LVD TEST REPORT

Report No.：	NTEK-2014NT1226080S
Product:	LED Lamp（Ceiling Lamp）
Model No.:	MX82008-20A, MX1163-3, MX1167-6+3A, MP82008-30A MP8525-6B
Applicant：	JIANGMEN BAOTIAN LIGHTING CO., LTD.
Address：	Nange Industrial Zone, Hetang Town, Jiangmen City, Guangdong Province, China
Issued by：	Shenzhen NTEK Testing Technology Co., Ltd.
Lab Location：	1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China
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TEST REPORT
IEC/EN 60598-2-1
Luminaires
– Part 2: Particular requirements
– Section 1: Fixed general purpose luminaires

Report Reference No. ....:	NTEK-2014NT1226080S
Tested by (name+signature)............:	Cora Chan Cora Chan
Approved by (name+signature) ....:	Helen Lin
Date of issue ....:	Jan. 14, 2015
CB/CCA Testing Laboratory ....:	Shenzhen NTEK Testing Technology Co., Ltd.
Address ....:	1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China
Testing procedure ....:	CBTL ☐ RMT ☐ SMT ☐ WMT ☐ TMP ☐
Testing address ....:	(Same as above)
Applicant's name ....:	Jiangmen Baotian Lighting Co., LTD.
Address ....:	Nange Industrial Zone, Hetang Town, Jiangmen City, Guangdong Province
Test specification:	
Standard..:	EN 60598-2-1:1989 EN 60598-1:2008+A11:2009 EN 62031:2008+A1:2012 EN 62493:2010 &EN 62471:2008
Test procedure ....:	CE -LVD
Non-standard test method……………..:	N/A
Test Report Form No. ....:	EN 60598_2_1
TRF Originator ....:	NTEK
Master TRF ....:	N/A

Test item description.....................:	LED Lamp（Ceiling Lamp）
Manufacturer...................................:	Same as applicant
Address ....:	Same as applicant
Trademark...:	N/A
Model/Type reference ....:	MX82008-20A, MX1163-3, MX1167-6+3A, MP82008-30A MP8525-6B
Ratings ....:	AC 220-240V, 50/60Hz

Test item and test requirement particulars

Operating condition .... Continuous

Class of equipment... Class II fixed luminaires

Degree of protection IP20

Possible test case verdicts

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

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

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

Testing

Date of receipt of test item(sample)............................ Dec. 31, 2014

Date (s) of performance of tests .... Jan. 4, 2015 to Jan. 19, 2015

General remarks:

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

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

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

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

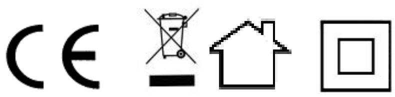
General product information:

Models MX82008-20A and MP82008-30A are same electrical construction except appearance and model name, and all the test would perform on model MX82008-30A. Models MX1163-3, MX1167-6+3A MP8525-6B are different electrical construction would perform full test.

Artwork of Marking Label:

The height of graphical symbols shall not be less than 5 mm, the height of letters and numerals either shown separately or with or as part of symbols shall not be less than 2 mm, representative model for reference.

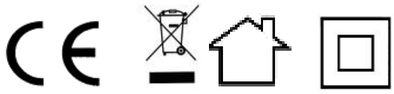
LED Lamp（Ceiling Lamp）
Model: MP82008-30A
Rating: 220-240V~, 50/60Hz, 55W



JIANGMEN BAOTIAN LIGHTING CO., LTD.
Made In China

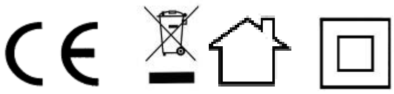
Artwork of Marking Label:

LED Lamp（Ceiling Lamp）
Model: MX1163-3
Rating: 220-240V~, 50/60Hz, 13.2W



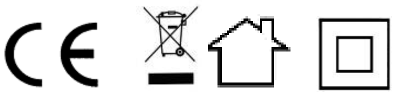
JIANGMEN BAOTIAN LIGHTING CO., LTD.
Made In China

LED Lamp（Ceiling Lamp）
Model: MX1167-6+3A
Rating: 220-240V~, 50/60Hz, 40W



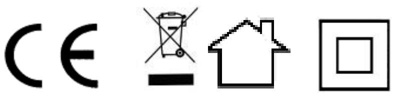
JIANGMEN BAOTIAN LIGHTING CO., LTD.
Made In China

LED Lamp（Ceiling Lamp）
Model: MX82008-20A
Rating: 220-240V~, 50/60Hz, 36.5W



JIANGMEN BAOTIAN LIGHTING CO., LTD.
Made In China

LED Lamp（Ceiling Lamp）
Model: MP8525-6B
Rating: 220-240V~, 50/60Hz, 22.5W



JIANGMEN BAOTIAN LIGHTING CO., LTD.
Made In China

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

1.2 (0)	**GENERAL TEST REQUIREMENTS**		**P**
1.2 (0.1)	Information for luminaire design considered	Standard Yes ☒ No ☐	—
1.2 (0.3)	More sections applicable ....:	Yes ☐ No ☒	—

1.4 (2)	**CLASSIFICATION**		**P**
1.4 (2.2)	Type of protection ....:	Class II	—
1.4 (2.3)	Degree of protection...:	IP20	—
1.4 (2.4)	Luminaire only suitable for non-combustible surfaces ....:	Yes ☐ No ☒	—
	Luminaire suitable for normally flammable surfaces ....:	Yes ☒ No ☐	—
	Luminaire suitable to be covered by insulating material :	Yes ☐ No ☒	—
1.4 (2.5)	Luminaire for normal use ....:	Yes ☒ No ☐	—
	Luminaire for rough service ....:	Yes ☐ No ☒	—

1.5 (3)	**MARKING**		**P**
1.5 (3.2)	Mandatory markings		P
	Position of the marking	On metal base	P
	Format of symbols/text		P
1.5 (3.3)	Additional information		P
	Language of instructions	English	P
1.5 (3.3.1)	Combination luminaires		N
1.5 (3.3.2)	Nominal frequency in Hz	50/60Hz	P
1.5 (3.3.3)	Operating temperature		P
1.5 (3.3.4)	Symbol or warning notice		P
1.5 (3.3.5)	Wiring diagram		P
1.5 (3.3.6)	Special conditions		N
1.5 (3.3.7)	Metal halide lamp luminaire – warning		N
1.5 (3.3.8)	Limitation for semi-luminaires		N
1.5 (3.3.9)	Power factor and supply current		N
1.5 (3.3.10)	Suitability for use indoors	Indoor use only	P
1.5 (3.3.11)	Luminaires with remote control		N
1.5 (3.3.12)	Clip-mounted luminaire – warning		N
1.5 (3.3.13)	Specifications of protective shields		N

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

1.5 (3.3.14)	Symbol for nature of supply	∿	P
1.5 (3.3.15)	Rated current of socket outlet		N
1.5 (3.3.16)	Rough service luminaire	Unit are not for rough service luminaires	N
1.5 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments	Type Y	P
1.5 (3.3.18)	Non-ordinary luminaires with PVC cable		N
1.5 (3.3.101)	Adequate warning on the package (EN)		N
1.5 (3.4)	Test with water	15s with water	P
	Test with hexane	15s with hexane	P
	Legible after test	Yes	P
	Label attached	Label was not be easily removable and show no curling	P
1.5.1(-)	Warning notice, if not suitable for insulating ceiling		N

1.6 (4)	**CONSTRUCTION**		**P**
1.6 (4.2)	Components replaceable without difficulty	Not to be replaced by user.	N
1.6 (4.3)	Wire ways smooth and free from sharp edges		P
1.6 (4.4)	Lampholders		N
1.6 (4.4.1)	Integral lampholder		N
1.6 (4.4.2)	Wiring connection		N
1.6 (4.4.3)	Lampholder for end-to-end mounting		N
1.6 (4.4.4)	Positioning		N
	- pressure test (N) .... :		N
	- bending test (Nm) .... :		N
1.6 (4.4.5)	Peak pulse voltage		N
1.6 (4.4.6)	Centre contact		N
1.6 (4.4.7)	Parts in rough service luminaires resistance to tracking	Not rough service luminaires	N
1.6 (4.4.8)	Lamp connectors		N
1.6 (4.4.9)	Caps and bases correctly used		N
1.6 (4.5)	Starter holders		N
	Starter holder in luminaires other than Class I	No starter holders.	N
	Starter holder Class I construction		N
1.6 (4.6)	Terminal blocks		P
	Tails		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Unsecured blocks		P
1.6 (4.7)	Terminals and supply connections		P
1.6 (4.7.1)	Contact to metal parts		P
1.6 (4.7.2)	Test 8 mm live conductor		P
	Test 8 mm earth conductor		P
1.6 (4.7.3)	Terminals for supply conductors		P
1.6 (4.7.3.1)	Welded connections:		P
	- stranded or solid conductor		P
	- spot welding		N
	- welding between wires		N
	- Type Z attachment		N
	- mechanical test according to 15.8.2		N
	- electrical test according to 15.9		N
	- ageing test according to 15.9.2.3 and 15.9.2.4		N
1.6 (4.7.4)	Terminals other than supply connection		N
1.6 (4.7.5)	Heat-resistant wiring/sleeves		P
1.6 (4.7.6)	Multi-pole plug	No multi-pole plug	N
	- test at 30 N		N
1.6 (4.8)	Switches:		N
	- adequate rating		N
	- adequate fixing		N
	- polarized supply		N
	- compliance with 61058-1 for electronic switches		N
1.6 (4.9)	Insulating lining and sleeves		P
1.6 (4.9.1)	Retainment		P
	Method of fixing..:	Heating shrinkable tub at input wire provides mechanical fixing	P
1.6 (4.9.2)	Insulated linings and sleeves		P
	a) & c) Insulation resistance and electric strength	UL approved shrinkable tube	N
	b) Ageing test. Temperature (°C) ....:		N
1.6 (4.10)	Insulation of Class II luminaries		P
1.6 (4.10.1)	No contact, mounting surface - accessible metal parts - wiring of basic insulation		P
	Safe installation fixed luminaires		P
	Capacitors and switches		N
	Interference suppression capacitors according to IEC 60384-14		N

EN 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.10.2)	Assembly gaps:		N
	- not coincidental		N
	- no straight access with test probe		P
1.6 (4.10.3)	Retainment of insulation:		P
	- fixed		P
	- unable to be replaced; luminaire inoperative		P
	- sleeves retained in position		P
	- lining in lampholder		N
1.6 (4.11)	Electrical connections		P
1.6 (4.11.1)	Contact pressure	Contact pressure is not transmitted through insulating material.	N
1.6 (4.11.2)	Screws:		N
	- self-tapping screws		N
	- thread-cutting screws	Thread-cutting screws not used	N
	- at least two self-tapping screws		N
1.6 (4.11.3)	Screw locking:		N
	- spring washer	No screws and rivets serve as electrical as well as mechanical connections.	N
	- rivets		N
1.6 (4.11.4)	Material of current-carrying parts	>50% copper	P
1.6 (4.11.5)	No contact to wood		P
1.6 (4.11.6)	Electro-mechanical contact systems	No electro-mechanical contact systems	N
1.6 (4.12)	Mechanical connections and glands		—
1.6 (4.12.1)	Screws not made of soft metal		N
	Screws of insulating material		N
	Torque test: torque (Nm); part ....:		N
	Torque test: torque (Nm); part ....:		N
1.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N
1.6 (4.12.4)	Locked connections:		—
	- fixed arms; torque (Nm) ....:	2.5	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- lampholder; torque (Nm).......................................:		N
	- push-button switches; torque 0,8 Nm ....:		N
1.6 (4.12.5)	Screwed glands; force (N) ....:		N
1.6 (4.13)	Mechanical strength		—
1.6 (4.13.1)	Impact tests:		—
	- fragile parts; energy (Nm) ....:		N
	- other parts; energy (Nm).......................................:	0.35 Nm	P
	1) live parts	Not become accessible	P
	2) linings		N
	3) protection	Not become accessible	P
	4) covers	Not become accessible	P
1.6 (4.13.3)	Straight test finger	Can't touch with live part with 30N	P
1.6 (4.13.4)	Rough service luminaires		—
	- IP54 or higher	Not rough service luminaires	N
	a) fixed		N
	b) hand-held		N
	c) delivered with a stand		N
	d) for temporary installations and suitable for mounting on a stand		N
1.6 (4.13.6)	Tumbling barrel	Not socket-outlet-mounted luminaires	P
1.6 (4.14)	Suspensions and adjusting devices		—
1.6 (4.14.1)	Mechanical load:		—
	A) four times the weight		P
	B) torque 2,5 Nm ....:		N
	C) bracket arm; bending moment (Nm) ....:		N
	D) load track-mounted luminaires		N
	E) clip-mounted luminaires, glass-shelve. Thickness (mm) ....:		N
	metal rod. Diameter (mm) ....:		N
	Fixed luminaire or independent control gear without fixing devices		N
1.6 (4.14.2)	Load to flexible cables		—
	Mass (kg) ....:		N
	Stress in conductors (N/mm^2) ....:	No load to flexible cables	N

EN 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Semi-luminaires – mass (kg) ....:		N
	Semi-luminaires – bending moment (Nm) ....:		N
1.6 (4.14.3)	Adjusting devices:		—
	- flexing test; number of cycles ....:		N
	- no strands broken		N
	- electric strength test afterwards		N
1.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors	Telescopic tubes not used	N
1.6 (4.14.5)	Guide pulleys	No guide pulleys	N
1.6 (4.14.6)	Strain on socket-outlets		N
1.6 (4.15)	Flammable materials:		—
	- glow-wire test 650 °C	Plastic cover	N
	- spacing ≥ 30 mm		N
	- screen withstanding test of 13.3.1		N
	- screen dimensions		N
	- no fiercely burning material		N
	- thermal protection		N
	- electronic circuits exempted		N
1.6 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		—
	a) construction		N
	b) temperature sensing control		N
	c) surface temperature		N
1.6 (4.16)	Luminaires marked with F-symbol		—
	No lamp control gear		N
1.6 (4.16.1)	Lamp control gear spacing:		—
	- spacing 35 mm		N
	- spacing 10 mm		N
1.6 (4.16.2)	Thermal protection:		—
	- in lamp control gear		N
	- external		N
	- fixed position		N
	- temperature marked lamp control gear		N
1.6 (4.16.3)	"F" curve measured		N

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Clause	Requirement + Test	Result - Remark	Verdict

1.6 (4.17)	Drain holes		N
	Clearance at least 5 mm		N
1.6 (4.18)	Resistance to corrosion:		—
1.6 (4.18.1)	- rust-resistance		N
1.6 (4.18.2)	- season cracking in copper		N
1.6 (4.18.3)	- corrosion of aluminium		N
1.6 (4.19)	Ignitors compatible with ballast		N
1.6 (4.20)	Rough service vibration	Not rough service used	N
1.6 (4.21)	Protective shield:		—
1.6 (4.21.1)	Shield fitted		N
1.6 (4.21.2)	Particles from a shattering lamp not impair safety		N
1.6 (4.21.3)	No direct path		N
1.6 (4.21.4)	Impact test on shield		N
	Glow-wire test on lamp compartment		N
1.6 (4.22)	Attachments to lamps		P
1.6 (4.23)	Semi-luminaires comply Class I		N
1.6 (4.24)	UV radiation, metal halide lamps		N
1.6 (4.25)	No sharp point or edges		P
1.6 (4.26)	Short-circuit protection:		—
1.6 (4.26.1)	Uninsulated accessible SELV parts		P
1.6 (4.26.2)	Short-circuit test		P
1.6 (4.26.3)	Test chain according to Figure 29		P
1.6 (4.27)	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N
	Pull test of terminal fixing (20 N)		N
	After test, resistance < 0,05 Ω		N
	Pull test of mechanical connection (50 N)		N
	After test, resistance < 0,05 Ω		N
	Voltage drop test, resistance < 0,05 Ω		N

1.7 (11)	**CREEPAGE DISTANCES AND CLEARANCES**		**P**

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

	Working voltage (V)... :	240V~	—
	Voltage form	Sinusoidal ☒ Non-sinusoidal ☐	—
	PTI	< 600 ☒ ≥ 600 ☐	—
	Rated pulse voltage (kV) .... :		—
	1) Current-carrying parts of different polarity: cr (mm); cl (mm)... :	cl=cr>2.5mm measured on different polarity	P
	2) Current-carrying parts and accessible parts: cr (mm); cl (mm)... :	cl>3.0mm cr>5.0mm	P
	3) Parts becoming live due to breakdown of basic insulation and metal parts: cr (mm); cl (mm) .... :		N
	4) Outer surface of cable where it is clamped and metal parts: cr (mm); cl (mm)................................. :		N
	5) Not used		—
	6) Current-carrying parts and supporting surface: cr (mm); cl (mm)... :	cl>3.0mm cr>5.0mm	P

1.8 (7)	**PROVISION FOR EARTHING**		**N**
1.8 (7.2.1 + 7.2.3)	Accessible metal parts		N
	Metal parts in contact with supporting surface		N
	Resistance < 0,5 Ω		N
	Two self-tapping screws used		N
	Thread-forming screws		N
	Thread-forming screw used in a groove		N
	Earth makes contact first		N
1.8 (7.2.2 + 7.2.3)	Earth continuity in joints etc.		N
1.8 (7.2.4)	Locking of clamping means		N
	Compliance with 4.7.3		N
1.8 (7.2.5)	Earth terminal integral part of connector socket		N
1.8 (7.2.6)	Earth terminal adjacent to mains terminals		N
1.8 (7.2.7)	Electrolytic corrosion of the earth terminal		N
1.8 (7.2.8)	Material of earth terminal		N
	Contact surface bare metal		N
1.8 (7.2.10)	Class I luminaire for looping-in		N
	Double or reinforced insulation to functional earth		N
1.8 (7.2.11)	Earthing core coloured green-yellow		N
	Length of earth conductor		N

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Clause	Requirement + Test	Result - Remark	Verdict

1.9 (14)	**SCREW TERMINALS**		**N**
	Separately approved; component list	(see Annex 1) no such component	N
	Part of the luminaire	(see Annex 3)	N

1.9 (15)	**SCREWLESS TERMINALS**		
	Separately approved; component list	(see Annex 1) no such component	N
	Part of the luminaire	(see Annex 4)	N

1.10 (5)	**EXTERNAL AND INTERNAL WIRING**		**P**
1.10 (5.2)	Supply connection and external wiring		P
1.10 (5.2.1)	Means of connection ....:	Terminal block	P
	Connecting leads (EN)		P
	- without a means for connection to the supply		P
	- terminal block specified		P
	- relevant information provided		P
	- compliance with 4.6, 4.7.1, 4.7.2, 4.10.1, 11.2, 12 and 13.2 of Part 1		N
1.10 (5.2.2)	Type of cable...:	Please see annex 1	P
	Cables equal to HD21 S2 or HD22 S2 (EN)		P
	Nominal cross-sectional area (mm²).....................:	Please see annex 1	P
1.10 (5.2.3)	Type of attachment, X, Y or Z	Type Y	P
1.10 (5.2.5)	Type Z not connected to screws		N
1.10 (5.2.6)	Cable entries:		P
	- suitable for introduction		P
	- adequate degree of protection		P
1.10 (5.2.7)	Cable entries through rigid material have rounded edges		N
1.10 (5.2.8)	Insulating bushings:		P
	- suitably fixed		P
	- material in bushings		P
	- material not likely to deteriorate		P
	- tubes or guards made of insulating material		P

EN 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.10 (5.2.9)	Locking of screwed bushings		P
1.10 (5.2.10)	Cord anchorage:		P
	- covering protected from abrasion		P
	- clear how to be effective		P
	- no mechanical or thermal stress		P
	- no tying of cables into knots etc.		N
	- insulating material or lining		N
1.10 (5.2.10.1)	Cord anchorage for type X attachment:		N
	a) at least one part fixed		N
	b) types of cable		N
	c) no damaging of the cable		N
	d) whole cable can be mounted		N
	e) no touching of clamping screws		N
	f) metal screw not directly on cable		N
	g) replacement without special tool		N
	Glands not used as anchorage		N
	Labyrinth type anchorages		N
1.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		P
1.10 (5.2.10.3)	Tests:		P
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N) ....:	60	P
	- torque test: torque (Nm).......................................:	0.15	P
	- displacement ≤ 2 mm	0.75	P
	- no movement of conductors		P
	- no damage of cable or cord		P
1.10 (5.2.11)	External wiring passing into luminaire		P
1.10 (5.2.12)	Looping-in terminals		N
1.10 (5.2.13)	Wire ends not tinned		N
	Wire ends tinned: no cold flow		P
1.10 (5.2.14)	Mains plug same protection		N
	Class II luminaire plug		N

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Clause	Requirement + Test	Result - Remark	Verdict
1.10 (5.2.15)	Colour code low voltage (EN)		N
1.10 (5.2.16)	Appliance inlets (IEC 60320)		N
	Appliance couplers of Class I type		N
1.10 (5.2.17)	No standardized interconnecting cables properly assembled		N
1.10 (5.2.18)	Used plug in accordance with		N
	- IEC 60083		N
	- other standard		N
1.10 (5.3)	Internal wiring		P
1.10 (5.3.1)	Internal wiring of suitable size and type	Suitable size and type	P
	Through wiring		P
	- not delivered/ mounting instruction		P
	- factory assembled		P
	- socket outlet loaded (A) ....:		N
	- temperatures...:	(see Annex 2)	P
	Green-yellow for earth only		N
1.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		P
	Cross-sectional area (mm²) ....:	see Annex 1	P
	Insulation thickness		P
	Extra insulation added where necessary		N
1.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		N
	Adequate cross-sectional area and insulation thickness		N
1.10 (5.3.1.3)	Double or reinforced insulation for Class II		P
1.10 (5.3.1.4)	Conductors without insulation		N
1.10 (5.3.1.5)	SELV current-carrying parts		P
1.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		N
1.10 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		N
	Joints, raising/lowering devices		N
	Telescopic tubes etc.		N

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Clause	Requirement + Test	Result - Remark	Verdict
	No twisting over 360°		P
1.10 (5.3.3)	Insulating bushings:		P
	- suitable fixed		P
	- material in bushings		P
	- material not likely to deteriorate		P
	- cables with protective sheath		P
1.10 (5.3.4)	Joints and junctions effectively insulated		P
1.10 (5.3.5)	Strain on internal wiring		N
1.10 (5.3.6)	Wire carriers		N
1.10 (5.3.7)	Wire ends not tinned		N
	Wire ends tinned: no cold flow		P
1.11 (8)	**PROTECTION AGAINST ELECTRIC SHOCK**		P
1.11 (8.2.1)	Live parts not accessible		P
	Basic insulated parts not used on the outer surface without appropriate protection		P
	Protection in any position		P
	Double-ended tungsten filament lamp		N
	Insulation lacquer not reliable		N
	Double-ended high pressure discharge lamp		N
	Relevant warning according to 3.2.18 fitted to the luminaire		N
1.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N
1.11 (8.2.3a)	Class II luminaire:		P
	- basic insulated metal parts not accessible during starter or lamp replacement		P
	- basic insulation not accessible other than during starter or lamp replacement		P
	- glass protective shields not used as supplementary insulation		P
1.11 (8.2.3b)	Class I luminaire with BC lampholder	No BC lampholder provided	N
1.11 (8.2.3c)	Class III luminaires with exposed SELV parts:		N
	Ordinary luminaire:		P
	- touch current		P

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Clause	Requirement + Test	Result - Remark	Verdict

	- no-load voltage		P
	Other than ordinary luminaire:		N
	- nominal voltage		N
1.11 (8.2.4)	Portable luminaire:		N
	- protection independent of supporting surface		N
	- terminal block completely covered		N
1.11 (8.2.5)	Compliance with the standard test finger or relevant probe		P
1.11 (8.2.6)	Covers reliably secured		P
1.11 (8.2.7)	Discharging of capacitors ≥ 0,5 μF		P
	Portable plug connected luminaire with capacitor		N
	Other plug connected luminaire with capacitor		N
	Discharge device on or within capacitor		N
	Discharge device mounted separately		P

1.12 (12)	**ENDURANCE TEST AND THERMAL TEST**		**P**
1.12 (12.3)	Endurance test:		P
	- mounting-position.. :	ceiling mounting	—
	- test temperature (°C) .... :	33-37°C	—
	- total duration (h).. :	240h	—
	- supply voltage: Un factor; calculated voltage (V) . :	240V x 1.1= 264V	—
	- lamp used .... :	LED lamp	—
1.12 (12.3.2)	After endurance test:		P
	- no part unserviceable	Compliance is checked by inspection	P
	- luminaire not unsafe		P
	- no damage to track system	No track system provided	N
	- marking legible	Compliance is checked by inspection	P
	- no cracks, deformation etc.	Compliance is checked by inspection	P
1.12 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
1.12 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	P
1.12 (12.6)	Thermal test (failed lamp control gear condition):		N
1.12 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A) ....:		—

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Clause	Requirement + Test	Result - Remark	Verdict
	- case of abnormal conditions .... :		—
	- electronic lamp control gear		N
	- measured winding temperature (°C) at 1,1 Un ..... :		—
	- measured mounting surface temperature (°C) at 1,1 Un.. :		N
	- calculated mounting surface temperature (°C)..... : .... :		N
	- track-mounted luminaires		N
1.12 (12.6.2)	Temperature sensing control		N
	- case of abnormal conditions .... :		—
	- thermal link		N
	- manual reset cut-out		N
	- auto reset cut-out		N
	- measured mounting surface temperature (°C) .... :		N
	- track-mounted luminaires		N
1.12 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N
1.12 (12.7.1)	Through wiring or lopping-in wiring loaded by a current of (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 .... :		N
	- calculated temperature of fixing point/ exposed part (°C)... :		N
1.12 (12.7.2)	Temperature sensing control		N
	- thermal link		N
	- manual reset cut-out		N
	- auto reset cut-out		N
	- measured temperature of fixing point/ exposed part (°C) .... :		N

1.13 (9)	**RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE**		**P**
1.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP .... :	IP20	—
	- mounting position during test............................... :	ceiling position	—
	- fixing screws tightened; torque (Nm) .... :		—
	- tests according to clauses .... :		—
	- electric strength test afterwards		P

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Clause	Requirement + Test	Result - Remark	Verdict

	a) no deposit in dust-proof luminaire		N
	b) no talcum in dust-tight luminaire		N
	c) no trace of water on current-carrying parts or where it could become a hazard		N
	d) i) For luminaires without drain holes – no water entry		N
	d) ii) For luminaires with drain holes – no hazardous water entry		N
	e) no water in watertight luminaire		N
	f) no contact with live parts (IP 2X)	No contact with live parts	P
	f) no entry into enclosure (IP 3X and IP 4X)		N
	f) no contact with live parts (IP3X and IP4X)		N
1.13 (9.3)	Humidity test 48 h	93%RH, 28℃	P

1.14 (10)	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		**P**
1.14 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mmØ ....:		—
	Insulation resistance (MΩ):		—
	SELV:		P
	- between current-carrying parts of different polarity ....:	> 10 MΩ	P
	- between current-carrying parts and mounting surface ....:	> 10 MΩ	P
	- between current-carrying parts and metal parts of the luminaire...:	> 10 MΩ	P
	Other than SELV:		P
	- between live parts of different polarity ....:	> 200 MΩ	P
	- between live parts and mounting surface ....:	> 200 MΩ	P
	- between live parts and metal parts ....:	> 200 MΩ	P
	- between live parts of different polarity through action of a switch..:		N
1.14 (10.2.2)	Electric strength test		P
	Dummy lamp		N
	Luminaires with ignitors after 24 h test		N
	Luminaires with manual ignitors		N
	Test voltage (V):		N
	SELV:		P

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Clause	Requirement + Test	Result - Remark	Verdict

	- between current-carrying parts of different polarity ...:	500V/1MIN	P
	- between current-carrying parts and mounting surface ...:	500V/1MIN	P
	- between current-carrying parts and metal parts of the luminaire...:	500V/1MIN	P
	Other than SELV:		P
	- between live parts of different polarity ...:	1480V/1MIN	P
	- between live parts and mounting surface ...:	2960V/1MIN	P
	- between live parts and metal parts ...:	2960V/1MIN	P
	- between live parts of different polarity through action of a switch...:		N
1.14 (10.3.1)	Leakage current (mA) ...:	< 0.7mA	P

1.15 (13)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		P
1.15 (13.2.1)	Ball-pressure test:		P
	- part tested; temperature (°C) ...:	Terminal block: 125℃, 1.1mm	P
	- part tested; temperature (°C) ...:	End connector: 125℃, 0.91mm	P
	- part tested; temperature (°C) ...:		N
1.15 (13.3.1)	Needle flame test (10 s):		P
	- part tested ...:	End connector	P
	- part tested ...:	Terminal block	P
1.15 (13.3.2)	Glow wire test (650 °C):		N
	- part tested ...:	LED lens	P
	- part tested ...:	Heat shrinkage tube	P
	- part tested ...:	Terminal block tails	P
1.15 (13.4.1)	Tracking test: part tested ...:		N

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Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX1: Components				P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity
LED driver input Lead wire	3E	(N)6Y6YAF	300/300 V, 180℃ VDE Reg-No.7675	VDE 0250	VDE 40037988
	Feng Tai	FT-PFA-102	300/500 V, 180℃ VDE Reg-No.7998	VDE 0250	VDE 40013284
	Variety	H03VVH2-F	300/300V, 3 x 0.75mm^2	IEC 60227	VDE
LED driver output Lead wire	FOSHAN Zheng Guan Co.,Ltd.	ZG-FEP-018149	300/300V 180℃	VDE 0250	VDE 40023039
	Guangzhou FengTai Co.,Ltd.	FEP-101 7673	300/300V 180℃	VDE 0250	VDE 136964
	Jianmen jiaqixing Co.,Ltd.	(N)6YAF 8351	300/300V 180℃	VDE 0250	VDE 40029535
	Variety	1015	18AWG, 105℃, 300V	UL 758	UL
fiberglass sleeving for other section	SHENZHEN UNITED POWER ELECTRONIC CO LTD	FSG-2	180℃, 300V	UL1441	UL E238355
	NAN TAI HARDWARE & CHEMICAL CO LTD	GS30-2E	180℃, 300V	UL1441	UL E173547
Heat shrinkable tube	DONGGUAN QUANTAI ELECTRONICS CO LTD	T-2	600V, 125℃	UL 224	UL E227336
	SHENZHEN WOER HEAT-SHRINKABLE MATERIAL CO LTD	RSER-H	600V.125℃ VW-1	UL 224	UL E203950
Close-end Connector	Heavy Power Co.,Ltd	CE5	300V/600V 105℃	UL486	UL E113650
Connection box	zhongshan Lianjin Metal & Electrical Appliances Co., Ltd.	EJE-2215	10A 250V～, 85℃ 0,75- 2,5 mm²	EN 60998	VDE 40030009
LED	Variety	Variety	150°C , 3.0VDC,	UL 8750	UL
LED Aluminum substrate	Variety	Variety	V-0, 130°C	UL94	UL
LED lens	Variety	Variety	V0, 90°C	UL 94	UL
LED driver	Eagleise Electric & Electronic Co.,Ltd.	EBP045V012 0LS	PRI: AC220V-240V, 50/60HZ, 0.35A SEC: 12Vdc, 3.75A, ta:50℃, tc:85℃	EN61347-2-13	Intertek GZ110904 56

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Clause	Requirement + Test	Result - Remark	Verdict

		ELP30-12LS	PRI: AC220V-240V, 50/60HZ, 0.25A SEC: 12Vdc, 2.5A, ta:45℃, tc:80℃	EN61347-2-13	Intertek 1306887
		ELP18-24LS	PRI: AC220V-240V, 50/60HZ, 0.2A SEC: 24Vdc, 0.75A, ta:50℃, tc:80℃	EN61347-2-13	Intertek 1310408
	Jun Lee Lighting Co.,Ltd	JW-03-120-0500	PRI: AC100V-250V, 50/60HZ, SEC: 12Vdc, 0.5A, ta:45℃, tc:88℃	EN61347-2-13	Nemko 155754
The remote control	ZHONGSHAN AIFEIER ELECTRIAL FACTORY	FC-226	PRI: AC220V-240V, 50/60HZ, SEC: Max2A, ta:65℃, tc:85℃ Frequency: 433.92MHz	EN61058	TUV 16038852
1) An asterisk indicates a mark which assures the agreed level of surveillance					

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Clause	Requirement + Test	Result - Remark	Verdict

1	**ANNEX 2: temperature measurements, thermal tests of Section 12**		**P**
	Type reference ......:	MX82008-30A	—
	Lamp used ......:	LED	—
	Lamp control gear used ......:	LED driver	—
	Mounting position of luminaire ......:	Ceiling mounting	—
	Table: measured temperatures corrected for ta = 25 °C:		P
	- abnormal operating mode ......:	--	—
	- test 1: rated voltage ......:	--	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage......:	1.06 x 240V	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ......:	--	—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage......:	1.1 x 240V Short circuit 20% LED	—
	Through wiring or lopping-in wiring loaded by a current of (A) during the tests ......:	--	—

temperature (°C) of part	clause 12.4 - normal				clause 12.5 - abnormal	
	test 1	test 2	test 3	limits	test 4	limit
LED lens	-	39.6	-	90	-	-
Metal enclosure near LED	-	38.6	-	REF	-	-
PCB of LED	-	40.9	-	130	-	-
Lead wire near LED	-	39.0	-	180	-	-
Tc of LED driver	-	70.9	-	80	67.8	90
Terminal block	-	32.6	-	85	-	-
Cable under stress	-	36.2	-	165	-	-
Mounting surface	-	30.5	-	90	30.1	130
Supply cord	-	31.2	-	90	-	-
End connector	-	31.3	-	105	-	-

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Clause	Requirement + Test	Result - Remark	Verdict

2	**ANNEX 2: temperature measurements, thermal tests of Section 12**		**P**
	Type reference ....:	MP8525-6B	—
	Lamp used ....:	LED	—
	Lamp control gear used ....:	LED driver	—
	Mounting position of luminaire ....:	Ceiling mounting	—
	Table: measured temperatures corrected for ta = 25 °C:		P
	- abnormal operating mode..................................:	--	—
	- test 1: rated voltage ....:	--	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage...:	1.06 x 240V	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ....:	--	—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage..:	1.1 x 240V Short circuit 20% LED	—
	Through wiring or lopping-in wiring loaded by a current of (A) during the tests ....:	--	—

temperature (°C) of part	clause 12.4 - normal				clause 12.5 - abnormal	
	test 1	test 2	test 3	limits	test 4	limit
LED lens	-	38.7	-	90	-	-
Metal enclosure near LED	-	37.2	-	REF	-	-
PCB of LED	-	44.7	-	130	-	-
Lead wire near LED	-	41.4	-	180	-	-
Tc of LED driver	-	65.2	-	85	62.5	95
Terminal block	-	32.3	-	85	-	-
Mounting surface	-	30.2	-	90	30.1	130
Supply cord	-	31.4	-	90	-	-
End connector	-	30.8	-	105	-	-

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Clause	Requirement + Test	Result - Remark	Verdict

3	**ANNEX 2: temperature measurements, thermal tests of Section 12**		**P**
	Type reference ....:	MX1167-6+3A	—
	Lamp used ....:	LED	—
	Lamp control gear used ....:	LED driver	—
	Mounting position of luminaire ....:	Ceiling mounting	—
	Table: measured temperatures corrected for ta = 25 °C:		P
	- abnormal operating mode..................................:	--	—
	- test 1: rated voltage ....:	--	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage...:	1.06 x 240V	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ....:	--	—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage...:	1.1 x 240V Short circuit 20% LED	—
	Through wiring or lopping-in wiring loaded by a current of (A) during the tests ....:	--	—

temperature (°C) of part	clause 12.4 - normal				clause 12.5 - abnormal	
	test 1	test 2	test 3	limits	test 4	limit
LED lens	-	38.4	-	90	-	-
Metal enclosure near LED	-	36.5	-	REF	-	-
PCB of LED	-	40.7	-	130	-	-
Lead wire near LED	-	39.1	-	180	-	-
Tc of LED driver	-	62.8	-	85	61.2	95
Terminal block	-	34.6	-	85	-	-
Mounting surface	-	32.3	-	90	31.8	130
Supply cord	-	33.1	-	90	-	-
End connector	-	32.7	-	105	-	-

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Clause	Requirement + Test	Result - Remark	Verdict

4	**ANNEX 2: temperature measurements, thermal tests of Section 12**		**P**
	Type reference ....:	MX1163-3	—
	Lamp used ....:	LED	—
	Lamp control gear used ....:	LED driver	—
	Mounting position of luminaire ....:	Ceiling mounting	—
	Table: measured temperatures corrected for ta = 25 °C:		P
	- abnormal operating mode....................................:	--	—
	- test 1: rated voltage ....:	--	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage...:	1.06 x 240V	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ....:	--	—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage...:	1.1 x 240V Short circuit 20% LED	—
	Through wiring or lopping-in wiring loaded by a current of (A) during the tests ....:	--	—

temperature (°C) of part	clause 12.4 - normal				clause 12.5 - abnor-mal	
	test 1	test 2	test 3	limits	test 4	limit
LED lens	-	37.7	-	90	-	-
Metal enclosure near LED	-	36.8	-	REF	-	-
PCB of LED	-	40.2	-	130	-	-
Lead wire near LED	-	38.4	-	180	-	-
Tc of LED driver	-	52.2	-	80	50.3	90
Terminal block	-	30.3	-	85	-	-
Mounting surface	-	29.2	-	90	28.8	130
Supply cord	-	30.1	-	90	-	-
End connector	-	30.2	-	105	-	-

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Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX 3: screw terminals (part of the luminaire)		**N**
(14)	**SCREW TERMINALS**		
(14.2)	Type of terminal ....:		—
	Rated current (A)..:		—
(14.3.2.1)	One or more conductors		N
(14.3.2.2)	Special preparation		N
(14.3.2.3)	Terminal size		N
	Cross-sectional area (mm²) ....:		N
(14.3.3)	Conductor space (mm) ....:		N
(14.4)	Mechanical tests		
(14.4.1)	Minimum distance		N
(14.4.2)	Cannot slip out		N
(14.4.3)	Special preparation		N
(14.4.4)	Nominal diameter of thread (metric ISO thread)....:		N
	External wiring		N
	No soft metal		N
(14.4.5)	Corrosion		N
(14.4.6)	Nominal diameter of thread (mm) ....:		N
	Torque (Nm)..:		N
(14.4.7)	Between metal surfaces		N
	Lug terminal		N
	Mantle terminal		N
	Pull test; pull (N)..:		N
(14.4.8)	Without undue damage		N

	ANNEX 4: screwless terminals (part of the luminaire)		**N**
(15)	**SCREWLESS TERMINALS**		**N**
(15.2)	Type of terminal..:		—
	Rated current (A)..:		—
(15.3.1)	Material		N
(15.3.2)	Clamping		N
(15.3.3)	Stop		N
(15.3.4)	Unprepared conductors		N
(15.3.5)	Pressure on insulating material		N
(15.3.6)	Clear connection method		N
(15.3.7)	Clamping independently		N
(15.3.8)	Fixed in position		N

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Clause	Requirement + Test	Result - Remark	Verdict

(15.3.10)	Conductor size		N
	Type of conductor		N
(15.5.1)	Terminals internal wiring		
(15.5.1.1)	Pull test spring-type terminals (4 N, 4 samples)		N
(15.5.1.2)	Pull test pin or tab terminals (4 N, 4 samples)		N
	Insertion force not exceeding 50 N		N
(15.5.2)	Permanent connections: pull-off test (20 N)		N
(15.6)	Electrical tests		
	Voltage drop (mV) after 1 h (4 samples)................:		N
	Voltage drop of two inseparable joints		N
	Number of cycles..:		—
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples)..:		N
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples)..:		N
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples) ....:		N
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples) ....:		N
(15.7)	Terminals external wiring		N
	Terminal size and rating		N
(15.8.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) ....:		N
	Pull test pin or tab terminals or welded connections (4 samples); pull (N) ....:		N
(15.9)	Contact resistance test		
	Voltage drop (mV) after 1 h		N

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

	Voltage drop of two inseparable joints		N
	Voltage drop after 10th alt. 25th cycle		N
	Max. allowed voltage drop (mV).........................:		—

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

	Voltage drop after 50th alt. 100th cycle		N
	Max. allowed voltage drop (mV).........................:		—

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

	Continued ageing: voltage drop after 10th alt. 25th cycle		N

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Clause	Requirement + Test	Result - Remark	Verdict

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

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

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Clause	Requirement + Test	Result - Remark	Verdict
	To protect against retinal photochemical injury from chronic blue-light exposure, the integrated spectral radiance of the light source weighted against the blue-light hazard function, B(λ), i.e., the blue-light weighted radiance , L_B, shall not exceed the levels defined by:		P
	$L_B \cdot t = \sum_{300}^{700} \sum_{t} L_\lambda(\lambda,t) \cdot B(\lambda) \cdot \Delta t \cdot \Delta\lambda \leq 10^6 \quad \mathrm{J \cdot m^{-2} \cdot sr^{-1}}$		P
	$L_B = \sum_{300}^{700} L_\lambda \cdot B(\lambda) \cdot \Delta\lambda \leq 100 \quad \mathrm{W \cdot m^{-2} \cdot sr^{-1}}$		P
4.3.4	Retinal blue light hazard exposure limit - small source		P
	Thus the spectral irradiance at the eye E_λ, weighted against the blue-light hazard function B(λ) shall not exceed the levels defined by:	See clause 4.2	P
	$E_B \cdot t = \sum_{300}^{700} \sum_{t} E_\lambda(\lambda,t) \cdot B(\lambda) \cdot \Delta t \cdot \Delta\lambda \leq 100 \quad \mathrm{J \cdot m^{-2}}$	For t ≤100s	P
	$E_B = \sum_{300}^{700} E_\lambda \cdot B(\lambda) \cdot \Delta\lambda \leq 1 \quad \mathrm{W \cdot m^{-2}}$	For t>100s	P
4.3.5	Retinal thermal hazard exposure limit		P
	To protect against retinal thermal injury, the integrated spectral radiance of the light source, L_λ, weighted by the burn hazard weighting function R(λ) (from Figure 4.2 and Table 4.2), i.e., the burn hazard weighted radiance, shall not exceed the levels defined by:	10us≤t≤10s	P
	$L_R = \sum_{380}^{1400} L_\lambda \cdot R(\lambda) \cdot \Delta\lambda \leq \frac{50\,000}{\alpha \cdot t^{0,25}} \quad \mathrm{W \cdot m^{-2} \cdot sr^{-1}}$		P
4.3.6	Retinal thermal hazard exposure limit – weak visual stimulus		N
	For an infrared heat lamp or any near-infrared source where a weak visual stimulus is inadequate to activate the aversion response, the near infrared (780 nm to 1400 nm) radiance, L_{IR}, as viewed by the eye for exposure times greater than 10 s shall be limited to:		N
	$L_{IR} = \sum_{780}^{1400} L_\lambda \cdot R(\lambda) \cdot \Delta\lambda \leq \frac{6\,000}{\alpha} \quad \mathrm{W \cdot m^{-2} \cdot sr^{-1}}$	t > 10 s	N
4.3.7	Infrared radiation hazard exposure limits for the eye		N

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Clause	Requirement + Test	Result - Remark	Verdict
	The avoid thermal injury of the cornea and possible delayed effects upon the lens of the eye (cataractogenesis), ocular exposure to infrared radiation, E_{IR}, over the wavelength range 780 nm to 3000 nm, for times less than 1000 s, shall not exceed:		N
	$E_{IR} = \sum_{780}^{3000} E_\lambda \cdot \Delta\lambda \leq 18000 \cdot t^{-0,75}$ $\quad W \cdot m^{-2}$		N
	For times greater than 1000 s the limit becomes:		N
	$E_{IR} = \sum_{780}^{3000} E_\lambda \cdot \Delta\lambda \leq 100$ $\quad W \cdot m^{-2}$		N
4.3.8	Thermal hazard exposure limit for the skin		N
	Visible and infrared radiant exposure (380 nm to 3000 nm) of the skin shall be limited to:		N
	$E_H \cdot t = \sum_{380}^{3000} \sum_t E_\lambda(\lambda,t) \cdot \Delta t \cdot \Delta\lambda \leq 20000 \cdot t^{0,25}$ $\quad J \cdot m^{-2}$		N
5	**MEASUREMENT OF LAMPS AND LAMP SYSTEMS**		—
5.1	Measurement conditions		P
	Measurement conditions shall be reported as part of the evaluation against the exposure limits and the assignment of risk classification.		P
5.1.1	Lamp ageing (seasoning)		N
	Seasoning of lamps shall be done as stated in the appropriate IEC lamp standard.		N
5.1.2	Test environment		P
	For specific test conditions, see the appropriate IEC lamp standard or in absence of such standards, the appropriate national standards or manufacturer’s recommendations.		P
5.1.3	Extraneous radiation		P
	Careful checks should be made to ensure that extraneous sources of radiation and reflections do not add significantly to the measurement results.		P
5.1.4	Lamp operation		P
	Operation of the test lamp shall be provided in accordance with:		P
	– the appropriate IEC lamp standard, or		N
	– the manufacturer’ s recommendation		P

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Clause	Requirement + Test	Result - Remark	Verdict
5.1.5	Lamp system operation		P
	The power source for operation of the test lamp shall be provided in accordance with:		P
	– the appropriate IEC standard, or		N
	– the manufacturer’ s recommendation		P
5.2	Measurement procedure		P
5.2.1	Irradiance measurements		P
	Minimum aperture diameter 7mm.		P
	Maximum aperture diameter 50 mm.		P
	The measurement shall be made in that position of the beam giving the maximum reading.		P
	The measurement instrument is adequate calibrated.		P
5.2.2	Radiance measurements		P
5.2.2.1	Standard method		N
	The measurements made with an optical system.		N
	The instrument shall be calibrated to read in absolute radiant power per unit receiving area and per unit solid angle to acceptance averaged over the field of view of the instrument.		N
5.2.2.2	Alternative method		P
	Alternatively to an imaging radiance set-up, an irradiance measurement set-up with a circular field stop placed at the source can be used to perform radiance measurements.		P
5.2.3	Measurement of source size		P
	The determination of α, the angle subtended by a source, requires the determination of the 50% emission points of the source.		P
5.2.4	Pulse width measurement for pulsed sources		N
	The determination of Δt, the nominal pulse duration of a source, requires the determination of the time during which the emission is > 50% of its peak value.		N
5.3	Analysis methods		P
5.3.1	Weighting curve interpolations		P
	To standardize interpolated values, use linear interpolation on the log of given values to obtain intermediate points at the wavelength intervals desired.	see table 4.1	P

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Clause	Requirement + Test	Result - Remark	Verdict
5.3.2	Calculations		P
	The calculation of source hazard values shall be performed by weighting the spectral scan by the appropriate function and calculating the total weighted energy.		P
5.3.3	Measurement uncertainty		P
	The quality of all measurement results must be quantified by an analysis of the uncertainty.	see Annex C in the norm	P
6	**LAMP CLASSIFICATION**		—
	For the purposes of this standard it was decided that the values shall be reported as follows:	see table 6.1	P
	– for lamps intended for general lighting service, the hazard values shall be reported as either irradiance or radiance values at a distance which produces an illuminance of 500 lux, but not at a distance less than 200 mm		N
	– for all other light sources, including pulsed lamp sources, the hazard values shall be reported at a distance of 200 mm		P
6.1	Continuous wave lamps		P
6.1.1	Except Group		P
	In the except group are lamps, which does not pose any photobiological hazard. The requirement is met by any lamp that does not pose:		P
	– an actinic ultraviolet hazard (E_S) within 8-hours exposure (30000 s), nor		P
	– a near-UV hazard (E_{UVA}) within 1000 s, (about 16 min), nor		P
	– a retinal blue-light hazard (L_B) within 10000 s (about 2,8 h), nor		P
	– a retinal thermal hazard (L_R) within 10 s, nor		P
	– an infrared radiation hazard for the eye (E_{IR}) within 1000 s		N
6.1.2	Risk Group 1 (Low-Risk)		N
	In this group are lamps, which exceeds the limits for the except group but that does not pose:		N
	– an actinic ultraviolet hazard (E_S) within 10000 s, nor		N
	– a near ultraviolet hazard (E_{UVA}) within 300 s, nor		N

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Clause	Requirement + Test	Result - Remark	Verdict
	– a retinal blue-light hazard (L_B) within 100 s, nor		N
	– a retinal thermal hazard (L_R) within 10 s, nor		N
	– an infrared radiation hazard for the eye (E_{IR}) within 100 s		N
	Lamps that emit infrared radiation without a strong visual stimulus and do not pose a near-infrared retinal hazard (L_{IR}), within 100 s are in Risk Group 1.		N
6.1.3	Risk Group 2 (Moderate-Risk)		N
	This requirement is met by any lamp that exceeds the limits for Risk Group 1, but that does not pose:		N
	– an actinic ultraviolet hazard (E_S) within 1000 s exposure, nor		N
	– a near ultraviolet hazard (E_{UVA}) within 100 s, nor		N
	– a retinal blue-light hazard (L_B) within 0,25 s (aversion response), nor		N
	– a retinal thermal hazard (L_R) within 0,25 s (aversion response), nor		N
	– an infrared radiation hazard for the eye (E_{IR}) within 10 s		N
	Lamps that emit infrared radiation without a strong visual stimulus and do not pose a near-infrared retinal hazard (L_{IR}), within 10 s are in Risk Group 2.		N
6.1.4	Risk Group 3 (High-Risk)		N
	Lamps which exceed the limits for Risk Group 2 are in Group 3.		N
6.2	Pulsed lamps		N
	Pulse lamp criteria shall apply to a single pulse and to any group of pulses within 0,25 s.		N
	A pulsed lamp shall be evaluated at the highest nominal energy loading as specified by the manufacturer.		N
	The risk group determination of the lamp being tested shall be made as follows:		N
	– a lamp that exceeds the exposure limit shall be classified as belonging to Risk Group 3 (High-Risk)		N
	– for single pulsed lamps, a lamp whose weighted radiant exposure or weighted radiance does is below the EL shall be classified as belonging to the Exempt Group		N

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Clause	Requirement + Test	Result - Remark	Verdict
	– for repetitively pulsed lamps, a lamp whose weighted radiant exposure or weighted radiance dose is below the EL, shall be evaluated using the continuous wave risk criteria discussed in clause 6.1, using time averaged values of the pulsed emission		N

Table 4.1	Spectral weighting function for assessing ultraviolet hazards for skin and eye		P
Wavelength[1] λ, nm	**UV hazard function $S_{uv}(\lambda)$**	**Wavelength λ, nm**	**UV hazard function $S_{uv}(\lambda)$**
200	0,030	313*	0,006
205	0,051	315	0,003
210	0,075	316	0,0024
215	0,095	317	0,0020
220	0,120	318	0,0016
225	0,150	319	0,0012
230	0,190	320	0,0010
235	0,240	322	0,00067
240	0,300	323	0,00054
245	0,360	325	0,00050
250	0,430	328	0,00044
254*	0,500	330	0,00041
255	0,520	333*	0,00037
260	0,650	335	0,00034
265	0,810	340	0,00028
270	1,000	345	0,00024
275	0,960	350	0,00020
280*	0,880	355	0,00016
285	0,770	360	0,00013
290	0,640	365*	0,00011
295	0,540	370	0,000093
297*	0,460	375	0,000077
300	0,300	380	0,000064
303*	0,120	385	0,000053
305	0,060	390	0,000044
308	0,026	395	0,000036

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Clause	Requirement + Test	Result - Remark	Verdict

Table 4.1	Spectral weighting function for assessing ultraviolet hazards for skin and eye		P
310	0,015	400	0,000030

[1] Wavelengths chosen are representative: other values should be obtained by logarithmic interpolation at intermediate wavelengths.
* Emission lines of a mercury discharge spectrum.

Table 4.2	Spectral weighting functions for assessing retinal hazards from broadband optical sources	N
Wavelength nm	**Blue-light hazard function B (λ)**	**Burn hazard function R (λ)**
300	0,01	—
305	0,01	—
310	0,01	—
315	0,01	—
320	0,01	—
325	0,01	—
330	0,01	—
335	0,01	—
340	0,01	—
345	0,01	—
350	0,01	—
355	0,01	—
360	0,01	—
365	0,01	—
370	0,01	—
375	0,01	—
380	0,01	0,1
385	0,013	0,13
390	0,025	0,25
395	0,05	0,5
400	0,10	1,0
405	0,20	2,0
410	0,40	4,0
415	0,80	8,0

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Clause	Requirement + Test	Result - Remark	Verdict

Table 4.2	Spectral weighting functions for assessing retinal hazards from broadband optical sources	N

420	0,90	9,0
425	0,95	9,5
430	0,98	9,8
435	1,00	10,0
440	1,00	10,0
445	0,97	9,7
450	0,94	9,4
455	0,90	9,0
460	0,80	8,0
465	0,70	7,0
470	0,62	6,2
475	0,55	5,5
480	0,45	4,5
485	0,40	4,0
490	0,22	2,2
495	0,16	1,6
500-600	$10^{[(450-\lambda)/50]}$	1,0
600-700	0,001	1,0
700-1050	—	$10^{[(700-\lambda)/500]}$
1050-1150	—	0,2
1150-1200	—	$0{,}2 \cdot 10^{0{,}02(1150-\lambda)}$
1200-1400	—	0,02

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

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Clause	Requirement + Test	Result - Remark	Verdict

Table 5.4	Summary of the ELs for the surface of the skin or cornea (irradiance based values)				P
small source			>100		1,0
Eye IR	$E_{IR} = \sum E_\lambda \cdot \Delta\lambda$	780 –3000	≤1000 >1000	1,4 (80)	$18000/t^{0,75}$ 100
Skin thermal	$E_H = \sum E_\lambda \cdot \Delta\lambda$	380 – 3000	< 10	2π sr	$20000/t^{0,75}$

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

Table 6.1	Emission limits for risk groups of continuous wave lamps (based on EU Directive 2006/25/EC)								P
				Emission Measurement					
Risk	Action spectrum	Symbol	Units	Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	E_s	$W \cdot m^{-2}$	0,001	0.0002	0.003	-	0.03	-
Near UV		E_{UVA}	$W \cdot m^{-2}$	10	0.01	33	-	100	-
Blue light	B(λ)	L_B	$W \cdot m^{-2} \cdot sr^{-1}$	100	-	10000	-	4000000	-
Blue light, small source	B(λ)	E_B	$W \cdot m^{-2}$	1.0*	-	1,0	-	400	-
Retinal thermal	R(λ)	L_R	$W \cdot m^{-2} \cdot sr^{-1}$	28000/α	652.0	28000/α	-	71000/α	-
Retinal thermal, weak visual stimulus**	R(λ)	L_{IR}	$W \cdot m^{-2} \cdot sr^{-1}$	6000/α	-	6000/α	-	6000/α	-
IR radiation,		E_{IR}	$W \cdot m^{-2}$	100	0.10	570	-	3200	-

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Clause	Requirement + Test	Result - Remark	Verdict

eye

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

** Involves evaluation of non-GLS source

NOTE The action functions: see Table 4.1 and Table 4.2

The applicable aperture diameters: see 4.2.1

The limitations for the angular subtenses: see 4.2.2

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

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Clause	Requirement + Test	Result - Remark	Verdict

4	**GENERAL REQUIREMENTS**		--
4.4	Integral modules treated as part of luminaires defined in clause 0.5 of IEC 60598-1	Yes ☒ No ☐	--
4.5	Independent modules complies with requirements in IEC 60598-1	Yes ☐ No ☒	--
5	**GENERAL TEST REQUIREMENTS**		-
5.5	SELV-operated LED modules comply with Annex I of IEC 61347-2-13	(see Annex B)	--
6	**CLASSIFICATION**		**--**
	Built-in module	Yes ☐ No ☒	--
	Independent module	Yes ☐ No ☒	--
	Integral module	Yes ☒ No ☐	--
	For Integral module; Note to 1.2.1 in IEC 60598-1applies.		--
7	**MARKING**		P
7.1	Mandatory markings:		N
	mark of origin		N
	model number, type reference	MX82008-30A	P
	- rated supply voltage (V)	220-240V~	P
	rated supply current (A)		N
	rated input power (V)		N
	nominal power		N
	indication of connections, wiring diagram		N
	value of t_c		N
	- eye protection		N
	marking of built-in modules only		N
7.2	location of marking		P
7.3	Marking durable and legible		P
	Rubbing 15 s water, marking legible		P
8	**SCREW TERMINALS**		N
	Compliance with section 14 of IEC 60598-1		N
	SCREW TERMINALS		N
	Compliance with section 15 of IEC 60598-1		N
	Compliance with IEC 60838-2-2		N

9	**PROVISION FOR PROTECTIVE EARTHING**	--

EN 62031			
Clause	Requirement + Test	Result - Remark	Verdict

	The requirements of EN 61347-1, Clause 9, apply.		N

8(10)	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**		--
	Protection against accidental contact with live parts in compliance with clause 10 of IEC 61347-1		P

11	**MOISTURE RESISTANCE AND INSULATION**		--
	Protection against moisture and insulation in compliance with Clause 11, IEC 61347-1		P

12	**ELECTRIC STRENGTH**		--
	Electric strength in compliance with Clause 12 of IEC 61347-1		P

13	**FAULT CONDITIONS**		--
13.1	In compliance with clause 14 of IEC 61347-1		P
13.2	Module withstands overpower condition >15 min.		P
	Module with automatic protective device or power limiter, test performed 15 min. at limit.		N
	During the tests, tissue paper, spread below module, does not ignite		P

15	**CONSTRUCTION**		--
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P

16	**CREEPAGE DISTANCES AND CLEARANCES**		--
	Creepage and distances and clearances in compliance with section 11 of IEC 60598-1		P

17(17)	**SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS**		--
	Screws, current-carrying parts and connections in compliance with IEC 60598-1		P

18(18)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		--
	Resistance to Heat, Fire and Tracking in compliance with clause 17 of IEC 61347-1		P

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Clause	Requirement + Test	Result - Remark	Verdict

19	**RESISTANCE TO CORROSION**	--
	Resistance to corrosion in compliance with clause 18 of IEC 61347-1	P

A	**ANNEX A - TESTS**	--
	All tests performed in accordance with the advise given in Annex H of IEC 61347-1, if applicable	P

B	**ANNEX B - SELV-operated LED modules**	--
	SELV-operated LED modules in compliance with Annex I of IEC 61347-2-13	P

EN 62493			
Clause	Requirement + Test	Result - Remark	Verdict

Part 3: EN 62493:2010			
Clause	Requirement + Test	Result - Remark	Verdict
4.2	**APPLICATION OF LIMITS(TEST SUMMARY)**		--
	Specific absorption rate (SAR)		--
a)	CISPR 15 clause 4.3.1 Disturbance voltage mains terminals 20 kHz-30 MHz	*)	P
b)	CISPR 15 clause 4.4 Radiated electromagnetic disturbances 100 kHz-30 MHz	*)	P
c)	CISPR 15 clause 4.4.2 Radiated electromagnetic disturbances 30 MHz -300 MHz	*)	P
*)	☒See separate Test Report for measurements of a), b), and c) above ☐Only measurement of d) below. See measurement results below. In this case this test report does not show compliance with IEC 62493.		-
	Induced current density		P
d)	Induced current density 20 kHz-10 MHz	See measurement results below	P

4.2.d	**INDUCED CURRENT DENSITY**		**--**

	Power supply system utilized:		--
	Voltage………………………………………………..:	220-240V~	--
	Frequency…………………………………………….:		--
	Environmental conditions:		--
	Temperature……………………………………….:	25.2℃	--
	Humidity……………………………………………:	54%	--
	EuT operation mode:		--
	☒Normal operation		--
	☐Other operation		--
			--

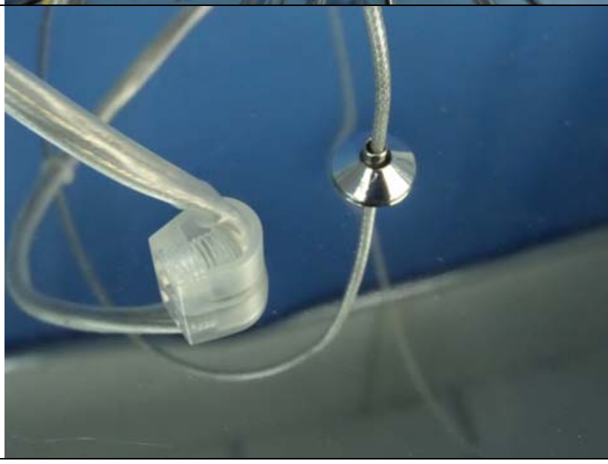
EN 62493			
Clause	Requirement + Test	Result - Remark	Verdict

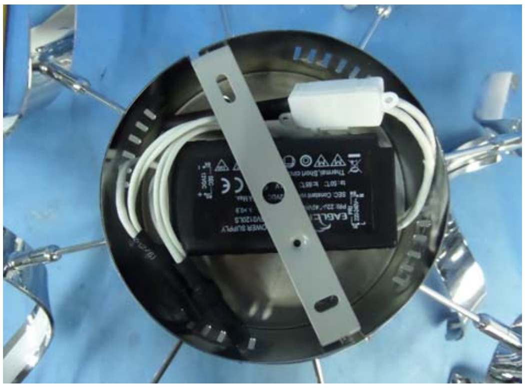
4.3.d	MEASUREMENT RESULTS			--
	Measuring with “Van der Hoofden” test head			--
Location of EuT	Measuring distance	Result (F)	Limit (F)	Verdict
Model: KXZ-TB01801				
Front of EuT	30cm	<0.85	0.85	P
Rear of EuT	30cm	<0.85	0.85	P
Side of EuT	30cm	<0.85	0.85	P

4.2.d	EQUIPMENT USED DURING TEST		
Equipment	Manufacture	Type	Id. No.
“Van der Hoofden” test head	AFJ	VDH30	NTEK
Measurement receiver	Agilent	E7405A	NTEK
Coaxial cable	DRAKA COMTEQ	M17/75-RG213	NTEK

Attachment – Photos

For models: MP82008-30A



For models: MX1167-6+3A	
	
	
For models: MX82008-20A	
	
	

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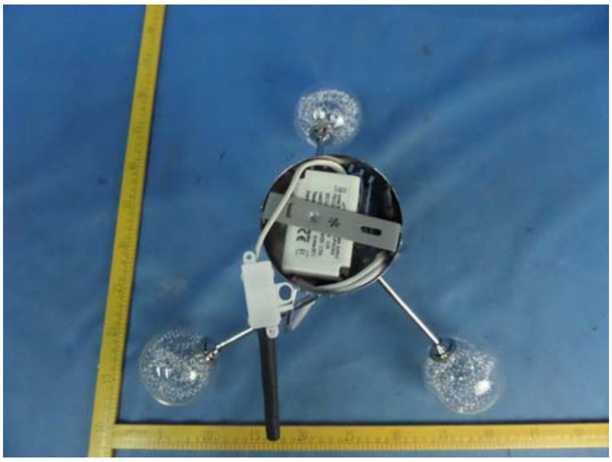
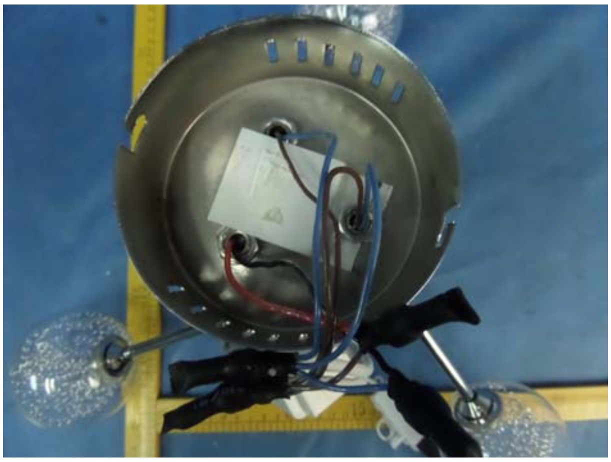
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
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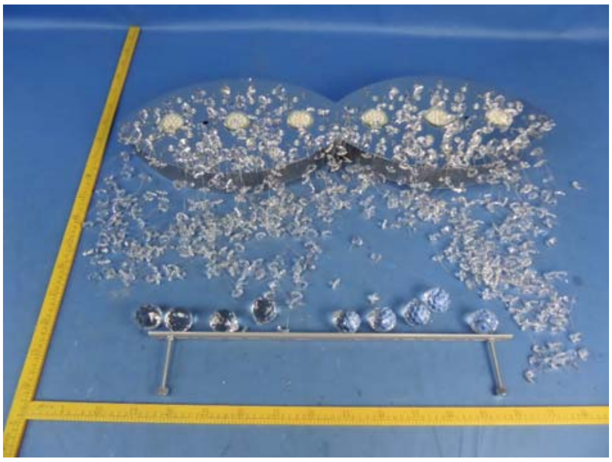	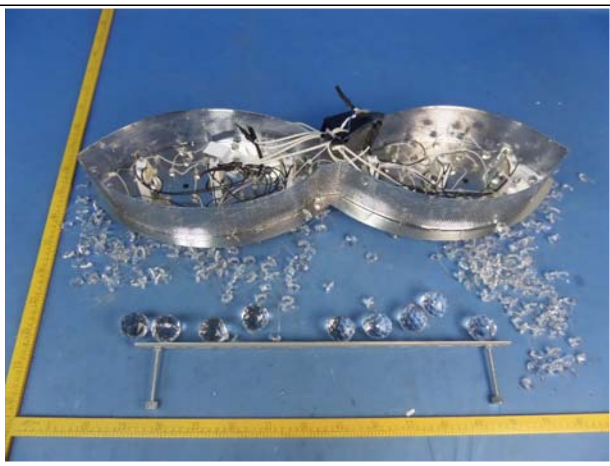
	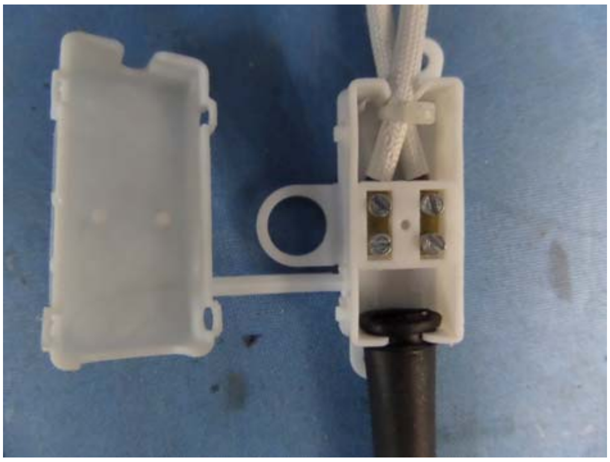

--End of report--