

Test Report issued under the responsibility of:



# TEST REPORT IEC 60598-2-5 Luminaires Part 2: Particular requirements Section 5: Floodlights

Report Number:	CN23JQ5V 001
Date of issue:	2023-05-11
Total number of pages	44 pages
Name of Testing Laboratory preparing the Report:	TÜV Rheinland (Shenzhen) Co., Ltd.
Applicant's name:	MIC Optoelectronic Co., Ltd
Address:	2nd floor, Third building, 97# Ainan road, LongDong, BaoLong Street, LongGuang District, Shenzhen, Guangdong, P.R. China
Test specification:	
Standard:	IEC 60598-2-5:2015 used in conjunction with IEC 60598-1:2020
Test procedure:	CB Scheme
Non-standard test method:	N/A
TRF template used:	IECEE OD-2020-F1:2021, Ed.1.4
Test Report Form No	IEC60598_2_5G
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Master TRF:	2021-11-11
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General disclaimer:

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

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Test	item description:	LED F	lood Light	
Trad	le Mark(s):	Mic		
		-////0	(MIC)	
Man	ufacturer:	Same	as applicant's name and	laddress
Mod	el/Type reference:	See "G	General product informati	on"
Rati	ngs:	See "G	General product informati	on"
Res	oonsible Testing Laboratory (as a	applica	ble), testing procedure	and testing location(s):
	CB Testing Laboratory:		TÜV Rheinland (Shenzh	nen) Co., Ltd.
Test	ing location/address	:	1601-1604, 17-18F, Tov International Innovation Xili Community, Nansha	wer A Building 2, Shenzhen Valley, Dashi 1st Road, Xili Street, an District, Shenzhen 518052, China
Test	ed by (name, function, signature	):	Duffe Zhong (Project handle)	Dutte 2hory
Арр	roved by (name, function, signat	ure):	Young Yang (Reviewer)	Young Yang
	Tasting procedure: CTE Stage 1			
⊔ To et	ing location/address	•	N/A	
162			N/A	
Test	ed by (name, function, signature	):	N/A	
Арр	roved by (name, function, signat	ure):	N/A	
	Testing procedure: CTF Stage 2	•	Ν/Δ	
L Test	ing location/address		N/A	
100				
Test	ed by (name + signature)	:	N/A	
Witr	nessed by (name, function, signa	ture).:	N/A	
Арр	roved by (name, function, signat	ure):	N/A	
	Testing procedure: CTF Stage 3	•	N/A	
	Testing procedure: CTF Stage 4	<u>.</u>	N/A	
Test	ing location/address	· ·	N/A	
Test	ed by (name, function, signature	):	N/A	
Witr	nessed by (name, function, signa	ture).:	N/A	
Арр	roved by (name, function, signat	ure):	N/A	
Sup	ervised by (name, function, signa	ature):	N/A	

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

Attachment 1: EMF Assessment according to IEC 62493:2015. (9 pages)

Attachment 2: Tests according to IEC 62031:2018. (23 pages)

Attachment 3: Photobiological safety of lamps and lamp systems were according to standard IEC TR 62778:2014. (9 pages)

Attachment 4: Photo document. (5 pages)

## Summary of testing:

Tests performe	ed (name of test and test clause):	Testing location:
Clause(s)	<u>Test(s)</u>	TÜV Rheinland (Shenzhen) Co., Ltd.
IEC 60598-1:2	020, IEC 60598-2-5:2015	1601-1604, 17-18F, Tower A Building 2, Shenzhen
5.5 (3.4)	Rubbing test	International Innovation Valley, Dashi 1st Road, XII
5.6 (4.12.1)	Screw torque test	518052, China
5.6 (4.12.5)	Screwed gland test	
5.6 (4.13.1)	Impact test	
5.6 (4.13.3)	Straight unjointed test finger	
5.6 (4.14.1)	Test for mechanical suspensions	
5.6 (4.14.3)	Adjusting devices	
5.6 (4.18)	Resistance to corrosion	
5.6.5 (-)	Fixing device	
5.6.6 (-)	Locking of angular adjustment	
5.6.7 (-)	Vibration resistance	
5.7 (11)	CREEPAGE DISTANCES AND CLEARANCE	
5.10	Pull and torque test on cord	
(5.2.10.3)	anchorage	
5.8(7)	Earth resistance test	
5.11 (8.2.5)	Protection against electric shock	
5.11 (8.2.6)	Test for covers and other parts providing protection against electric shock	
5.11 (8.2.7)	Discharge test	
5.13 (9.2)	Tests for ingress of dust, solid objects and moisture	
5.13 (9.3)	Humidity test	
5.14 (10.2.1)	Insulation resistance test	
5.14 (10.2.2)	Electric strength test	
5.14 (10.3)	Touch current and protective conductor current	
5.12 (12.3)	Endurance test	
5.12 (12.4)	Thermal test (normal operation)	
5.15 (13.2.1)	Ball pressure test	
5.15 (13.3.1)	Needle flame test	
5.15 (13.3.2)	Glow-wire test	
Full test were per partial tests wer and MFL-G120.	erformed on model MFL-G1440, re performed on models MFL-G360	

Summary of compliance with National Differences (List of countries addressed):  $N\!/\!A$ 

#### Use of uncertainty of measurement for decisions on conformity (decision rule) :

⊠ No decision rule is specified by the IEC standard, when comparing the measurement result with the applicable limit according to the specification in that standard. The decisions on conformity are made without applying the measurement uncertainty ("simple acceptance" decision rule, previously known as "accuracy method").

Other:... (to be specified, for example when required by the standard or client, or if national accreditation requirements apply)

### Information on uncertainty of measurement:

The uncertainties of measurement are calculated by the laboratory based on application of criteria given by OD-5014 for test equipment and application of test methods, decision sheets and operational procedures of IECEE.

IEC Guide 115 provides guidance on the application of measurement uncertainty principles and applying the decision rule when reporting test results within IECEE scheme, noting that the reporting of the measurement uncertainty for measurements is not necessary unless required by the test standard or customer.

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

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.

Location: sticking on the external surface of luminaire.

LED Flood Light Model: MFL-G1440	Mic
100-240V~, 50/60Hz, 1440W IP65 ta 50°C 6500K	
MIC Optoelectronic Co., Ltd 2nd floor, Third building, 97# Ainan road, Longdong, street, Longgang district, Shenzhen, Guangdong, Ch Importer: XXXXXXX Address: XXXXXXX	Baolong ina
MAD	E IN CHINA

Note 1: Above labels are only representative, other model labels are the same design, except model name and rating correspondingly.

Note 2: The height of graphical symbols is 5 mm;

Note 3: The height of letters and numerals is 2mm;

Note 4: The height of WEEE symbol is 7mm;

Test item particulars:	
Classification of installation and use:	LED floodlight for indoor and outdoor use
Supply Connection:	Supply cord
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	2023-03-15
Date (s) of performance of tests	2023-03-15 to 2023-04-25
General remarks:	
Throughout this report a $\boxtimes$ comma / $\square$ point is u	used as the decimal separator.
Clause numbers between brackets refer to clause	s in IEC 60598-1
Clause numbers between brackets refer to clause Manufacturer's Declaration per sub-clause 4.2.5 o	s in IEC 60598-1 f IECEE 02:
Clause numbers between brackets refer to clause Manufacturer's Declaration per sub-clause 4.2.5 o 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.	s in IEC 60598-1 f IECEE 02:
Clause numbers between brackets refer to clause Manufacturer's Declaration per sub-clause 4.2.5 o 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	s in IEC 60598-1

# General product information and other remarks:

Product: LED Flood Light

Rating: 100-240VAC, 50/60Hz, ta: 50°C, IP65, Class I, and used with SELV LED drivers, suitable for direct mounting on normally flammable surfaces, suitable for indoor and outdoor use.

1. All models have the same structure and appearance except different for the LED driver, power and size. 2. All models use same type of LED chip with CCT 2700K-6500K.

Model list:

Model name	Input current (A)	Power (W)	LED Driver	Dimension (LxWxH)⁄ Weight	Max. project area (m²)	Maximum mounting height(m)
MFL-G120	1,2	120	ELG-150-48A	W310xL116xH 132mm/2,8kg	0,036	8
MFL-G240	2,4	240	ELG-240-48A	W362xL343xL 132mm/5,6kg	0,124	12
MFL-G360	3,6	360	ELG-200-48A x 2pcs	W362xL475xL 132mmm/7,25 kg	0,172	16
MFL-G480	4,8	480	ELG-240-48A x 2pcs	W362xL597xH 132mm/11kg	0,216	18
MFL-G720	7,2	720	ELG-240-48A x 3pcs	W649xL475xH 132mm/16,8kg	0,297	22
MFL-G960	9,6	960	ELG-240-48A x 4pcs	W649xL597xH 132mm/18kg	0,387	25
MFL-G1200	12	1200	ELG-240-48A x 5pcs	W649xL729xH 132mm/27,2kg	0,473	30
MFL-G1440	14,4	1440	ELG-240-48A x 6pcs	W649xL861xH 132mm/33,6kg	0,559	35

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IEC 60598-2-5			
Clause	Requirement + Test	Result - Remark	Verdict

5.2 (0)	GENERAL TEST REQUIREMENTS		Р
5.2 (0.3)	More sections applicable:	Yes □ No ⊠ Section/s:	_
5.2 (0.5)	Components	(see Annex 1)	—
5.2 (0.7)	Information for luminaire design in light sources s	tandards	
5.2 (0.7.2)	Light source safety standard	IEC 62031, IEC TR 62778	
	Luminaire design in the light source safety standard		Р

5.4 (2)	CLASSIFICATION OF LUMINAIRES		Р
5.4 (2.2)	Type of protection:	Class I	Р
5.4 (2.3)	Degree of protection	IP65	Р
5.4 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces	Yes 🛛 No 🗆	
5.4 (2.5)	Luminaire for normal use:	Yes 🛛 No 🗆	_
	Luminaire for rough service	Yes 🗌 No 🖾	

5.5 (3)	MARKING		Р
5.5 (3.2)	Mandatory markings		Р
	Position of the marking		Р
	Format of symbols/text		Р
5.5 (3.3)	Additional information		Р
	Language of instructions	English	Р
5.5 (3.3.1)	Combination luminaires		N/A
5.5 (3.3.2)	Nominal frequency in Hz	50/60Hz	Р
5.5 (3.3.3)	Operating temperature		N/A
5.5 (3.3.5)	Wiring diagram		N/A
5.5 (3.3.6)	Special conditions		N/A
5.5 (3.3.7)	Metal halide lamp luminaire – warning		N/A
5.5 (3.3.8)	Limitation for semi-luminaires		N/A
5.5 (3.3.9)	Power factor and supply current		N/A
5.5 (3.3.10)	Suitability for use indoors		Р
5.5 (3.3.11)	Luminaires with remote control		N/A
5.5 (3.3.12)	Clip-mounted luminaire – warning		N/A
5.5 (3.3.13)	Specifications of protective shields		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.5 (3.3.14)	Symbol for nature of supply	$\sim$	Р
5.5 (3.3.15)	Rated current of socket outlet		N/A
5.5 (3.3.16)	Rough service luminaire		N/A
5.5 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments	Туре Ү	Р
5.5 (3.3.18)	Non-ordinary luminaires with PVC cable		N/A
5.5 (3.3.19)	Protective conductor current in instruction if applicable		N/A
5.5 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N/A
5.5 (3.3.21)	Non replaceable and non-user replaceable light sources information provided	Non-user replaceable light sources	Р
5.5 (3.3.22)	Controllable luminaires, classification of insulation provided		N/A
5.5 (3.3.23)	Luminaires without control gear provided with necessary information for selection of appropriate component		N/A
5.5 (3.3.24)	If not supplied with terminal block, information on the packaging		Р
5.5 (3.3.25)	Luminaires employing light sources emitting UV on mains wiring, information provided		N/A
5.5 (3.3.26)	Wall mounted luminaire using external flexible cable or cord longer than 0.3 m, information provided		N/A
5.5 (3.4)	Test with water		Р
	Test with hexane		Р
	Legible after test		Р
	Label attached		Р
5.5 (-)	Additional information if applicable		Р
	a) Operation position		Р
	b) Weight and dimensions		Р
	c) Maximum protected area		Р
	d) Limitation of use indoors and/or outdoor		Р
	e) Maximum mounting height if ≤ 5 m		N/A

5.6 (4)	CONSTRUCTION		Р
5.6 (4.2)	Components replaceable without difficulty		Р
5.6 (4.3)	Wireways smooth and free from sharp edges		Р
5.6 (4.4)	Lampholders		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.6 (4.4.1)	Integral lampholder		N/A
5.6 (4.4.2)	Wiring connection		N/A
5.6 (4.4.3)	Lampholder for end-to-end mounting		N/A
5.6 (4.4.4)	Positioning		N/A
	- pressure test (N):		—
	After test the lampholder comply with relevant standard sheets and show no damage		N/A
	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
5.6 (4.4.5)	Peak pulse voltage		N/A
5.6 (4.4.6)	Centre contact		N/A
5.6 (4.4.7)	Parts in rough service luminaires resistant to tracking		N/A
5.6 (4.4.8)	Lamp connectors		N/A
5.6 (4.4.9)	Caps and bases correctly used		N/A
5.6 (4.4.10)	Light source for lampholder or connection according IEC 60061 not connected another way		N/A
5.6 (4.5)	Starter holders		N/A
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A
5.6 (4.6)	Terminal blocks		Р
	Tails		N/A
	Unsecured blocks		N/A
5.6 (4.7)	Terminals and supply connections		Р
5.6 (4.7.1)	Contact to metal parts		Р
5.6 (4.7.2)	Test 8 mm live conductor		Р
	Test 8 mm earth conductor		Р
5.6 (4.7.3)	Terminals for supply conductors		Р
5.6 (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

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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
5.6 (4.7.4)	Terminals other than supply connection		Р
5.6 (4.7.5)	Heat-resistant wiring/sleeves		N/A
5.6 (4.7.6)	Multi-pole plug		N/A
	- test at 30 N		N/A
5.6 (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
5.6 (4.9)	Insulating lining and sleeves	·	N/A
5.6 (4.9.1)	Retainment		N/A
	Method of fixing:		N/A
5.6 (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
5.6 (4.10)	Double or reinforced insulation		N/A
5.6 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		N/A
	Safe installation fixed luminaires		N/A
	Capacitors and switches		N/A
5.6 (4.10.2)	Assembly gaps:		N/A
	- not coincidental		N/A
	- no straight access with test probe		N/A
5.6 (4.10.3)	Retainment of insulation:		N/A
	- fixed		N/A
	- unable to be replaced; luminaire inoperative		N/A
	- sleeves retained in position		N/A
	- lining in lampholder		N/A
5.6 (4.10.4)	Protective impedance device	1	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
		I	
	Basic and supplementary insulation bridged by resistor(s) or appropriate capacitor		N/A
	Double or reinforced insulation bridged by appropriate and at least two resistors or two Y2 capacitors or one Y1 capacitor		N/A
	Capacitors comply with IEC 60384-14		N/A
	Resistors comply with test (a) in 14.1 of IEC 60065		N/A
5.6 (4.11)	Electrical connections and current-carrying parts		Р
5.6 (4.11.1)	Contact pressure		Р
5.6 (4.11.2)	Screws:		N/A
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
5.6 (4.11.3)	Screw locking:		Р
	- spring washer		Р
	- rivets		N/A
5.6 (4.11.4)	Material of current-carrying parts		Р
5.6 (4.11.5)	No contact to wood or mounting surface		Р
5.6 (4.11.6)	Electro-mechanical contact systems		N/A
5.6 (4.12)	(4.12) Screws and connections (mechanical) and glands		Р
5.6 (4.12.1)	Screws not made of soft metal		Р
	Screws of insulating material		N/A
	Torque test: torque (Nm); part:	Fixed LED driver: 1,2Nm	Р
	Torque test: torque (Nm); part	Fixed plastics lens: 0,6Nm	Р
	Torque test: torque (Nm); part	Fixed LED PCB: 0,6Nm	Р
5.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
5.6 (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
5.6 (4.12.5)	Screwed glands; force (Nm)	Metal gland: 6,25Nm	Р
5.6 (4.13)	Mechanical strength		Р
5.6 (4.13.1)	Impact tests:		Р
	- fragile parts; energy (Nm)		N/A
	- other parts; energy (Nm):	Metal enclosure and plastics lens: 0,7Nm	Р

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Clause	Requirement + Test	Result - Remark	Verdict
			_
	1) live parts		Р
	2) linings		N/A
	3) protection		Р
	4) covers		Р
5.6 (4.13.2)	Metal parts have adequate mechanical strength		Р
5.6 (4.13.3)	Straight test finger		Р
5.6 (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
5.6 (4.13.6)	Tumbling barrel		N/A
5.6 (4.14)	Suspensions, fixings and means of adjusting		Р
5.6 (4.14.1)	Mechanical load:		Р
	A) four times the weight	For model MFL-G1440: 4x33,6Kg=134,4Kg For model MFL-G120:	Р
	B) torque 2.5 Nm	1,2,01,g=11,21,g	N/A
	C) bracket arm: bending moment (Nm)	For model MEL_G1440:	
	C) bracket ann, benuing moment (Nin)	289,3Nm For model MFL-G120: 3,248Nm	
	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
5.6 (4.14.2)	Load to flexible cables		N/A
	Mass (kg):		—
	Stress in conductors (N/mm <sup>2</sup> ):		N/A
	Mass (kg) of semi-luminaire		N/A
	Bending moment (Nm) of semi-luminaire		N/A
5.6 (4.14.3)	Adjusting devices:		Р

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Clause	Requirement + Test	Result - Remark	Verdict
		·	
	- flexing test; number of cycles:	45 cycles	Р
	- strands broken:	No broken	Р
	<ul> <li>electric strength test afterwards</li> </ul>		Р
5.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N/A
5.6 (4.14.5)	Guide pulleys		N/A
5.6 (4.14.6)	Strain on socket-outlets		N/A
5.6 (4.15)	Flammable materials		N/A
	- glow-wire test 650°C	See Test Table 5.15 (13.3.2)	N/A
	- spacing ≥30 mm		N/A
	- screen withstanding test of 13.3.1		N/A
	- screen dimensions		N/A
	- no fiercely burning material		N/A
	- thermal protection		N/A
	- electronic circuits exempted		N/A
5.6 (4.15.2)	.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
5.6 (4.16)	Luminaires for mounting on normally flammable s	urfaces	Р
	No lamp control gear	(compliance with Section 12)	N/A
	Provided with adaptor for a track meet the requirements for direct mounting on normally flammable surfaces		N/A
5.6 (4.16.1)	Lamp control gear spacing:		N/A
	- spacing 35 mm		N/A
	- spacing 10 mm		N/A
5.6 (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
5.6 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	N/A
5.6 (4.17)	Drain holes		N/A
	Clearance at least 5 mm		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
		•	
5.6 (4.18)	Resistance to corrosion	1	Р
5.6 (4.18.1)	- rust-resistance		Р
5.6 (4.18.2)	- season cracking in copper		Р
5.6 (4.18.3)	- corrosion of aluminium		Р
5.6 (4.19)	Ignitors compatible with ballast		N/A
5.6 (4.20)	Rough service vibration		N/A
5.6 (4.21)	Protective shield		N/A
5.6 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N/A
	Shield of glass if tungsten halogen lamps		N/A
5.6 (4.21.2)	Particles from a shattering lamp not impair safety		N/A
5.6 (4.21.3)	No direct path		N/A
5.6 (4.21.4)	Impact test on shield		N/A
	Glow-wire test on lamp compartment	See Test Table 5.15 (13.3.2)	N/A
5.6 (4.22)	Attachments to lamps not cause overheating or damage		N/A
5.6 (4.23)	Semi-luminaires comply Class II		N/A
5.6 (4.24)	Photobiological hazards		Р
5.6 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		N/A
5.6 (4.24.2)	Retinal blue light hazard		Р
	Class of risk group assessed according to IEC/TR 62778	RG1	—
	Luminaires with E <sub>thr:</sub>		N/A
	a) Fixed luminaires		N/A
	- distance x m, borderline between RG1 and RG2:		N/A
	- marking and instruction according 3.2.23		N/A
	b) Portable and handheld luminaires		N/A
	- marking according 3.2.23 if RG1 exceeded at 200 mm according to IEC/TR 62778		N/A
	Portable luminaires for children IEC 60598-2-10 and Mains socket outlet nightlights IEC 60598-2-12 not exceed RG1 at 200 mm according to IEC/62778		N/A
5.6 (4.25)	Mechanical hazard		Р
	No sharp point or edges		Р
5.6 (4.26)	Short-circuit protection		N/A

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Clause	Requirement + Test Result - Remark	Verdict
5.6 (4.26.1)	Adequate means of uninsulated accessible SELV parts	N/A
5.6 (4.26.2)	Short-circuit test with test chain according 4.26.3	N/A
	Supply source ES1 PSE	N/A
	Test chain not melt through	N/A
	Test sample not exceed values of Table 12.1 and 12.2	N/A
5.6 (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 < $0,05 \Omega$	N/A
	Pull test of mechanical connection (50 N)	N/A
	After test, resistance < $0,05 \Omega$	N/A
	Voltage drop test, resistance < $0,05 \Omega$	N/A
5.6 (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
5.6 (4.29)	Luminaires with non-replaceable light source	N/A
	Not possible to replace light source	N/A
	Live part not accessible after parts have been opened by hand or tools	N/A
5.6 (4.30)	Luminaires with non-user replaceable light source	Р
	If protective cover provide protection against electric shock and marked with "caution, electric shock risk" symbol:	N/A
	At least one fixing means requiring use of tool	Р
5.6 (4.31)	Insulation between circuits	Р
	Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3	Р

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Clause	Requirement + Test	Result - Remark	Verdict
	Controllable luminaires requiring same level of insulation for all components, the insulation between control terminals and LV supply fulfil requirements according 4.31.1 – 4.31.3		N/A
5.6 (4.31.1)	SELV or PELV circuits		Р
	Used SELV/PELV source		Р
	Voltage ≤ ELV		Р
	Insulating of SELV/PELV circuits from LV supply		Р
	Insulating of SELV/PELV circuits from other non SELV/PELV circuits		N/A
	Insulating of SELV/PELV circuits from FELV		N/A
	Insulating of SELV/PELV circuits from other SELV/PELV circuits		N/A
	SELV/PELV circuits insulated from accessible parts according Table X.1		Р
	Plugs not able to make any electrical contact with 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
5.6 (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 make any electrical contact with socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A
	Socket-outlets does not have protective conductor contact		N/A
5.6 (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 pro with live parts:	tection against indirect contacts	N/A
	- conductive parts are connected together		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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
	<ul> <li>master luminaire provided with terminal for accessible conductive parts of slave luminaires</li> </ul>		N/A
	- slave luminaire constructed as class I		N/A
5.6 (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
5.6 (4.33)	Luminaire powered via information technology co	mmunication cabling	N/A
	Requirements for Class III luminaire		N/A
	Rated voltage within the range of ES1 and does not exceed maximum voltage of used connector		N/A
	Luminaire does not create any hazard from overvoltage	(see Annex 2)	N/A
5.6 (4.34)	Electromagnetic fields (EMF)		Р
	No harmful electromagnetic fields		Р
5.6 (4.35)	Protection against moving fan blades		N/A
	Test with a standard test finger		N/A
	Test with test probe acc. to Figure 13 (IEC 61032) for portable luminaire		N/A
	Blades rounded with radius $\geq 0.5$ mm and:		N/A
	-hardness less than D60 Shore		N/A
	-peripheral speed less than 15 m/s		N/A
	-input power of fan $\leq$ 2 W at rated voltage		N/A
5.6 (4.36)	Track-mounted luminaires		N/A
	Test in accordance with Annex A of IEC60570:2003/AMD2:2019		N/A
5.6.1 (-)	At least IPX3 if for outdoor use	IP65	Р
5.6.2 (-)	Lampholder brackets and lamp supports		N/A
5.6.3 (-)	Adjusting means		Р
5.6.4 (-)	Controlling components		N/A
5.6.5 (-)	Fixing device		Р

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Clause	Requirement + Test	Result - Remark	Verdict
	Wind force test	For model MFL-G1440:	Р
		Test Force: 1341,6N, 0,1°; no failure	
		(0,559x2,4 KN/m²)	
		For model MFL-G120:	
		Test Force: 86,4N, 0,1°; no failure	
		(0,036x2,4 KN/m²)	
5.6.6 (-)	Locking of angular adjustment		Р
5.6.7 (-)	Vibration resistance		Р
5.6.8 (-)	Requirement on glass cover if mounting height > 5 m		N/A
	Method of protection	Plastics lens	

5.7 (11)	CREEPAGE DISTANCES AND CLEARANCES		Р
5.7 (11.2)	Creepage distances and clearances	See Table 5.7 (11.2)	Р
	Impulse withstand category (Normal category II) (Category III Annex U, Table U.1)	Category II ⊠ Category III □	_
	Protected against pollution, reduced creepage and clearance according Annex P of IEC 61347-1		N/A
5.7 (11.2.2)	Creepage distances for frequency up to 30 kHz	See Test Table 5.7 (11.2) I	Р
	Creepage distances for frequency over 30 kHz:		N/A
	- Controlgear marked with $\hat{U}_{out}$ and $f_{Uout}$ according IEC 61347-1, clause 7.1, item w	See Test Table 5.7 (11.2) II	N/A
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 5.7 (11.2) II	N/A
5.7 (11.2.3)	Clearances for frequency up to 30 kHz	See Test Table 5.7 (11.2) I	Р
	Clearances distances for frequency over 30 kHz:		N/A
	- Controlgear marked with $U_{ m P}$	See Test Table 5.7 (11.2) II	N/A
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 5.7 (11.2) II	N/A

5.8 (7)	PROVISION FOR EARTHING		Р
5.8 (7.2.1 + 7.2.3)	Accessible metal parts		Р
	Metal parts in contact with supporting surface		Р
	Resistance < 0,5 $\Omega$	For model MFL-G1440:	Р
		Max 0,1 Ω< 0,5 Ω	
	Self-tapping screws used		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
		l .	
	Thread-forming screws		N/A
	Thread-forming screw used in a grove		N/A
	Protective earth makes contact first		Р
	Terminal blocks with integrated screwless protective earthing contacts tested according Annex V		N/A
	Protective earthing of the luminaire not via built-in control gear		Р
5.8 (7.2.2 + 7.2.3)	Protective earth continuity in joints, etc.		N/A
5.8 (7.2.4)	Locking of clamping means		Р
	Compliance with 4.7.3		Р
5.8 (7.2.5)	Protective earth terminal integral part of connector socket		N/A
5.8 (7.2.6)	Protective earth terminal adjacent to mains terminals		Р
5.8 (7.2.7)	Electrolytic corrosion of the protective earth terminal		Р
5.8 (7.2.8)	Material of protective earth terminal		Р
	Contact surface bare metal		Р
5.8 (7.2.10)	Class II luminaire for looping-in		N/A
	Double or reinforced insulation to functional earth		N/A
5.8 (7.2.11)	Protective earthing core coloured green-yellow		Р
	Length of earth conductor		Р
5.8 (7.2.12)	PELV circuit connected to protective earth for functional purpose		N/A

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

5.9 (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

5.10 (5)	EXTERNAL AND INTERNAL WIRING		Р
5.10 (5.2)	Supply connection and external wiring		Р
5.10 (5.2.1)	Means of connection	Supply cord	Р

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Clause	Requirement + Test	Result - Remark	Verdict
	Outdoor luminaire has not PVC insulated external wiring if not Class III or SELV/PELV circuits ≤ 25 V AC/60 V DC/25 V peak interrupted DC voltage with frequency 10Hz -200 Hz or protected from outdoor environment		N/A
5.10 (5.2.2)	Type of cable	H05RN-F	Р
	Nominal cross-sectional area (mm <sup>2</sup> )	3x1,0mm <sup>2</sup>	Р
	Cables equal to IEC 60227 or IEC 60245		Р
5.10 (5.2.3)	Type of attachment, X, Y or Z	Туре Ү	Р
5.10 (5.2.5)	Type Z not connected to screws		N/A
5.10 (5.2.6)	Cable entries:		Р
	- suitable for introduction		Р
	- adequate degree of protection		Р
5.10 (5.2.7)	Cable entries through rigid material have rounded edges		Р
5.10 (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
5.10 (5.2.9)	Locking of screwed bushings		N/A
5.10 (5.2.10)	Cord anchorage:		Р
	- covering protected from abrasion		Р
	- clear how to be effective		Р
	- no mechanical or thermal stress		Р
	- no tying of cables into knots etc.		Р
	- insulating material or lining		Р
5.10 (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
	f) metal screw not directly on cable		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	g) replacement without special tool		N/A
	Glands not used as anchorage		N/A
	Labyrinth type anchorages		N/A
5.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		Р
5.10 (5.2.10.3)	Tests:		Р
	- impossible to push cable; unsafe		Р
	- pull test: 25 times; pull (N)	60	Р
	- torque test: torque (Nm):	0,25	Р
	- displacement ≤ 2 mm	Max. 0,5mm	Р
	- no movement of conductors		Р
	- no damage of cable or cord		Р
	- function independent of electrical connection		Р
5.10 Luminaire with/designed for use with supply cord with maximum current (5.2.10.4)		maximum current of 2A:	N/A
	- Ordinary Class III luminaire supplied with SELV ≤ 25V RMS/60V DC		N/A
	- Ordinary Class III luminaire supplied with PELV ≤12V RMS/30V DC		N/A
	- Other than ordinary Class III luminaire supplied with voltage $\leq$ 12V RMS/30V DC		N/A
	Pull test of 30N		N/A
5.10 (5.2.11)	External wiring passing into luminaire		Р
5.10 (5.2.12)	Looping-in terminals		N/A
5.10 (5.2.13)	Wire ends not tinned		Р
	Wire ends tinned: no cold flow		N/A
5.10 (5.2.14)	Mains plug same protection		N/A
	Class III luminaire plug		N/A
	No unsafe compatibility		N/A
5.10 (5.2.15)	Connectors for Class III luminaires (IEC 60603 or IEC 62680)		N/A
5.10 (5.2.16)	Appliance inlets (IEC 60320)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Installation couplers (IEC 61535)		N/A
	Appliance inlet or connector systems (IEC 61984)		N/A
5.10 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
5.10 (5.2.18)	Used plug in accordance with		N/A
	- IEC 60083		N/A
	- other standard		N/A
5.10 (5.3)	Internal wiring		Р
5.10 (5.3.1)	Internal wiring of suitable size and type		Р
	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 protective earth only		Р
5.10 (5.3.1.1)	10 Internal wiring connected directly to fixed wiring .3.1.1)		N/A
	Cross-sectional area (mm <sup>2</sup> ):	see Annex 1	N/A
	Insulation thickness		N/A
	Extra insulation added where necessary		N/A
5.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal cu	urrent-limiting device	Р
	Cross-sectional area (mm <sup>2</sup> )	see Annex 1	Р
5.10 (5.3.1.3)	Double or reinforced insulation for class II		N/A
5.10 (5.3.1.4)	Conductors without insulation		N/A
5.10 (5.3.1.5)	SELV/PELV current-carrying parts		Р
5.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		N/A
5.10 (5.3.2)	Sharp edges etc.		Р
	No moving parts of switches etc.		N/A
	Joints, raising/lowering devices		N/A
	Telescopic tubes etc.		N/A
	No twisting over 360°		Р

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Clause	Requirement + Test	Result - Remark	Verdict
5.10 (5.3.3)	Insulating bushings:		N/A
	- suitable fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- cables with protective sheath		N/A
5.10 (5.3.4)	Joints and junctions effectively insulated		N/A
5.10 (5.3.5)	Strain on internal wiring		N/A
5.10 (5.3.6)	Wire carriers		N/A
5.10 (5.3.7)	Wire ends not tinned		Р
	Wire ends tinned: no cold flow		N/A
5.10 (5.4)	Test to determine suitability of conductors having area	a reduced cross-sectional	N/A
	Under test the temperature of the luminaire wiring insulation not exceed the limits stated in Table 12.2	(see Annex 2)	N/A
	No damage to luminaire wiring after test		N/A

5.11 (8)	PROTECTION AGAINST ELECTRIC SHOCK	Р
5.11 (8.2.1)	Live parts not accessible	Р
	Basic insulated parts not used on the outer surface without appropriate protection	Р
	Basic insulated parts not accessible with standard test finger on portable, settable and adjustable luminaires	Р
	Basic insulated parts not accessible with Ø 50 mm probe from outside, other types of luminaires	N/A
	Lamp and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements	N/A
	Basic insulation only accessible under lamp or starter replacement	Р
	Protection in any position	Р
	Double-ended tungsten filament lamp	N/A
	Insulation lacquer not reliable	Р
	Double-ended high pressure discharge lamp	N/A
	Relevant warning according to 3.2.18 fitted to the luminaire	N/A
5.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.11 (8.2.3.a)	Class II luminaire:		N/A
	- basic insulated metal parts not accessible during starter or lamp replacement		N/A
	<ul> <li>basic insulation not accessible other than during starter or lamp replacement</li> </ul>		N/A
	- glass protective shields not used as supplementary insulation		N/A
5.11 (8.2.3.b)	BC lamp holder of metal in class I luminaires shall be connected to protective earth		N/A
5.11 (8.2.3.c)	SELV circuits with exposed current carrying parts:		N/A
	Ordinary luminaire:		N/A
	- voltage under load/ no-load AC (V)		N/A
	- voltage under load/ no-load DC (V)		N/A
	- interrupted DC 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
	- voltage under load/ no-load AC (V)		N/A
	- voltage under load/ no-load DC (V)		N/A
	- interrupted DC 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
5.11 (8.2.3.d)	PELV circuits with exposed current carrying parts:		N/A
	Ordinary luminaire:		N/A
	- voltage under load/ no-load AC (V)		N/A
	- voltage under load/ no-load DC (V)		N/A
	Other than ordinary luminaire:		N/A
	- voltage under load/ no-load AC (V)		N/A
	- voltage under load/ no-load DC (V)		N/A
	One pole insulated if required		N/A
5.11 (8.2.4)	Portable luminaire have protection independent of supporting surface		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.11 (8.2.5)	Compliance with the standard test finger or relevant probe		Р
5.11 (8.2.6)	Covers reliably secured		Р
5.11 (8.2.7)	Luminaire other than below with capacitor $>$ 0,5 $\mu F$ not exceed 50 V 1 min after disconnection	4V	Р
	Portable luminaire with capacitor $>$ 0,1 $\mu F$ (0.25) not exceed 34 V 1 s after disconnection		N/A
	Other luminaires with capacitor > 0,1 $\mu$ F (0.25) with plug and track adaptors not exceed 60 V 5 s after disconnection		N/A

5.12 (12)	ENDURANCE TEST AND THERMAL TEST		Р
5.12 (-)	If IP > IP 20 relevant test of (12.4), (12.5), (12.6) and (12.7) after (9.2) before (9.3) as specified in $5.13$		—
5.12 (12.2)	Selection of lamps and ballasts		
	Lamp used according Annex B	(Lamp used see Annex 2)	
	Control gear if separate and not supplied	(Control gear used see Annex 2)	—
5.12 (12.3)	Endurance test:		Р
	a) mounting-position:	Normal use mounting	
	b) test temperature (°C):	60	
	c) total duration (h):	240	
	d) supply voltage (V)	264	
	d) if not equipped with control gear, constant voltage/current (V) or (A):		
5.12 (12.3.1d)	d) Class III luminaires powered via information techno	logy communication cable:	N/A
	- voltage under normal operation (V)		
	- voltage under abnormal operation (V)		
	e) luminaire ceases to operate		
	f) luminaire with constant light output function		N/A
5.12 (12.3.2)	5.12 After endurance test: (12.3.2)		Р
	- no part unserviceable		Р
	- luminaire not unsafe		Р
	- no damage to track system		N/A
	- marking legible		Р

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Clause	Requirement + Test	Result - Remark	Verdict	
		I		
	- no cracks, deformation etc.		Р	
5.12 (12.4)	Thermal test (normal operation)	(see Annex 2)	Р	
5.12 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	N/A	
5.12 (12.6)	Thermal test (failed lamp control gear condition):	1	N/A	
5.12 (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	
5.12 (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	
5.12 (12.7)	Thermal test (failed lamp control gear in plastic lu	minaires):	N/A	
5.12 (12.7.1)	Luminaire without temperature sensing control		N/A	
5.12 (12.7.1.1)	Luminaire with fluorescent lamp $\leq$ 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:			

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Clause	Requirement + Test	Result - Remark	Verdict		
	I				
	- 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 5.15 (13.2.1)	N/A		
5.12 (12.7.1.2)	W, 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 5.15 (13.2.1)	N/A		
5.12 (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		
5.12 (12.7.2)	Luminaire with temperature sensing control		N/A		
	- thermal link:	Yes 🗆 No 🗆			
	- manual reset cut-out:	Yes 🗌 No 🗌			
	- auto reset cut-out:	Yes 🗌 No 🗌			
	- case of abnormal conditions:				
	- highest measured temperature of fixing point/ exposed part (°C)::		—		
	Ball-pressure test::	See Table 5.15 (13.2.1)	N/A		
5.12.1 (-)	Reduction 10 °C of measured temperatures if for outdoor use				
5.12.2 (-)	Glass covers used within the thermal limits		N/A		

5.13 (9)	RESISTANCE TO DUST AND MOISTURE				
5.13.1 (-)	If IP > IP 20 the order of tests as specified in clause 5.12				
5.13 (9.2)	Tests for ingress of dust, solid objects and moisture:				
	- classification according to IP IP65	_			

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Clause	Requirement + Test	Result - Remark	Verdict			
	- mounting position during test	Normal use mounting				
	- fixing screws tightened; torque (Nm):	Fixed plastics lens: 0,4Nm Metal glands: 4,2Nm;	—			
	- tests according to clauses:	Clause 9.2.2 and 9.2.6				
	- electric strength test afterwards		Р			
	a) no deposit in dust-proof luminaire		N/A			
	b) no talcum in dust-tight luminaire		Р			
	c) no trace of water on current-carrying parts or on insulation where it could become a hazard		Р			
	c.1) For luminaires without drain holes – no water entry		Р			
	c.2) For luminaires with drain holes – no hazardous water entry		N/A			
	d) no water in watertight, pressure watertight, high pressure and temperature water jet-proof or high pressure and cold water jet-proof luminaire		N/A			
	e) no contact with live parts (IP 2X)		N/A			
	e) no entry into enclosure (IP 3X and IP 4X)		N/A			
	e) no contact with live parts 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		N/A			
	g) no damage of protective shield or glass envelope		N/A			
5.13 (9.3)	Humidity test 48 h	Relative humidity 93%, temperature 25°C, 48h	Р			

5.14 (10)	INSULATION RESISTANCE AND ELECTRIC STRENGTH			
5.14 (10.2.1)	Insulation resistance test		Р	
	Cable or cord covered by metal foil or replaced by a metal rod of mm $\varnothing$	Supply covered by metal foil	_	
	Insulation resistance (M $\Omega$ ):	See below		
	SELV/PELV:			
	- between current-carrying parts of different polarity:		N/A	
	- between current-carrying parts and mounting surface	100ΜΩ>1ΜΩ	Р	
	- between current-carrying parts and metal parts of the luminaire	100ΜΩ>1ΜΩ	Р	

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Clause	Requirement + Test	Result - Remark	Verdict	
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts		N/A	
	- Insulation bushings as described in Section 5:		N/A	
	Other than SELV/PELV:		Р	
	- between live parts of different polarity	L/N: 100MΩ>2MΩ	Р	
	- between live parts and mounting surface:	between L/N and mounting surface: $100M\Omega\!>\!2M\Omega$	Р	
	- between live parts and metal parts	between L/N and metal parts: $100M\Omega\!>\!2M\!\Omega$	Р	
	- 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:	between the outer surface of a the power cord where it is clamped in a cord anchorage and accessible metal parts: $100M\Omega > 2M\Omega$	Р	
	- Insulation bushings as described in Section 5:		N/A	
5.14 (10.2.2)	Electric strength test		Р	
	Dummy lamp		N/A	
	Luminaires with ignitors after 24 h test		N/A	
	Luminaires with manual ignitors		N/A	
	Test voltage (V):		Р	
	SELV/PELV:		Р	
	- between current-carrying parts of different polarity:		N/A	
	- between current-carrying parts and mounting surface	500V	Р	
	- between current-carrying parts and metal parts of the luminaire	500V	Р	
	- 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/PELV:		Р	
	- between live parts of different polarity	L/N: 1480V	Р	
	- between live parts and mounting surface:	between L/N and mounting surface: 1480V	Р	

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Clause	Requirement + Test	Result - Remark	Verdict		
	- between live parts and metal parts:	between L/N and metal parts: 1480V	Р		
	- 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:	between the outer surface of a the power cord where it is clamped in a cord anchorage and accessible metal parts: 1480V	Ρ		
	- Insulation bushings as described in Section 5:		N/A		
5.14 (10.3)	Touch current (mA)		N/A		
	Protective conductor current (mA)	For model MFL-G1440: Max 0,5mA<3,5mA	Р		

5.15 (13)	RESISTANCE TO HEAT, FIRE AND TRACKING		
5.15 (13.2.1)	Ball-pressure test:	See Test Table 5.15 (13.2.1)	Р
5.15 (13.3.1)	Needle-flame test (10 s):	See Test Table 5.15 (13.3.1)	Р
5.15 (13.3.2)	Glow-wire test (650°C):	See Test Table 5.15 (13.3.2)	Р
5.15 (13.4)	Proof tracking test (IEC 60112)	See Test Table 5.15 (13.4)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict	

5.7 (11.2)	TABLE I: Creepage distances and clearances							Р
	Minimum d	listances (mm	) for a.c. up to	o 30 kHz sinus	soidal voltage	S		Р
	Applicable	part of IEC 60	<b>598-1 Table</b> 1	1.1.A*, 11.1.B	* and 11.2*			Р
	Insulation	Measured	Req	uired	Measured	Requ	uired	
	type **	clearance	clearance	*Table	creepage	creepage	*	Table
Distance 1:	В	>10	1,5	Table 11.1.B	>10	2,5	Tab	le 11.1.A
Working voltage (V)				:	240			
PTI				:	< 600 🛛	<u>&gt;</u> 600 □		
Pulse voltag	je or <i>U</i> ⊧ if app	olicable (kV)		:				
Supplement	ary informatio	on: Between L	and N before f	use(For model	MFL-G1440)			
Distance 2:	В	>10	1,5	Table 11.1.B	>10	2,5	Tab	le 11.1.A
Working vol	tage (V)			:	240			
PTI				:	< 600 🛛	≥ 600 □		
Pulse voltag	je or <i>U</i> ⊧ if app	olicable (kV)		:				
Supplement	tary information	on: Between liv	e part to acces	sible parts(For	model MFL-G	1440)		
Distance 3:	В	>10	1,5	Table 11.1.B	>10	2,5	Tab	le 11.1.A
Working voltage (V)				240				
РТІ:				< 600 🛛	<u>&gt;</u> 600 □			
Pulse voltag	je or <i>U</i> ⊧ if app	olicable (kV)		:				
Supplement	ary information	on: Between liv	e part to mour	nting surface(Fo	or model MFL-0	G1440)	-	

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

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Clause	Requirement + Test	Result - Remark	Verdict	

5.7 (11.2)	5.7 (11.2) TABLE II: Creepage distances and clearances							
	Minimu	m distances	(mm) for a.c.	higher than 3	0 kHz sinusoi	dal voltages		
	Applicab	le part of IE	C 61347-1 Tak	ble 7 and 8* or	IEC 60664-4 1	Fable 1 and 2		
Distances	Insulation	Measured	Req	uired	Measured	Req	uirea	ł
	type **	clearance	clearance	*Table	creepage	creepage	*	Table
Distance 1:								
Working volt	age (V)			:				—
Frequency if	<sup>;</sup> applicable (k	:Hz)		:				
PTI				:	< 600 🗆	<u>≥</u> 600 🛛		
Peak value o	of the working	g voltage Û <sub>out</sub>	if applicable (	kV):				—
Supplementary information:								
Distance 2:								
Working volt	age (V)			:				—
Frequency if	<sup>:</sup> applicable (k	(Hz)		:				—
PTI				:	< 600 🗌	<u>&gt;</u> 600 🗌		—
Peak value o	of the working	g voltage Û <sub>out</sub>	if applicable (	kV):				
Supplement	ary informatio	n:						
Distance 3:								
Working volt	age (V)			:				—
Frequency if applicable (kHz)							—	
PTI				< 600 🗌	<u>&gt;</u> 600 🗌		—	
Peak value o	of the working	g voltage Û <sub>out</sub>	if applicable (	kV):				
Supplement	ary informatio	n:						

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

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Clause	Requirement + Test	Result - Remark	Verdict					

5.15 (13.2.1)	TABLE: Ball Pressure Test of Thermoplastics						
Allowed impression diameter (mm) 2							
Object/ Part	Object/ Part No./ Material Manufacturer/ trademark		Test temperature (°C)	Impression diamete	er (mm)		
Plastics lens See Annex 1		108	0,6				
Supplement	tary information:	-	·	-			

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5.15 (13.3.1)	TABLE	ΓABLE: Needle-flame test						
Object/ Part No./ Material		Manufacturer/ trademark	Duration of application of test flame (ta); (s)	lgnition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict		
AC waterproof connector		See Annex 1	10	No	0	Р		
DC waterproof connector		See Annex 1	10	No	0	Р		
Supplementary information:								

5.15 (13.3.2)	TABLE: Resistanc	Р								
Object/	Manualantumat									
Part No./ Material	Manufacturer/ trademark	650		750		950	Verdict			
		te	ti	te	ti	850				
Plastics lens	See Annex 1	No burning	No burning				Р			
Ignition of the specified layer placed underneath the test specimen (Yes/No)										
Supplementary information:										

5.15 (13.4) TABLE: Proof tra	TABLE: Proof tracking test						
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	Verdic		

ANNEX 1	TABLE	: Critical components in	formation			Р
Object / part No.	Code	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity <sup>1)</sup>
Supply cord	В	Ningbo Dabu Electric Appliance Co.,Ltd.	H05RN-F	300/500V, 3X1,0mm <sup>2</sup>	DIN EN 50525- 2-21 (VDE 0285-525-2- 21):2012-01; EN 50525-2- 21:2011	VDE 40030691
Output wire of LED driver	В	Queshan Yuqiang Cable Co.,Ltd.	H05RN-F	300/500V, 2X1,0mm <sup>2</sup>	DIN EN 50525- 2-21 (VDE 0285-525-2- 21):2012-01; EN 50525-2- 21:2011	VDE 40044073
-Alt	D	Guangdong Rifeng Electrical Cable Co.,Ltd	H07RN-F	300/500V, 2X1,0mm <sup>2</sup>	DIN EN 50525- 2-21 (VDE 0285-525-2- 21):2012-01; EN 50525-2- 21:2011	VDE 40015999
Plastics lens	С	SABIC JAPAN L LC	ER015651	V-0, 130°C	IEC 60598-2- 5:2015 IEC 60598- 1:2020	UL E207780 Tested with appliance
AC waterproof connector	В	ShenZhen Lilutong Electronic Technology Co.,Ltd	LTT-L20- 25003L001	20A, 380V, IP68	IEC 60998- 1(ed.2), IEC 60998-2- 1(ed.2)	TUV SUD SG-IT-00149
DC waterproof connector	В	ShenZhen Lilutong Electronic Technology Co.,Ltd	LTT-L20- 25002L001	20A, 380V, IP68	IEC 60998- 1(ed.2), IEC 60998-2- 1(ed.2)	TUV SUD SG-IT-00149
LED PCB	С	DONGGUAN CITY SHIMAO ELECTRONICS CO LTD	SM-1	V-0, 105°C	IEC 60598-2- 5:2015 IEC 60598- 1:2020	UL E365107 Test with appliance
LED	С	Fujian Lightning Optoelectronic Co.,Ltd.	5050	lf=200mA, Vf=24VDC CCT. 2700K- 6500K	IEC TR 62778:2014	Test with appliance

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Clause	Require	ement + Test			Result - Re	mark		Verdict	
				1					
LED driver	В	MEAN WELL Enterprises Co., Ltd.	ELG-200-48A	Input: 240V, 1,8A, 277V, 1,0A Output 199,6d (Input: 240V, 149,70 (Input: 200V) ta.50° Const Class Indepe	AC 100- 50/60Hz, 50/60Hz, at: 48VDC, 8W, 4,16A, AC 200- 277V) 6W, 3,12A, AC 100- C tc.90°C ant voltage, I, SELV, endent	IEC 61347- 1:2015 IEC 61347-2- 13:2014 IEC 61347-2- 13:2014/AMD1 :2016	TUV DE 3 023	/ Rh CB 2- 141	
LED driver	В	MEAN WELL Enterprises Co., Ltd.	ELG-150-48A	Input: 240V, 1,7A, 277V, 0,7A Output 150,2 (Input: 240V, 105W (Input: 200V) ta.55° Const Class Indepe	AC 100- 50/60Hz, 50/60Hz, tt: 48VDC, W, 3,13A, AC 200- 277V) , 2,19A, AC 100- C tc.90°C ant voltage, I, SELV, endent	IEC 61347- 1:2015 IEC 61347-2- 13:2014 IEC 61347-2- 13:2014/AMD1 :2016	DE <sup>k</sup> NL-{	(RA CB 51177	
LED driver	В	MEAN WELL Enterprises Co., Ltd.	ELG-240-48A	Input: 240V, 2,2A, 277V, 1,2A Output 240W (Input: 240V, 180W (Input: 200V) ta.50° Const Class Indepe	AC 100- 50/60Hz, 50/60Hz, it: 48VDC, 5,0A, AC 200- 277V) 3,75A, AC 100- C tc.90°C ant voltage, I, SELV, endent	IEC 61347- 1:2015 IEC 61347-2- 13:2014 IEC 61347-2- 13:2014/AMD1 :2016	TUV DE 2 023	/ Rh CB 2- 141	
	IEC 60598-2-5								
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Clause	Requirement + Test	Result - Remark	Verdict						

Supplementary information:

<sup>1)</sup> 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	TABLE: Thermal tests of Section 12								
1/3	Type reference M					MFL-G1440			
	Lamp used			:	LED mod	ule			
	Lamp control gear	used		:	ELG-240	-48A*6pcs			
	Mounting position	of luminaire		:	Normal u	se mountin	g		
	Supply wattage (M	/)		:	1448				
	Supply current (A)			:	5,8				
	Temperatures in te ta (°C)	est 1 - 4 bel	ow are corr	ected for	50				
	- abnormal operati	ng mode		:					
5.12 (12.4)	- test 1: rated volta	ge		:	240V				
	- test 2: 1,06 times rated voltage or 1,05 times rated 2 wattage or 1,1 times constant voltage/current							—	
	- test 3: Load on w voltage or 1,05 tim	riring to soc es wattage	ket-outlet, ´	1,06 times :					
	Through wiring or current of A during	ooping-in w	viring loade	d by a :				—	
5.12 (12.5)	- test 4: 1,1 times wattage or 1,1 time 130/150% of rated	rated voltag es constant input voltag	e or 1,05 ti voltage/cu ge	mes rated rrent or				—	
		Tem	perature m	easuremen	ts (°C)				
				Cl. 12.4 -	- normal	normal Cl. 12.5 – a			
Part		Ambient	test 1	test 2	test 3	limit	test 4	limit	
Supply cord	l	50		61,6		90			
Tc of LED d	river	50	81,1			90			
AC waterpro	oof connector	50		66,9		90			
DC waterpro	oof connector	50		68,6		90			
Output wire	of LED driver	50		62,1		90			
Plastics lens		50		82,6		Ref.			
LED PCB		50		80,9		90			
Metal enclos position of the range of 5cr	sure(Adjust the he touch and the n around it)	50		73,6		Ref.			
Mounting su	urface	50		53,6		90			
Lighting sur	face (0,1cm)	50		55,9		90			

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Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:

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Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	TABLE: Thermal f	tests of Sec	ction 12					Р
2/3	Type reference			:	MFL-G36	60		
	Lamp used			:	LED mod	ule		
	Lamp control gear	used		:	ELG-200-	-48A*2pcs		
	Mounting position (	of luminaire		:	Normal us	se mountin	g	
	Supply wattage (W	/)		·····:	365			—
	Supply current (A)			:	1,47			_
	Temperatures in te ta (°C)	st 1 - 4 belo	ow are corre	ected for	50			—
	- abnormal operatin	ng mode		:				
5.12 (12.4)	- test 1: rated volta	:	240V					
	- test 2: 1,06 times wattage or 1,1 time	rated volta	ge or 1,05 t voltage/cur	imes rated rent				—
	- test 3: Load on w voltage or 1,05 tim	iring to soc	ket-outlet, 1	,06 times				_
	Through wiring or I current of A during	ooping-in w	iring loaded	d by a				_
5.12 (12.5)	- test 4: 1,1 times r wattage or 1,1 time 130/150% of rated	rated voltag es constant input voltaç	e or 1,05 tir voltage/cur ge	mes rated rrent or				—
		Tem	perature m	easuremen	ts (°C)			
Dort		Ambient		Cl. 12.4 -	- normal		Cl. 12.5 –	abnormal
Pan		Ambient	test 1	test 2	test 3	limit	test 4	limit
Tc of LED d	river	50	76,9			90		
Supplement	ary information:							

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			IEC 60	)598-2-5				
Clause	Requirement + Tes	st			Result - F	Result - Remark		
ANNEX 2	TABLE: Thermal	tests of Se	ction 12					Р
3/3	Type reference			:	MFL-G12	20		
	Lamp used			:	LED mod	ule		
	Lamp control gear	used		:	ELG-150	-48A		
	Mounting position	of luminaire		:	Normal u	se mountir	ng	
	Supply wattage (W	/)		:	152,6			
	Supply current (A)			:	0,6			
	Temperatures in te ta (°C)	50	50					
	- abnormal operati	ng mode		:				
5.12 (12.4)	- test 1: rated volta	ge		:	240V	240V		
	- test 2: 1,06 times wattage or 1,1 time	s rated volta es constant	ige or 1,05 t voltage/cur	times rated rent:				
	- test 3: Load on w voltage or 1,05 tim	riring to soc es wattage	ket-outlet, 1	1,06 times :				—
	Through wiring or current of A during	ooping-in w	iring loade	d by a :				—
5.12 (12.5)	- test 4: 1,1 times wattage or 1,1 time 130/150% of rated	rated voltag es constant input voltag	e or 1,05 til voltage/cu ge	mes rated rrent or				
		Tem	perature m	easuremen	ts (°C)			
				Cl. 12.4 -	- normal		Cl. 12.5 –	abnormal
Рап		Amplent	test 1	test 2	test 3	limit	test 4	limit
Tc of LED d	river	50	74,4			90		
Supplemen								

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Clause	Requirement + Test	Result - Remark	Verdict				
ANNEX 3	Screw terminals (part of the luminaire)		N/A				
(14)	SCREW TERMINALS		N/A				
(14.2)	Type of terminal						
	Rated current (A):						
(14.3.2.1)	One or more conductors		N/A				
(14.3.2.2)	Special preparation		N/A				
(14.3.2.3)	Terminal size		N/A				
	Cross-sectional area (mm <sup>2</sup> ):						
(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):	М	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
		• •	1
ANNEX 4	Screwless terminals (part of the luminaire)		N/A
(15)	SCREW LESS TERMINALS		N/A
(15.2)	Type of terminal		—
	Rated current (A)		
(15.3.1)	Material		N/A
(15.3.2)	Clamping		N/A
(15.3.3)	Stop		N/A
(15.3.4)	Unprepared conductors		N/A
(15.3.5)	Pressure on insulating material		N/A
(15.3.6)	Clear connection method		N/A
(15.3.7)	Clamping independently		N/A
(15.3.8)	Fixed in position		N/A
(15.3.10)	Conductor size		N/A
	Type of conductor		N/A
(15.5)	Terminals and connections for internal wiring		N/A
(15.5.1)	Mechanical tests		N/A
(15.5.1.1.1)	Pull test spring-type terminals (4 N, 4 samples):		N/A
(15.5.1.1.2)	Pull test pin or tab terminals (4 N, 4 samples):		N/A
	Insertion force not exceeding 50 N		N/A
(15.5.1.2)	Permanent connections: pull-off test (20 N)		N/A
(15.5.2)	Electrical tests		N/A
	Voltage drop (mV) after 1 h (4 samples)		N/A
	Voltage drop of two inseparable joints		N/A
	Number of cycles:		—
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples):		N/A
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples):		N/A
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples):		N/A
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples):		N/A
(15.6)	Terminals and connections for external wiring		N/A
(15.6.1)	Conductors	·	N/A
	Terminal size and rating		N/A

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Clause	Requ	irement + T	est				Resu	ılt - Rema	ark		Verdict
45.0.0											
15.6.2	Mech	anical tests	5								N/A
(15.6.2.1)	Pull t (4 sa	est spring-ty mples); pull	ype term (N)	inals or v	velded co	onnection	ns :				N/A
(15.6.2.2)	Pull t	est pin or ta	b termin	als (4 sa	mples);						N/A
	pull (I	N)									
(15.6.3)	Elect	rical 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)	TABL	E: Contac	t resista	nce test	/ Heatin	g tests					N/A
	Volta	ge drop (m\	/) after 1	h							
terminal		1	2	3	4	5	6	7	8	9	10
voltage drop	o (mV)										
		Voltage dro	op of two	insepara	able joint	s					
		Voltage dro	op after 1	0th alt. 2	25th cycle	e					
		Max. allow	ed voltag	ge drop (r	mV)	:					—
terminal		1	2	3	4	5	6	7	8	9	10
voltage drop	) (mV)										
		Voltage dro	op after 5	i0th alt. 1	100th cyc	le					
		Max. allow	ed voltag	ge drop (r	mV)	:					—
terminal		1	2	3	4	5	6	7	8	9	10
voltage drop	o (mV)										
		Continued	ageing: \	<i>v</i> oltage d	rop after	10th alt.	25th cyc	cle			
		Max. allow	ed voltag	ge drop (r	mV)	:					_
terminal		1	2	3	4	5	6	7	8	9	10
voltage drop	o (mV)										
		Continued	ageing: \	<i>v</i> oltage d	rop after	50th alt.	100th cy	/cle			
		Max. allow	ed voltag	ge drop (r	mV)	:					
terminal		1	2	3	4	5	6	7	8	9	10
voltage drop	(mV)										
Supplement	ary info	ormation:									



Test Report issued under the responsibility of:



# TEST REPORT IEC 62493

# Assessment of lighting equipment related to human exposure to electromagnetic fields

Report Number:	Attachment 1 of CN23JQ5V 001
Date of issue:	See main report
Total number of pages	9 pages
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Applicant's name:	See main report
Address:	See main report
Test specification:	
Standard:	IEC 62493 (ed.2)
Test procedure:	CB Scheme
Non-standard test method:	N/A
Test Report Form No:	IEC62493B
Test Report Form(s) Originator:	Intertek Semko AB
Master TRF:	2016-04

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#### General disclaimer:

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Test	item description:	See m	ain report			
Trad	le Mark:	See m	ain report			
Man	ufacturer:	See m	iain report			
Mod	el/Type reference:	See m	ain report			
Rati	ngs:	See m	ain report			
Res	oonsible Testing Laboratory (as a	applica	ble), testing procedure	and testing location(s):		
$\boxtimes$	CB Testing Laboratory:		TÜV Rheinland (Shenzl	hen) Co., Ltd.		
Test	ing location/address	:	1601-1604, 17-18F, Tov International Innovation Xili Community, Nansha	wer A Building 2, Shenzhen Valley, Dashi 1st Road, Xili Street, an District, Shenzhen 518052, China		
	Associated CB Testing Laborate	ory:				
Test	ing location/address	:				
Test	ed by (name, function, signature	):	See main report			
Арр	roved by (name, function, signat	ure):	See main report			
	Testing procedure: CTF Stage 1	:	N/A			
Test	ing location/address	:	N/A			
Test	ed by (name, function, signature	):	N/A			
Арр	roved by (name, function, signat	ure):	N/A			
	Testing procedure: CTF Stage 2		N/A			
Test	ing location/address	:	N/A			
Test	ed by (name + signature)	:	N/A			
Witr	nessed by (name, function, signat	ture).:	N/A			
Арр	roved by (name, function, signat	ure):	N/A			
	Testing procedure: CTF Stage 3	:	N/A			
	Testing procedure: CTF Stage 4	:	N/A			
Test	ing location/address	:	N/A			
Test	ed by (name, function, signature	):	N/A			
Witnessed by (name, function, signature).:			N/A			
Арр	roved by (name, function, signat	ure):	N/A			
Sup	ervised by (name, function, signa	ture):	N/A			

List of Attachments (including a total number of N/A	pages in each attachment):					
Summary of testing:						
Tests performed (name of test and test clause): The test sample complied with the relevant produc t standard(s) and all applicable clauses.	<b>Testing location:</b> TÜV Rheinland (Shenzhen) Co., Ltd. 1601-1604, 17-18F, Tower A Building 2, Shenzhen International Innovation Valley, Dashi 1st Road, Xili Street, Xili Community, Nanshan District, Shenzhen 518052, China					
Summary of compliance with National Differences (List of countries addressed): N/A						

#### 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:				
Classification of installation and use:	LED floodlight for indoor and outdoor use			
Supply Connection:	Supply cord			
:				
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 main report			
Date (s) of performance of tests:	See main report			
General remarks:				
"(See Enclosure #)" refers to additional information a	ppended to the report.			
"(See appended table)" refers to a table appended to the report.				
(See appended table) Telers to a table appended to	пе героп.			
Throughout this report a 🛛 comma / 🗌 point is u	sed as the decimal separator.			
Manufacturer's Declaration per sub-clause 4.2.5 of	sed as the decimal separator.			
Throughout this report a ⊠ comma / □ point is u Manufacturer's Declaration per sub-clause 4.2.5 of 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.	sed as the decimal separator.			
Throughout this report a ⊠ comma / □ point is u Manufacturer's Declaration per sub-clause 4.2.5 of 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	sed as the decimal separator.			
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Throughout this report a ⊠ comma / □ point is u Manufacturer's Declaration per sub-clause 4.2.5 of 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	sed as the decimal separator.  IECEE 02:  Yes Not applicable the General product information section. See main report			
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Throughout this report a ⊠ comma / □ point is u Manufacturer's Declaration per sub-clause 4.2.5 of 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	sed as the decimal separator.  IECEE 02:  Yes Not applicable the General product information section. See main report			

#### Report No. Attachment 1 of CN23JQ5V 001

62493
02100

Clause Requirement + Test

Result - Remark

Verdict

General product information:	General product information:			
Description of the EUT		Luminaire		
		Self-ballasted lamp		
		Built-in electronic control gear		
		Independent electronic control gear		
		Others:		
Control Gear		Magnetic control gear / transformer		
		Electronic control gear		
		Others:		
Lamp technology used		Fluorescent lamp		
		High pressure discharge lamp (HID)		
	$\boxtimes$	Light emitting diode (LED)		
		Tungsten halogen lamp		
		Incandescent lamp		
		Others:		
Model Number	See 'General product information' in main report			
Brand:	See page 2 in main report			
Rated Voltage/Frequency:	$\boxtimes$	AC: See 'General product information' in main report		
		DC: See 'General product information' in main report		
		AC/DC: See 'General product information' in main report		
Rated Power	See 'General product information' in main report			
Protection Class	See	'General product information' in main report		
Number of phases	N/A			
Accessories	N/A			

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IEC 62493
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Clause Requirement + Test

Result - Remark

Verdict

4	LIMITS		Р			
4.1	General		Р			
	Comply with Van der Hoofden test limit in 4.2.3 or inherently compliant in 4.2.2 and pass assessment procedure for intentional radiators in 4.3		Р			
4.2	Unintentional radiating part of lighting equipment		Р			
4.2.2	Lighting equipment deemed to comply with the Van de	er Hoofden test without testing	Р			
	1) electronic controlgear	Yes 🛛 No 🗆				
	2) incandescent-lamp technology	Yes 🗆 No 🖾				
	3) LED-light-source technology	Yes 🛛 No 🗆				
	4) OLED-light-source technology	Yes 🗆 No 🖾				
	5) high-pressure discharge lamp LED-light-source technologies	Yes 🗆 No 🛛				
	6) low-pressure discharge lamp technologies with exposure distance $\ge$ 50 cm	Yes 🗆 No 🖾				
	7) independent auxiliary	Yes 🗌 No 🖾				
	Not fulfil any of 1-7 above subject to 4.2.3					
4.2.3	Applications of limits					
	Not fulfil any of 1-7 in 4.2.2 but the compliance factor $F$ is $\leq 1$		N/A			
4.3	Intentional radiating part of lighting equipment					
	Comply with one of methods in Clause 7 if intentional radiator		N/A			

5	GENERAL		N/A
5.1	Measurand		N/A
	Test head, measuring instrumentation and measuring conditions according Clause $5.1 - 5.8$		N/A

6	MEASUREMENT PROCEDURE FOR THE VAN DER HOOFDEN TEST		
6.1	General		
	Measurements carried out under conditions according Clause $6.1 - 6.6$	See Table 6	N/A

# Page 8 of 9

Report No. Attachment 1 of CN23JQ5V 001

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IEC 62493
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Clause Requirement + Test

Result - Remark

Verdict

7	ASSESSMENT PROCEDURE INTENTIONAL RADIATORS	N/A	
7.2	Low-power exclusion method		
7.2.1	Input P <sub>int,rad</sub> :		
	Exclusion level P <sub>max</sub> :		
	Input power $P_{int,rad}$ < exclusion level $P_{max}$	N/A	
7.3	Application of the EMF product standard for body worn-equipment		
	If not Clause 7.2 is met and expose distance ≤ 0.05 m, comply with IEC 62209-2	N/A	
7.4	Application of the EMF product standard for base stations	N/A	
	If not Clause 7.2 is met and if intentional radiator is base station, comply with IEC 62232	N/A	
7.5	Application of another EMF standard	N/A	
	If not Clause 7.2 is met and if intentional radiator cannot be considered as in Clause 7.3 or 7.4, comply with IEC 62311	N/A	

6	TABLE: Measurement results with Van der Hoofden test head				N/A
Location of EuT		Measuring distance	Result (F)	Limit ( <i>F</i> )	Verdict

6	FABLE: Equipment used during test with Van der Hoofden test head					
Equipmen	t	Manufacturer	Туре	ld. No.		
Van der Hoofden test head						
Measurement receiver						

1 440 0 01 0	Page	9	of	9	
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#### Report No. Attachment 1 of CN23JQ5V 001

IEC 62493	
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Clause	Requirement + Test	Result - Remark	Verdict
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est set-up, photos N/A	

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Test Report issued under the responsibility of:



#### TEST REPORT IEC 62031

# LED modules for general lighting – Safety specifications

Report Number:	Attachment 2 of CN23JQ5V 001	
Date of issue:	See main report	
Total number of pages	23 pages	
Name of Testing Laboratory preparing the Report:	TÜV Rheinland (Shenzhen) Co., Ltd.	
Applicant's name:	See main report	
Address:	See main report	
Test specification:		
Standard:	IEC 62031:2018	
Test procedure:	CB Scheme	
Non-standard test method:	N/A	
Test Report Form No:	IEC62031F	
Test Report Form(s) Originator:	Intertek Semko AB	
Master TRF:	2018-06-14	
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	Page 2 of 23	Report No. Attachment 2 of CN23JQ5V 001
Test item description:	Built-in module	
Trade Mark:	See main report	
Manufacturer:	See main report	
Model/Type reference	See main report	
Ratings:	See main report	

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

$\boxtimes$	CB Testing Laboratory:	TÜV Rheinland (Shenzh	nen) Co., Ltd.	
Testing location/address:		1601-1604, 17-18F, Tower A Building 2, Shenzhen International Innovation Valley, Dashi 1st Road, Xili Street, Xili Community, Nanshan District, Shenzhen 518052, China		
Test	ed by (name, function, signature):	See main report		
Арр	roved by (name, function, signature):	See main report		
	Testing procedure: CTF Stage 1:	N/A		
Testing location/address:		N/A		
Test	ed by (name, function, signature):	N/A		
Арр	roved by (name, function, signature):	N/A		
	Testing procedure: CTF Stage 2:	N/A		
Testing location/address:		N/A		
Tested by (name + signature):		N/A		
Witnessed by (name, function, signature).: N/A				
Арр	roved by (name, function, signature):	N/A		
	Testing procedure: CTF Stage 3:	N/A		
	Testing procedure: CTF Stage 4:	N/A		
Testing location/address:		N/A		
Test	ed by (name, function, signature):	N/A		
Witnessed by (name, function, signature).:		N/A		
Approved by (name, function, signature):		N/A		
Sup	ervised by (name, function, signature):	N/A		

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):	<b>Testing location:</b> TÜV Rheinland (Shenzhen) Co., Ltd.		
The test sample complied with the relevant produc t standard(s) and all applicable clauses.	1601-1604, 17-18F, Tower A Building 2, Shenzhen International Innovation Valley, Dashi 1st Road, XII Street, XII Community, Nanshan District, Shenzhen 518052, China		
Summary of compliance with National Differenc List of countries addressed N/A	es:		

#### Copy of marking plate:

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Mode	l: LED	module 1	

MIC Optoelectronic Co., Ltd

Note 1: The height of letters and numerals is 2mm;

Test item particulars:			
Classification of installation and use:	Built-in module		
Supply Connection:	Copper contact		
:			
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 main report		
Date (s) of performance of tests:	See main report		
General remarks:			
"(See appended table)" refers to a table appended to the report. Throughout this report a $\boxtimes$ comma / $\square$ point is used as the decimal separator.			
Manufacturer's Declaration per sub-clause 4.2.5 of	FIECEE 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	<ul> <li>□ Yes</li> <li>☑ Not applicable</li> </ul>		
When differences exist; they shall be identified in the Name and address of factory (ies)	t <b>he General product information section.</b> See main report		

**General product information:** See main report

IEC 62031				
Clause	Requirement + Test	Result - Remark	Verdict	

4	GENERAL REQUIREMENTS		Р
4.2	Classification		Р
	Built-in module:	Yes 🛛 No 🗆	
	Independent module:	Yes 🗌 No 🖾	
	Integral module:	Yes 🗌 No 🖾	_
4.6	Independent modules comply with requirements in IEC 60598-1:2014/AMD1:2017		N/A
4.8	Modules with integrated controlgear providing SELV comply with requirements according to IEC 61347-1:2015/AMD1:2017 clause L.5 to L.11.	(see Annex 1)	N/A

6	MARKING	Р
6.2	Contents of marking for built-in and for independent LED modules	
	a) mark of origin	Р
	b) model number, type reference	Р
	c1) constant voltage module; rated supply voltage and supply frequency	N/A
	c2) constant current module; rated supply current and supply frequency	N/A
	d) rated power	N/A
	e) indication of connections, wiring diagram	N/A
	f) value of <i>t</i> c and place on the module	N/A
	g) Ethr if required	N/A
	h) symbol for built-in modules	N/A
	i) heat transfer temperature $t_{\rm d}$	N/A
	j) power for heat-conduction $P_d$	N/A
	k) working voltage for insulation	N/A
6.3	Location of marking for built-in LED modules	Р
	- marking of a) and b) in 6.2 on the modules	Р
	- marking of other applicable items in 6.2 on the modules or in data sheet, leaflet or website	Р
6.4	Location of marking for independent LED modules	N/A
	- marking of a), b), c) and f) in 6.2 on the modules	N/A
	- marking of other applicable items in 6.2 on the modules or in data sheet, leaflet or website	N/A
6.5	Marking of integral LED modules	N/A

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
	- information in 6.2 a) to g) in data sheet, leaflet or website		N/A
6.6	Durable and legibility of marking		Р
	- marking on the LED module legible after test with water	ו	Р
	- marking not on the LED module legible		Р

7	TERMINALS		N/A
7.1	Integral terminals		N/A
	Screw terminals comply with section 14 of IEC 60598-1	(see Annex 3)	N/A
	Screwless terminals comply with section 15 of IEC 60598-1	(see Annex 4)	N/A
7.2	Terminals other than integral terminals		N/A
	Separately approved; component list	(see Annex 2)	N/A
	Ratings suit the conditions		N/A
	Satisfy additional relevant requirements of this standard		N/A

8 (9)	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
	Earthing via means of fixing	N/A
	Earthing terminal only used for the earthing of the control gear	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

	IEC 62031		
Clause	Requirement + Test	Result - Remark	Verdict
- (9.3)	Lamp controlgear with conductors for protective e circuit board	earthing by tracks on printed	N/A
	Test with a current of 25 A between earthing terminal and each of the accessible metal parts; measured resistance ( $\Omega$ ) at $\geq$ 10 A according 7.2.3 of		N/A
- (9.4)	IEC 60598-1: < 0,5 $\Omega$ 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
	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 mm <sup>2</sup> and of copper or equivalent		N/A
	Protective earthing wires in line with 5.3.1.1 and clause 7		N/A
- (9.5.2)	Earthing of the lamp compartments powered via the in	dependent lamp controlgear	N/A
	Test with a current of 25 A between input and output earth terminals; measured resistance ( $\Omega$ ) between earthing terminal and each of the accessible metal parts at $\geq$ 10 A according 7.2.3 of IEC 60598-1: < 0,5 $\Omega$		N/A
	Output earthing terminal marked as in 7.1 t) of IEC 61347-1		N/A

9 (10)	PROTECTION AGAINST ACCIDENTAL CONTACT	WITH LIVE PARTS	N/A
- (10.1)	Controlgear protected against accidental contact with live parts		N/A
- (A2)	Voltage measured with 50 k $\Omega$	(see Annex A)	N/A
- (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		N/A
	Adequate mechanical strength on parts providing protection		N/A
- (10.2)	Capacitors > 0,5 μF: voltage after 1 min (V): < 50 V		N/A
- (10.3)	Controlgear providing SELV	•	N/A

	IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict	
	Accessible conductive parts are insulated from live parts by double or reinforced insulation in SELV controlgear		N/A	
	No connection between output circuit and the body or protective earthing circuit		N/A	
	No possibility of connection between output circuit and the body or protective earthing circuit through other conductive parts		N/A	
	SELV outputs separated from earth by at least basic insulation		N/A	
	ELV conductive parts insulated as live parts		N/A	
	Tests according Annex L of IEC 61347-1		N/A	
- (10.4)	Accessible conductive parts in SELV circuits		N/A	
	Output voltage under load $\leq$ 25 V r.m.s. or $\leq$ 60 V d.c.		N/A	
	If output voltage > 25 V r.m.s. or > 60 V d.c.; No load output $\leq$ 35 V peak or $\leq$ 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	

10 (11)	MOISTURE RESISTANCE AND INSULATION		Р
	After storage 48 h at 91-95% relative humidity and 20-30 °C measuring of insulation resistance with d.c. 500 V (M $\Omega$ ):		Р
	For basic insulation $\ge 2 \ M\Omega$ :	Between different polarity: Min.100 M $\Omega$ >1 M $\Omega$	Р
	For double or reinforced insulation $\ge 4 \ M\Omega$ :		N/A
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1		N/A

11 (12)	ELECTRIC STRENGTH		Р
	Immediately after clause 11 electric strength test for 1 min		Р

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	IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict	
		1		
	Basic insulation for SELV, test voltage 500 V		Р	
	Working voltage $\leq$ 50 V, test voltage 500 V		N/A	
	Working voltage > 50 V $\leq$ 1000 V, test voltage (V):	-	N/A	
	Basic insulation, 2U + 1000 V		N/A	
	Supplementary insulation, 2U + 1000 V		N/A	
	Double or reinforced insulation, 4U + 2000 V		N/A	
	No flashover or breakdown		Р	
	Solid or thin sheet insulation for double or reinforced insulation fulfil the requirements in Annex N in IEC 61347-1		N/A	

12 (14)	FAULT CONDITIONS		Р
- (14.1)	When operated under fault conditions the controlgear		Р
	- does not emit flames or molten material		Р
	- does not produce flammable gases		Р
	- protection against accidental contact not impaired		Р
	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)	Р
- (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)	Р
- (14.3)	Short-circuit or interruption of semiconductor devices	(see appended table)	Р
- (14.4)	Short-circuit across insulation consisting of lacquer, enamel or textile	(see appended table)	N/A
- (14.5)	Short-circuit across electrolytic capacitors	(see appended table)	N/A
	Short-circuit or interruption of SPDs	(see appended table)	N/A
- (14.6)	After the tests has been carried out on three samples:		Р
	The insulation resistance $\geq 1 \ M\Omega$	Min.100 MΩ>1 MΩ	Р
	No flammable gases		Р
	No accessible parts have become live		Р
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		Р
- (14.7)	Relevant fault condition tests with high-power a.c. supply and in turn to a d.c. supply		—

# Page 12 of 23 Report No. Attachment 2 of CN23JQ5V 001

	IEC 62031		
Clause	Requirement + Test	Result - Remark	Verdict

12.2	Overpower condition	Р
	Module withstands overpower condition >15 min.	Р
	Module with automatic protective device or power limiter, test performed 15 min. at limit.	N/A
	No fire, smoke or flammable gas is produced	Р
	Molten material does not ignite tissue paper, spread below the module	Р

14 (15)	CONSTRUCTION		Р
- (15.1)	Wood, cotton, silk, paper and similar fibrous material		Р
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		Р
- (15.2)	Printed circuits		Р
	Printed circuits used as internal connections complies with clause 14		Р

15 (16)	CREEPAGE DISTANCES AND CLEARANCES		Р
- (16.1)	General		Р
	Creepage distances and clearances according to 16.2 and 16.3		Р
	Controlgears providing SELV comply with additional requirements in Annex L		N/A
	Insulating lining of metallic enclosures		N/A
	Controlgear protected against pollution comply with Annex P		N/A
- (16.2)	Creepage distances		Р
- (16.2.2)	Minimum creepage distances for working voltages		Р
	Creepage distances according to Table 7	(see appended table)	Р
- (16.2.3)	Creepage distances for working voltages with frequer	icies above 30 kHz	N/A
	Creepage distances according to Table 8	(see appended table)	N/A
- (16.3)	Clearances	•	Р
- (16.3.2)	Clearances for working voltages		Р
	Clearances distances according to Table 9	(see appended table)	Р
- (16.3.3)	Clearances for ignition voltages and working voltages	with higher frequencies	N/A
	Clearances distances for basic or supplementary insulation according to Table 10		N/A
	Clearances distances for reinforced insulation according to Table 11		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

16 (17)	SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS	
	Screws, current-carrying parts and connections in compliance with IEC 60598-1 (clause numbers between parentheses refer to IEC 60598-1)	—
(4.11)	1) Electrical connections	
(4.11.1)	Contact pressure	N/A
(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	Р
(4.11.5)	No contact to wood or mounting surface	Р
(4.11.6)	Electro-mechanical contact systems	N/A
(4.12)	Mechanical connections and glands	
(4.12.1)	Screws not made of soft metal	Р
	Screws of insulating material	N/A
	Torque test: torque (Nm); part Fixed LED PCB: 0,6Nm	Р
	Torque test: torque (Nm); part:	N/A
	Torque test: torque (Nm); part	N/A
(4.12.2)	Screws with diameter < 3 mm screwed into metal	N/A
(4.12.4)	Locked connections:	N/A
	- fixed arms; torque (Nm):	N/A
	- lampholder; torque (Nm)	N/A
	- push-button switches; torque 0,8 Nm:	N/A
(4.12.5)	Screwed glands; force (Nm)	N/A

17 (18)	RESISTANCE TO HEAT, FIRE AND TRACKING		N/A
- (18.1)	Ball-pressure test:	See Test Table 17 (18.1)	N/A
- (18.2)	Test of printed boards	See Test Table 17 (18.2)	N/A
- (18.3)	Glow-wire test (650°C):	See Test Table 17 (18.3)	N/A
- (18.4)	Needle-flame test (10 s)	See Test Table 17 (18.4)	N/A
- (18.5)	Proof tracking test	See Test Table 17 (18.5)	N/A

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Clause	Requirement + Test		Result - Remark	Verdict
	•		-	

18	RESISTANCE TO CORROSION		N/A
	Comply with requirements according 4.18 of		N/A
	IEC 60598-1		

20	HEAT MANAGEMENT		N/A
20.1	0.1 General		N/A
	Fulfil clause 20 if replaceable LED module and when heat conducting thermal interface is needed.		N/A
20.2	Thermal interface material		N/A
	Thermal interface material delivered with the module if necessary		N/A
20.3	Heat protection		N/A
	Not impair safety when operated under poor heat- conduction conditions according Annex D		N/A

22	PHOTOBIOLOGICAL SAFETY	PHOTOBIOLOGICAL SAFETY		Р
22.1	UV radiation			N/A
	Luminous radiation not exceed 2mW/klm			N/A
22.2	Blue light hazard			Р
	Assessed according to IEC TR 62778	RG1		Р
22.3	Infrared radiation			N/A
	Requirements for infrared radiation when required			N/A

Α	ANNEX A - TESTS	N/A
	All tests performed in accordance with the advice given in Annex H of IEC 61347-1, if applicable	N/A

12 (14)	TABLE: tests of fault conditions	Р
Part	Simulated fault	Hazard
LED	SC, normal working, no flames, no gases, recoverable	No

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Clause	Requirement + Test	Result - Remark	Verdict

15 (16)	TABLE: clea	rance and c	reepage dista	nce measure	asurements (mm)(See main report) N/A			
		Applic	able part of IE	C 61347-1 Ta	ble 7 – 11*			
Distances	Insulation	n Measured	Requ	uired	Measured	Requi	ed	
	type **	clearance	clearance	*Table	creepage	creepage	*Table	
Distance 1:				-				
Working voltage (V) – – –								
Frequency if applicable (kHz)								
PTI				:	< 600 🗌	<u>&gt;</u> 600 🗌		
Peak value o	f the working	voltage $\hat{U}_{\text{out}}$	if applicable (k	V):				
Pulse voltage	e if applicable	(kV)		:				
Supplementa	ary information	n:						
Distance 2:								
Working volta	age (V)			:				
Frequency if	applicable (kł	Hz)		:				
PTI				:	< 600 🛛	≥600 □		
Peak value o	of the working	voltage $\hat{U}_{\text{out}}$	if applicable (k	V):				
Pulse voltage	e if applicable	(kV)		:				
Supplementa	ary information	n:						
Distance 3:								
Working volta	age (V)			:				
Frequency if applicable (kHz)								
PTI: < 600 □ ≥ 600 □								
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV):								
Pulse voltage	e if applicable	(kV)						
Supplementary information:								

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

	IEC 62031		
Clause	Requirement + Test	Result - Remark	Verdict

17 (18.1)	TABLE: Ball Pressure Test of Thermoplastics			N/A			
Allowed im	pression diameter	(mm)	2				
Object/ Part No./ Material Manufacturer/ trademark		Test temperature (°C) Impression diame		ər (mm)			
Supplement	Supplementary information:						

17 (18.2) N/A TABLE: Test of printed boards Object/ Part No./ Ignition of specified layer Manufacturer/ Duration of Duration of burning Verdict application of test trademark (s) Material flame (s) Yes/No ----------------Supplementary information:

17 (18.3)	TABLE:	TABLE: Glow-wire test					N/A	
Glow wire temperature 650°C								
Object/ Part No./ Material		Manufacturer/ trademark	Duration of application of test flame (ta); (s)		lgnition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict	
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)								
Supplement	Supplementary information:							

17 (18.4)	TABLE: Needle-flame test		N/A			
Object/ Part Material	No./	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
Supplementary information:						

17 (18.5)	TABLE: Proof tracking test		N/A
Test voltage	e PTI:	175 V	—

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IEC 62031							
Clause	Requirement + Test Result - Remark		Verdict				
Object/ Part No./ Material Ma tra		Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens		Verdict		
Supplement	Supplementary information:						

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	IEC 62031		
Clause	Requirement + Test	Result - Remark	Verdict

(A)	ANNEX A - TEST TO ESTABLISH WHETHER A C PART WHICH MAY CAUSE AN ELECTRIC SHOCK	CONDUCTIVE PART IS A LIVE	N/A
(A.1)	Comply with A.2 or A.3		N/A

ANNEX 1	LED MODULES WITH INTEGRAL CONTROLGEAR PROVIDING SELV	N/A
(L.5)	Protection against electric shock	N/A
	Comply with 9.2 of IEC 61558-1	N/A
(L.6)	Heating	N/A
	No excessive temperatures in normal use	N/A
	Value if capacitor tc marked	
	Winding insulation classified as Class	
	Comply with tests of clause 14 of IEC 61558-1 with adjustments	N/A
(L.7)	Short-circuit and overload protection	N/A
	Comply with tests of clause 15 of IEC 61558-1 with adjustments	N/A
(L.8)	Insulation resistance and electric strength	N/A
(L.8.1)	Conditioned 48 h between 91 % and 95 %	N/A
(L.8.2)	Insulation resistance	N/A
	Between input- and output circuits not less than 5 $M\Omega$ :	N/A
	Between metal parts of class II convertors which are separated from live parts by basic insulation only and the body not less than $5 M\Omega$	N/A
	Between metal foil in contact with the inner and outer surfaces of enclosures of insulating material not less than 2 M $\Omega$ :	N/A
(L.8.3)	Electric strength	N/A
	1) Between live parts of input circuits and live parts of output circuits:	N/A
	2) Over basic or supplementary insulation between:	N/A
	a) live parts having different polarity	N/A
	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

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IEC 62031					
Clause	Requirement + Test	Result - Remark	Verdict		
		Γ			
	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		N/A		
(L.9)	Construction		N/A		
(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		N/A		
(L.10)	Components		N/A		
	Protective devices comply with 20.6 – 20.11 of IEC 61558-1		N/A		
(L.11)	Creepage distances, clearances and distances th	N/A			
	Creepage distances and clearances not less than in Clause 16		N/A		
	Distance through insulation according Table L.5 in IE	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		—		
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Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	TABI	TABLE: Critical components information         N/A							
Object / pa No.	rt	Code	Manufacturer/ trademark	Type / model	Technical data	Standard	Ma cor	rk(s) of nformity <sup>1)</sup>	
See main r	eport			-	• •	-			
Supplement <sup>1)</sup> Provided e The codes a A - The c B - The c C - Integr D - Altern	ary infe evidence above h ompor ompor ated c ative c	ormation ce ens nave the nent is nent is ompor compo	on: ures the agreed lev ne following meanin replaceable with ar replaceable if authonent tested together nent	el of compliance ng: nother one, also orised by the tes r with the appliar	e. See OD-CB2039. certified, with equiv t house nce	alent characterist	ics		

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	IEC 62031		
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 3	Screw terminals (part of the luminaire)				
(14)	SCREW TERMINALS		N/A		
(14.2)	Type of terminal				
	Rated current (A)				
(14.3.2.1)	One or more conductors		N/A		
(14.3.2.2)	Special preparation		N/A		
(14.3.2.3)	Terminal size		N/A		
	Cross-sectional area (mm <sup>2</sup> )				
(14.3.3)	Conductor space (mm)		N/A		
(14.4)	Mechanical tests				
(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):	М	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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	IEC 62031		
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 teminal					
	Rated current (A):					
(15.3.1)	Material					
(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					
(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					
	Voltage drop (mV) after 1 h (4 samples)	N/A				
	Voltage drop of two inseparable joints	N/A				
	Number of cycles:					
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples):	N/A				
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples):	N/A				
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples):	N/A				
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples):	N/A				
(15.6)	Terminals and connections for external wiring	N/A				
(15.6.1)	Conductors					
	Terminal size and rating	N/A				

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	IEC 62031						
Clause	Requirement + Test Result - Remark						
(15.6.2)	Mechanical tests		N/A				
(15.6.2.1)	5.6.2.1) Pull test spring-type terminals or welded connections (4 samples); pull (N):						
(15.6.2.2)	2.2) Pull test pin or tab terminals (4 samples); pull (N)						
(15.6.3)	(15.6.3) Electrical tests						
	Tests according 15.6.3.1 + 15.6.3.2 in IEC 60598-1 N/A						

(15.6.3.1) (15.6.3.2)	TABL	BLE: Contact resistance test / Heating tests						N/A			
	Voltag	ge drop (m\	/) after 1	h							
terminal	•	1	2	3	4	5	6	7	8	9	10
voltage drop	(mV)										
		Voltage dro	op of two	insepara	able joints	S					N/A
		Voltage dro	op after 1	0th alt. 2	25th cycle	Э					N/A
		Max. allow	ed voltag	e drop (n	nV)	: -	-				_
terminal		1	2	3	4	5	6	7	8	9	10
voltage drop	(mV)		-	1				-	-	1	
		Voltage dro	op after 5	0th alt. 1	00th cyc	le					N/A
Max. allowed voltage drop (mV):					—						
terminal		1	2	3	4	5	6	7	8	9	10
voltage drop	(mV)		-	1				-	-	-	
		Continued ageing: voltage drop after 10th alt. 25th cycle								N/A	
		Max. allow	ed voltag	e drop (n	nV)	: -	-				—
terminal		1	2	3	4	5	6	7	8	9	10
voltage drop	(mV)			1					-	1	
		Continued	ageing: v	oltage di	rop after	50th alt.	100th cy	cle			N/A
		Max. allow	ed voltag	e drop (n	nV)	: -	-				
terminal		1	2	3	4	5	6	7	8	9	10
voltage drop (mV)											
Supplement	Supplementary information:										



Test Report issued under the responsibility of:



### TEST REPORT IEC TR 62778

# Application of IEC 62471 for the assessment of blue light hazard to light sources and luminaires

Report Number:	Attachment 3 of CN23JQ5V 001					
Date of issue:	See main report					
Total number of pages	9 pages					
Name of Testing Laboratory preparing the Report	TÜV Rheinland (Shenzhen) Co., Ltd.					
Applicant's name:	See main report					
Address:	See main report					
Test specification:						
Standard:	IEC TR 62778:2014 (Second Edition)					
Test procedure:	CB Scheme					
Non-standard test method:	N/A					
Test Report Form No:	IEC62778A					
Test Report Form(s) Originator:	TÜV SÜD Product Service GmbH					
Master TRF:	Dated 2016-02					
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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:	See m	ain report		
Trad	e Mark:	See m	nain report		
Man	ufacturer	See m	nain report		
Mod	el/Type reference	See m	ain report		
Rati	nas .	See m	ain report		
Ttati					
Resp	oonsible Testing Laboratory (as a	pplical	ble), testing procedure	and testing location(s):	
$\boxtimes$	CB Testing Laboratory:		TÜV Rheinland (Shenzh	nen) Co., Ltd.	
Testing location/address:		1601-1604, 17-18F, Tov International Innovation Xili Community, Nansha	wer A Building 2, Shenzhen Valley, Dashi 1st Road, Xili Street, an District, Shenzhen 518052, China		
	Associated CB Testing Laborato	ory:			
Test	ing location/address	:			
Test	ed by (name, function, signature)	):	See main report		
Арр	roved by (name, function, signatu	ure):	See main report		
	Testing procedure: CTF Stage 1		N/A		
Test	ing location/address	:	N/A		
Test	ed by (name, function, signature)	):	N/A		
Арр	roved by (name, function, signatu	ure):	N/A		
	Testing procedure: CTF Stage 2		N/A		
Test	ing location/address	:	N/A		
Test	ed by (name + signature)	:	N/A		
Witr	essed by (name, function, signat	ure).:	N/A		
Арр	roved by (name, function, signatu	ure):	N/A		
	Testing procedure: CTF Stage 3		N/A		
□ Testing procedure: CTF Stage 4:		N/A			
Test	ing location/address	:	N/A		
Test	ed by (name, function, signature)	:	N/A		
Witr	essed by (name, function, signat	ure).:	N/A		
Арр	roved by (name, function, signatu	ure):	N/A		
Sup	ervised by (name, function, signa	ture):	N/A		

List of Attachments (including a total number N/A	er of pages in each attachment):				
Summary of testing:					
Tests performed (name of test and test clause): The test sample complied with the relevant pro duct standard(s) and all applicable clauses.	Testing location: TÜV Rheinland (Shenzhen) Co., Ltd. 1601-1604, 17-18F, Tower A Building 2, Shenzhen International Innovation Valley, Dashi 1st Road, Xili Street, Xili Community, Nanshan District, Shenzhen 518052, China				
Summary of compliance with National Differences (List of countries addressed):					
N/A					

## 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	See main report
Product evaluated	
Product e valuated:	
Rated voltage (V):	100-240VAC
Rated current (mA):	N/A
Rated CCT (K):	2700K-6500K
Rated Luminance (Mcd/m <sup>2</sup> ):	N/A
Component report data used:	⊠ Not applicable
	LED package
	☐ LED module
	🗆 Lamp
	Report number:
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 main report
Date (s) of performance of tests:	See main report
General remarks:	
"(See Enclosure #)" refers to additional information a	ppended to the report.
"(See appended table)" refers to a table appended to t	the report.
Inroughout this report a 🖄 comma / 🗆 point is u	ised as the decimal separator.
Manufacturer's Declaration per sub-clause 4.25 of	FIECEE 02.
The application for obtaining a CB Test Certificate	
includes more than one factory location and a	☐ Tes Not applicable
declaration from the Manufacturer stating that the	
sample(s) submitted for evaluation is (are)	
been provided	
 	I
When differences exist; they shall be identified in	the General product information section.
Name and address of factory (ies)	: See main report

**General product information:** See main report

		IEC TR 62778		
Clause	Requirement + Test		Result - Remark	Verdict

7	MEASUREMENT INFORMATION FLOW				
7.1	Basic flow				
	'Law of conservation of luminance' applied		Р		
	Use of only true luminance/radiance values		Р		
	In case of luminaire: The light source is operated in the luminaire under similar conditions as when tested as a component		P		
	In case Ethr value for RG2 was established the peak value was derived from angular light distribution		N/A		
7.2	Conditions for the radiance measurement				
	Standard condition applied (200mm distance, 0,011rad field of view)	Tested at 200mm	Р		
	Non-standard condition applied		N/A		
7.3	Special cases (I): Replacement by a lamp or LED module of another type				
	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				
	LED package is evaluated as:	<ul> <li>RG0 unlimited</li> <li>RG1 unlimited</li> </ul>	N/A		
	Ethr of LED package applies to array		N/A		
8	RISK GROUP CLASSIFICATION				
	Risk group achieved:		Р		
	Risk Group 0 unlimited		N/A		
	Risk Group 1 unlimited		Р		
	- E <sub>thr</sub> (lx) : Distance to reach RG1 (m) :		N/A		

TABLE: Spectror	TABLE: Spectroradiometric measurement					Р	
Measurement pe	formed	on:		□ LED pac ⊠ LED mo □ Lamp ⊠ Luminai	kage dule re		
Model number	Model number			MFL-G1440(6500K)			
Test voltage (V)	Test voltage (V)			240VAC			
Test current (mA)	Test current (mA)						
Test frequency (H	Test frequency (Hz)			50			_
Ambient, t (°C)	Ambient, t (°C)			25,3°C			_
Measurement dis	Mea surement distance				⊠ 20 cm □ cm		—
Source size	Source size			⊠ Non-small □ Small: mm			—
Field of view	Field of view			☐ 100 mrad ⊠ 11 mrad ☐ 1,7 mrad (for small sources)		—	
ltem	Symb ol	Units		Result	Re	mark	
Correlated colour temperature	CCT	К		6401			
x/y colour coordinates							
Blue light hazard radiance	L <sub>B</sub>	W/(m <sup>2</sup> •sr <sup>1</sup> )		6521	RG1		
Blue light hazard irradiance	Е <sub>в</sub>	W/m <sup>2</sup>					
Luminance	L	cd/m <sup>2</sup>	7,	406E+06			
Illuminance	Е	lx					
Supplementary information:							

TABLE: Angular light distribution				
N/A				



Figure 1 Over view of model MFL-G1440



Figure 2 Over view of model MFL-G1440



Figure 3 Over view of model MFL-G1440



Figure 4 Internal view of model MFL-G1440



Figure 6 LED driver of model ELG-240-48A



Figure 7 LED module





Figure 9 LED driver of model ELG-150-48A



Figure 10 Over view of model MFL-G120

- END OF REPORT -