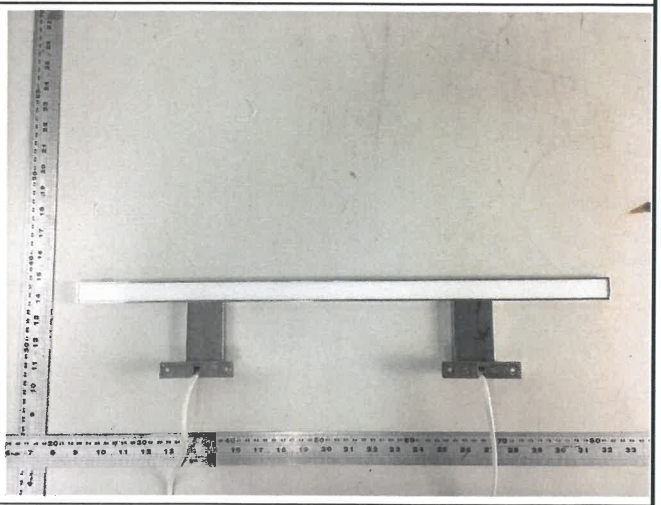
Prüfbericht-Nr.: *Test Report No.:*	**50085197 001**	**Auftrags-Nr.:** *Order No.:*	1160035834	Seite 1 von 47 *Page 1 of 47*
Kunden-Referenz-Nr.: *Client Reference No.:*	N/A	**Auftragsdatum:** *Order date:*	27.05.2017	
Auftraggeber: *Client:*	NINGBO JIAHANG ELECTRIC APPLIANCE CO., LTD. Zhangjiaying Village, Qiu'ai Town, Yinzhou District, Ningbo City P.R. China			
Prüfgegenstand: *Test item:*	LED MIRROR LIGHT			
Bezeichnung / Typ-Nr.: *Identification / Type No.:*	NC-LE71, NC-LE72, NC-LE78, NC-LE80			
Auftrags-Inhalt: *Order content:*	Type test			
Prüfgrundlage: *Test specification:*	EN 60598-1:2015 EN 60598-2-1:1989 EN 62471:2008 EN 62493:2010; EN 62493:2015 AfPS GS 2014:01 Par. 3.1			
Wareneingangsdatum: *Date of receipt:*	27.05.2017			
Prüfmuster-Nr.: *Test sample No.:*	A000578265			
Prüfzeitraum: *Testing period:*	05.07.2017 – 22.09.2017			
Ort der Prüfung: *Place of testing:*	TÜV Rheinland / CCIC (Ningbo) Co., Ltd.			
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland / CCIC (Ningbo) Co., Ltd.			
Prüfergebnis*: *Test result*:*	Pass			



geprüft von / *tested by*:

2017.09.22	Yuanda Mao / PE	Yuanda Mao
Datum *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*

kontrolliert von / *reviewed by*:

2017-09-22	Heiko Li / TC	
Datum *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*

Sonstiges / *Other*:
"Foreseeable use was considered. Currently neither a safeguard clause procedure has been invoked nor is an increase in accidents known for this/these product(s)."
Attachment list refer to page 4.

Zustand des Prüfgegenstandes bei Anlieferung: Prüfmuster vollständig und unbeschädigt
Condition of the test item at delivery: *Test item complete and undamaged*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
Legend:	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

Test Report issued under the responsibility of:

TÜVRheinland®

www.tuv.com

TEST REPORT
IEC 60598-2-1
Luminaires
Part 2: Particular requirements
Section 1: Fixed general purpose luminaires

Report Number. ..... :	**50085197 001**
Date of issue ..... :	See cover page
Total number of pages ..... :	See cover page
Name of Testing Laboratory preparing the Report ..... :	TÜV Rheinland / CCIC (Ningbo) Co., Ltd. 3F, Building C13, R&D Park, No.32 Lane 299 Guanghua Road, National Hi-Tech Zone, Ningbo 315048, P.R. China.
Applicant's name ..... :	NINGBO JIAHANG ELECTRIC APPLIANCE CO., LTD.
Address ..... :	Zhangjiaying Village, Qiu'ai Town, Yinzhou District, Ningbo City P.R. China
Test specification:	
Standard ..... :	IEC 60598-2-1 (ed.1), am1 used in conjunction with IEC 60598-1 (ed.8)
Test procedure ..... :	GS and CE LVD
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IEC60598_2_1E
Test Report Form(s) Originator .... :	Intertek Semko AB
Master TRF ..... :	2016-04

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.
This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description ..... :	LED MIRROR LIGHT
Trade Mark ..... :	N/A
Manufacturer ..... :	NINGBO JIAHANG ELECTRIC APPLIANCE CO., LTD. Zhangjiaying Village, Qiu'ai Town, Yinzhou District, Ningbo City P.R. China
Model/Type reference ..... :	NC-LE71, NC-LE72, NC-LE78, NC-LE80
Ratings ..... :	AC 220-240V, 50/60Hz, Class II, IP44 others see “General product information”

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):			
☒	**Testing Laboratory:**	TÜV Rheinland / CCIC (Ningbo) Co., Ltd.	
Testing location/ address.....:		3F, Building C13, R&D Park, No.32 Lane 299 Guanghua Road, National Hi-Tech Zone, Ningbo 315048, P.R. China	
☐	**Associated CB Testing Laboratory:**		
Testing location/ address.....:			
Tested by (name, function, signature).....:		See cover page	
Approved by (name, function, signature)...:		See cover page	
☐			
Testing location/ address.....:			
Tested by (name, function, signature).....:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: CTF Stage 2:**		
Testing location/ address.....:			
Tested by (name + signature).....:			
Witnessed by (name, function, signature) .:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: CTF Stage 3:**		
☐	**Testing procedure: CTF Stage 4:**		
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: Acceptance test for LED driver (40 pages).
Attachment 2: Assessment of lighting equipment related to photobiological safety, testing report according to EN62471:2008(18 pages).
Attachment 3: Equipment list (4 pages).
Attachment 4: PAH material list (filled by manufactory, 1 page).
Attachment 5: PAH material list (filled by TUV engineer, 1 page).
Attachment 6: For assessment of lighting equipment related to human exposure to electromagnetic fields according to EN 62493:2010 and EN 62493:2015 (report No: 50098017 001(11 pages)).

Summary of testing:

NC-LE80 has two drivers and two LED module circuits, the driver and each LED module are same as it in NC-LE78.

Tests performed (name of test and test clause):

NC-LE78 selected to perform thermal tests.
Other tests performed on all types.

NC-LE78 with highest colour temperature and highest luminance was selected to perform the test of IEC TR 62778: 2014. Details refer to page 45 - 46.

Testing result: Pass.

Testing location:

TÜV Rheinland / CCIC (Ningbo) Co., Ltd.
3F, Building C13, R&D Park, No.32 Lane 299 Guanghua Road, National Hi-Tech Zone, Ningbo 315048, P.R. China

Summary of compliance with National Differences:

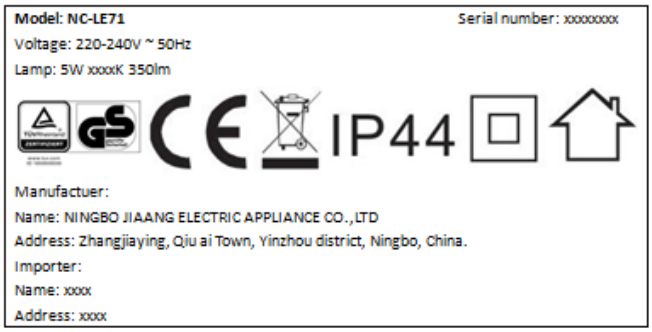
EU Group Differences.

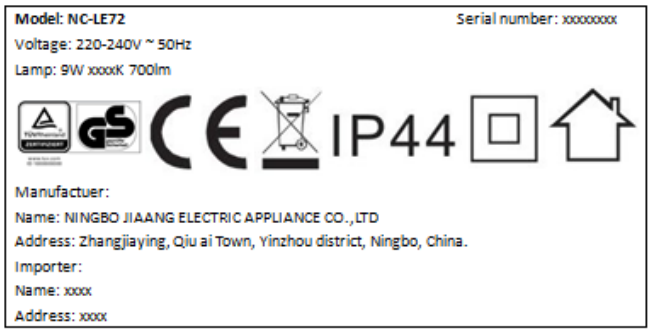
☒ **The product fulfils the requirements of EN 60598-2-1:1989 used in conjunction with EN 60598-1:2015.**

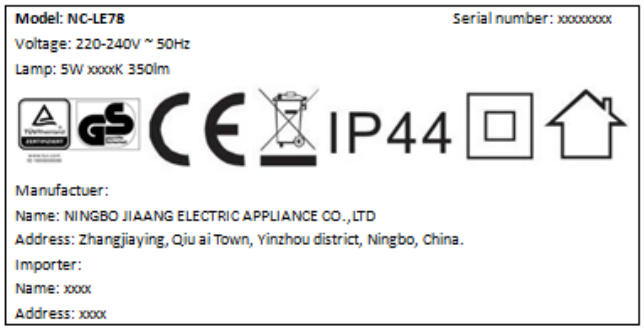
Copy of marking plate:

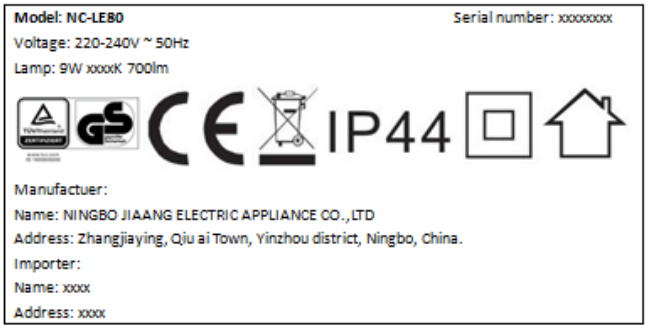
The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

English version:

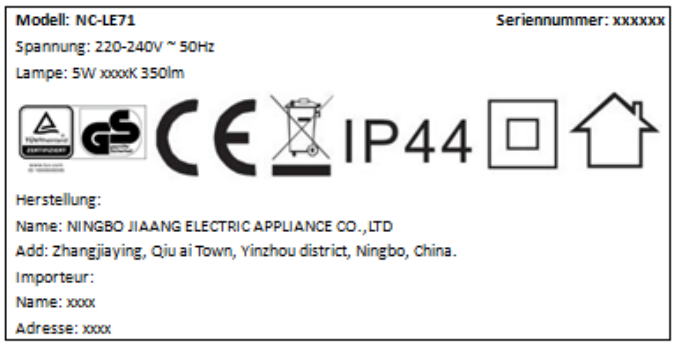


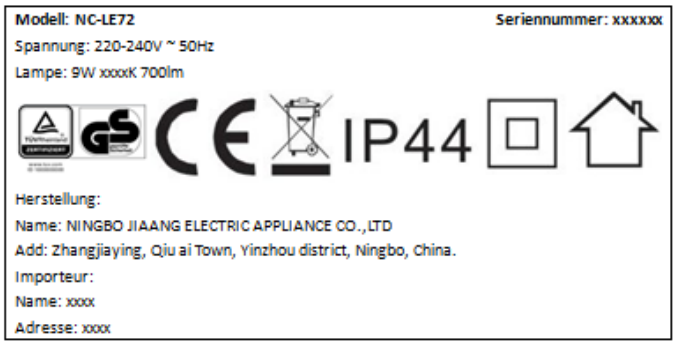


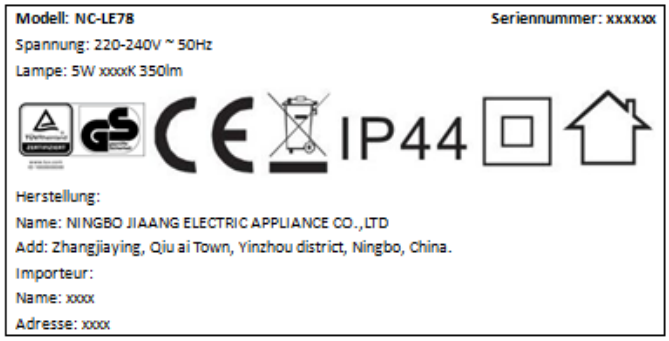


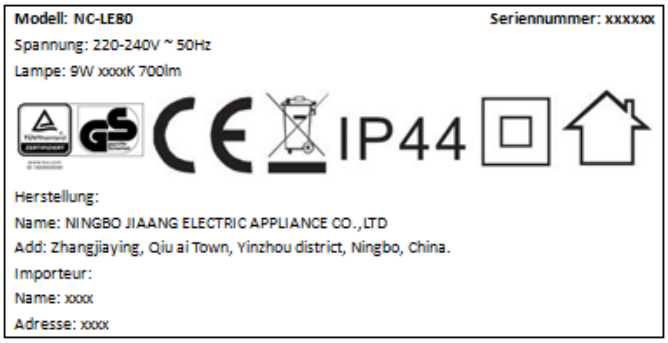


Germany version:









Remark: 1. xxxxK=3000K, 4000K, 5000K, 6000K; It means the color temperature of the luminaire.

2. “Manufacture or/and his importer shall ensure product bears label requirements in article 6 and article 8 of the 2014/35/EU relate to name, batch number, post address prior place the product into EU market.”

Test item particulars.....:	LED MIRROR LIGHT, Fixed luminaire
Classification of installation and use.....:	Class II
Supply Connection.....:	Supply cords with connecting box
.....:	
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 .....:	See cover page
Date (s) of performance of tests.....:	See cover page

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

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 DUT is fixed Luminaires; lighting source is LED.
2. The DUT has built-in diver inside. The LED driver is with plastic enclosure and insulation tap outside.
3. Rated voltage: AC 220-240V, 50/60Hz; Class II appliance. IP44, only for indoor use.

Model	Rated wattage	Material of the enclosure	Amount of LED driver
NC-LE71	5W	Metal enclosure and plastic cover	1
NC-LE72	9W		2
NC-LE78	5W	Plastic enclosure and plastic cover	1
NC-LE80	9W		2

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.2 (0)	**GENERAL TEST REQUIREMENTS**		P
1.2 (0.1)	Information for luminaire design considered ..... :	Yes ☒ No ☐ Lamp standard: --	—
1.2 (0.3)	More sections applicable..... :	Yes ☐ No ☒ Section/s:	—

1.4 (2)	**CLASSIFICATION OF LUMINAIRES**		P
1.4 (2.2)	Type of protection ..... :	Class II	P
1.4 (2.3)	Degree of protection..... :	IP44	P
1.4 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces ..... :	Yes ☒ No ☐	—
1.4 (2.5)	Luminaire for normal use ..... :	Yes ☒ No ☐	—
	Luminaire for rough service ..... :	Yes ☐ No ☒	—

1.5 (3)	**MARKING**		P
1.5 (3.2)	Mandatory markings		P
	Position of the marking	Marking on the enclosure	P
	Format of symbols/text		P
1.5 (3.3)	Additional information	Mention in instruction manual	P
	Language of instructions	English version and German version	P
1.5 (3.3.1)	Combination luminaires		N/A
1.5 (3.3.2)	Nominal frequency in Hz	50Hz	P
1.5 (3.3.3)	Operating temperature		N/A
1.5 (3.3.4)	Symbol or warning notice	Suitable for putting on a normally flammable surface	N/A
1.5 (3.3.5)	Wiring diagram		P
1.5 (3.3.6)	Special conditions		N/A
1.5 (3.3.7)	Metal halide lamp luminaire – warning		N/A
1.5 (3.3.8)	Limitation for semi-luminaires		N/A
1.5 (3.3.9)	Power factor and supply current		N/A
1.5 (3.3.10)	Suitability for use indoors		P
1.5 (3.3.11)	Luminaires with remote control		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.5 (3.3.12)	Clip-mounted luminaire – warning		N/A
1.5 (3.3.13)	Specifications of protective shields		N/A
1.5 (3.3.14)	Symbol for nature of supply	~	P
1.5 (3.3.15)	Rated current of socket outlet		N/A
1.5 (3.3.16)	Rough service luminaire		N/A
1.5 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments	Type Z	P
1.5 (3.3.18)	Non-ordinary luminaires with PVC cable		N/A
1.5 (3.3.19)	Protective conductor current in instruction if applicable		N/A
1.5 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N/A
1.5 (3.3.21)	Non replaceable and non-user replaceable light sources information provided	Non-replaceable light sources	P
	Cautionary symbol		N/A
1.5 (3.3.22)	Controllable luminaires, classification of insulation provided		N/A
1.5 (3.4)	Test with water	15s	P
	Test with hexane	15s	P
	Legible after test		P
	Label attached	Not be easily removable, show no curling	P
1.6 (4)	**CONSTRUCTION**		P
1.6 (4.2)	Components replaceable without difficulty		N/A
1.6 (4.3)	Wireways smooth and free from sharp edges		P
1.6 (4.4)	**Lampholders**		N/A
1.6 (4.4.1)	Integral lampholder		N/A
1.6 (4.4.2)	Wiring connection		N/A
1.6 (4.4.3)	Lampholder for end-to-end mounting		N/A
1.6 (4.4.4)	Positioning		N/A
	- pressure test (N) ..... :		—
	After test the lampholder comply with relevant standard sheets and show no damage		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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
1.6 (4.4.5)	Peak pulse voltage		N/A
1.6 (4.4.6)	Centre contact		N/A
1.6 (4.4.7)	Parts in rough service luminaires resistant to tracking		N/A
1.6 (4.4.8)	Lamp connectors		N/A
1.6 (4.4.9)	Caps and bases correctly used		N/A
1.6 (4.4.10)	Light source for lampholder or connection according IEC 60061 not connected another way		N/A
1.6 (4.5)	**Starter holders**		N/A
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A
1.6 (4.6)	**Terminal blocks**		N/A
	Tails		N/A
	Unsecured blocks		N/A
1.6 (4.7)	**Terminals and supply connections**		P
1.6 (4.7.1)	Contact to metal parts	Fixed luminaire that can't be adjusted	N/A
1.6 (4.7.2)	Test 8 mm live conductor		N/A
	Test 8 mm earth conductor		N/A
1.6 (4.7.3)	Terminals for supply conductors		P
1.6 (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 15.6.3.2.3 and 15.6.3.2.4		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.7.4)	Terminals other than supply connection		N/A
1.6 (4.7.5)	Heat-resistant wiring/sleeves		N/A
1.6 (4.7.6)	Multi-pole plug		N/A
	- test at 30 N		N/A
1.6 (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
1.6 (4.9)	**Insulating lining and sleeves**		P
1.6 (4.9.1)	Retainment		P
	Method of fixing ..... :	Glue used	P
1.6 (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
1.6 (4.10)	**Double or reinforced insulation**		P
1.6 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		P
	Safe installation fixed luminaires		P
	Capacitors and switches		N/A
	Interference suppression capacitors according to IEC 60384-14		N/A
1.6 (4.10.2)	Assembly gaps:		P
	- not coincidental		N/A
	- no straight access with test probe		P
1.6 (4.10.3)	Retainment of insulation:		P
	- fixed		P
	- unable to be replaced; luminaire inoperative		P
	- sleeves retained in position		N/A
	- lining in lampholder		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6 (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
1.6 (4.11)	**Electrical connections and current-carrying parts**		P
1.6 (4.11.1)	Contact pressure	Compliance check	P
1.6 (4.11.2)	Screws:		P
	- self-tapping screws	Not be used for the connection of current-carry part	P
	- thread-cutting screws	Not found use thread cutting screws	P
1.6 (4.11.3)	Screw locking:		N/A
	- spring washer		N/A
	- rivets		N/A
1.6 (4.11.4)	Material of current-carrying parts		P
1.6 (4.11.5)	No contact to wood or mounting surface		P
1.6 (4.11.6)	Electro-mechanical contact systems		N/A
1.6 (4.12)	**Screws and connections (mechanical) and glands**		P
1.6 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		P
	Torque test: torque (Nm); part..... :	0,5Nm, Enclosure fixed screw	P
	Torque test: torque (Nm); part..... :	0,6Nm, Mounting surface fixed screw (plastic)	P
	Torque test: torque (Nm); part..... :	0,5Nm; Cord anchorage screw	P
1.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
1.6 (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
1.6 (4.12.5)	Screwed glands; force (Nm)..... :		N/A
1.6 (4.13)	**Mechanical strength**		P

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm) ..... :	No fragile parts	N/A
	- other parts; energy (Nm)..... :	0,35Nm for enclosure & cover	P
	1) live parts	Not have become accessible	P
	2) linings	Not have been impaired	P
	3) protection	Continue to afford the degree of the degree of protection	P
	4) covers	No breaking	P
1.6 (4.13.3)	Straight test finger	30N	P
1.6 (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
1.6 (4.13.6)	Tumbling barrel		N/A
1.6 (4.14)	**Suspensions, fixings and means of adjusting**		P
1.6 (4.14.1)	Mechanical load:		P
	A) four times the weight	NC-LE72: 4x1,51N=6,04N; NC-LE80: 4x3,52N=14,08N	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
1.6 (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

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Bending moment (Nm) of semi-luminaire ..... :		N/A
1.6 (4.14.3)	Adjusting devices:		N/A
	- flexing test; number of cycles..... :		N/A
	- strands broken ..... :		N/A
	- electric strength test afterwards		N/A
1.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N/A
1.6 (4.14.5)	Guide pulleys		N/A
1.6 (4.14.6)	Strain on socket-outlets		N/A
1.6 (4.15)	**Flammable materials**		P
	- glow-wire test 650°C ..... :	See Test Table 1.15 (13.3.2)	P
	- spacing ≥30 mm		N/A
	- screen withstanding test of 13.3.1		N/A
	- screen dimensions		N/A
	- no fiercely burning material		P
	- thermal protection		N/A
	- electronic circuits exempted		N/A
1.6 (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
1.6 (4.16)	**Luminaires for mounting on normally flammable surfaces**		P
	No lamp control gear ..... :	(compliance with Section 12)	N/A
1.6 (4.16.1)	Lamp control gear spacing:		P
	- spacing 35 mm	Electronic control gear	N/A
	- spacing 10 mm		N/A
1.6 (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
1.6 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.17)	**Drain holes**		N/A
	Clearance at least 5 mm		N/A
1.6 (4.18)	**Resistance to corrosion**		P
1.6 (4.18.1)	- rust-resistance		N/A
1.6 (4.18.2)	- season cracking in copper		N/A
1.6 (4.18.3)	- corrosion of aluminium		P
1.6 (4.19)	Ignitors compatible with ballast		N/A
1.6 (4.20)	Rough service vibration		N/A
1.6 (4.21)	**Protective shield**		N/A
1.6 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N/A
	Shield of glass if tungsten halogen lamps		N/A
1.6 (4.21.2)	Particles from a shattering lamp not impair safety		N/A
1.6 (4.21.3)	No direct path		N/A
1.6 (4.21.4)	Impact test on shield		N/A
	Glow-wire test on lamp compartment..... :	See Test Table 1.15 (13.3.2)	N/A
1.6 (4.22)	Attachments to lamps not cause overheating or damage		N/A
1.6 (4.23)	Semi-luminaires comply Class II		N/A
1.6 (4.24)	**Photobiological hazards**		P
1.6 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		N/A
1.6 (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

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Clause	Requirement + Test	Result - Remark	Verdict
	Portable luminaires for children IEC 60598-2-10 and Mains socket outlet nightlights IEC 60598-2-12 not exceed RG1 at 200 mm according to IEC/62778		N/A
1.6 (4.25)	**Mechanical hazard**		P
	No sharp point or edges		P
1.6 (4.26)	**Short-circuit protection**		N/A
1.6 (4.26.1)	Adequate means of uninsulated accessible SELV parts		N/A
1.6 (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
1.6 (4.27)	**Terminal blocks with integrated screwless earthing contacts**		N/A
	Test according Annex V		N/A
	Pull test of terminal fixing (20 N)		N/A
	After test, resistance < 0,05 Ω		N/A
	Pull test of mechanical connection (50 N)		N/A
	After test, resistance < 0,05 Ω		N/A
	Voltage drop test, resistance < 0,05 Ω		N/A
1.6 (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
1.6 (4.29)	**Luminaires with non-replaceable light source**		P
	Not possible to replace light source		P
	Live part not accessible after parts have been opened by hand or tools		N/A
1.6 (4.30)	**Luminaires with non-user replaceable light source**		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	If protective cover provide protection against electric shock and marked with “caution, electric shock risk” symbol:		N/A
	Minimum two fixing means		N/A
1.6 (4.31)	**Insulation between circuits**		P
	Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3		P
	Controllable luminaires requiring same level of insulation for all components, the insulation between control terminals and LV supply fulfil requirements according 4.31.1 – 4.31.3		N/A
1.6 (4.31.1)	SELV circuits		P
	Used SELV source		N/A
	Voltage ≤ ELV		P
	Insulating of SELV circuits from LV supply		P
	Insulating of SELV circuits from other non SELV circuits		N/A
	Insulating of SELV circuits from FELV		N/A
	Insulating of SELV circuits from other SELV circuits		P
	SELV circuits insulated from accessible parts according Table X.1		P
	Plugs not able to enter socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A
	Plugs and socket-outlets does not have protective conductor contact		N/A
1.6 (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

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Clause	Requirement + Test	Result - Remark	Verdict
	Socket-outlets does not have protective conductor contact		N/A
1.6 (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
1.6 (4.32)	**Overvoltage protective devices**		N/A
	Comply with IEC 61643-11		N/A
	External to controlgear and connected to earth:		N/A
	- only in fixed luminaires		N/A
	- only connected to protective earth		N/A

1.7 (11)	**CREEPAGE DISTANCES AND CLEARANCES**		P
1.7 (11.2)	Creepage distances and clearances..... :	See Table 1.7 (11.2)	P
	Impulse withstand category (Normal category II) (Category III Annex U, Table U.1)	Category II ☒ Category III ☐	—

1.8 (7)	**PROVISION FOR EARTHING**		N/A
1.8 (7.2.1 + 7.2.3)	Accessible metal parts		N/A
	Metal parts in contact with supporting surface		N/A
	Resistance < 0,5 Ω..... :		N/A
	Self-tapping screws used		N/A
	Thread-forming screws		N/A
	Thread-forming screw used in a grove		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Earth makes contact first		N/A
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
	Protective earthing of the luminaire not via built-in control gear		N/A
1.8 (7.2.2 + 7.2.3)	Earth continuity in joints, etc.		N/A
1.8 (7.2.4)	Locking of clamping means		N/A
	Compliance with 4.7.3		N/A
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
1.8 (7.2.5)	Earth terminal integral part of connector socket		N/A
1.8 (7.2.6)	Earth terminal adjacent to mains terminals		N/A
1.8 (7.2.7)	Electrolytic corrosion of the earth terminal		N/A
1.8 (7.2.8)	Material of earth terminal		N/A
	Contact surface bare metal		N/A
1.8 (7.2.10)	Class II luminaire for looping-in		N/A
	Double or reinforced insulation to functional earth		N/A
1.8 (7.2.11)	Earthing core coloured green-yellow		N/A
	Length of earth conductor		N/A
1.9 (14)	**SCREW TERMINALS**		N/A
	Separately approved; component list	(see Annex 1)	N/A
	Part of the luminaire	(see Annex 3)	N/A
1.9 (15)	**SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS**		N/A
	Separately approved; component list..... :	(see Annex 1)	N/A
	Part of the luminaire ..... :	(see Annex 4)	N/A
1.10 (5)	**EXTERNAL AND INTERNAL WIRING**		P
1.10 (5.2)	**Supply connection and external wiring**		P
1.10 (5.2.1)	Means of connection ..... :	Supply cords with connecting box	P

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Clause	Requirement + Test	Result - Remark	Verdict
	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
1.10 (5.2.2)	Type of cable ..... :	H03VVH2-F	P
	Nominal cross-sectional area (mm²) ..... :	2x0,75mm^2	P
	Cables equal to IEC 60227 or IEC 60245		N/A
1.10 (5.2.3)	Type of attachment, X, Y or Z	Type Z	P
1.10 (5.2.5)	Type Z not connected to screws		P
1.10 (5.2.6)	Cable entries:		P
	- suitable for introduction		P
	- adequate degree of protection		P
1.10 (5.2.7)	Cable entries through rigid material have rounded edges		P
1.10 (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
1.10 (5.2.9)	Locking of screwed bushings		N/A
1.10 (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 cables into knots etc.		P
	- insulating material or lining		N/A
1.10 (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

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Clause	Requirement + Test	Result - Remark	Verdict
	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
1.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		P
1.10 (5.2.10.3)	Tests:		P
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N) ..... :	60N	P
	- torque test: torque (Nm) ..... :	0,15Nm	P
	- displacement ≤ 2 mm		P
	- no movement of conductors		P
	- no damage of cable or cord		P
	- function independent of electrical connection		P
1.10 (5.2.11)	External wiring passing into luminaire		P
1.10 (5.2.12)	Looping-in terminals		N/A
1.10 (5.2.13)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		N/A
1.10 (5.2.14)	Mains plug same protection		N/A
	Class III luminaire plug		N/A
	No unsafe compatibility		N/A
1.10 (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
1.10 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
1.10 (5.2.18)	Used plug in accordance with		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- IEC 60083		N/A
	- other standard		N/A
1.10 (5.3)	**Internal wiring**		P
1.10 (5.3.1)	Internal wiring of suitable size and type	H05S-K, 1x0,5mm²; H03VVH2-F, 2x0,75mm²	P
	Through wiring		N/A
	- not delivered/ mounting instruction		N/A
	- factory assembled		N/A
	- socket outlet loaded (A) ..... :		N/A
	- temperatures ..... :	(see Annex 2)	N/A
	Green-yellow for earth only		N/A
1.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		P
	Cross-sectional area (mm²)..... :	0,75mm²	P
	Insulation thickness		P
	Extra insulation added where necessary		N/A
1.10 (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
1.10 (5.3.1.3)	Double or reinforced insulation for class II		P
1.10 (5.3.1.4)	Conductors without insulation		N/A
1.10 (5.3.1.5)	SELV current-carrying parts		N/A
1.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		N/A
1.10 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		N/A
	Joints, raising/lowering devices		N/A
	Telescopic tubes etc.		N/A
	No twisting over 360°		P
1.10 (5.3.3)	Insulating bushings:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- suitable fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- cables with protective sheath		N/A
1.10 (5.3.4)	Joints and junctions effectively insulated		N/A
1.10 (5.3.5)	Strain on internal wiring		P
1.10 (5.3.6)	Wire carriers		N/A
1.10 (5.3.7)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		N/A
1.11 (8)	**PROTECTION AGAINST ELECTRIC SHOCK**		P
1.11 (8.2.1)	Live parts not accessible		P
	Basic insulated parts not used on the outer surface without appropriate protection		P
	Basic insulated parts not accessible with standard test finger on portable, settable and adjustable luminaires		N/A
	Basic insulated parts not accessible with Ø 50 mm probe from outside, other types of luminaires		P
	Lamp and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements		N/A
	Basic insulation only accessible under lamp or starter replacement		N/A
	Protection in any position		P
	Double-ended tungsten filament lamp		N/A
	Insulation lacquer not reliable		P
	Double-ended high pressure discharge lamp		N/A
	Relevant warning according to 3.2.18 fitted to the luminaire		N/A
1.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N/A
1.11 (8.2.3.a)	Class II luminaire:		P
	- basic insulated metal parts not accessible during starter or lamp replacement		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- basic insulation not accessible other than during starter or lamp replacement		N/A
	- glass protective shields not used as supplementary insulation		N/A
1.11 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		N/A
1.11 (8.2.3.c)	SELV circuits with exposed current carrying parts:		N/A
	Ordinary luminaire:		N/A
	- voltage under load (V)..... :		N/A
	- no-load voltage (V)..... :		N/A
	- touch current if applicable (mA) ..... :		N/A
	One conductive part insulated if required		N/A
	Other than ordinary luminaire:		N/A
	- nominal voltage (V) ..... :		N/A
	Class III luminaire only for connection to SELV		N/A
	Class III luminaire not provided with means for protective earthing		N/A
1.11 (8.2.4)	Portable luminaire have protection independent of supporting surface		N/A
1.11 (8.2.5)	Compliance with the standard test finger or relevant probe		P
1.11 (8.2.6)	Covers reliably secured		P
1.11 (8.2.7)	Luminaire other than below with capacitor > 0,5 µF not exceed 50 V 1 min after disconnection		P
	Portable luminaire with capacitor > 0,1 µF (0.25) not exceed 34 V 1 s after disconnection		N/A
	Other luminaires with capacitor > 0,1 µF (0.25) with plug and track adaptors not exceed 60 V 5 s after disconnection		N/A

1.12 (12)	**ENDURANCE TEST AND THERMAL TEST**		P
1.12 (-)	If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 1.13		—
1.12 (12.3)	Endurance test:		P
	- mounting-position..... :	As in normal used	—

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Clause	Requirement + Test	Result - Remark	Verdict
	- test temperature (°C) ..... :	35±2°C	—
	- total duration (h) ..... :	240h	—
	- supply voltage: Un factor; calculated voltage (V)... :	264V	—
	- lamp used..... :	LED module used	—
1.12 (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
1.12 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
1.12 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	N/A
1.12 (12.6)	Thermal test (failed lamp control gear condition):		N/A
1.12 (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
1.12 (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
1.12 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
1.12 (12.7.1)	Luminaire without temperature sensing control		N/A
1.12 (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 1.15 (13.2.1)	N/A
1.12 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		N/A
	- case of abnormal conditions ..... :		—
	- measured winding temperature (°C): at 1,1 Un ..... :		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un ..... :		—
	- calculated temperature of fixing point/exposed part (°C) ..... :		—
	Ball-pressure test ..... :	See Table 1.15 (13.2.1)	N/A
1.12 (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
1.12 (12.7.2)	Luminaire with temperature sensing control		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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 1.15 (13.2.1)	N/A

1.13 (9)	**RESISTANCE TO DUST AND MOISTURE**		P
1.13 (-)	If IP > IP 20 the order of tests as specified in clause 1.12		P
1.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		
	- classification according to IP..... :	IP44	—
	- mounting position during test ..... :	In the most unfavourable position of normal use	—
	- fixing screws tightened; torque (Nm) ..... :	Enclosure fixed screw: 2/3x0,5Nm=0,33Nm	—
	- tests according to clauses..... :	Cl 9.2.0 and Cl 9.2.5	—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		N/A
	b) no talcum in dust-tight luminaire		N/A
	c) no trace of water on current-carrying parts or on insulation where it could become a hazard		P
	c.1) For luminaires without drain holes – no water entry		P
	c.2) For luminaires with drain holes – no hazardous water entry		N/A
	d) no water in watertight or pressure watertight luminaire		N/A
	e) no contact with live parts (IP 2X)		N/A
	e) no entry into enclosure (IP 3X and IP 4X)		P
	e) no contact with live parts through drain holes and ventilation slots (IP3X and IP4X)		N/A
	f) no trace of water on part of lamp requiring protection from splashing water		P
	g) no damage of protective shield or glass envelope		P

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Clause	Requirement + Test	Result - Remark	Verdict
1.13 (9.3)	Humidity test 48 h	25°C, 93,1%	P
1.14 (10)	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		P
1.14 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø ..... :	--	—
	Insulation resistance (MΩ) ..... :	See bellow	—
	SELV		P
	- between current-carrying parts of different polarity :		N/A
	- between current-carrying parts and mounting surface..... :	>500 MΩ	P
	- between current-carrying parts and metal parts of the luminaire..... :	>500 MΩ	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :		N/A
	- Insulation bushings as described in Section 5 ..... :		N/A
	Other than SELV		P
	- between live parts of different polarity ..... :	>500MΩ	P
	- between live parts and mounting surface ..... :	>500MΩ	P
	- between live parts and metal parts ..... :	>500MΩ	P
	- 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
1.14 (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) ..... :	See bellow	P
	SELV		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- between current-carrying parts of different polarity:		N/A
	- between current-carrying parts and mounting surface.....:	500V	P
	- between current-carrying parts and metal parts of the luminaire.....:	500V	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts.....:		N/A
	- Insulation bushings as described in Section 5 .....:		N/A
	Other than SELV		P
	- between live parts of different polarity .....:	1480V	P
	- between live parts and mounting surface .....:	2960V	P
	- between live parts and metal parts .....:	2960V	P
	- between live parts of different polarity through action of a switch.....:		N/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
1.14 (10.3)	Touch current or protective conductor current (mA).:	Max. 0,066mA	P

1.15 (13)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		P
1.15 (13.2.1)	Ball-pressure test .....:	See Test Table 1.15 (13.2.1)	P
1.15 (13.3.1)	Needle-flame test (10 s).....:	See Test Table 1.15 (13.3.1)	P
1.15 (13.3.2)	Glow-wire test (650°C) .....:	See Test Table 1.15 (13.3.2)	P
1.15 (13.4)	Proof tracking test (IEC 60112).....:	See Test Table 1.15 (13.4)	P

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

1.7 (11.2)	**TABLE: Creepage distances and clearances**							P
	Minimum distances (mm) for a.c. (50/60 Hz) sinusoidal voltages							P
	Applicable part of IEC 60598-1 Table 11.1* and 11.2*							P
	Insulation type **	**Measured clearance**	**Required**		**Measured creepage**	**Required**		
			clearance	***Table**		**creepage**	***Table**	
Distance 1:	B	Min. 5,4	1,5	11.1	Min. 5,4	2,5	11.1	
Working voltage (V) .....:					AC 220-240V			—
PTI .....:					< 600 ☒ ≥ 600 ☐			—
Pulse voltage if applicable (kV) .....:					2,5kV			—
Supplementary information: Current-carrying parts of different polarity								
Distance 2:	R	Min. 5,2	3,0	11.1	Min. 5,2	5,0	11.1	
Working voltage (V) .....:					AC 220-240V			—
PTI .....:					< 600 ☒ ≥ 600 ☐			—
Pulse voltage if applicable (kV) .....:					2,5kV			—
Supplementary information: Current-carrying parts and metal enclosure, Current-carrying parts and accessible parts.								
Distance 3:	--	--	--	--	--	--	--	
Working voltage (V) .....:					--			—
PTI .....:					< 600 ☐ ≥ 600 ☐			—
Pulse voltage if applicable (kV) .....:					--			—
Supplementary information: --								
Distance 4:	--	--	--	--	--	--	--	
Working voltage (V) .....:					--			—
PTI .....:					< 600 ☐ ≥ 600 ☐			—
Pulse voltage if applicable (kV) .....:					--			—
Supplementary information: --								

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

1.15 (13.2.1)	**TABLE: Ball Pressure Test of Thermoplastics**	P
Allowed impression diameter (mm) ..... :	2mm	—

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)
Plastic tube for driver	--	125°C	1,6mm
LED cover	--	76°C	1,3mm
Lamp plastic enclosure	--	78°C	1,3mm
PCB of driver	--	125°C	1,3mm
Bobbin	--	125°C	1,2mm
Supplementary information: --			

1.15 (13.3.1)	**TABLE: Needle-flame test (IEC 60695-11-5)**				P
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
Plastic tube for driver	--	10s	No	4,5s	P
Bobbin	--	10s	No	3,5s	P
PCB of driver	--	10s	No	2,5s	P
Supplementary information: --					

1.15 (13.3.2)	**TABLE: Glow-wire test (IEC 60695-2-11)**			P
Glow wire temperature ..... :	650°C			—
Object/ Part No./ Material	Manufacturer/ trademark	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
LED cover	--	No	0s	P
Lamp plastic enclosure	--	No	0s	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: --				

1.15 (13.4)	**TABLE: Proof tracking test (IEC 60112)**	**P**
Test voltage PTI ..... :	175 V	—

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens			Verdict
PCB of driver	--	P	P	P	P
Bobbin	--	P	P	P	P
Supplementary information: --					

IEC 60598-2-1			
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)]**
Connecting box	B	SHENZHEN GREENWAY ELECTRONIC CO.,LTD	M654	250VAC, IP54	EN 60670-22 EN 60670-1+A1	TUV SUD B 17 09 90250 017
Power cord	B	Ningbo Liansheng Wire & Cable Co., Ltd	H05VVH2-F	2x0,75mm²	EN 50525-2-11	VDE 40022054
LED driver	C	Ningbo Jiangbei Saiyuan Electronics Co., Ltd.	Sy009	Input: 220-240V, 50Hz; Output: 11,8-12,8V, 300mA, no load voltage: 22V	EN 61347-1 EN 61347-2-13	Test with appliance
Plastic tube for LED driver	C	Ningbo Yinzhou Wuxiang zhusheng stamping factory	ZS-006	PC	EN 60598-1 EN 60598-2-1	Test with appliance
Insulation tape around LED driver	B	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD	CT-280B	Yellow, 150°C	EN 60598-1 EN 60598-2-1	Test with appliance and UL E165111
Fuse	B	Anhui Changsheng Electronics Co.,Ltd.	RXF21-1W	1W, 5,1Ω	EN 60065	VDE 40024768
CX1	B	HUIZHOU CITY YUXINYUAN ELECTRONICS CO., LTD	MKP	X2, 47nF, 400V, 40/110/65	EN 60384-14	VDE 40045442
CY1	B	Jyh Chung Electronic Co., Ltd.	JD	Y1, 1nF, 400V, 40/110/65	EN 60384-14	VDE 137027
Transformer	C	Haining haoyi Electronic Co., LTD	EFD15	N1: 111T(φ0,13x1); N2: 25T(φ0,30x1);	EN 61347-1 EN 61347-2-13	Test with appliance

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

Pri. winding of T1	B	ZHEJIANG HONGBO TECHNOLOGY CO LTD	QA-2/155	155°C	EN 61347-1 EN 61347-2-13	Test with appliance and UL E221719
Sec. winding of T1	B	Fuyang Youheng Cable Co.,LTD	YH-F	155°C	EN 60950-1+A11+A1+A12+A2	VDE 40041248
Bobbin of T1	C	CHANSHU SOUTH-EAST PLASTIC CO.,LTD	PF2AF-151J(b)	V-0	EN 61347-1 EN 61347-2-13	Test with appliance and UL E136137
Insulation tape of T1	B	JINGJIANG JINGYI ADHESIVE PRODUCT CO LTD	CT-280B	Yellow, 130°C	EN 61347-1 EN 61347-2-13	Test with appliance and UL E165111
Teflon tube	B	CHANGYUAN ELECTRONICS GROUP CO LTD	LING FREE PTFE TUBE	Max Voltage: 600V, 200°C	EN 61347-1 EN 61347-2-13	Test with appliance and UL E352366
PCB of driver	C	WENZHOU RUIHAO ELECTRONICS CO LTD	RH-M	130°C, V-0	EN 61347-1 EN 61347-2-13	Test with appliance and UL E339059
LED chip	C	XIAMEN DACOL PHOTOELECTRONICS TECHNOLOGY CO.,LTD.	TOP 2835	DC-P2835Wxx-xx-E; IF: 60mA; VF: 2,9V-3,3V	IEC TR 62778 EN 62471	Test with appliance
Driver output wire	B	CIXI SHUANGHONG WIRE CO., LTD.	H05S-K	1x0,5mm²	EN 50525-2-41	VDE 40017324
Luminaire plastic enclosure	C	ZhenJiang Chi Mei Chemical Co., Ltd	PA-726M	ABS	EN 60598-1 EN 60598-2-1	Test with appliance
LED cover	C	CIXI Miao Heng Plastic Products Co.Ltd	MH-1	PC	EN 60598-1 EN 60598-2-1	Test with appliance

IEC 60598-2-1			
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 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12		P
	Type reference ..... :	NC-LE78	—
	Lamp used..... :	LED module used	—
	Lamp control gear used..... :	--	—
	Mounting position of luminaire ..... :	In the most unfavourable position of normal use	—
	Supply wattage (W) ..... :	5,6W	—
	Supply current (A) ..... :	0,047A	—
	Calculated power factor..... :	--	—
	Table: measured temperatures corrected for ta = 25 °C:		P
	- abnormal operating mode ..... :	N/A	—
	- test 1: rated voltage..... :	N/A	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage..... :	1,06 times rated voltage: 1,06x240V=254,4V	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ..... :	N/A	—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage..... :	N/A	—
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :	N/A	—

Temperature measurements, (°C)

Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Power cord	--	--	38,2	--	90	--	--
CX1	--	--	48,0	--	110	--	--
EC1	--	--	52,1	--	105	--	--
EC2	--	--	54,9	--	105	--	--
Pri. winding of T1	--	--	66,7	--	155	--	--
Sec. winding of T1	--	--	65,9	--	155	--	--
Bobbin of T1	--	--	67,0	--	Cl.13.2.1	--	--
Insulation tape	--	--	65,7	--	130	--	--

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

PCB	--	--	66,1	--	130	--	--
CY1	--	--	65,0	--	110	--	--
Output wire	--	--	65,8	--	90	--	--
Driver enclosure	--	--	57,7	--	Cl. 13.2.1	--	--
LED board	--	--	51,2	--	For reference	--	--
Front cover	--	--	51,0	--	Cl. 13.2.1	--	--
Lamp enclosure near driver	--	--	48,1	--	Cl.13.2.1	--	--
Lamp enclosure beside LED board	--	--	53,2	--	Cl.13.2.1	--	--
Mounting surface	--	--	26,2	--	90	--	--
Ambient temperature	--	--	25,0	--	--	--	--
Supplementary information: --							

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 3	**Screw terminals (part of the luminaire)**		N/A
(14)	**SCREW TERMINALS**		N/A
(14.2)	Type of terminal.....:		—
	Rated current (A).....:		—
(14.3.2.1)	One or more conductors		N/A
(14.3.2.2)	Special preparation		N/A
(14.3.2.3)	Terminal size		N/A
	Cross-sectional area (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 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 4	**Screwless terminals (part of the luminaire)**		N/A
(15)	**SCREWLESS TERMINALS**		N/A
(15.2)	Type of terminal.....:		—
	Rated current (A).....:		—
(15.3.1)	Material		N/A
(15.3.2)	Clamping		N/A
(15.3.3)	Stop		N/A
(15.3.4)	Unprepared conductors		N/A
(15.3.5)	Pressure on insulating material		N/A
(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
(15.5.1)	Terminals internal wiring		N/A
(15.5.1.1)	Pull test spring-type terminals (4 N, 4 samples) .....:		N/A
(15.5.1.2)	Pull test pin or tab terminals (4 N, 4 samples) .....:		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 external wiring		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

	Terminal size and rating		N/A
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) .....:		N/A
	Pull test pin or tab terminals (4 samples); pull (N) .....:		N/A

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

IEC60598_2_1E - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 60598-2-1
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES
Luminaires
Part 2: Particular requirements
Section 1: Fixed general purpose luminaires

Differences according to.....:	EN 60598-2-1:1989 used in conjunction with EN 60598-1:2015
Annex Form No.....:	EU_GD_IEC60598_2_1E
Annex Form Originator.....:	OVE
Master Annex Form.....:	2015-04

	CENELEC COMMON MODIFICATIONS (EN)		P
1.5 (3)	**MARKING**		P
1.5 (3.3.101)	For luminaires not supplied with terminal block: Adequate warning on the package		P
1.6 (4)	**CONSTRUCTION**		P
1.6 (4.11.6)	Electro-mechanical contact systems		P
1.10 (5)	**EXTERNAL AND INTERNAL WIRING**		P
1.10 (5.2.1)	Connecting leads		N/A
	- without a means for connection to the supply		N/A
	- terminal block specified		N/A
	- relevant information provided		N/A
	- compliance with 4.6, 4.7.1, 4.7.2, 4.10.1, 11.2, 12 and 13.2 of Part 1		N/A
1.10 (5.2.2)	Cables equal to EN 50525		N/A
	Replace table 5.1 – Supply cord		N/A

IEC60598_2_1E - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

1.12 (12)	**ENDURANCE TESTS AND THERMAL TESTS**		P
1.12 (12.4.2c)	Thermal test (normal operation) see footnote c to table 12.2 relating to unsleeved fixed wiring		N/A

ZB	**ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)**		N/A
(3.3)	DK: power supply cords of class I luminaires with label		N/A
(4.5.1)	DK: socket-outlets		N/A
(5.2.1)	CY, DK, FI, GB: type of plug		N/A

ZC	**ANNEX ZC, NATIONAL DEVIATIONS (EN)**		N/A
(4 & 5)	FR: Shuttered socket-outlets 10/16A		N/A
	FR: Safety requirements for high buildings (Arrêté du 30 décembre 2011 portant règlement de sécurité pour la construction des immeubles de grande hauteur et leur protection contre les risques d'incendie et de panique; Section VIII; Article GH 48, Eclairage) Glow-wire test for outer parts of luminaires:		N/A
	- 850°C for luminaires in stairways and horizontal travel paths		N/A
	- 650°C for indoor luminaires		N/A
	GB: Requirements according to United Kingdom Building Regulation		N/A

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict

13 (14)	**FAULT CONDITIONS**		P
13.2	**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

IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict

7	**MEASUREMENT INFORMATION FLOW**		**P**
7.1	**Basic flow**		**P**
	'Law of conservation of luminance' applied		P
	Use of only true luminance/radiance values		P
	In case of luminaire: The light source is operated in the luminaire under similar conditions as when tested as a component		P
	In case E_{thr} value for RG2 was established the peak value was derived from angular light distribution		P
7.2	**Conditions for the radiance measurement**		**P**
	Standard condition applied (200mm distance, 0,011rad field of view)	Tested at 200mm	P
	Non-standard condition applied		N/A
7.3	**Special cases (I): Replacement by a lamp or LED module of another type**		**N/A**
	Light source is a white light source		N/A
	Evaluation done based on highest luminance		N/A
	Evaluation done based on CCT value		N/A
7.4	**Special cases (II): Arrays and clusters of primary light sources**		**P**
	LED package is evaluated as ..... :	☒ RG0 unlimited ☐ RG1 unlimited	P
	E_{thr} of LED package applies to array		P
8	**RISK GROUP CLASSIFICATION**		**P**
	Risk group achieved:		P
	- .. Risk Group 0 unlimited	RG0	P
	- .. Risk Group 1 unlimited		N/A
	- E_{thr} ..... (lx) : Distance to reach RG1 ..... (m) :		N/A

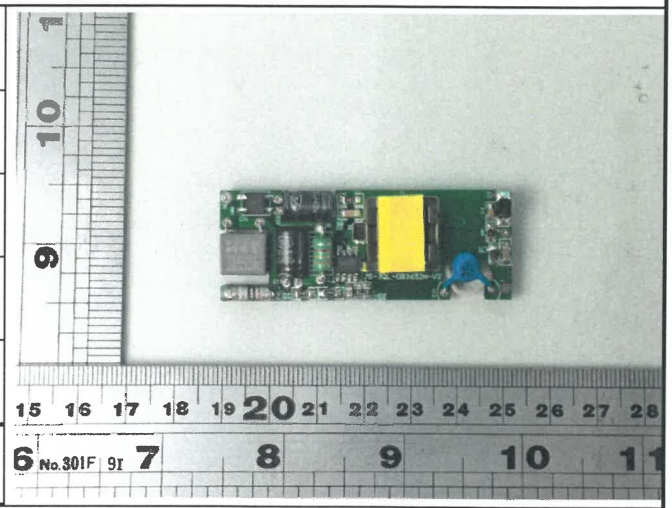
IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict

	TABLE: Spectroradiometric measurement		P
	Measurement performed on:	☐ **LED package** ☐ **LED module** ☐ **Lamp** ☒ **Luminaire**	
	Model number.....	NC-LE78	
	Test voltage (V)	AC 240V	—
	Test current (mA)	0,4773mA	—
	Test frequency (Hz).....	50Hz	—
	Ambient, t (°C)	23,7°C	—
	Measurement distance.....	☒ 20 cm ☐ ... cm	—
	Source size	☒ Non-small ☐ Small : .... mm	—
	Field of view	☒ 100 mrad ☐ 11 mrad ☐ 1,7 mrad (for small sources)	—

Item	Symbol	Units	Result	Remark
Correlated colour temperature	CCT	K	N/A	N/A
x/y colour coordinates	--	--	N/A / N/A	N/A
Blue light hazard radiance	L_B	$W/(m^2 \cdot sr^1)$	$1{,}900x10^1$	N/A
Blue light hazard irradiance	E_B	W/m^2	N/A	N/A
Luminance	L	cd/m^2	$3{,}445x10^4$	N/A
Illuminance	E	lx	N/A	N/A
Supplementary information: N/A				

Prüfbericht-Nr.: *Test Report No.:*	**Attachment 1 of 50085197 001**	**Auftrags-Nr.:** *Order No.:*	1160035834	Seite 1 von 39 *Page 1 of 39*
Kunden-Referenz-Nr.: *Client Reference No.:*	N/A	**Auftragsdatum:** *Order date:*	27.05.2017	
Auftraggeber: *Client:*	NINGBO JIAHANG ELECTRIC APPLIANCE CO., LTD. Zhangjiaying Village, Qiu'ai Town, Yinzhou District, Ningbo City P.R. China			
Prüfgegenstand: *Test item:*	LED Driver			
Bezeichnung / Typ-Nr.: *Identification / Type No.:*	Sy009			
Auftrags-Inhalt: *Order content:*	Acceptance test			
Prüfgrundlage: *Test specification:*	EN 61347-1:2015 EN 61347-2-13:2014			

Wareneingangsdatum: *Date of receipt:*	27.05.2017
Prüfmuster-Nr.: *Test sample No.:*	A000578265
Prüfzeitraum: *Testing period:*	05.07.2017 – 06.09.2017
Ort der Prüfung: *Place of testing:*	TÜV Rheinland / CCIC (Ningbo) Co., Ltd.
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland / CCIC (Ningbo) Co., Ltd.
Prüfergebnis*: *Test result*:*	Pass



geprüft von / *tested by*:

2017.09.06 Yuanda Mao / PE Yuanda Mao

Datum *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*

kontrolliert von / *reviewed by*:

2017.09.11 Chengchao Hunag / TC Chengchao Hunag

Datum *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*

Sonstiges / *Other*: Acceptance test

Zustand des Prüfgegenstandes bei Anlieferung: Prüfmuster vollständig und unbeschädigt
Condition of the test item at delivery: *Test item complete and undamaged*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
Legend:	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

Test Report issued under the responsibility of:

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TEST REPORT
IEC 61347-2-13
Part 2: Particular requirements:
Section 13 – d.c. or a.c. supplied electronic controlgear for LED modules

Report Number. .....:	Attachment 1 of 50085197 001
Date of issue .....:	See cover page
Total number of pages.....	See cover page
Name of Testing Laboratory preparing the Report.....:	TÜV Rheinland / CCIC (Ningbo) Co., Ltd. 3F, Building C13, R&D Park, No.32 Lane 299 Guanghua Road, National Hi-Tech Zone, Ningbo 315048, P.R. China
Applicant's name.....:	NINGBO JIAHANG ELECTRIC APPLIANCE CO., LTD.
Address .....:	Zhangjiaying Village, Qiu'ai Town, Yinzhou District, Ningbo City P.R. China
Test specification:	
Standard .....:	IEC 61347-2-13:2014 used in conjunction with IEC 61347-1:2015
Test procedure .....:	Acceptance test
Non-standard test method……..:	N/A
Test Report Form No.....:	IEC61347_2_13F
Test Report Form(s) Originator.....:	Intertek Semko AB
Master TRF.....:	2016-10

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 .....:	LED Driver
Trade Mark .....:	N/A
Manufacturer.....:	NINGBO JIAHANG ELECTRIC APPLIANCE CO., LTD. Zhangjiaying Village, Qiu'ai Town, Yinzhou District, Ningbo City P.R. China
Model/Type reference .....:	Sy009
Ratings .....:	AC 220-240V, 50Hz, Details in “General product information”

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):			
☒	**Testing Laboratory:**	TÜV Rheinland / CCIC (Ningbo) Co., Ltd.	
Testing location/ address ..... :		3F, Building C13, R&D Park, No.32 Lane 299 Guanghua Road, National Hi-Tech Zone, Ningbo 315048, P.R. China	
Tested by (name, function, signature) ..... :		See cover page	
Approved by (name, function, signature) .. :		See cover page	
☐	**Testing procedure: CTF Stage 1:**		
Testing location/ address ..... :			
Tested by (name, function, signature) ..... :			
Approved by (name, function, signature) .. :			
☐	**Testing procedure: CTF Stage 2:**		
Testing location/ address ..... :			
Tested by (name + signature) ..... :			
Witnessed by (name, function, signature). :			
Approved by (name, function, signature) .. :			
☐	**Testing procedure: CTF Stage 3:**		
☐	**Testing procedure: CTF Stage 4:**		
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):

N/A

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
Acceptance tests performed within the appliance. **Result: Pass.**	**TÜV Rheinland / CCIC (Ningbo) Co., Ltd.** **3F, Building C13, R&D Park, No.32 Lane 299 Guanghua Road, National Hi-Tech Zone, Ningbo 315048, P.R. China**

Summary of compliance with National Differences:

List of countries addressed: EU Group Differences.

☒ **The product fulfils the requirements of EN 61347-2-13:2014 used in conjunction with EN 61347-1:2015.**

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.

N/A

Test item particulars .....:	LED Driver
Classification of installation and use.....:	Built-in
Supply Connection.....:	Supply cords
.....:	
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 .....:	See cover page
Date (s) of performance of tests .....:	See cover page

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 61347-1

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. LED drivers are intended to be built-in use, suitable for use together with LED lighting source.
2. Isolating control gear. Input voltage: AC 220-240V, 50Hz; Output: SELV, 11,8V-12,8V, 300mA, no load voltage: Max. 22V;

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
4 (4)	**GENERAL REQUIREMENTS**		P
- (4)	Insulation materials according requirements in Annex N of IEC 61347-1	(see Annex N)	N/A
- (4)	Compliance of independent controlgear enclosure with IEC 60 598-1		N/A
- (4)	Built-in electronic controlgear with double or reinforced insulation comply with Annex O of IEC 61347-1	(see Annex O)	N/A
4 (4)	SELV controlgear comply with Annex I of this part 2 and Annex L of IEC 61347-1	(see Annex L)	P
4 (-)	Transformer comply with IEC 61558		P
	Dielectric strength test of insulated winding wires is limited to 3 kV if input voltage ≤ 300 V		P
6 (6)	**CLASSIFICATION**		P
	Built-in controlgear ..... :	Yes ☒ No ☐	—
	Independent controlgear ..... :	Yes ☐ No ☒	—
	Integral controlgear ..... :	Yes ☐ No ☒	—
6 (-)	Auto-wound controlgear ..... :	Yes ☐ No ☒	—
	Separating controlgear ..... :	Yes ☐ No ☒	—
	Isolating controlgear ..... :	Yes ☒ No ☐	—
	SELV controlgear ..... :	Yes ☒ No ☐	—
7 (7)	**MARKING**		N/A
7.1 (7.1)	**Mandatory markings**		N/A
	a) mark of origin		N/A
	b) model number or type reference		N/A
	c) symbol for independent controlgear, if applicable		N/A
	d) correlation between interchangeable parts and controlgear marked		N/A
	e) rated supply voltage (V)		N/A
	supply frequency (Hz)		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	supply current (A)		N/A
	f) earthing symbol		N/A
	k) wiring diagram		N/A
	l) value of tc		N/A
	m) symbol for declared temperature		N/A
	t) LUM earthing symbol		N/A
	u) if not SELV maximum working voltage U_{out} between:		N/A
	- output terminals (V) ..... :		N/A
	- output terminals and earth (V) ..... :		N/A
7.1 (-)	Constant voltage type:	Yes ☐ No ☐	—
	- rated output power P_{rated} (W) ..... :		N/A
	- rated output voltage U_{rated} (V) ..... :		N/A
	Constant current type:	Yes ☐ No ☐	—
	- rated output power P_{rated} (W) ..... :		N/A
	- rated output current I_{rated} (A) ..... :		N/A
	Indication if for LED modules only		N/A
7.1 (7.2)	Marking durable and legible		N/A
	Rubbing 15 s water, 15 s petroleum; marking legible		N/A
7.2 (7.1)	**Information to be provided, if applicable**		N/A
	h) declaration of protection against accidental contact		N/A
	i) cross-section of conductors (mm²)		N/A
	j) number, type and wattage of lamp(s)		N/A
	s) SELV symbol		N/A
7.2 (-)	- declaration of mains connected windings		N/A

8 (10)	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**		P
- (10.1)	Controlgear protected against accidental contact with live parts	Protected by luminaire	P
- (A2)	Voltage measured with 50 kΩ	(see Annex A)	N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
- (A3)	Voltage > 35 V peak or > 60 V d.c. or protective impendance device	(see Annex A)	N/A
- (10.1)	Lacquer or enamel not used for protection or insulation		P
	Adequate mechanical strength on parts providing protection		P
- (10.2)	Capacitors > 0,5 μF: voltage after 1 min (V): < 50 V .....:	0,046 μF	P
- (10.3)	**Controlgear providing SELV**		P
	Accessible conductive parts are insulated from live parts by double or reinforced insulation in SELV controlgear		P
	No connection between output circuit and the body or protective earthing circuit		P
	No possibility of connection between output circuit and the body or protective earthing circuit through other conductive parts		P
	SELV outputs separated by at least basic insulation		N/A
	ELV conductive parts insulated as live parts		N/A
	Tests according Annex L of IEC 61347-1	(see Annex L)	P
- (10.4)	**Accessible conductive parts in SELV circuits**		N/A
	Output voltage under load ≤ 25 V r.m.s. or ≤ 60 V d.c.		N/A
	If output voltage > 25 V r.m.s. or > 60 V d.c.; No load output ≤ 35 V peak or ≤ 60 V d.c and touch current does not exceed 0,7 mA (peak) or 2 mA d.c. .....:		N/A
	One conductive part is insulated if output voltage or current exceeding the values above and withstand test voltage 500 V		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

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

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

10 (9)	**PROVISION FOR PROTECTIVE EARTHING**		N/A
- (9.1)	**Provisions for protective earthing**		N/A
	Terminal complying with clause 8		N/A
	Locked against loosening and not possible to loosen by hand		N/A
	Not possible to loosen clamping means unintentionally on screwless terminals		N/A
	All parts of material minimizing the danger of electrolytic corrosion		N/A
	Made of brass or equivalent material		N/A
	Contact surface bare metal		N/A
	Test according 7.2.3 of IEC 60598-1		N/A
- (9.2)	**Provision for functional earthing**		N/A
	Comply with clause 8 and 9.1		N/A
	Functional earth insulated from live parts by double or reinforced insulation		N/A
- (9.3)	**Lamp controlgear with conductors for protective earthing by tracks on printed circuit board**		N/A
	Test with a current of 25 A between earthing terminal or earthing contact and each of the accessible metal parts; measured resistance (Ω) at ≥ 10 A according 7.2.3 of IEC 60598-1: < 0,5 Ω ..... :		N/A
- (9.4)	**Earthing of built-in lamp controlgear**		N/A
	Earth by means of fixing to earthed metal of luminaire in compliance of 7.2 of IEC 60598-1		N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Earthing terminal only for earthing the built-in controlgear		N/A
- (9.5)	**Earthing via independent controlgear**		N/A
- (9.5.1)	Earth connection to other equipment		N/A
	Looping or through connection, conductor min. 1,5 mm² and of copper or equivalent		N/A
	Protective earthing wires in line with 5.3.1.1 and clause 7 of IEC 60598-1		N/A
- (9.5.2)	Earthing of the lamp compartments powered via the independent lamp controlgear		N/A
	Test with a current of 25 A between input and output earth terminals; measured resistance (Ω) between earthing terminal or earthing contact and each of the accessible metal parts at ≥ 10 A according 7.2.3 of IEC 60598-1: < 0,5 Ω ..... :		N/A
	Output earthing terminal marked as in 7.1 t) of IEC 61347-1		N/A
11 (11)	**MOISTURE RESISTANCE AND INSULATION** **Test with the luminaire**		P
- (11)	After storage 48 h at 91-95% relative humidity and 20-30 °C measuring of insulation resistance:		P
	For basic insulation ≥ 2 MΩ ..... :	>500 MΩ (Between L and N after fuse open)	P
	For double or reinforced insulation ≥ 4 MΩ ..... :	>500 MΩ (between input circuit and output circuit) (between primary circuit and enclosure) (between transformer's primary and secondary circuit)	P
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1		P
12 (12)	**ELECTRIC STRENGTH** **Test within the luminaire**		P
- (12)	Immediately after clause 11 electric strength test for 1 min		P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Basic insulation for SELV, test voltage 500 V		N/A
	Working voltage ≤ 50 V, test voltage 500 V		N/A
	Working voltage > 50 V ≤ 1000 V, test voltage (V):		P
	Basic insulation, 2U + 1000 V	Between L and N after fuse open. U_{test}: 240→1480V	P
	Supplementary insulation, 2U + 1000 V		N/A
	Double or reinforced insulation, 4U + 2000 V	Between input circuit and output circuit: Utest 240V→ 2960V Between input circuit and enclosure: Utest 240V→ 2960V	P
	No flashover or breakdown		P
	Solid or thin sheet insulation for double or reinforced insulation fulfil the requirements in Annex N in IEC 61347-1		P

14 (14)	**FAULT CONDITIONS**		P
- (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	(see appended table)	P
- (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)	(see appended table)	N/A
- (14.3)	Short-circuit or interruption of semiconductor devices	(see appended table)	P
- (14.4)	Short-circuit across insulation consisting of lacquer, enamel or textile	(see appended table)	P
- (14.5)	Short-circuit across electrolytic capacitors	(see appended table)	P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
14 (-)	Reversed voltage polarity if d.c. supplied control gear	(see appended table)	N/A
- (14.6)	After the tests has been carried out on three samples:		P
	The insulation resistance ≥ 1 MΩ ..... :	>500 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		—
14 (-)	Temperature declared thermally protected lamp controlgear fulfil requirements in Annex C		N/A
15 (-)	**TRANSFORMER HEATING**		P
15.1	**General**		P
	Transformer comply with clause L.6 and L.7 of IEC 61347-1		P
	Output voltage of SELV controlgear not exceed limits in 10.4 of IEC 61347-1 during the test of 15.1 and 15.2		P
15.2 (-)	**Normal operation**		P
	Comply with clause L.6 of IEC 61347-1		P
15.3 (-)	**Abnormal operation**		P
	Comply with clause L.7 of IEC 61347-1		P
	Double LED modules or equivalent load connected in parallel to the output terminals of constant voltage type		N/A
	Double LED modules or equivalent load connected in parallel to the output terminals of constant current type		N/A
15 (-)	During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced		P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

16 (15)	**CONSTRUCTION**		P
- (15.1)	**Wood, cotton, silk, paper and similar fibrous material**		P
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P
- (15.2)	**Printed circuits**		P
	Printed circuits used as internal connections complies with clause 14		P
- (15.3)	**Plugs and socket-outlets used in SELV or ELV circuits**		N/A
	No dangerous compatibility between output socket-outlet and a plug for socket-outlets for input circuit in relation to installation rules, voltages and frequencies		N/A
	Plugs and socket-outlets for SELV comply with IEC 60906-3 and IEC 60884-2-4		N/A
	Plugs and socket-outlets for SELV ≤ 3 A, ≤ 25 V r.m.s. or ≤ 60 V d.c. and ≤ 72 W comply with IEC 60906-3 and IEC 60884-2-4 or:		N/A
	- plugs not able to enter socket-outlets of other standardised system		N/A
	- socket-outlets not admit plugs of other standardised system		N/A
	- socket-outlets without protective earth		N/A
- (15.4)	**Insulation between circuits and accessible parts**		P
- (15.4.2)	SELV circuits		P
	Source used to supply SELV circuits:		P
	- safety isolating transformer in accordance with relevant part 2 of IEC 61558		P
	- controlgear providing SELV in accordance with relevant part 2 of IEC 61347		P
	- another source		N/A
	Voltage in the circuit not higher than ELV		N/A
	SELV circuits insulated from LV by double or reinforced insulation		P
	SELV circuits insulated from non SELV circuits by double or reinforced insulation		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	SELV circuits insulated from FELV circuits by supplementary insulation		N/A
	SELV circuits insulated from other SELV circuits by basic insulation		N/A
	SELV circuits insulated from accessible conductive parts according Table 6 in 15.4.5		N/A
- (15.4.3)	FELV circuits		N/A
	Source used to supply FELV circuits:		N/A
	- separating transformer in accordance with relevant part 2 of IEC 61558		N/A
	- separating controlgear providing basic insulation between input and output circuits in accordance with relevant part 2 of IEC 61347		N/A
	- another source		N/A
	- source in circuits separated by the LV supply by basic insulation		N/A
	Voltage in the circuit not higher than ELV		N/A
	FELV circuits insulated from LV supply by at least basic insulation		N/A
	FELV circuits insulated from other FELV circuits if functional purpose		N/A
	FELV circuits insulated from accessible conductive parts according Table 6 in 15.4.5		N/A
	Plugs and socket-outlets for FELV system comply with:		N/A
	- plugs not able to enter socket-outlets of other voltage systems		N/A
	- socket-outlets not admit plugs of other voltage systems		N/A
	- socket-outlets have a protective conductor contact		N/A
- (15.4.4)	Other circuits		N/A
	Insulation between circuits other than SELV or FELV and accessible conductive parts in according Table 6 in 15.4.5.		N/A
- (15.4.5)	Insulation between circuits and accessible conductive parts		P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Accessible conductive parts insulated from active parts of electric circuits by insulating according Table 6		P
	Requirements for Class II construction with equipotential bonding for protection against indirect contact with live parts:		N/A
	- all conductive parts are connected together		N/A
	- conductive parts are reliably connected together according test of IEC 60598-1 cl. 7.2.3		N/A
	- conductive parts comply with requirements of Annex A in case of insulation fault		P
17 (16)	**CREEPAGE DISTANCES AND CLEARANCES**		P
- (16)	Creepage distances and clearances according to 16.2 and 16.3		P
	Controlgears providing SELV comply with additional requirements in Annex L		P
	Insulating lining of metallic enclosures		N/A
	Controlgear protected against pollution comply with Annex P	(see Annex P)	N/A
- (16.2)	**Creepage distances**		P
- (16.2.2)	Minimum creepage distances for working voltages		P
	Creepage distances according to Table 7	(see appended table)	P
- (16.2.3)	Creepage distances for working voltages with frequencies above 30 kHz		P
	Creepage distances according to Table 8	(see appended table)	P
- (16.3)	**Clearances**		P
- (16.3.2)	Clearances for working voltages		P
	Clearances distances according to Table 9	(see appended table)	P
- (16.3.3)	Clearances for ignition voltages and working voltages with higher frequencies		P
	Clearances distances for basic or supplementary insulation according to Table 10	(see appended table)	P
	Clearances distances for reinforced insulation according to Table 11	(see appended table)	P
18 (17)	**SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS**		P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Screws, current-carrying parts and connections in compliance with IEC 60598-1 (clause numbers between parentheses refer to IEC 60598-1)		P
(4.11)	**Electrical connections**		**P**
(4.11.1)	Contact pressure		P
(4.11.2)	Screws:		N/A
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
(4.11.3)	Screw locking:		N/A
	- spring washer		N/A
	- rivets		N/A
(4.11.4)	Material of current-carrying parts		P
(4.11.5)	No contact to wood or mounting surface		P
(4.11.6)	Electro-mechanical contact systems		N/A
(4.12)	**Mechanical connections and glands**		N/A
(4.12.1)	Screws not made of soft metal		N/A
	Screws of insulating material		N/A
	Torque test: torque (Nm); part ..... :		N/A
	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

19 (18)	**RESISTANCE TO HEAT, FIRE AND TRACKING**	**Refer to TR 50085197 001**	P
- (18.1)	Ball-pressure test ..... :	See Test Table 19 (18.1)	P
- (18.2)	Test of printed boards ..... :	See Test Table 19 (18.2)	P
- (18.3)	Glow-wire test ..... :	See Test Table 19 (18.3)	P
- (18.4)	Needle flame test ..... :	See Test Table 19 (18.4)	P

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
- (18.5)	Tracking test .....:	See Test Table 19 (18.5)	P
20 (19)	**RESISTANCE TO CORROSION**		N/A
	- test according 4.18.1 of IEC 60598-1		N/A
	- adequate varnish on the outer surface		N/A

14	**TABLE: tests of fault conditions**	**P**
Part	Simulated fault	Hazard
DB1	SC; FR1 broken, stop working	~~YES~~/NO
EC1	SC; FR1 broken, stop working	~~YES~~/NO
EC2	SC; FR1 broken, stop working	~~YES~~/NO
D1	SC; Stop working	~~YES~~/NO
D2	SC; 0,047A, normal working	~~YES~~/NO
Output of TR1	SC; Stop working	~~YES~~/NO
Output of driver	OC; Stop working	~~YES~~/NO

15	**TABLE: test of transformer heating (☐ Constant voltage ☒ Constant current)**		**P**
	Type reference:	Sy009	
	Test 1: Normal Operation		—
	1.00 times rated voltage:	1,0Un: 240V	—
	ta = ...:	Test with appliance	—
	Test 2: Abnormal Operation: Short-circuit the output according to L.7		—
	1.1 or 0.9 times rated voltage:	1,1Un: 264V (Test with appliance)	—
	tc = ...:	Acceptance test within luminaire	—
	Test 3: Abnormal Operation: overload according to L.7		—
	1.1 or 0.9 times rated voltage:	N/A	—
	tc = ...:	N/A	—

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

	Test 4: Abnormal Operation: Double the number of LED modules or equivalent load.		—
	1.1 or 0.9 times rated voltage:	N/A	—
	tc = ...:	N/A	—

Temperature (°C) of Part	Cl. 15.1		Cl. 15.2			
	Test 1(ºC)	Limit[3)]	Test 2(ºC)	Test 3(ºC)	Test 4(ºC)	Limit[3)]
Power cord	38,2	90	39,9	--	--	--
CX1	48,0	110	48,5	--	--	--
EC1	52,1	105	52,7	--	--	--
EC2	54,9	105	59,9	--	--	--
Pri. winding of T1	66,7	155	67,6	--	--	175
Sec. winding of T1	65,7	155	66,9	--	--	175
Bobbin of T1	67,0	Cl.13.2.1	68,0	--	--	--
Insulation tape	65,7	130	66,6	--	--	--
PCB	66,1	130	67,0	--	--	--
CY1	65,0	110	65,8	--	--	
Output wire	65,8	90	66,7	--	--	--
Driver enclosure	57,7	Cl. 13.2.1	59,2	--	--	--
LED board	51,2	For reference	52,8	--	--	
Front cover	51,0	Cl. 13.2.1	52,8	--	--	
Lamp enclosure near driver	48,1	Cl.13.2.1	51,2	--	--	--
Lamp enclosure beside LED board	53,2	Cl.13.2.1	55,3	--	--	--
Mounting surface	26,2	90	27,0	--	--	--
Ambient temperature	25,0	--	25,0	--	--	--

Working Voltage Measurement	
Supply voltage: 240Vac, 50/60Hz; Output condition: Max Load or no load	

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Clause	Requirement + Test	Result - Remark	Verdict

Location	V peak (V)	V rms (V)	Frequency (kHz)
CY1	8,7V	1,65V	50,1Hz
T1 P+ to Pin 1	375,1V	193,2V	53,2kHz
T1 P+ to Pin 2	410,1V	203,2V	52,5kHz
T1 P+ to Pin 3	440,2V	187,3V	52,6kHz
T1 P- to Pin 1	355,3V	192,5V	51,1kHz
T1 P- to Pin 2	420,5V	213,1V	51,7kHz
T1 P- to Pin 3	350,2V	187,3V	51,5kHz

	TABLE: Transformer check		**P**
Construction details: -- Core: N/A			
Transformer manufacturer: Haining haoyi Electronic Co., LTD Type designation: EFD15			
Measured creepage distance base on Max.240V working voltage according to Annex I of EN 61347-2-13:2014			
Location	Required (mm)	Measured (mm)	
Pri. – Sec.	5,0mm	7,4mm	
Pri. – Core	--	--	
Sec. – Core	5,0mm	7,4mm	
Measured clearance distance:			
Location	Required (mm)	Measured (mm)	
Pri. – Sec.	4,7mm	7,4mm	
Pri. – Core	--	--	
Sec. – Core	4,7mm	7,4mm	
Distance through insulation	Required (mm)	Measured (mm)	
use reinforced insulation SEC. wire	--	--	
Electric strength test: AC 3128V; 60s between Pri. to Sec.	Pass		
Specifications of winding:			
Primary winding: N1: 111T(φ0,13x1);			

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Clause	Requirement + Test	Result - Remark	Verdict

Secondary winding: N2: 25T(φ0,30x1);
Insulation: Class B (130ºC)

17 (16)	TABLE: clearance and creepage distance measurements (mm)							P
Applicable part of IEC 61347-1 Table 7 – 11*								
Distances	**Insulation type ****	**Measured clearance**	**Required**		**Measured creepage**	**Required**		
			clearance	***Table**		**creepage**	***Table**	
Distance 1:	B	5,4mm	1,5mm	9	5,4mm	2,5mm	7	
Working voltage (V) ..... :					250V			—
Frequency if applicable (kHz) ..... :					--			—
PTI ..... :					< 600 ☒	≥ 600 ☐		—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :					--			—
Pulse voltage if applicable (kV) ..... :					--			—
Supplementary information: Between live parts of different polarity								
Distance 2:	R	7,4mm	3,0mm	9, 11	7,4mm	5,0mm	7, 8	
Working voltage (V) ..... :					Max. 240V			—
Frequency if applicable (kHz) ..... :					53,2kHz			—
PTI ..... :					< 600 ☒	≥ 600 ☐		—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :					0,44kV			—
Pulse voltage if applicable (kV) ..... :					N/A			—
Supplementary information: Between input and output circuits								
Distance 3:	--	--	--	--	--	--	--	
Working voltage (V) ..... :					--			—
Frequency if applicable (kHz) ..... :					--			—
PTI ..... :					< 600 ☐	≥ 600 ☐		—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :					--			—
Pulse voltage if applicable (kV) ..... :					--			—
Supplementary information: N/A								

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

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Clause	Requirement + Test	Result - Remark	Verdict

19 (18.1)	TABLE: Ball Pressure Test		See TR 50085197 001	P
Allowed impression diameter (mm) ..... :		--		—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	
--	--	--	--	
--	--	--	--	
--	--	--	--	
Supplementary information: --				

19 (18.2)	TABLE: Test of printed boards			See TR 50085197 001	P
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (s)	Ignition of specified layer Yes/No	Duration of burning (s)	Verdict
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
Supplementary information: --					

19 (18.3)	TABLE: Glow-wire test		See TR 50085197 001	P
Glow wire temperature..... :		650°C		—
Object/ Part No./ Material	Manufacturer/ trademark	Ignition of specified layer Yes/No	Duration of burning (s)	Verdict
--	--	--	--	--
--	--	--	--	--
--	--	--	--	--
Supplementary information: --				

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Clause	Requirement + Test	Result - Remark	Verdict

19 (18.4)	**TABLE: Needle-flame test**			**See TR 50085197 001**	**P**
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (s)	Ignition of specified layer Yes/No	Duration of burning (s)	Verdict
--	--	--	--	--	**--**
--	--	--	--	--	**--**
--	--	--	--	--	**--**
Supplementary information: --					

19 (18.5)	**TABLE: Proof tracking test**			**See TR 50085197 001**	**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
--	--	--	--	--	**--**
--	--	--	--	--	**--**
--	--	--	--	--	**--**
Supplementary information: --					

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Clause	Requirement + Test	Result - Remark	Verdict
(A)	**ANNEX A - TEST TO ESTABLISH WHETHER A CONDUCTIVE PART IS A LIVE PART WHICH MAY CAUSE AN ELECTRIC SHOCK**		N/A
(A.1)	Comply with A.2 or A.3		N/A
(A.2)	Voltage ≤ 35 V peak or ≤ 60 V d.c ..... :		N/A
(A.3)	If voltage measured according Clause A.2 exceeds the limit value; touch current does not exceed 0,7 mA (peak) or 2 mA d.c. ..... :		N/A
	Comply with Annex G.2 of IEC 60598-1		N/A
(C)	**ANNEX C – PARTICULAR REQUIREMENTS FOR ELECTRONIC LAMP CONTROLGEAR WITH MEANS OF PROTECTION AGAINST OVERHEATING**		N/A
(C3)	**GENERAL REQUIREMENTS**		N/A
(C3.1)	Thermal protection means integral with the convertor, protected against mechanical damage		N/A
	Renewable only by means of a tool		N/A
	If function depending on polarity, for cord-connected equipment protection means in both leads		N/A
	Thermal links comply with IEC 60691		N/A
	Electrical controls comply with IEC 60730-2-3		N/A
(C3.2)	No risk of fire by breaking (clause C7)		N/A
(C5)	**CLASSIFICATION**		N/A
	a) automatic resetting type		—
	b) manual resetting type		—
	c) non-renewable, non-resetting type		—
	d) renewable, non-resetting type		—
	e) other type of thermal protection; description .. :		—
(C6)	**MARKING**		N/A
(C6.1)	Symbol for temperature declared thermally protected ballasts		N/A
(C6.2)	Declaration of the type of protection provided		N/A
(C7)	**LIMITATION OF HEATING**		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

(C7.1)	**Preselection test:**		N/A
	Test sample placed for at least 12 h in an oven having temperature (t_c - 5) K		N/A
	No operation of the protection device		N/A
(C7.2)	**Functioning of protection means:**		N/A
	Normal operation of the sample in a test enclosure according to Annex D at an ambient temperature such that (t_c +0; -5) °C is obtained		N/A
	No operation of the protection device		N/A
	Introducing of the most onerous test condition determined during test of clause 14.2 to 14.5		N/A
	Output of windings connected to the mains supply short-circuited, and other part of the controlgear operated under normal conditions		N/A
	Increasing of the current through the windings continuously until operation of the protection means		N/A
	Continuous measuring of the highest surface temperature		N/A
	Ballasts according to C5 a) or C5 e) operated until stable conditions are achieved		N/A
	Automatic-resetting thermal protectors working 3 times		N/A
	Ballasts according to C5 b) working 6 times		N/A
	Ballasts according to C5 c) and C5) d) working once		N/A
	Highest temperature does not exceed the marked value		N/A
	Any overshoot of 10% over the marked value within 15 min		N/A
	After 15 min value not exceed marked value		N/A

(D)	**ANNEX D – REQUIREMENTS FOR CARRY OUT THE HEATING TESTS OF THERMALLY PROTECTED LAMP CONTROLGEAR**		N/A
	Tests in C7 performed in accordance with Annex D, if applicable		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

(F)	**ANNEX F – DRAUGHT-PROOF ENCOSURE**		P
	Draught-proof enclosure in accordance with the description		P
	Dimensions of the enclosure		P
	Other design; description		P

(H)	**ANNEX H - TESTS**		P
	All tests performed in accordance with the advice given in Annex H, if applicable		P

I (L)	**ANNEX I IN THIS PART 2 – PARTICULAR ADDITIONAL REQUIREMENTS FOR SELV D.C. OR A.C. SUPPLIED ELECTRONIC CONTROLGEARS FOR LED MODULES**		P
(L.3)	**Classification**		P
	Class I	Yes ☐ No ☒	—
	Class II	Yes ☐ No ☒	—
	Class III	Yes ☐ No ☒	—
	non-inherently short circuit proof controlgear	Yes ☒ No ☐	—
	inherently short circuit proof controlgear	Yes ☐ No ☒	—
	fail safe controlgear	Yes ☐ No ☒	—
	non-short-circuit proof controlgear	Yes ☐ No ☒	—
(L.4)	**Marking**		N/A
	Adequate symbols are used		N/A
(L.5)	**Protection against electric shock**		P
	Comply with clause 9.2 of IEC 61558-1		P
(L.6)	**Heating**		P
	No excessive temperatures in normal use		P
	Value if capacitor t_c marked ..... :	--	—
	Winding insulation classified as Class ..... :	Class B	—
	Comply with tests of clause 14 of IEC 61558-1 with adjustments		P

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Clause	Requirement + Test	Result - Remark	Verdict

(L.7)	**Short-circuit and overload protection**		P
	Comply with tests of clause 15 of IEC 61558-1 with adjustments		P
(L.8)	**Insulation resistance and electric strength**		P
(L.8.1)	Conditioned 48 h between 91 % and 95 %		P
(L.8.2)	Insulation resistance		P
	Between input- and output circuits not less than 5 MΩ ..... :	>500MΩ	P
	Between metal parts of class II convertors which are separated from live parts by basic insulation only and the body not less than 5 MΩ ..... :		N/A
	Between metal foil in contact with the inner and outer surfaces of enclosures of insulating material not less than 2 MΩ ..... :		N/A
(L.8.3)	Electric strength		P
	1) Between live parts of input circuits and live parts of output circuits ..... :	3000V	P
	2) Over basic or supplementary insulation between:		N/A
	a) live parts having different polarity ..... :	1500V	P
	b) live parts and body if intended to be connected to protective earth ..... :		N/A
	c) accessible metal parts and a metal rod of the same diameter as the flexible cable or cord ..... :		N/A
	d) live parts and an intermediate metal part ..... :		N/A
	e) intermediate metal parts and the body ..... :		N/A
	f) each input circuit and all other input circuits ... :		N/A
	3) Over reinforced insulation between the body and live parts ..... :	3000V	P
(L.9)	**Construction**		P
(L.9.1)	Transformer comply with 19.12 of IEC 61558-1 and 19 of IEC 61558-2-6		N/A
	HF transformer comply with 19 of IEC 61558-2-16		P
(L.10)	**Components**		N/A
	Protective devices comply with 20.6 – 20.11 of IEC 61558-1		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

(L.11)	**Creepage distances, clearances and distances through insulation**		P
	Creepage distances and clearances not less than in Clause 16		P
	Distance through insulation according Table L.5 in IEC 61347-1		N/A
	1) Basic distance through insulation		N/A
	Required distance (mm) ..... :		—
	Measured (mm) ..... :		N/A
	Supplementary information		—
	2) Supplementary distance through insulation		N/A
	Required distance (mm) ..... :		—
	Measured (mm) ..... :		N/A
	Supplementary information		—
	3) Reinforced distance through insulation		N/A
	Required distance (mm) ..... :		—
	Measured (mm) ..... :		N/A
	Supplementary information		—

J (-)	**ANNEX J IN THIS PART 2 – PARTICULAR ADDITIONAL SAFETY REQUIREMENTS FOR A.C., A.C./D.C. OR D.C. SUPPLIED ELECTRONIC CONTROLGEAR FOR EMERGENCY LIGHTING**		N/A
J.1	**General**		N/A
	Intended for centralized emergency power supply	Yes ☐ No ☐	—
J.2	**Marking**		N/A
J.2.1	Mandatory markings		N/A
	a) symbol EL		N/A
	b) rated emergency supply voltage (V)		N/A
J.2.2	Information to be provided if applicable		N/A
	a) Limits of ambient temperature		N/A
	b) Emergency output factor (EOF_X)		N/A
	c) Information if intended for use in luminaires for high-risk task area lighting		N/A
J.3	General notes on tests		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Length of output cable in tests..... :		N/A
	Load instead of LED lamps/modules..... :		N/A
J.4	Starting conditions		N/A
	Start rated load in emergency mode without adversely affecting the performance		N/A
J.5	Operating condition		N/A
	Comply with the requirements of 7.2 of IEC 62384 at 90% and 110% of rated emergency supply voltage		N/A
J.6	Emergency supply current		N/A
	Emergency supply current not differ more than ±15 %		N/A
	Supply of low impedance and low inductance		N/A
J.7	EMC immunity		N/A
	Comply with the requirements of IEC 61547		N/A
J.8	Pulse voltage from central battery systems		N/A
	Withstand pulses according Table J.1		N/A
J.9	Tests for abnormal conditions		N/A
	Comply with the requirements of 12 of IEC 62384		N/A
J.10	Comply with the requirements of 13 of IEC 62384		N/A
J.11	Functional safety (EOF_x)		N/A
	Declared emergency output factor (EOF_x) N/A achieved during emergency operation		N/A

(N)	**ANNEX N: REQUIREMENTS FOR INSULATION MATERIALS USED FOR DOUBLE OR REINFORCED INSULATION**		N/A
(N.4)	**General requirements**		N/A
(N.4.1)	Material comply with IEC 60085 and IEC 60216 series		N/A
(N.4.2)	**Solid insulation**		N/A
	Electric strength test at least 5 kV or 1,35 x test voltage in Table N.1		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	If not classified according IEC 60085 and IEC 60216 series: Electric strength test increased 10 % of 5,5 kV or 1,5 x test voltage in Table N.1		N/A
(N.4.3)	**Thin sheet insulation**		N/A
(N.4.3.1)	Thickness and composition of thin sheet insulation		N/A
	- Inside the ballast and not subjected to handling or abrasion during the production and during maintenance		N/A
	- Non-separated layers: Min. 3 layers and fulfil mandrel test of 150N		N/A
	- Separated layers: Min. 2 layers and each layer fulfil mandrel test of 50N		N/A
	- Separated layers (alternative): Min. 3 layers and 2/3 of the layers fulfil mandrel test of 100N		N/A
(N.4.3.2)	Mandrel test (electric strength test during mechanical stress)		N/A
	Electric strength test after mandrel test:		N/A
	- Non-separated layers: min. 5 kV or 1,35 x test voltage in Table N.1		N/A
	- 2/3 of min. 3 separated layers: min. 5 kV or 1,25 x test voltage in Table N.1		N/A
	- one of 2 separated layers: min. 5 kV or 1,25 x test voltage in Table N.1		N/A
	No flashover or breakdown occurred		N/A

(O)	**ANNEX O: ADDITIONAL REQUIREMENTS FOR BUILT-IN ELECTRONIC CONTROLGEAR WITH DOUBLE OR REINFORCED INSULATION**		N/A
(O.6)	**Marking**		N/A
	Marking according clause 7 (7)	See clause 7	N/A
	Special symbol		N/A
	Meaning of the special symbol explained in catalogue		N/A
(O.7)	**Protection against accidental contact with live parts**		N/A
	Requirements of clause 8 (10)	See clause 8	N/A
	Test finger not possible to make contact with basic insulated metal parts		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

(O.8)	**Terminals**		N/A
	Clause 9 (8)	See clause 9	N/A
(O.9)	**Provision for earthing**		N/A
	Functional earthing terminals comply with clause 9 of part 1		N/A
	No protective earthing terminal		N/A
(O.10)	**Moisture resistance and insulation**		N/A
	Clause 11 (11)	See clause 11	N/A
(O.11)	**Electric strength**		N/A
	Clause 12 (12)	See clause 12	N/A
(O.13)	**Fault conditions**		N/A
	Clause 14 (14)	See clause 14	N/A
	End of test, between live part and accessible metal parts or external parts of insulating material in contact with the supporting surface comply with dielectric strength test reduced to 35 % of values according Table 1 in part 1		N/A
	Insulation resistance according to O.10 between live part and accessible metal parts or external parts of insulating material in contact with the supporting surface not less than 4 MΩ		N/A
(O.14)	**Construction**		N/A
	Clause 17 (15)	See clause 17	N/A
	Accessible metal parts insulated from live parts by double or reinforced insulation		N/A
	Live part insulated from supporting surface in contact with external faces by double or reinforced insulation		N/A
(O.15)	**Creepage distances and clearances**		N/A
	Clause 18 (16)	See clause 18	N/A
	Comply with corresponding values for luminaries in IEC 60598-1		N/A
(O.16)	**Screws, current-carrying parts and connections**		N/A
	Clause 19 (17)	See clause 19	N/A
(O.17)	**Resistance to heat and fire**		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Clause 20 (18)	See clause 20	N/A
(O.18)	**Resistance to corrosion**		N/A
	Clause 21 (19)	See clause 21	N/A

(P)	**Creepage distances and clearances and distance through isolation (DTI) for lamp controlgear which are protected against pollution by the use of coating or potting**		N/A
(P.1)	**General**		N/A
	P.2 applies if creepage distances less than the minimum in Table 7 and 8		N/A
	P.3 applies if clearance less than the minimum in Table 9, 10 and 11		N/A
(P.2)	**Creepage distances**		N/A
(P.2.2)	Minimum creepage distances for working voltages and rated voltages with frequencies up to 30 kHz (Table P.1)		N/A
	Basic or supplementary insulation:		N/A
	Required creepage ..... :		—
	Measured ..... :		N/A
	Supplementary information		—
	Reinforced insulation:		N/A
	Required creepage ..... :		—
	Measured ..... :		N/A
	Supplementary information		—
(P.2.3)	Creepage distances for working voltages with frequencies above 30 kHz (Table P.2)		N/A
	Voltage $\hat{U}_{out}$ kV ..... :		—
	Frequency ..... :		—
	Required distance ..... :		—
	Measured ..... :		N/A
	Supplementary information		—
(P.2.4)	Compliance with the required creepage distances		N/A
(P.2.4.1)	Compliance in accordance with 16.3.3 and test according P.2.4.2		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
(P.2.4.3)	Electrical tests after conditioning		N/A
(P.2.4.3.1)	Insulation resistance and electric strength according Clause 11 and 12		N/A
(P.3)	**Distance through isolation**		N/A
(P.3.4)	Electrical tests after conditioning		N/A
(P.3.4.1)	Insulation resistance and electric strength according Clause 11 and 12		N/A
(P.3.4.2)	Impulse voltage dielectrical test		N/A
	Basic or supplementary insulation:		N/A
	Working/rated voltage .....:		—
	Impulse voltage.....:		N/A
	Supplementary information		—
	Reinforced insulation:		N/A
	Working/rated voltage .....:		—
	Impulse voltage.....:		N/A
	Supplementary information		—

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Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 1	TABLE: Critical components information			Refer to TR 50085197 001		P
Object / part No.	**Code**	**Manufacturer/ trademark**	**Type / model**	**Technical data**	**Standard**	**Mark(s) of conformity[1)]**
--	--	--	--	--	--	--
Description:	--					
--	--	--	--	--	--	--
--	--	--	--	--	--	--
--	--	--	--	--	--	--

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

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Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	**Screw terminals (part of the luminaire)**		N/A
(14)	**SCREW TERMINALS**		N/A
(14.2)	Type of terminal ..... :		—
	Rated current (A) ..... :		—
(14.3.2.1)	One or more conductors		N/A
(14.3.2.2)	Special preparation		N/A
(14.3.2.3)	Terminal size		N/A
	Cross-sectional area (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

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Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 3	**Screwless terminals (part of the luminaire)**		N/A
(15)	**SCREWLESS TERMINALS**		N/A
(15.2)	Type of terminal.....:		—
	Rated current (A).....:		—
(15.3.1)	Material		N/A
(15.3.2)	Clamping		N/A
(15.3.3)	Stop		N/A
(15.3.4)	Unprepared conductors		N/A
(15.3.5)	Pressure on insulating material		N/A
(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

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples) ..... :		N/A
(15.6)	Terminals and connections for external wiring		N/A
(15.6.1)	Conductors		N/A
	Terminal size and rating		N/A
15.6.2	Mechanical tests		N/A
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) ..... :		N/A
(15.6.2.2)	Pull test pin or tab terminals (4 samples); pull (N) ..... :		N/A
(15.6.3)	Electrical tests		N/A
	Tests according 15.6.3.1 + 15.6.3.2 in IEC 60598-1		N/A

(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									N/A
	Voltage drop after 10th alt. 25th cycle									N/A
	Max. allowed voltage drop (mV) ..... :	--								—
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)	--	--	--	--	--	--	--	--	--	--
	Voltage drop after 50th alt. 100th cycle									N/A
	Max. allowed voltage drop (mV) ..... :	--								—
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)	--	--	--	--	--	--	--	--	--	--
	Continued ageing: voltage drop after 10th alt. 25th cycle									N/A
	Max. allowed voltage drop (mV) ..... :	--								—
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)	--	--	--	--	--	--	--	--	--	--
	Continued ageing: voltage drop after 50th alt. 100th cycle									N/A

IEC 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

	Max. allowed voltage drop (mV) ..... :	--	—

terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)	--	--	--	--	--	--	--	--	--	--

Supplementary information: --

List of test equipment used: Refer to equipment list.

A completed list of used test equipment shall be provided in the Test Reports when a Manufacturer Testing Laboratory according to CTF stage 1 or CTF stage 2 procedure has been used.
Other forms with a different layout but containing corresponding information are also acceptable.
Note: This page may be removed when CTF stage 1 CTF stage 2 are not used. See also clause 4.8 in OD 2020 for more details.

Clause	Measurement / testing	Testing / measuring equipment / material used, (Equipment ID)	Range used	Last Calibration date	Calibration due date
--	--	--	--	--	--
--	--	--	--	--	--
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IEC61347_2_13E - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 61347-2-13
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES

Part 2: Particular requirements

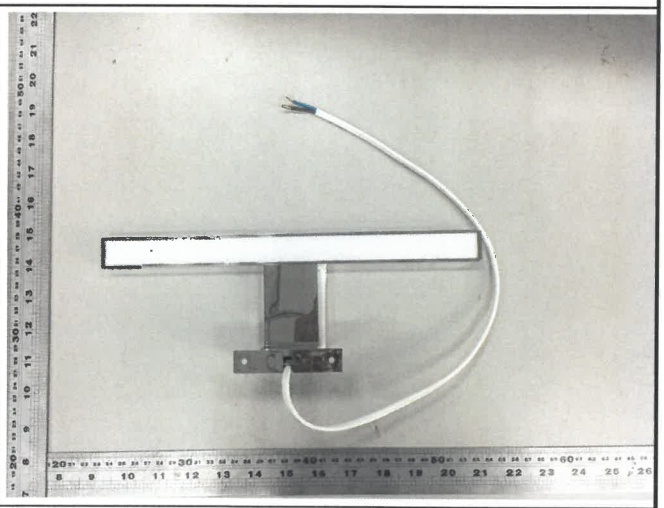
Section Thirteen – d.c. or a.c. supplied electronic controlgear for LED modules

Differences according to.....:	EN 61347-2-13:2014 used in conjunction with EN 61347-1:2015
Attachment Form No.....:	EU_GD_IEC61347_2_13
Attachment Originator .....:	--
Master Attachment .....:	Date 2015-03

	CENELEC COMMON MODIFICATIONS (EN)	**P**
	No Common modifications	P

Prüfbericht-Nr.: *Test Report No.:*	**Attachment 2 of 50085197 001**	**Auftrags-Nr.:** *Order No.:*	1160035834	Seite 1 von 18 *Page 1 of 18*
Kunden-Referenz-Nr.: *Client Reference No.:*	N/A	**Auftragsdatum:** *Order date:*	27.05.2017	
Auftraggeber: *Client:*	NINGBO JIAHANG ELECTRIC APPLIANCE CO., LTD. Zhangjiaying Village, Qiu'ai Town, Yinzhou District, Ningbo City P.R. China			
Prüfgegenstand: *Test item:*	LED MIRROR LIGHT			
Bezeichnung / Typ-Nr.: *Identification / Type No.:*	NC-LE71, NC-LE72, NC-LE78, NC-LE80			
Auftrags-Inhalt: *Order content:*	Type test			
Prüfgrundlage: *Test specification:*	EN 62471:2008 IEC 62471:2006			

Wareneingangsdatum: *Date of receipt:*	27.05.2017
Prüfmuster-Nr.: *Test sample No.:*	A000578265
Prüfzeitraum: *Testing period:*	05.07.2017 – 06.09.2017
Ort der Prüfung: *Place of testing:*	TÜV Rheinland / CCIC (Ningbo) Co., Ltd.
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland / CCIC (Ningbo) Co., Ltd.
Prüfergebnis*: *Test result*:*	Pass



geprüft von / *tested by*:

Datum *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*
2017.07.06	Yuanda Mao / PE	Yuanda Mao

kontrolliert von / *reviewed by*:

Datum *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*
20170908	Heiko Li / TC	Heiko Li

Sonstiges / *Other*:
-Optical output testing based on Photobiological safety: Exempt Group.

Zustand des Prüfgegenstandes bei Anlieferung: Prüfmuster vollständig und unbeschädigt
Condition of the test item at delivery: *Test item complete and undamaged*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
Legend:	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

Test Report issued under the responsibility of:

TÜVRheinland®

TEST REPORT
IEC/EN 62471
Photobiological safety of lamps and lamp systems

Report Reference No. ..... :	Attachment 2 of 50085197 001
Date of issue ..... :	See cover page
Total number of pages ..... :	See cover page
Testing Laboratory..... :	TÜV Rheinland /CCIC(Ningbo) Co., Ltd.
Address ..... :	3F, Building C13, R&D Park, No.32 Lane 299 Guanghua Road, National Hi-Tech Zone, Ningbo 315048, P.R.China.
Applicant's name ..... :	NINGBO JIAHANG ELECTRIC APPLIANCE CO., LTD.
Address ..... :	Zhangjiaying Village, Qiu'ai Town, Yinzhou District, Ningbo City P.R. China
Test specification:	
Standard..... :	IEC 62471:2006
Test procedure ..... :	Test report
Non-standard test method…….. :	N/A
Test Report Form No. ..... :	IEC62471A
TRF Originator..... :	VDE Testing and Certification Institute
Master TRF ..... :	Dated 2009-05

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.

Test item description ..... :	LED MIRROR LIGHT
Trade Mark..... :	N/A
Manufacturer ..... :	NINGBO JIAHANG ELECTRIC APPLIANCE CO., LTD.
Address ..... :	Zhangjiaying Village, Qiu'ai Town, Yinzhou District, Ningbo City P.R. China
Model/Type reference ..... :	NC-LE71, NC-LE72, NC-LE78, NC-LE80
Ratings ..... :	AC 220-240V, 50/60Hz, Class II, IP44 others see "General product information"

Testing procedure and testing location:	
☒ **Testing Laboratory**:	TÜV Rheinland / CCIC (Ningbo) Co., Ltd.
Testing location/ address.....:	3F, Building C13, R&D Park, No.32 Lane 299 Guanghua Road, National Hi-Tech Zone, Ningbo 315048, P.R.China
☐ **Associated CB Laboratory:**	--
Testing location/ address.....:	--
Tested by (name + signature) .....:	See cover page
Approved by (+ signature) .....:	See cover page
☐ Testing procedure: TMP	--
Tested by (name + signature) .....:	--
Approved by (+ signature) .....:	--
Testing location/ address.....:	--
☐ Testing procedure: WMT	--
Tested by (name + signature) .....:	--
Witnessed by (+ signature).....:	--
Approved by (+ signature) .....:	--
Testing location/ address.....:	--
☐ Testing procedure: SMT	--
Tested by (name + signature) .....:	--
Approved by (+ signature) .....:	--
Supervised by (+ signature) .....:	--
Testing location/ address..... :	--
☐ Testing procedure: RMT	--
Tested by (name + signature) .....:	--
Approved by (+ signature) .....:	--
Supervised by (+ signature) .....:	--
Testing location/ address.....:	--

Summary of testing:

NC-LE78 selected to perform acceptance test.

Test conditions:

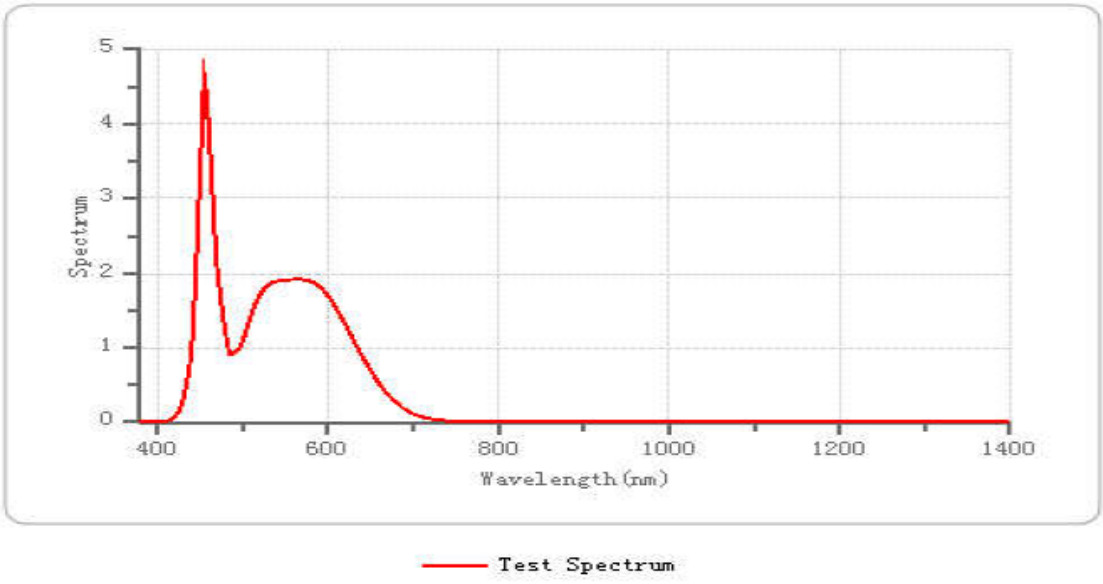
1. Tests performed on the working lamp supplied at 240VAC, 50Hz.
2. Ambient temperature: 25,0°C; Humidity: 62,0%
3. Measurement distance:

Measurement distance	☐ 500lux position at ___ mm ☒ 200mm

4. Aperture stop: 7mm
5. Angular subtense apparent Source:

1812L	α= 80,81 mrad

Spectral Distribution



Conclusion: Sample tested is considered as Exempt Group.

Tests performed (name of test and test clause):	**Testing location:**
1812L selected to perform acceptance test.	TÜV Rheinland / CCIC (Ningbo) Co., Ltd. 3F, Building C13, R&D Park, No.32 Lane 299 Guanghua Road, National Hi-Tech Zone, Ningbo 315048, P.R. China

Summary of compliance with National Differences:

EU GROUP DIFFERENCES.

Copy of marking plate:

Refer to TR 50089896 001

Test item particulars	LED MIRROR LIGHT
Tested lamp	☒ continuous wave lamps ☐ pulsed lamps
Tested lamp system	N/A
Lamp classification group	☒ exempt
	☐ risk 1
	☐ risk 2 ☐ risk 3
Lamp cap	N/A
Bulb	N/A
Rated of the lamp	AC 220-240V, 50Hz, 9W
Furthermore marking on the lamp	N/A
Seasoning of lamps according IEC standard	N/A
Used measurement instrument	Spectroradiometer SPR-5000B and Retina radiance meter MPR-16
Temperature by measurement	23,7°C
Information for safety use	N/A

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 ..... : See cover page

Date (s) of performance of tests ..... : See cover page

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 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.
List of test equipment must be kept on file and available for review.

This test report was issued for considering the potential radiation hazards resulting from the LED lamp under the normal operating conditions only.

Manufactory: YUYAO HANGJIA ELECTRONICS CO., LTD

Eastern Industrial Park, Linshan Town Yuyao, Zhejiang 315461 P.R. China

Factory: same as manufactory.

General product information:

Refer to TR 50085197 001

IEC 62471			
Clause	Requirement + Test	Result – Remark	Verdict
4	**EXPOSURE LIMITS**		P
4.1	General		P
	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		P
	Detailed spectral data of a light source are generally required only if the luminance of the source exceeds 10^4 cd·m^{-2}	see clause 4.3	P
4.3	Hazard exposure limits		P
4.3.1	Actinic UV hazard exposure limit for the skin and eye	Considered	P
	The exposure limit for effective radiant exposure is 30 J·m^{-2} within any 8-hour period		P
	To protect against injury of the eye or skin from ultraviolet radiation exposure produced by a broad-band source, the effective integrated spectral irradiance , E_S, of the light source shall not exceed the levels defined by:		P
	$E_s \cdot t = \sum_{200}^{400} \sum_{t} E_\lambda(\lambda,t) \cdot S_{UV}(\lambda) \cdot \Delta t \cdot \Delta\lambda \le 30$ J·m^{-2}		P
	The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye or skin shall be computed by:		P
	$t_{max} = \frac{30}{E_s}$ s		P
4.3.2	Near-UV hazard exposure limit for eye	Considered	P
	For the spectral region 315 nm to 400 nm (UV-A) the total radiant exposure to the eye shall not exceed 10000 J·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 W·m^{-2}.		P
	The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye for time less than 1000 s, shall be computed by:		P
	$t_{max} \le \frac{10\,000}{E_{UVA}}$ s		P
4.3.3	Retinal blue light hazard exposure limit	Considered	P
	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(λ), i.e., the blue-light weighted radiance , L_B, shall not exceed the levels defined by:		P

IEC 62471			
Clause	Requirement + Test	Result – Remark	Verdict
	$L_B \cdot t = \sum_{300}^{700} \sum_{t} L_\lambda(\lambda,t) \cdot B(\lambda) \cdot \Delta t \cdot \Delta\lambda \le 10^6$ J · m^{-2} · sr^{-1}	for t ≤ 10^4 s $t_{max} = \frac{10^6}{L_B}$	N/A
	$L_B = \sum_{300}^{700} L_\lambda \cdot B(\lambda) \cdot \Delta\lambda \le 100$ W · m^{-2} · sr^{-1}	for t > 10^4 s	P
4.3.4	Retinal blue light hazard exposure limit - small source		N/A
	Thus the spectral irradiance at the eye E_λ, weighted against the blue-light hazard function B(λ) shall not exceed the levels defined by:	see table 4.2	N/A
	$E_B \cdot t = \sum_{300}^{700} \sum_{t} E_\lambda(\lambda,t) \cdot B(\lambda) \cdot \Delta t \cdot \Delta\lambda \le 100$ J · m^{-2}	for t ≤ 100 s	N/A
	$E_B = \sum_{300}^{700} E_\lambda \cdot B(\lambda) \cdot \Delta\lambda \le 1$ W · m^{-2}	for t > 100 s	N/A
4.3.5	Retinal thermal hazard exposure limit	Considered	P
	To protect against retinal thermal injury, the integrated spectral radiance of the light source, L_λ, weighted by the burn hazard weighting function R(λ) (from Figure 4.2 and Table 4.2), i.e., the burn hazard weighted radiance, shall not exceed the levels defined by:		P
	$L_R = \sum_{380}^{1400} L_\lambda \cdot R(\lambda) \cdot \Delta\lambda \le \frac{50\,000}{\alpha \cdot t^{0,25}}$ W · m^{-2} · sr^{-1}	(10 µs ≤ t ≤ 10 s)	P
4.3.6	Retinal thermal hazard exposure limit – weak visual stimulus		N/A
	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/A
	$L_{IR} = \sum_{780}^{1400} L_\lambda \cdot R(\lambda) \cdot \Delta\lambda \le \frac{6\,000}{\alpha}$ W · m^{-2} · sr^{-1}	t > 10 s	N/A
4.3.7	Infrared radiation hazard exposure limits for the eye	Considered	N/A
	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/A
	$E_{IR} = \sum_{780}^{3\,000} E_\lambda \cdot \Delta\lambda \le 18\,000 \cdot t^{-0,75}$ W · m^{-2}	t ≤ 1000 s	N/A
	For times greater than 1000 s the limit becomes:		N/A

IEC 62471			
Clause	Requirement + Test	Result – Remark	Verdict
	$E_{IR} = \sum_{780}^{3\,000} E_\lambda \cdot \Delta\lambda \le 100 \qquad W \cdot m^{-2}$	t > 1000 s	N/A
4.3.8	Thermal hazard exposure limit for the skin	Considered	P
	Visible and infrared radiant exposure (380 nm to 3000 nm) of the skin shall be limited to:		P
	$E_H \cdot t = \sum_{380}^{3\,000} \sum_{t} E_\lambda(\lambda,t) \cdot \Delta t \cdot \Delta\lambda \le 20\,000 \cdot t^{0,25} \qquad J \cdot m^{-2}$		P
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.	See page 4	P
5.1.1	Lamp ageing (seasoning)		N/A
	Seasoning of lamps shall be done as stated in the appropriate IEC lamp standard.		N/A
5.1.2	Test environment	See page 4	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	Considered	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		P
	Operation of the test lamp shall be provided in accordance with:		P
	– the appropriate IEC lamp standard, or		N/A
	– the manufacturer' s recommendation	Supplied at 240Vac, 50Hz	P
5.1.5	Lamp system operation		N/A
	The power source for operation of the test lamp shall be provided in accordance with:		N/A
	– the appropriate IEC standard, or		N/A
	– the manufacturer' s recommendation		N/A
5.2	Measurement procedure	See below	P
5.2.1	Irradiance measurements		P
	Minimum aperture diameter 7mm.	7mm	P
	Maximum aperture diameter 50 mm.		N/A

IEC 62471			
Clause	Requirement + Test	Result – Remark	Verdict
	The measurement shall be made in that position of the beam giving the maximum reading.		P
	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/A
	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/A
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	CW	N/A
	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/A
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.	see table 4.1	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

IEC 62471			
Clause	Requirement + Test	Result – Remark	Verdict
	– 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
	– for all other light sources, including pulsed lamp sources, the hazard values shall be reported at a distance of 200 mm		N/A
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		N/A
	– a near-UV hazard (E_{UVA}) within 1000 s, (about 16 min), nor		N/A
	– 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		N/A
6.1.2	Risk Group 1 (Low-Risk)		N/A
	In this group are lamps, which exceeds the limits for the except group but that does not pose:		N/A
	– an actinic ultraviolet hazard (E_S) within 10000 s, nor		N/A
	– a near ultraviolet hazard (E_{UVA}) within 300 s, nor		N/A
	– a retinal blue-light hazard (L_B) within 100 s, nor		N/A
	– a retinal thermal hazard (L_R) within 10 s, nor		N/A
	– an infrared radiation hazard for the eye (E_{IR}) within 100 s		N/A
	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/A
6.1.3	Risk Group 2 (Moderate-Risk)		N/A
	This requirement is met by any lamp that exceeds the limits for Risk Group 1, but that does not pose:		N/A
	– an actinic ultraviolet hazard (E_S) within 1000 s exposure, nor		N/A
	– a near ultraviolet hazard (E_{UVA}) within 100 s, nor		N/A
	– a retinal blue-light hazard (L_B) within 0,25 s (aversion response), nor		N/A

IEC 62471			
Clause	Requirement + Test	Result – Remark	Verdict
	– a retinal thermal hazard (L_R) within 0,25 s (aversion response), nor		N/A
	– an infrared radiation hazard for the eye (E_{IR}) within 10 s		N/A
	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/A
6.1.4	Risk Group 3 (High-Risk)		N/A
	Lamps which exceed the limits for Risk Group 2 are in Group 3.		N/A
6.2	Pulsed lamps	CW	N/A
	Pulse lamp criteria shall apply to a single pulse and to any group of pulses within 0,25 s.		N/A
	A pulsed lamp shall be evaluated at the highest nominal energy loading as specified by the manufacturer.		N/A
	The risk group determination of the lamp being tested shall be made as follows:		N/A
	– a lamp that exceeds the exposure limit shall be classified as belonging to Risk Group 3 (High-Risk)		N/A
	– 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/A
	– 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/A

IEC 62471			
Clause	Requirement + Test	Result – Remark	Verdict

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.

IEC 62471			
Clause	Requirement + Test	Result – Remark	Verdict

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
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

IEC 62471			
Clause	Requirement + Test	Result – Remark	Verdict

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

IEC 62471			
Clause	Requirement + Test	Result – Remark	Verdict

Table 6.1	Emission limits for risk groups of continuous wave lamps									P
Risk	Action spectrum	Symbol	Units	Emission Measurement						
				Exempt		Low risk		Mod risk		
				Limit	Result	Limit	Result	Limit	Result	
Actinic UV	$S_{UV}(\lambda)$	E_s	$W \cdot m^{-2}$	0,001	--	0,003	--	0,03	--	
Near UV		E_{UVA}	$W \cdot m^{-2}$	10	--	33	--	100	--	
Blue light	B(λ)	L_B	$W \cdot m^{-2} \cdot sr^{-1}$	100	$1{,}900 \times 10^{1}$	10000	--	4000000	--	
Blue light, small source	B(λ)	E_B	$W \cdot m^{-2}$	1	--	1,0	--	400	--	
Retinal thermal	R(λ)	L_R	$W \cdot m^{-2} \cdot sr^{-1}$	28000/α	$3{,}328 \times 10^{5}$ (α=0,08081 rad)	28000/α	--	71000/α	--	
Retinal thermal, weak visual stimulus**	R(λ)	L_{IR}	$W \cdot m^{-2} \cdot sr^{-1}$	6000/α	--	6000/α	--	6000/α	--	
IR radiation, eye		E_{IR}	$W \cdot m^{-2}$	100	--	570	--	3200	--	
* Small source defined as one with α < 0,011 radian. Averaging field of view at 10000 s is 0,1 radian. ** Involves evaluation of non-GLS source										

EN 62471			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 62471 **EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES** Photobiological safety of lamps and lamps systems	
Differences according to.....:	EN 62471:2008
Attachment Form No.....:	EU_GD_IEC62471A
Attachment Originator .....:	IMQ S.p.A.
Master Attachment .....:	2009-07

	CENELEC COMMON MODIFICATIONS (EN)		P
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	P
4.1	General		P
	First paragraph deleted		—

EN 62471			
Clause	Requirement + Test	Result – Remark	Verdict

Table 6.1	Emission limits for risk groups of continuous wave lamps (based on EU Directive 2006/25/EC)								P
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	E_s	$W \cdot m^{-2}$	0,001	--	--	--	--	--
Near UV		E_{UVA}	$W \cdot m^{-2}$	0,33	--	--	--	--	--
Blue light	B(λ)	L_B	$W \cdot m^{-2} \cdot sr^{-1}$	100	$1,894x10^1$	10000	--	4000000	--
Blue light, small source	B(λ)	E_B	$W \cdot m^{-2}$	0,01*	--	1,0	--	400	--
Retinal thermal	R(λ)	L_R	$W \cdot m^{-2} \cdot sr^{-1}$	28000/α	$3,328x10^5$ (α=0,08081 rad)	28000/α	--	71000/α	--
Retinal thermal, weak visual stimulus**	R(λ)	L_{IR}	$W \cdot m^{-2} \cdot sr^{-1}$	545000 0,0017≤ α ≤ 0,011	--				
				6000/α 0,011≤ α ≤ 0,1	--				

EN 62471			
Clause	Requirement + Test	Result – Remark	Verdict

Table 6.1	Emission limits for risk groups of continuous wave lamps (based on EU Directive 2006/25/EC)								P
IR radiation, eye		E_{IR}	$W \cdot m^{-2}$	100	--	570	--	3200	--

* Small source defined as one with α < 0,011 radian. Averaging field of view at 10000 s is 0,1 radian.
** Involves evaluation of non-GLS source

NOTE The action functions: see Table 4.1 and Table 4.2

The applicable aperture diameters: see 4.2.1

The limitations for the angular subtenses: see 4.2.2

The related measurement condition 5.2.3 and the range of acceptance angles: see Table 5.5.

MYD

Measuring and Testing Equipment List

TÜVRheinland®

Used MTE

Report Number: 50085197 001

Description	MTE Type/model	Internal ID	Next Calibration (DD/MM/YY)
☒ Digital Power Meter	WT210	1.005E	14/10/2017
☒ Digital Power Meter	WT310	1.005F	26/07/2017
☒ Withstanding Voltage Tester	TOS5101	1.006A	14/10/2017
☒ Insulation Resistance Meter	HIOKI 3453	1.008	14/10/2017
☒ Leakage current tester	HIOKI 3156	1.013	05/01/2018
☒ Glow Wire Test Apparatus	F3-3020	1.014A	10/05/2018
☒ Tracking tester	DML600	1.015A	08/03/2018
☒ Needle Flame Test Apparatus	NF-II	1.016	10/01/2018
☒ Oscilloscope	TDS3012B	1.032	23/05/2018
☒ Ball pressure tester	QK1	1.035A	01/02/2019
☒ Impact hammer	F 22.50 5021350	1.037	26/07/2017
☒ IPX3 , X4 ; X5 , X6 ;	KXT1323	1.051X	22/03/2018
☒ High voltage probe	P-6015A	1.055	20/05/2018
☒ High voltage probe	P-5200	1.055A	03/08/2017
☒ Stopwatch	HW30	1.056C	13/03/2018
☒ IP4X	¢1mm/1N	1.154	25/02/2019
☒ 50K Ohm nonductive resistor	50KΩ	1.165B	21/07/2017
☒ Temp. & Humidity recorder	175H1	1.215D	30/06/2018
☒ True RMS Multimeter	Flueke287	1.219	05/01/2018
☒ Power cord pulling and torsion tester	DMS702	1.317	26/07/2017
☒ LCR tester	HF2817G	1.321	17/02/2018

Signature: Ruibin Zhao

Date: 2017.07.21

MYD

Measuring and Testing Equipment List

TÜVRheinland®

Used MTE

Report Number: 50085197 001

Description	MTE Type/model	Internal ID	Next Calibration (DD/MM/YY)
☒ Climate Chamber	SETH-Z-042L	1.357A	08/03/2018
☒ Lumi. Endurance testing system	AOB194Z-9K4-UIP	1.358	28/09/2017
☒ Data acquisition/switch unit	34972A	1.381H	10/05/2018
☒ Electronic scales	BS-30KA	1.382	14/10/2017
☒ Microscope	AM3111	1.655	05/08/2017
☒ Oven	LC-213	1.657C	10/01/2017

Measurement Uncertainty Reference Data

Current Measurement(YOKOGAWA WT310):
(0.005A-20A):±0.41%
Voltage Measurement(YOKOGAWAWT310):
(0.4V-300V): ±0.35%
Power Measurement(YOKOGAWA WT310):
(45Hz-66Hz):±1.20% (0.1W-1W), ±1.21% (1W-3600W)
Temperature Rise Measurement:
(Thermocouple method YOKOGAWA DX230):±3.5℃
Leakage Current Measurement(HIOKI3156):±0.008mA
Ball pressure Measurement:±0.042mm
Insulation Resistance Measurement(Insulation Resistance Meter HIOKI3453): ±0.027 MΩ
Pull Force Measurement(Digital Force Gauge HP-1K): ±0.29N
Torque Measurement: ±3.47%
Tempature measurement for glow-wire tester: 0.3%
Humidity(175H1): ±2.32%RH (2-80%RH)
Mass: ±0.00024g

Signature: Ruibin Zhao

Date: 2017.07.21

MYD

Measuring and Testing Equipment List

TÜVRheinland

Used MTE

Report Number: too 85197 001

Description	MTE Type/model	Internal ID	Next Calibration (DD/MM/YY)
☒ D.C power supply	PAT160-25T	1.021B	14/10/2017
☒ Temp. & Humidity recorder	175H1	1.218	17/05/2018
☒ Spectroradiometer for safety evaluaiton	SPR-5000C	1.360A	15/05/2018
☒ illuminance meter	Z-10	1.361A	23/02/2018
☒ Digital Power Meter	WT210	1.363	14/10/2017
☒ Standard light source	36V/400W LIR4001008	1.366A	04/03/2018
☒ Longer Tape	20M	1.640	20/05/2020

Measurement Uncertainty Reference Data

Current Measurement(YOKOGAWA WT310):
(0.005A-20A):±0.41%
Voltage Measurement(YOKOGAWAWT310):
(0.4V-300V): ±0.35%
Power Measurement(YOKOGAWA WT310):
(45Hz-66Hz):±1.20% (0.1W-1W), ±1.21% (1W-3600W)
Photobiological safety system measurement:
(Effective irradiance measurement ES) ±22.74%
(Near ultraviolet hazard) ±22.74%
(Retinal blue-light hazard) ±11.06%
(Retinal thermal hazard) ±11.06%
(Retinal thermal hazard – weak visual stimulus) ±11.06%
(Infrared radiation hazard exposure for the eye) ±14.81%
(Thermal hazard exposure limit for the skin) ±14.81%
Power Factor(YOKOGAWA WT310)(10Hz-1.2kHz): ±0.005
Frequency (YOKOGAWA WT310)(45Hz - 66Hz): ±0.07%
Humidity(175H1): ±2.32%RH (2-80%RH)
Uncertainty of Evaluation (Caliper): ±0.02mm

Signature: dara zhang

Date: 2017.7.13

MYD

Measuring and Testing Equipment List

TÜVRheinland®

Used MTE

Report Number: T0085197 001

Description	MTE Type/model	Internal ID	Next Calibration (DD/MM/YY)
[x] Spring impact hammer	F 22.50 5021350	1.037	26/07/2017
[x] Jointed Test Finger(φ12×80)	P10.01 5021352	1.045	25/02/2019
[x] Digital Display Caliper	91511 S160900770	1.063E	18/10/2017

Measurement Uncertainty Reference Data

Clearance& Creepage Distance Measurement(Digital caliper):±0.14mm
Pull Force Measurement(Digital Force Gauge HP-1K): ±0.29N
Torque Measurement: ±3.47%
Uncertainty of Evaluation (Caliper): ±0.02mm
Mass: ±0.00024g

Signature: Yuanda Mao

Date: 2017.09.06

Attachment 4 of 50085197 001

TÜVRheinland®
Precisely Right.

PAH Material List (to be filled by the manufactory)
Material list for PAH risk assessment, only materials accessible without tools shall be listed

Material #	Location/Function of the material	Name/Description of the material	Evidence attached. Institute, report no., date	Category	Smell	Rigidity	Colour
1	Paint of enclosure	Paint/Silver	--	☐ 1 ☐ 2 ☒ 3	☐ Yes ☒ No	☐ Soft ☐ Flexible ☒ Rigid	☐ Black or dark-colored ☒ White or light-colored
2	Plastic cover	Plastic/White	--	☐ 1 ☐ 2 ☒ 3	☐ Yes ☒ No	☐ Soft ☐ Flexible ☒ Rigid	☐ Black or dark-colored ☒ White or light-colored
3	Power cord	Insulation/PVC	--	☐ 1 ☐ 2 ☒ 3	☐ Yes ☒ No	☐ Soft ☒ Flexible ☐ Rigid	☐ Black or dark-colored ☒ White or light-colored

I herewith declare that the above listed materials are used in our product submitted to GS-certification and conform with the attached PAH test reports.

Product Identification: LED MIRROR LIGHT

NC-LE71, NC-LE72, NC-LE78, NC-LE80

Place Ningbo, Date 2017.8.30

(Applicant's seal and legally binding signature)

Attachment 5: Information from GS test center
Material list for PAH risk assessment; Only materials accessible without tools

Product designation: LED MIRROR LIGHT

Certificate No.: S 50385211 0001

Test report No.: 50085197 001

Material / Compo-nent #	Location / Function of the material	Name / Description of the material	PAH relevant 1)	Evidence attached. Institute, report no., date	Category	Smell	Rigidity	Colour	Correction of data by test center? 1)	Chem. test needed?	Test result (within the given limits)	Attachement
1	Paint of enclosure	Paint/Silver	☒ Yes ☐ No	--	☐ 1 ☐ 2 ☒ 3	☐ Yes ☒ No	☐ Soft ☐ Flexible ☒ Rigid	☐ Black or dark-colored ☒ White or light-colored	☒ No ☐ Yes	☒ No ☐ Yes	☒ passed ☐ failed	---
2	Plastic cover	Plastic/White	☒ Yes ☐ No	--	☐ 1 ☐ 2 ☒ 3	☐ Yes ☒ No	☐ Soft ☐ Flexible ☒ Rigid	☐ Black or dark-colored ☒ White or light-colored	☒ No ☐ Yes	☒ No ☐ Yes	☒ passed ☐ failed	---
3	Power cord	Insulation/PVC	☒ Yes ☐ No	--	☐ 1 ☐ 2 ☒ 3	☐ Yes ☒ No	☐ Soft ☒ Flexible ☐ Rigid	☐ Black or dark-colored ☒ White or light-colored	☒ No ☐ Yes	☒ No ☐ Yes	☒ passed ☐ failed	---

1) Enter all PAK considered materials.

2) Applicant data from Annex 1

Assessed by *name*

Place Ningbo, Date 2017.08.29

Yuanda Mao
(Test engineers signature)

Risk assessment for the above mentioned product indicates PAH relevance :

☐ Yes [1)]

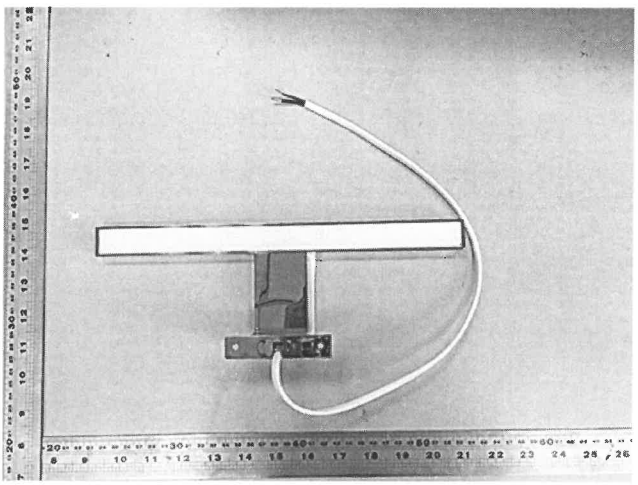
☒ No

☐ Short statement

Rev. 4 on 2008-07-10

Prüfbericht - Nr.: *Test Report No.:*	**50098017 001**	**Auftrags-Nr.:** *Order No:*	1160035834	Seite 1 von11 *Page 1 of 11*
Kunden-Referenz-Nr.: *Client Reference No.:*	N/A	**Auftragsdatum:** *Order date:*	27.05.2017	
Auftraggeber: *Client:*	NINGBO JIAHANG ELECTRIC APPLIANCE CO., LTD. Zhangjiaying Village, Qiu'ai Town, Yinzhou District, Ningbo City P.R. China			
Prüfgegenstand: *Test item:*	LED MIRROR LIGHT			
Bezeichnung / Typ-Nr. : *Identification / Type No. :*	NC-LE71, NC-LE72, NC-LE78, NC-LE80			
Auftrags-Inhalt: *Order content:*	TÜV Rheinland – EMC Service			
Prüfgrundlage: *Test specification:*	**EN 62493:2010** **EN 62493:2015**			

Wareneingangsdatum: *Date of receipt:*	27.05.2017
Prüfmuster-Nr.: *Test sample No.:*	1160035834
Prüfzeitraum: *Testing period:*	05.09.2017
Ort der Prüfung: *Place of testing:*	Refer to section 1.1
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland / CCIC (Ningbo) Co., Ltd.
Prüfergebnis*: *Test result*:*	Pass



geprüft von/ *tested by:*

Datum *Date*	Name/Stellung *Name/Position*	Unterschrift *Signature*
05.09.2017	Shey Zheng /trainee	Shey Zheng
05.09.2017	Carrie Lei /PE	Carrie Lei

kontrolliert von/ *reviewed by:*

Datum *Date*	Name/Stellung *Name/Position*	Unterschrift *Signature*
07.09.2017	Feng Liang/TC	Feng Liang

Sonstiges/ *Other:*

Refer to Page 2 for detail information.

Zustand des Prüfgegenstandes bei Anlieferung: *Condition of the test item at delivery :*	Prüfmuster vollständing und unbeschädigt *Test item complete and undamaged*

*Legende:	1= Sehr gut	2 = gut	3= befriedigend	4= ausreichend	5 = mangelhaft
	P(ass) =entspricht o.g.	Prüfgrundlage(n)	F(ail)= entspricht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T =nicht getestet
Legend:	*1= very good*	*2 = good*	*3= satisfactory*	*4= sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail)= failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

Model List:

No.	Model name	Rated Input	Rated power
1	NC-LE71	AC 220-240V, 50Hz	5W
2	NC-LE72		9W
3	NC-LE78		5W
4	NC-LE80		9W

Other aspects:

1. According to the standard EN 62493:2015, the DUT belongs to unintentional radiating part of lighting equipment. Due to the reason that the DUT fulfils the inherent-compliance condition "It is a LED-light-source technology", the DUT is deemed to comply with requirements of this standard without testing.
2. In electrical characteristics, all models are based on the similar circuit diagram. The differences among them are in the mechanical aspects.
3. All models have been EMC approved in test reports 50098016 001. According to the standard EN 62493:2010, EMF test is performed on model NC-LE72 which has the highest power.

Test Summary

4.1 DISTURBANCE VOLTAGE AT MAINS TERMINAL (20KHZ-30MHZ)
RESULT:
PASS
4.2 RADIATED ELECTROMAGNETIC DISTURBANCES (100KHZ-30MHZ)
RESULT:
PASS
4.3 RADIATED ELECTROMAGNETIC DISTURBANCES (30-300MHZ)
RESULT:
PASS
4.4 INDUCED CURRENT DENSITY DUE TO THE ELECTRIC FIELD (20KHZ-10MHZ)
RESULT:
PASS

Contents

1 Test Sites

1.1 Test Facilities

Laboratory: Ningbo Joysun Product Testing Service Co., Ltd.

No.66, Qingyi Road, Hi-Tech District, Ningbo, Zhejiang, China.

The used test equipment is in accordance with CISPR 16-1 series standards for measurement of radio interference.

1.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment of Laboratory

No.	Equipment	Model	Serial No.	Cal. due date
1	EMI test receiver	ESCI	101406	26.06.2018
2	Van der Hoofden Test-Head	VDHH9502	096	25.06.2018

2 General Product Information

2.1 Product Function and Intended Use

The EUT (equipment under test) is an ordinary LED MIRROR LIGHT for lighting and similar use. For the further information, refer to the user's manual.

2.2 Ratings and System Details

System input voltage	:	Refer to page 2	For all models
Frequency	:	Refer to page 2	For all models
Rated Output Power	:	Refer to page 2	For all models
Protection Class	:	II	For all models

2.3 Independent Operation Modes

The basic operation modes are: "On" or "Off".

2.4 Submitted Documents

None.

3 Test Set-up and Operation Modes

3.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its highest possible emission level. The test conditions were adapted accordingly in reference to the instructions for use.

Refer to the related paragraph of this report.

3.2 Physical Configuration for Testing

Refer to the related paragraph of this report.

3.3 Test Operation and Test Software

Refer to the related paragraph of this report. No software was used.

3.4 Special Accessories and Auxiliary Equipment

None.

4 Test Results

4.1 Disturbance Voltage at Mains Terminal (9kHz-30MHz)

Result:	**Pass**

The models have been EMC approved as described in test report 50098016 001.
Therefore the models were deemed to meet the requirement of disturbance voltage at mains terminal (9kHz-30MHz) without additional test.

4.2 Radiated Electromagnetic Disturbances (9kHz-30MHz)

Result:	**Pass**

The models have been EMC approved as described in test report 50098016 001.
Therefore the models were deemed to meet the requirement of radiated electromagnetic disturbance (9kHz-30MHz) without additional test.

4.3 Radiated Electromagnetic Disturbances (30-300MHz)

Result:	**Pass**

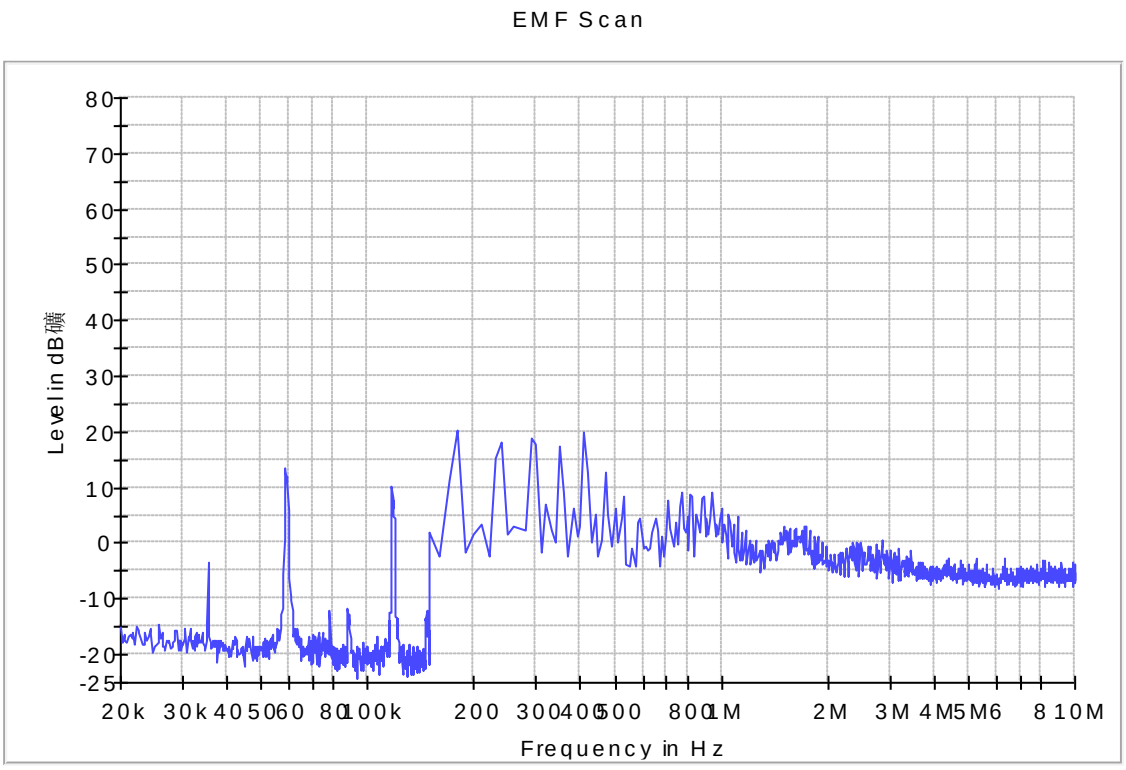
The models have been EMC approved as described in test reports 50098016 001.
Therefore the models were deemed to meet the requirement of radiated electromagnetic disturbance (30-300MHz) without additional test.

4.4 Induced Current Density due to the Electric Field (20kHz-10MHz)

Result:	**Pass**

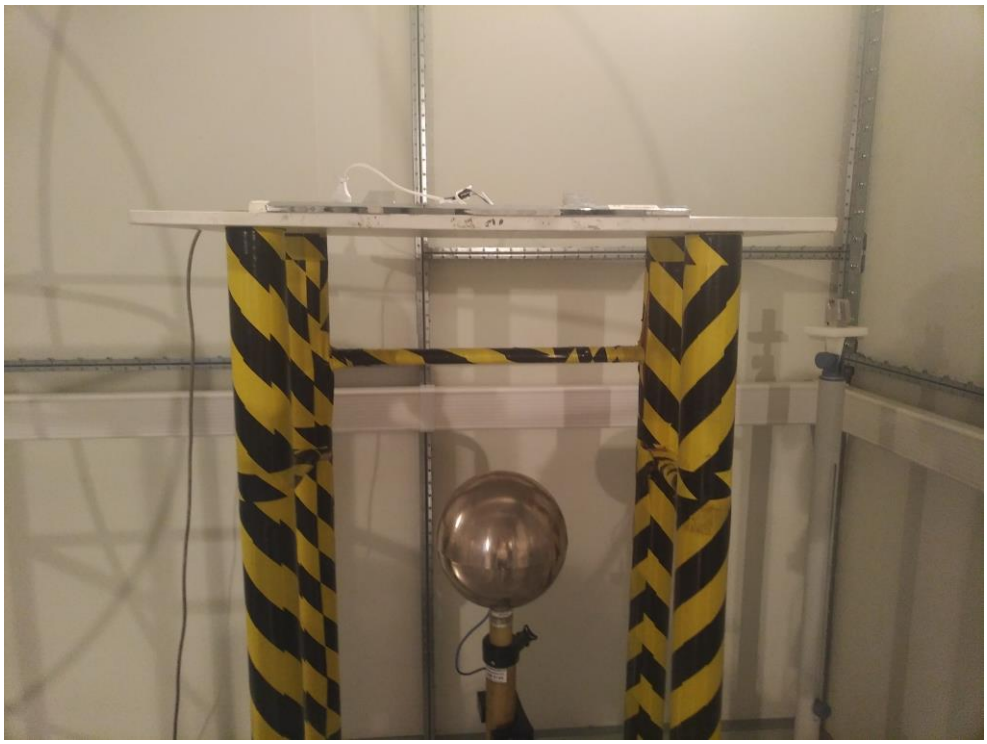
Test date	:	2017.08.29
Test procedure	:	EN 62493:2010
Frequency range	:	20kHz-10MHz
Test voltage	:	AC 220-240V, 50Hz
Measuring distance	:	50cm
Test-head location	:	Figure B.2a, Annex B, EN 62493:2010
Operating condition	:	Continuous operation at least 30min. before test
Ambient temperature	:	22°C
Measurement uncertainty (*U*)	:	55%
Limit	:	The factor (*F*) ≤ 0.85
Measurement result	:	F = 0.012

Figure 1: Spectral diagram of induced current density measurement



5 Photographs of the Test Set-Up

Photograph 1: Set-up for measurement of induced current density due to the electric field (20kHz-10MHz)



6 List of Tables

7 List of Figures

8 List of Photographs