
19 (19)	RESISTANCE TO CORROSION		N
20	INFORMATION FOR LUMINAIRE DESIGN		N
	See annex D		N
21	HEAT MANAGEMENT		N
	This clause is applicable for exchangeable module		N
21.2	Heat-conducting foil and paste		N
	Heat-conducting foil can be necessary		N
	Heat-conducting foil shall be delivered within the LED module packaging.		N

Attachment 1: EN 62031

Clause	Requirement + Test	Result - Remark	Verdict
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	Heat-conducting paste shall not be used		N
21.3	LED modules shall be equipped with a device that cuts the power off or reduces it when t_c is exceeded.		N
21.4	The heat-conduction should be separate unless the contrary is proven safe		N

14	TABLE: tests of fault conditions		N
Part	Simulated fault		Hazard
/	/		/

ANNEX A	TEST (NORMATIVE)		P
	All tests performed in accordance with the advise given in Annex H of IEC 61347-1, if applicable		P

-	SELV- operated LED modules		N
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Attachment 2: EN 62471

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

Attachment 2: EN 62471

Clause	Requirement + Test	Result - Remark	Verdict
	$L_B \cdot t = \sum_{300}^{700} \sum_t L_{\lambda}(\lambda, t) \cdot B(\lambda) \cdot \Delta\lambda \leq 10^6 \quad \text{J} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	for $t \leq 10^4 \text{ s}$ $t_{\max} = \frac{10^6}{L_B}$	N
	$L_B = \sum_{300}^{700} L_{\lambda} \cdot B(\lambda) \cdot \Delta\lambda \leq 100 \quad \text{W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	for $t > 10^4 \text{ s}$	N
4.3.4	Retinal blue light hazard exposure limit - small source		N
	Thus the spectral irradiance at the eye E_{λ} , weighted against the blue-light hazard function $B(\lambda)$ shall not exceed the levels defined by:	see table 4.2	N
	$E_B \cdot t = \sum_{300}^{700} \sum_t E_{\lambda}(\lambda, t) \cdot B(\lambda) \cdot \Delta\lambda \leq 100 \quad \text{J} \cdot \text{m}^{-2}$	for $t \leq 100 \text{ s}$	N
	$E_B = \sum_{300}^{700} E_{\lambda} \cdot B(\lambda) \cdot \Delta\lambda \leq 1 \quad \text{W} \cdot \text{m}^{-2}$	for $t > 100 \text{ s}$	N
4.3.5	Retinal thermal hazard exposure limit		N
	To protect against retinal thermal injury, the integrated spectral radiance of the light source, L_{λ} , weighted by the burn hazard weighting function $R(\lambda)$ (from Figure 4.2 and Table 4.2), i.e., the burn hazard weighted radiance, shall not exceed the levels defined by:		N
	$I_R = \sum_{380}^{1400} L_{\lambda} \cdot R(\lambda) \cdot \Delta\lambda \leq \frac{50\,000}{\alpha \cdot t^{0.25}} \quad \text{W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	($10 \mu\text{s} \leq t \leq 10 \text{ s}$)	N
4.3.6	Retinal thermal hazard exposure limit – weak visual stimulus		N
	For an infrared heat lamp or any near-infrared source where a weak visual stimulus is inadequate to activate the aversion response, the near infrared (780 nm to 1400 nm) radiance, L_{IR} , as viewed by the eye for exposure times greater than 10 s shall be limited to:		N
	$L_{\text{IR}} = \sum_{780}^{1400} L_{\lambda} \cdot R(\lambda) \cdot \Delta\lambda \leq \frac{6\,000}{\alpha} \quad \text{W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	$t > 10 \text{ s}$	N
4.3.7	Infrared radiation hazard exposure limits for the eye		N
	The avoid thermal injury of the cornea and possible delayed effects upon the lens of the eye (cataractogenesis), ocular exposure to infrared radiation, E_{IR} , over the wavelength range 780 nm to 3000 nm, for times less than 1000 s, shall not exceed:		N
	$E_{\text{IR}} = \sum_{780}^{3000} E_{\lambda} \cdot \Delta\lambda \leq 18\,000 \cdot t^{-0.75} \quad \text{W} \cdot \text{m}^{-2}$	$t \leq 1000 \text{ s}$	N
	For times greater than 1000 s the limit becomes:		N

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Clause	Requirement + Test	Result - Remark	Verdict
	$E_{IR} = \sum_{380}^{3000} E_{\lambda} \cdot \Delta\lambda \leq 100 \quad W \cdot m^{-2}$	$t > 1000 \text{ s}$	N
4.3.8	Thermal hazard exposure limit for the skin		N
	Visible and infrared radiant exposure (380 nm to 3000 nm) of the skin shall be limited to:		N
	$E_H \cdot t = \sum_{380}^{3000} \sum_t E_{\lambda}(\lambda, t) \cdot \Delta\lambda \cdot \Delta t \leq 20\,000 \cdot t^{0.25} \quad J \cdot m^{-2}$		N

5	MEASUREMENT OF LAMPS AND LAMP SYSTEMS		P
5.1	Measurement conditions		P
	Measurement conditions shall be reported as part of the evaluation against the exposure limits and the assignment of risk classification.		P
5.1.1	Lamp ageing (seasoning)		N
	Seasoning of lamps shall be done as stated in the appropriate IEC lamp standard.		N
5.1.2	Test environment		P
	For specific test conditions, see the appropriate IEC lamp standard or in absence of such standards, the appropriate national standards or manufacturer's recommendations.		P
5.1.3	Extraneous radiation		P
	Careful checks should be made to ensure that extraneous sources of radiation and reflections do not add significantly to the measurement results.		P
5.1.4	Lamp operation		N
	Operation of the test lamp shall be provided in accordance with:		N
	– the appropriate IEC lamp standard, or		N
	– the manufacturer's recommendation		N
5.1.5	Lamp system operation		P
	The power source for operation of the test lamp shall be provided in accordance with:		P
	– the appropriate IEC standard, or		N
	– the manufacturer's recommendation		P
5.2	Measurement procedure		P
5.2.1	Irradiance measurements		P
	Minimum aperture diameter 7mm.		P
	Maximum aperture diameter 50 mm.		P
	The measurement shall be made in that position of the beam giving the maximum reading.		P

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Clause	Requirement + Test	Result - Remark	Verdict
	The measurement instrument is adequate calibrated.		P
5.2.2	Radiance measurements		P
5.2.2.1	Standard method		P
	The measurements made with an optical system.		P
	The instrument shall be calibrated to read in absolute radiant power per unit receiving area and per unit solid angle to acceptance averaged over the field of view of the instrument.		P
5.2.2.2	Alternative method		N
	Alternatively to an imaging radiance set-up, an irradiance measurement set-up with a circular field stop placed at the source can be used to perform radiance measurements.		N
5.2.3	Measurement of source size		P
	The determination of α , the angle subtended by a source, requires the determination of the 50% emission points of the source.		P
5.2.4	Pulse width measurement for pulsed sources		N
	The determination of Δt , the nominal pulse duration of a source, requires the determination of the time during which the emission is > 50% of its peak value.		N
5.3	Analysis methods		P
5.3.1	Weighting curve interpolations		P
	To standardize interpolated values, use linear interpolation on the log of given values to obtain intermediate points at the wavelength intervals desired.		P
5.3.2	Calculations		P
	The calculation of source hazard values shall be performed by weighting the spectral scan by the appropriate function and calculating the total weighted energy.		P
5.3.3	Measurement uncertainty		P
	The quality of all measurement results must be quantified by an analysis of the uncertainty.	see Annex C in the norm	P
6	LAMP CLASSIFICATION		P
	For the purposes of this standard it was decided that the values shall be reported as follows:	see table 6.1	P
	– for lamps intended for general lighting service, the hazard values shall be reported as either irradiance or radiance values at a distance which produces an illuminance of 500 lux, but not at a distance less than 200 mm		P

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Clause	Requirement + Test	Result - Remark	Verdict
	– for all other light sources, including pulsed lamp sources, the hazard values shall be reported at a distance of 200 mm		N
6.1	Continuous wave lamps		P
6.1.1	Exempt Group		P
	In the except group are lamps, which does not pose any photobiological hazard. The requirement is met by any lamp that does not pose:		P
	– an actinic ultraviolet hazard (E_S) within 8-hours exposure (30000 s), nor		P
	– a near-UV hazard (E_{UVA}) within 1000 s, (about 16 min), nor		P
	– a retinal blue-light hazard (L_B) within 10000 s (about 2,8 h), nor		P
	– a retinal thermal hazard (L_R) within 10 s, nor		P
	– an infrared radiation hazard for the eye (E_{IR}) within 1000 s		P
6.1.2	Risk Group 1 (Low-Risk)		N
	In this group are lamps, which exceeds the limits for the except group but that does not pose:		N
	– an actinic ultraviolet hazard (E_S) within 10000 s, nor		N
	– a near ultraviolet hazard (E_{UVA}) within 300 s, nor		N
	– a retinal blue-light hazard (L_B) within 100 s, nor		N
	– a retinal thermal hazard (L_R) within 10 s, nor		N
	– an infrared radiation hazard for the eye (E_{IR}) within 100 s		N
	Lamps that emit infrared radiation without a strong visual stimulus and do not pose a near-infrared retinal hazard (L_{IR}), within 100 s are in Risk Group 1.		N
6.1.3	Risk Group 2 (Moderate-Risk)		N
	This requirement is met by any lamp that exceeds the limits for Risk Group 1, but that does not pose:		N
	– an actinic ultraviolet hazard (E_S) within 1000 s exposure, nor		N
	– a near ultraviolet hazard (E_{UVA}) within 100 s, nor		N
	– a retinal blue-light hazard (L_B) within 0,25 s (aversion response), nor		N
	– a retinal thermal hazard (L_R) within 0,25 s (aversion response), nor		N
	– an infrared radiation hazard for the eye (E_{IR}) within 10 s		N

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Clause	Requirement + Test	Result - Remark	Verdict
	Lamps that emit infrared radiation without a strong visual stimulus and do not pose a near-infrared retinal hazard (L_{IR}), within 10 s are in Risk Group 2.		N
6.1.4	Risk Group 3 (High-Risk)		N
	Lamps which exceed the limits for Risk Group 2 are in Group 3.		N
6.2	Pulsed lamps		N
	Pulse lamp criteria shall apply to a single pulse and to any group of pulses within 0,25 s.		N
	A pulsed lamp shall be evaluated at the highest nominal energy loading as specified by the manufacturer.		N
	The risk group determination of the lamp being tested shall be made as follows:		N
	– a lamp that exceeds the exposure limit shall be classified as belonging to Risk Group 3 (High-Risk)		N
	– for single pulsed lamps, a lamp whose weighted radiant exposure or weighted radiance does is below the EL shall be classified as belonging to the Exempt Group		N
	– for repetitively pulsed lamps, a lamp whose weighted radiant exposure or weighted radiance dose is below the EL, shall be evaluated using the continuous wave risk criteria discussed in clause 6.1, using time averaged values of the pulsed emission		N

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

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

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Clause	Requirement + Test	Result - Remark	Verdict
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Table 4.2	Spectral weighting functions for assessing retinal hazards from broadband optical sources		P
500-600	$10^{[(450-\lambda)/50]}$	1,0	
600-700	0,001	1,0	
700-1050	—	$10^{[(700-\lambda)/500]}$	
1050-1150	—	0,2	
1150-1200	—	$0,2 \cdot 10^{0,02(1150-\lambda)}$	
1200-1400	—	0,02	

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

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

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Clause	Requirement + Test	Result - Remark	Verdict
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	CENELEC COMMON MODIFICATIONS (EN)		—
4	EXPOSURE LIMITS		P
	Contents of the whole Clause 4 of IEC 62471:2006 moved into a new informative Annex ZB		—
	Clause 4 replaced by the following:		P
	Limits of the Artificial Optical Radiation Directive (2006/25/EC) have been applied instead of those fixed in IEC 62471:2006	See appended Table 6.1 RG0	P
4.1	General		P
	First paragraph deleted		—

Table 6.1	Emission limits for risk groups of continuous wave lamps (based on EU Directive 2006/25/EC)			P
Optical hazard	Test result	Used hazard exposure limit		Ref.
1. E_s	2.809E-07 W/ m ²	0,001 W/m ²	200-800 nm	P
2. E_{UVA}	6.224E-03 W/ m ²	10 W/m ²	200-800 nm	P
3. L_B	2.115E+01 W/ m ² sr	100 W/m ² sr	300-700 nm	P
4. $E_{B(small\ source)}$	--	--	--	N
5. L_R	1.488E+03 W/ m ² sr	2.897E+05 W/m ² sr	380-1400 nm	P
6. L_{IR}	1.572E+02 W/ m ² sr	6.208E+04 W/m ² sr	380-1400 nm	P
7. E_{IR}	0.304E-01 W/ m ²	100 W/m ²	380-3000 nm	P
8. E_H	3.716E+02 W/ m ²	3556.56 W/m ²	380-3000 nm	P
<p>* Small source defined as one with $\alpha < 0,011$ radian. Averaging field of view at 10000 s is 0,1 radian.</p> <p>** Involves evaluation of non-GLS source</p> <p>NOTE The action functions: see Table 4.1 and Table 4.2</p> <p>The applicable aperture diameters: see 4.2.1</p> <p>The limitations for the angular subtenses: see 4.2.2</p> <p>The related measurement condition 5.2.3 and the range of acceptance angles: see Table 5.5.</p>				

Attachment 3: photo documentation



Picture 1: model 505075, whole view



Picture 2: LED driver



Picture 3: DC connector

Attachment 3: photo documentation

Picture 4: touch switch



Picture 5: wire entrance



Picture 6: internal view

Attachment 3: photo documentation



Picture 7: touch dimming switch system



Picture 8: close-end connector



Picture 9: PCB of LED module

Attachment 3: photo documentation



Picture 10: model 502124, whole view



Picture 11: LED driver



Picture 12: DC connector

Attachment 3: photo documentation



Picture 13: switch



Picture 14: wire entrance



Picture 15: internal view

Attachment 3: photo documentation



Picture 16: cord anchorage and LED module



Picture 17: model: 505055, whole view



Picture 18: LED driver

Attachment 3: photo documentation

Picture 19: wire entrance



Picture 20: touch switch



Picture 21: DC connector

Attachment 3: photo documentation



Picture 22: PCB of LED module



Picture 23: model: 505063, whole view

-----END OF TEST REPORT-----