



SEMLIGHT SEMICONDUCTOR LIGHTING CO., LIMITED

TEST REPORT

Prepared For:	SEMLIGHT SEMICONDUCTOR LIGHTING CO., LIMITED 5F, Building No.2, Yituan Industrial Park, 10th Shangxue Yituan Road, Bantian Street, Longgang District, Shenzhen
Product Name:	LED FLOOD LIGHT
Model :	SEM-FL150-01B, SEM-FL10-01B, SEM-FL20-01B, SEM-FL30-01B, SEM-FL40-01B, SEM-FL50-01B, SEM-FL60-01B, SEM-FL70-01B, SEM-FL80-01B, SEM-FL90-01B, SEM-FL100-01B, SEM-FL120-01B, SEM-FL160-01B, SEM-FL200-01B, SEM-FL300-01B, SEM-FL400-02B, SEM-FL400-03B, SEM-FL500-02B, SEM-FL500-03B, SEM-FL600-02B, SEM-FL600-03B, SEM-FL700-02B, SEM-FL700-03B
Prepared By :	Shenzhen BST Technology Co., Ltd. Building No.23-24, Zhiheng Industrial Park, Guankouer Road, Nantou, Nanshan District, Shenzhen, Guangdong, China
Test Date:	May. 13- 23, 2013
Date of Report :	May. 23, 2013
Report No.:	BSTDG13050805SR-2

**TEST REPORT****IEC 60598-1 & IEC 60598-2-5****Luminaires****Luminaires - Part 2-5: Particular requirements – Floodlights****IEC 62471****Luminaires****Part 1: General requirements and tests**

Testing Laboratory Name	Shenzhen BST Technology Co., Ltd.
Address	Building No.23-24,Zhiheng Industrial Park,Guankouer Road, Nantou,Nanshan District,Shenzhen,Guangdong,China
Testing location	Shenzhen BST Technology Co., Ltd.
Applicant's Name	SEMLIGHT SEMICONDUCTOR LIGHTING CO., LIMITED
Address	5F, Building No.2, Yituan Industrial Park,10th Shangxue Yituan Road, Bantian Street, Longgang District, Shenzhen
Manufacturer	SEMLIGHT SEMICONDUCTOR LIGHTING CO., LIMITED
Address	5F, Building No.2, Yituan Industrial Park,10th Shangxue Yituan Road, Bantian Street, Longgang District, Shenzhen
Test specification	
Standard.....	IEC 60598-2-5:1998 used in conjunction with IEC 60598-1:2008 + IEC 62471:2006
Procedure deviation	N/A
Non-standard test method	N/A
Test item description	LED FLOOD LIGHT
Trademark	SEMLIGHT
Model and/or type reference	SEM-FL150-01B, SEM-FL10-01B, SEM-FL20-01B, SEM-FL30-01B, SEM-FL40-01B, SEM-FL50-01B, SEM-FL60-01B, SEM-FL70-01B, SEM-FL80-01B, SEM-FL90-01B, SEM-FL100-01B, SEM-FL120-01B, SEM-FL160-01B, SEM-FL200-01B, SEM-FL300-01B, SEM-FL400- 02B, SEM-FL400-03B, SEM-FL500-02B, SEM-FL500-03B, SEM- FL600-02B, SEM-FL600-03B, SEM-FL700-02B, SEM-FL700-03B
Rating(s).....	230V~ 50Hz 150W
Test case verdicts	
Test case does not apply to the test object ...	N/A
Test item does meet the requirement	P(ass)
Test item does not meet the requirement	F(ail)



General remarks

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

The test results presented in this report relate only to the item(s) tested.

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

"(see Annex #)" refers to an annex appended to the report.

Clause numbers between brackets refer to clauses in IEC 60 598-1 (EN 60 598-1)

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

Copy of marking plate:

LED FLOOD LIGHT

Model : SEM-FL150-01B

Rating : 230V~ 50Hz 150W



SEMLIGHT SEMICONDUCTOR LIGHTING CO., LIMITED



Name and address of the testing laboratory : Shenzhen BST Technology Co.,Ltd.
Building No.23-24,Zhiheng Industrial Park,
Guankouer Road,Nantou,Nanshan District,
Shenzhen,Guangdong,China

Test by : Sgan May. 23, 2013
Signature Date
Technician
Title

Reported by : Jerry May. 23, 2013
Signature Date
Project Engineer
Title

Approved by : [Signature] May. 23, 2013
Signature Date
Christina/ Manager
Name and Title



IEC 60598-1 & IEC 60598-2-5			
Cl.	Requirement – Test	Result	Verdict

5.1 (0)	SCOPE		P
5.1 (0.1)	More sections applicable	Yes [<input checked="" type="checkbox"/>] No [<input type="checkbox"/>]	—

5.4 (2)	CLASSIFICATION		
5.4 (2.2)	Type of protection	Class I	—
5.4 (2.3)	Degree of protection	IP65	—
5.4 (2.4)	Portable or handheld luminaire	No	—
	Fixed luminaire suitable for normally flammable surfaces	Yes	—
	Fixed luminaire suitable for non-combustible materials only	No	—
5.4 (2.5)	Luminaire for normal use	Yes	—
	Luminaire for rough service	No	—

5.5 (3)	MARKING		P
5.5 (3.2)	Mandatory markings		P
	Position of the marking		P
	Format of symbols/text		P
5.5 (3.3)	Additional information	Install instruction	P
	Language of instructions	English	P
5.5 (3.3.1)	Combination luminaires		N
5.5 (3.3.2)	Nominal frequency in Hz	50Hz	P
5.5 (3.3.3)	Operating temperature		P
5.5 (3.3.4)	Symbol or warning notice	See marking label	P
5.5 (3.3.5)	Wiring diagram		N
5.5 (3.3.6)	Special conditions		N
5.5 (3.3.7)	Metal halid lamp luminaire – warning		N
5.5 (3.3.8)	Limitation for semi-luminaires		N
5.5 (3.3.9)	Power factor and supply current		N
5.5 (3.3.10)	Suitability for use indoors		N
5.5 (3.3.11)	Luminaires with remote control		N



IEC 60598-1 & IEC 60598-2-5			
Cl.	Requirement – Test	Result	Verdict
5.5 (3.3.12)	Clip-mounted luminaire - warning		N
5.5 (3.3.13)	Specifications of protective shields		N
5.5 (3.3.14)	Symbol for nature of supply		P
5.5 (3.3.15)	Rated current of socket outlet		N
5.5 (3.3.16)	Rough service luminaire		N
5.5 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments	Type Y attachment	P
4.5 (3.3.18)	Non-ordinary luminaires with PVC cable		N
5.5 (3.4)	Test with water	15s with water	P
	Test with hexane	15s with hexane	P
	Legible after test	The marking is legible	P
	Label attached	The marking not be easily removable and shows no curling	P

5.6 (4)	CONSTRUCTION		P
5.6.1 (-)	At least IPX3		N
5.6.2 (-)	Lampholder brackets		N
5.6.3 (-)	Adjusting means		N
5.6.4 (-)	Controlling components		N
5.6.5 (-)	Fixing device		N
	Wind force test		N
5.6.6 (-)	Locking system		N
5.6.7 (-)	Vibration resistance		N
5.6.8 (-)	Glass cover		P
5.6 (4.2)	Components replaceable without difficulty		P
5.6 (4.3)	Wireways smooth and free from sharp edges		P
5.6 (4.4)	Lampholders		--
5.6 (4.4.1)	Integral lampholder		P
5.6 (4.4.2)	Wiring connection		P
5.6 (4.4.3)	Lampholder for end-to-end mounting		N
5.6 (4.4.4)	Positioning		N



IEC 60598-1 & IEC 60598-2-5			
Cl.	Requirement – Test	Result	Verdict
5.6 (4.4.5)	Peak pulse voltage		N
5.6 (4.4.6)	Centre contact		N
5.6 (4.4.7)	Rough service luminaires	Ordinary luminaires	N
5.6 (4.4.8)	Lamp connectors		N
5.6 (4.5)	Starter holders-		--
	Starter holder in luminaires other than class II		N
	Starter holder class II construction		N
5.6 (4.6)	Terminal blocks		N
	Tails		N
	Unsecured blocks		N
5.6 (4.7)	Terminals and supply connections		N
5.6 (4.7.1)	Contact to metal parts		N
5.6 (4.7.2)	Test 8 mm live conductor		N
	Test 8 mm earth conductor		N
5.6 (4.7.3)	Terminals for supply conductors		N
5.6 (4.7.4)	Terminals other than supply connection		N
5.6 (4.7.5)	Heat-resistant wiring/sleeves		N
5.6 (4.7.6)	Multi-pole plug		N
5.6 (4.8)	Switches:		--
	- adequate rating		N
	- adequate fixing		N
	- polarized supply		N
5.6 (4.9)	Insulating lining and sleeves		N
5.6 (4.9.1)	Retainment		N
	Method of fixing		N
5.6 (4.9.2)	Insulated linings and sleeves		--
	a) & c) Insulation resistance and electric strength		N
	b) Ageing test. Temperature (°C)		N
5.6 (4.10)	Insulation of Class II luminaires		--
5.6 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		N
	Safe installation fixed luminaires		N
	Capacitors		N
	Interference suppression capacitors according to IEC 60384-14		N



IEC 60598-1 & IEC 60598-2-5			
Cl.	Requirement – Test	Result	Verdict
5.6 (4.10.2)	Assembly gaps:		--
	- not coincidental		N
	- no straight access with test probe		N
5.6 (4.10.3)	Retention of insulation:		N
	- fixed		N
	- unable to be replaced; luminaire inoperative		N
	- sleeves retained in position		N
	- lining in lampholder		N
5.6 (4.11)	Electrical connections		--
5.6 (4.11.1)	Contact pressure	Not transmitted through insulating material	P
5.6 (4.11.2)	Screws:		P
	- self-tapping screws	Not used for connection	P
	- thread-cutting screws		N
	- at least two self-tapping screws		N
5.6 (4.11.3)	Screw locking:		--
	- spring washer		P
	- rivets		N
5.6 (4.11.4)	Material of current-carrying parts	At least 50% copper	P
5.6 (4.11.5)	No contact to wood	No wood material in the luminaires	P
5.6 (4.11.6)	Electro-mechanical contact systems	No such systems	N
5.6 (4.12)	Mechanical connections and glands		--
5.6 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		P
	Torque test: torque (Nm); part.....:	Φ3.42 mm : 0.8Nm	P
	Torque test: torque (Nm); part.....:	Φ4.82 mm : 2.0Nm	P
	Torque test: torque (Nm); part.....:	Φ5.89 mm : 2.5Nm	P
5.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N



IEC 60598-1 & IEC 60598-2-5			
Cl.	Requirement – Test	Result	Verdict
5.6 (4.12.4)	Locked connections:		--
	- fixed arms; torque (Nm).....:		N
	- lampholder; torque (Nm)		N
	- push-button switches; torque 0,8 Nm.....:		N
5.6 (4.12.5)	Screwed glands; force (N).....:		N
5.6 (4.13)	Mechanical strength		--
5.6 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm).....:		N
	- other parts; energy (Nm)	0.35 Nm for all surfaces and box	P
	1) live parts	Not access	P
	2) linings		P
	3) protection	Continue to afford the degree of protection against ingress of dust, solid objects and moisture	P
	4) covers	No break	P
5.6 (4.13.3)	Straight test finger		P
5.6 (4.13.4)	Rough service luminaires		--
	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
5.6 (4.13.6)	Tumbling barrel		N
5.6 (4.14)	Suspensions and adjusting devices		--
5.6 (4.14.1)	Mechanical load:		N
	A) four times the weight		N
	B) torque 2,5 Nm		N
	C) bracket arm; bending moment (Nm).....:		N
	D) load track-mounted luminaires		N



IEC 60598-1 & IEC 60598-2-5			
Cl.	Requirement – Test	Result	Verdict
	E) clip-mounted luminaires, glass-shelve. Thickness (mm)		N
	metal rod. Diameter (mm).....		N
5.6 (4.14.2)	Load to flexible cables		--
	Mass (kg)		N
	Stress in conductors (N/mm ²).....		N
5.6 (4.14.3)	Adjusting devices:		--
	- flexing test; number of cycles		N
	- strands broken		N
	- electric strength test afterwards		N
5.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors	No telescopic tubes	N
5.6 (4.14.5)	Guide pulleys	No guide pulleys	N
5.6 (4.14.6)	Strain on socket-outlets	No socket-outlet	N
5.6 (4.15)	Flammable materials:		N
	- glow-wire test 650 °C		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
5.6 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		--
	a) construction		N
	b) temperature sensing control		N
	c) surface temperature		N
5.6 (4.16)	Luminaires marked with F-symbol		--
	No lamp control gear	(compliance with Section 12)	N
5.6 (4.16.1)	Lamp control gear spacing:		N
	- spacing 35 mm		N
	- spacing 10 mm		N



IEC 60598-1 & IEC 60598-2-5			
Cl.	Requirement – Test	Result	Verdict
5.6 (4.16.2)	Thermal protection:		N
	- in lamp control gear		N
	- external		N
	- fixed position		N
	- temperature marked lamp control gear		N
5.6 (4.16.3)	“F” curve measured	(see 12.6)	N
5.6 (4.17)	Drain holes		N
	Clearance at least 5 mm		N
5.6 (4.18)	Resistance to corrosion:		--
5.6 (4.18.1)	- rust-resistance		P
5.6 (4.18.2)	- season cracking in copper		P
5.6 (4.18.3)	- corrosion of aluminium		P
5.6 (4.19)	Igniters compatible with ballast		N
5.6 (4.20)	Rough service vibration		N
5.6 (4.21)	Protective shield:		N
5.6 (4.21.1)	Shield fitted		N
5.6 (4.21.2)	Particles from a shattering lamp not impair safety		N
5.6 (4.21.3)	No direct path		N
5.6 (4.21.4)	Impact test on shield		N
	Glow-wire test on lamp compartment		N
5.6 (4.22)	Attachments to lamps	No attachments	N
5.6 (4.23)	Semi-luminaires comply class II		N
5.6 (4.24)	UV radiation, metal halide lamps		N
5.6 (4.25)	No sharp point or edges	No sharp points or edges	P
5.6 (4.26)	Short-circuit protection:		--
5.6 (4.26.1)	Uninsulated accessible SELV parts		N
5.6 (4.26.2)	Short-circuit test		N



IEC 60598-1 & IEC 60598-2-5			
Cl.	Requirement – Test	Result	Verdict
5.6 (4.26.3)	Test chain according to IEC 61032		N

5.7 (11)	CREEPAGE DISTANCES AND CLEARANCES		P
	Working voltage (V)	230V	—
	Voltage form	Sinusoidal [<input checked="" type="checkbox"/>] Non-sinusoidal []	—
	PTI	< 600 [<input checked="" type="checkbox"/>] ≥ 600 []	—
	Rated pulse voltage (Kv)	--	—
	(1) Current-carrying parts of different polarity: cr (mm); cl (mm)	Between L and N, cr>2.5mm, cl>1.5mm required cr: 2.5mm, cl: 1.5mm	P
	(2) Current-carrying parts and accessible parts: cr (mm); cl (mm)		P
	(3) Parts becoming live due to breakdown of basic insulation and metal parts: cr (mm); cl (mm)		P
	(4) Outer surface of cable where it is clamped and metal parts: cr (mm); cl (mm)		N
	(5) Current-carrying parts of switches and metal parts, after removal of insulation: cr (mm); cl (mm)		N
	(6) Current-carrying parts and supporting surface: cr (mm); cl (mm)		N

5.8 (7)	PROVISION FOR EARTHING		P
5.8 (7.2.1 + 7.2.3)	Accessible metal parts		P
	Metal parts in contact with supporting surface		P
	Resistance < 0,5 Ω	0,1Ω	P
	Two self-tapping screws used		N
	Thread-forming screws		N
	Connector earthing first		N
5.8 (7.2.2 + 7.2.3)	Earth continuity in joints etc.		P
5.8 (7.2.4)	Locking of clamping means		P
	Compliance with 4.7.3		N
5.8 (7.2.5)	Earth terminal integral part of connector socket		N
5.8 (7.2.6)	Earth terminal adjacent to mains terminals		N



IEC 60598-1 & IEC 60598-2-5			
Cl.	Requirement – Test	Result	Verdict
5.8 (7.2.7)	Electrolytic corrosion of the earth terminal		N
5.8 (7.2.8)	Material of earth terminal		P
	Contact surface bare metal		N
5.8 (7.2.10)	Class II luminaire for looping-in		N
5.8 (7.2.11)	Earthing core coloured green-yellow		P
	Length of earth conductor		N

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

5.9 (15)	SCREWLESS TERMINALS		N
	Separately approved; component list	(see Annex 1)	N
	Part of the luminaire	(see Annex 4)	N

5.10 (5)	EXTERNAL AND INTERNAL WIRING		P
5.10 (5.2)	Supply connection and external wiring		--
5.10 (5.2.1)	Means of connection	Connect wire	P
5.10 (5.2.2)	Type of cable		P
	Nominal cross-sectional area (mm ²)	0.75mm ²	P
5.10 (5.2.3)	Type of attachment, X, Y or Z		N
5.10 (5.2.5)	Type Z not connected to screws		N
5.10 (5.2.6)	Cable entries:		--
	- suitable for introduction		P
	- adequate degree of protection		P
5.10 (5.2.7)	Cable entries through rigid material have rounded edges		P
5.10 (5.2.8)	Insulating bushings:		--
	- suitably fixed		P
	- material in bushings		P



IEC 60598-1 & IEC 60598-2-5			
Cl.	Requirement – Test	Result	Verdict
	- tubes or guards made of insulating material		P
5.10 (5.2.9)	Locking of screwed bushings		N
5.10 (5.2.10)	Cord anchorage:		--
	- covering protected from abrasion		P
	- clear how to be effective		P
	- no mechanical or thermal stress		P
	- no tying of cables into knots etc.		P
	- insulating material or lining		P
5.10 (5.2.10.1)	Cord anchorage for type X attachment:		--
	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
5.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		P
5.10 (5.2.10.3)	Tests:		--
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N).....: 60N		P
	- torque test: torque (Nm): 0.15Nm		P
	- displacement ≤ 2 mm		P
	- no movement of conductors		P
	- no damage of cable or cord		P
5.10 (5.2.11)	External wiring passing into luminaire		N
5.10 (5.2.12)	Looping-in terminals		N
5.10 (5.2.13)	Wire ends not tinned		N



IEC 60598-1 & IEC 60598-2-5			
Cl.	Requirement – Test	Result	Verdict
	Wire ends tinned: no cold flow		N
5.10 (5.2.14)	Mains plug same protection		N
	Class III luminaire plug		N
5.10 (5.2.15)	Colour code low voltage		N
5.10 (5.2.16)	Appliance inlets (IEC 60320)		N
	Appliance couplers of class II type		N
5.10 (5.3)	Internal wiring		--
5.10 (5.3.1)	Internal wiring of suitable size and type		P
	Through wiring		P
	- not delivered/ mounting instruction		N
	- factory assembled		P
	- socket outlet loaded (A).....:		N
	- temperatures: (see Annex 2)		P
	Green-yellow for earth only		P
5.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		--
	Cross-sectional area (mm ²).....:		P
	Insulation thickness		P
	Extra insulation added where necessary		N
5.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		--
	Adequate cross-sectional area and insulation thickness		N
5.10 (5.3.1.3)	Double or reinforced insulation for class II		N
5.10 (5.3.1.4)	Conductors without insulation		N
5.10 (5.3.1.5)	SELV current-carrying parts		N
5.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		P
5.10 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		N
	Joints, raising/lowering devices		N



IEC 60598-1 & IEC 60598-2-5			
Cl.	Requirement – Test	Result	Verdict
	Telescopic tubes etc.		N
	No twisting over 360°		P
5.10 (5.3.3)	Openings		N
	Bushings not removable		N
	Bushings in sharp openings		N
	Cables with protective sheath		N
5.10 (5.3.4)	Joints and junctions effectively insulated		N
5.10 (5.3.5)	Strain on internal wiring		N
5.10 (5.3.6)	Wire carriers		N
5.10 (5.3.7)	Wire ends not tinned		N
	Wire ends tinned: no cold flow		N

5.11 (8)	PROTECTION AGAINST ELECTRIC SHOCK		P
5.11 (8.2.1)	Live parts not accessible	No access of live part in normal use	P
	Protection in any position		P
	Double-ended tungsten filament lamp		N
	Insulation lacquer not reliable	No insulation lacquer and similar materials as protection against electric shock	N
	Double-ended high pressure discharge lamp		N
5.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N
5.11 (8.2.3)	Class II luminaire:		--
	- basic insulated metal parts not accessible during starter or lamp replacement		N
	- basic insulation not accessible other than during starter or lamp replacement		N
	- glass protective shields not used as supplementary insulation		N
	Class I luminaire with BC lampholder		N
5.11 (8.2.4)	Portable luminaire:		--
	- protection independent of supporting surface		N
	- terminal block completely covered		P
5.11 (8.2.6)	Covers reliably secured		P
5.11 (8.2.7)	Discharging of capacitors $\geq 0,5 \mu\text{F}$		N
	Portable plug connected luminaire with capacitor		N



IEC 60598-1 & IEC 60598-2-5			
Cl.	Requirement – Test	Result	Verdict
	Other plug connected luminaire with capacitor		N
	Discharge device on or within capacitor		N
	Discharge device mounted separately		N

5.12 (12)	ENDURANCE TEST AND THERMAL TEST		P
5.12 (12.3)	Endurance test:		P
	- mounting-position		—
	- test temperature (°C).....	35°C	—
	- total duration (h)	240h	—
	- supply voltage: Un factor; calculated voltage (V)	230V	—
	- lamp used	LED FLOOD LIGHT	—
5.12 (12.3.2)	After endurance test:		--
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N
	- marking legible		P
	- no cracks, deformation etc.		P
5.12 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
5.12.1 (-)	Temperature reduction		N
5.12 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	N
5.12 (12.6)	Thermal test (failed lamp control gear condition):		N
5.12 (12.6.1)	- 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
5.12 (12.6.2)	Temperature sensing control		N
	- case of abnormal conditions.....		—
	- thermal link		N
	- manual reset cut-out		N



IEC 60598-1 & IEC 60598-2-5			
Cl.	Requirement – Test	Result	Verdict
	- auto reset cut-out		N
	- measured mounting surface temperature (°C):		N
	- track-mounted luminaires		N
5.12 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N
	- case of abnormal conditions.....:		—
5.12 (12.7.1)	- 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
5.12 (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

5.13 (9)	RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE		P
5.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP		—
	- mounting position during test		—
	- fixing screws tightened; torque (Nm).....:		—
	- tests according to clauses		—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		P
	b) no talcum in dust-tight luminaire		P
	c) no trace of water on current-carrying parts or where it could become a hazard		P
	d) i) For luminaires without drain holes – no water entry		P
	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)		N



IEC 60598-1 & IEC 60598-2-5			
Cl.	Requirement – Test	Result	Verdict
	f) no entry into enclosure (IP 3X and IP 4X)		P
5.13 (9.3)	Humidity test 48 h	R.H.:93% T:25°C	P

5.14 (10)	INSULATION RESISTANCE AND ELECTRIC STRENGTH		P
5.14 (10.2.1)	Insulation resistance test		--
	Insulation resistance (MΩ):		P
	SELV:		N
	- between current-carrying parts of different polarity		N
	- between current-carrying parts and mounting surface		N
	- between current-carrying parts and metal parts of the luminaire		N
	Other than SELV:		P
	- between live parts of different polarity.....	>100MΩ	P
	- between live parts and mounting surface.....	>100MΩ	P
	- between live parts and metal parts	>100MΩ	P
	- between live parts of different polarity through action of a switch		N
5.14 (10.2.2)	Electric strength test		--
	Dummy lamp		N
	Luminaires with ignitors after 24 h test		N
	Luminaires with manual ignitors		N
	Test voltage (V):		N
	SELV:		--
	- between current-carrying parts of different polarity		N
	- between current-carrying parts and mounting surface		N
	- between current-carrying parts and metal parts of the luminaire		N
	Other than SELV:		P
	- between live parts of different polarity.....	1460V, no broken	P
	- between live parts and mounting surface.....	2920V, no broken	P
	- between live parts and metal parts	2920V, no broken	P



IEC 60598-1 & IEC 60598-2-5			
Cl.	Requirement – Test	Result	Verdict
	- between live parts of different polarity through action of a switch		N
5.14 (10.3.1)	Leakage current (Ma)		P

5.15 (13)	RESISTANCE TO HEAT, FIRE AND TRACKING		N
5.15 (13.2.1)	Ball-pressure test:		--
	- part tested; temperature (°C)		N
	- part tested; temperature (°C)		N
5.15 (13.3.1)	Needle flame test (10 s):		--
	- part tested.....		N
	- part tested.....		N
5.15 (13.3.2)	Glow-wire test (650°C):		--
	- part tested.....		N
	- part tested.....		N
5.15 (13.4.1)	Tracking test: part tested		N

	COMMON MODIFICATIONS		N
(3.3.101 + 5.2.1)	For luminaires connected by tails, information about terminal block		N
(5.2.2)	Cables equal to HD 21 S2 or HD 22 S2		N
(5.2.15)	Colour code low voltage		N

ZB	ANNEX ZB, SPECIAL NATIONAL CONDITIONS		N
(2.2)	Class 0 not accepted		N
(3.3)	DK: power supply cord with label		N
	IT: warning label on Class 0 luminaire		N
(4.5.1)	DK: socket-outlets		N
(4.5.1)	FR: socket-outlets		N
(5.2.1)	DK, FI, SE, GB: type of plug		N

ZC	ANNEX ZC, NATIONAL DEVIATIONS		N
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IEC 60598-1 & IEC 60598-2-5			
Cl.	Requirement – Test	Result	Verdict
(13.3)	DK: Needle flame test or glow-wire test 750°C for luminaires in access routes		N
(13.3)	GB: Requirements according to United Kingdom Building Regulation		N
(13.3.2)	FR: Glow-wire test 850°C alt. 750°C for luminaires in premises open to public and workers		N

ANNEX 1: components						P					
object/part No.		manufacturer/ trademark		type/model		technical data		standard		mark(s) of conformity	
Internal wire		Various		Various		105°C		--		Test with appliance	
PCB		CRDLIGHT		D1581		Foil MDF 100°C		--		Test with appliance	
No.	mark of conformity		No.	mark of conformity		No.	mark of conformity		No.	mark of conformity	
1			2	VDE		3	SEV		4	ÖVE	
5	DEMKO		6	SEMKO		7	NEMKO		8	FIMKO	
9	BSI		10	UL		11	CSA		12	LCIE	
13	IMQ		14	BNL		15	CEBEC		16	KEMA	
<p>The codes above have the following meaning:</p> <p>A – The component is replaceable with another one, also certified, with equivalent characteristics</p> <p>B – The component is replaceable if authorised by the test house</p> <p>C – Integrated component tested together with the appliance</p> <p>D – Alternative component</p>											

ANNEX 2: temperature measurements, thermal tests of Section 12		P
Type reference	SEM-FL150-01B	—
Lamp used	LED FLOOD LIGHT	—
Lamp control gear used		—
Mounting position of luminaire	Normal position	—
Supply wattage (W).....	150W	—
Supply voltage (V).....	230V	—
Supply current (A)	0.68A	—
Calculated power factor	--	—
Table: measured temperatures corrected for ta = 25 °C:		



IEC 60598-1 & IEC 60598-2-5						
Cl.	Requirement – Test	Result				Verdict
	- abnormal operating mode	--				—
	- test 1: rated voltage	--				—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage	243.8V				—
	- 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.....	--				—
temperature (°C) of part		clause 12.4 – normal			clause 12.5 – abnormal	
		test 1	test 2	test 3	limits	test 4
	Power cord		48.5		75	
	Enclosure		56.4		75	
	Internal wire		56.6		105	
	Ambient		25.5		--	

	ANNEX 3: screw terminals (part of the luminaire)		P
(14)	SCREW TERMINALS		P
(14.2)	Type of terminal	Cross	—
	Rated current (A).....		—
(14.3.2.1)	One or more conductors		P
(14.3.2.2)	Special preparation		P
(14.3.2.3)	Terminal size		P
	Cross-sectional area (mm ²)	0.75mm ²	P
(14.3.3)	Conductor space (mm)		P
(14.4)	Mechanical tests		--
(14.4.1)	Minimum distance		P
(14.4.2)	Cannot slip out		P
(14.4.3)	Special preparation		P
(14.4.4)	Nominal diameter of thread (metric ISO thread)		P
	External wiring		P
	No soft metal		P
(14.4.5)	Corrosion		P
(14.4.6)	Nominal diameter of thread (mm)		P
	Torque (Nm).....		P
(14.4.7)	Between metal surfaces		N



IEC 60598-1 & IEC 60598-2-5			
Cl.	Requirement – Test	Result	Verdict
	Lug terminal		N
	Mantle terminal		N
	Pull test; pull (N)..... :		N
(14.4.8)	Without undue damage		P

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



IEC 60598-1 & IEC 60598-2-5											
Cl.	Requirement – Test									Result	Verdict
(15.7)	Terminals external wiring										N
	Terminal size and rating										N
(15.8.1)	Pull test spring-type terminals (4 samples); pull (N)										N
	Pull test pin or tab terminals (4 samples); pull (N)										N
(15.9)	Contact resistance test										N
	Voltage drop (mV) after 1 h										--
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
Voltage drop of two inseparable joints											
Voltage drop after 10th alt. 25th cycle											
Max. allowed voltage drop (mV).....: —											
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
Voltage drop after 50th alt. 100th cycle											
Max. allowed voltage drop (mV).....: —											
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
Continued ageing: voltage drop after 10th alt. 25th cycle											
Max. allowed voltage drop (mV).....: —											
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
Continued ageing: voltage drop after 50th alt. 100th cycle											
Max. allowed voltage drop (mV).....: —											
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											



IEC 62471			
Cl.	Requirement – Test	Result	Verdict
1	SCOPE		P
	More sections applicable	Yes [<input checked="" type="checkbox"/>] No [<input type="checkbox"/>]	—

Annex ZB 4	EXPOSURE LIMITS		P
4.1	General		P
4.2	Specific factors involved in the determination and application of retinal exposure limits		P
4.2.1	Pupil diameter		N
4.2.2	Angular subtense of source and measurement field-of-view		P
4.3	Hazard exposure limits		P
4.3.1	Actinic UV hazard exposure limit for the skin and eye		N
4.3.2	Near-UV hazard exposure limit for the eye		N
4.3.3	Retinal blue light hazard exposure limit		N
4.3.4	Retinal blue light hazard exposure limit - small source		P
4.3.5	Retinal thermal hazard exposure limit		N
4.3.6	Retinal thermal hazard exposure limit – weak visual stimulus		N
4.3.7	Infrared radiation hazard exposure limits for the eye		N
4.3.8	Thermal hazard exposure limit for the skin		N
5	MEASUREMENT OF LAMPS AND LAMP SYSTEMS		P
5.1	Measurement conditions		--
5.1.1	Lamp ageing (seasoning)		P
5.1.2	Test environment		P
5.1.3	Extraneous radiation		N
5.1.4	Lamp operation		P
5.1.5	Lamp system operation		N
5.2	Measurement procedure		--
5.2.1	Irradiance measurements		N
5.2.2	Radiance measurements		N
5.2.2.1	Standard method		N
5.2.2.2	Alternative method		P
5.2.3	Measurement of source size		P
5.2.4	Pulse width measurement for pulsed sources		N



IEC 62471			
Cl.	Requirement – Test	Result	Verdict
5.3	Analysis methods		P
5.3.1	Weighting curve interpolations		P
5.3.2	Calculations		P
5.3.3	Measurement uncertainty		N
6	LAMP CLASSIFICATION		--
	This standard was developed by CIE TC 6-47 with representation of IEC SC34A. This joint effort was deemed important so that issues concerning risk group classification and distance at which the photobiological hazard values due to lamp radiation are reported could be agreed upon. Since lamps may be hazardous from several aspects, a classification scheme is helpful. For the purposes of this standard it was decided that the values shall be reported as follows:		N
	for lamps intended for general lighting service (GLS), see definition 3.11, 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.		N
6.1	Continuous wave lamps		P
6.1.1	Exempt group		N
	The philosophical basis for the exempt group classification is that the lamp does not pose any photobiological hazard for the end points in this standard. This requirement is met by any lamp that does not pose		N
	an actinic ultraviolet hazard (E_s) within 8-hours exposure (30000 s), nor		N
	a near-UV hazard (E_{UVA}) within 1000 s, (about 16 min) nor		N
	a retinal blue-light hazard (L_B) within 10000 s (about 2,8 h), nor		N
	a retinal thermal hazard (L_R) within 10 s, nor		N
	an infrared radiation hazard for the eye (E_{IR}) within 1000 s.		N
6.1.2	Risk Group 1 (Low-Risk)	Group 1	P
	The philosophical basis for this classification is that the lamp does not pose a hazard due to normal behavioral limitations on exposure. This requirement is met by any lamp that exceeds the limits for the Exempt Group but that does not pose		P



IEC 62471			
Cl.	Requirement – Test	Result	Verdict
	an actinic ultraviolet hazard (E_s) within 10000 s, nor		P
	a near ultraviolet hazard (E_{UVA}) within 300 s, nor		P
	a retinal blue-light hazard (L_B) within 100 s, nor		P
	a retinal thermal hazard (L_R) within 10 s, nor		P
	an infrared radiation hazard for the eye (E_{IR}) within 100 s.		P
6.1.3	Risk Group 2 (Moderate-Risk)		N
	The philosophical basis for the Risk Group 2 (Moderate-Risk) classification is that the lamp does not pose a hazard due to the aversion response to very bright light sources or due to thermal discomfort. This requirement is met by any lamp that exceeds the limits for Risk Group 1 (Low-Risk), 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
6.1.4	Risk Group 3 (High-Risk)		N
	The philosophical basis for this classification is that the lamp may pose a hazard even for momentary or brief exposure. Lamps which exceed the limits for Risk Group 2 (Moderate-Risk) are in Risk Group 3 (High-Risk).		N
6.2	Pulsed lamps		N
	Pulsed lamp criteria shall apply to a single pulse and to any group of pulses within 0,25 second.		N
ANNEX A	SUMMARY OF BIOLOGICAL EFFECTS		--
	Bioeffect datasheet #1: Infrared cataract		N
A.1	Bioeffect: INFRARED CATARACT also known as "industrial heat cataract", "furnaceman's cataract", or "glassblower's cataract".		N
A.1.1	Organ/Site: Eye/Crystalline Lens.		N
A.1.2	Spectral range: 700 nm to 1400 nm and possibly to 3000 nm.		N
A.1.3	Peak of action spectrum: Not known; probably between 900-1000 nm.		N



IEC 62471			
Cl.	Requirement – Test	Result	Verdict
A.1.4	State of knowledge: Limited threshold data available for acute cataract for rabbit at 1064 nm (Wolbarsht, 1992) and IR-A region (Pitts and Cullen, 1981); no data for man. Degree of additivity and action spectrum unknown. Good epidemiological evidence (Lydahl, 1984).		N
A.1.5	Time course: Noticeable clouding of the lens generally following years of chronic high-level exposure, the elapsed time depending upon how much difference between exposure and threshold, heavy exposures producing reaction in shortest time.		N
A.1.6	Mechanism: Generally presumed to be thermal, although recent evidence suggests possible photochemical reaction - details not understood. The lens may be heated either from direct irradiation (Vogt, 1919) or by conductive heating from the heated iris (Goldmann, 1983).		N
A.1.7	Symptoms: Clouding of vision.		N
A.1.8	Needed information: Action spectrum, if existent, for acute and for effects of concomitant ultraviolet radiation exposure; additivity of multiple exposures, and the possibility of delayed effects from recurrent exposures.		N
A.1.9	Experience with lamps: Accidental injury is not known, even from exposure to heat lamps. Limited population exposed.		N
A.1.10	Key references		N

	Bioeffect datasheet #2		--
A.2	Bioeffect		P
A.2.1	Organ/Site		P
A.2.2	Spectral range		P
A.2.3	Peak of action spectrum		P
A.2.4	State of knowledge		P
A.2.5	Time course		P
A.2.6	Mechanism		P
A.2.7	Symptoms		P
A.2.8	Needed information		P
A.2.9	Experience with lamps		P
A.2.10	Key references		P
Bioeffect datasheet #3			--



IEC 62471			
Cl.	Requirement – Test	Result	Verdict
A.3	Bioeffect		N
A.3.1	Organ/Site		N
A.3.2	Spectral range		N
A.3.3	Peak of action spectrum		N
A.3.4	State of knowledge		N
A.3.5	Time course		N
A.3.6	Mechanism		N
A.3.7	Symptoms		N
A.3.8	Needed information		N
A.3.9	Experience with lamps		N
A.3.10	Key references		N
Bioeffect datasheet #4			--
A.4	Bioeffect		N
A.4.1	Organ/Site		N
A.4.2	Spectral range		N
A.4.3	Peak of action spectrum		N
A.4.4	State of knowledge		N
A.4.5	Time course		N
A.4.6	Mechanism		N
A.4.7	Symptoms		N
A.4.8	Needed information		N
A.4.9	Experience with lamps		N
A.4.10	Key references		N
Bioeffect datasheet #5			--
A.5	Bioeffect		N
A.5.1	Organ/Site		N
A.5.2	Spectral range		N
A.5.3	Peak of action spectrum		N
A.5.4	State of knowledge		N
A.5.5	Time course		N
A.5.6	Mechanism		N
A.5.7	Symptoms		N
A.5.8	Needed information		N



IEC 62471			
Cl.	Requirement – Test	Result	Verdict
A.5.9	Experience with lamps		N
A.5.10	Key references		N

ANNEX B	MEASUREMENT METHOD		N
B.1	Instrumentation		N
B.1.1	Double monochromator: Recommended instrument		N
B.1.2	Broadband detectors		N
B.2	Instrument limitations		N
B.2.1	Noise equivalent irradiance		N
B.2.2	Instrument spectral response		N
B.2.3	Wavelength accuracy		N
B.2.4	Stray radiant power		N
B.2.5	Input optics for spectral irradiance measurements: Recommendation		N
B.2.6	Linearity		N
B.3	Calibration sources		N

ANNEX C	UNCERTAINTY ANALYSIS		N
ANNEX D	GENERAL REFERENCES		N
ANNEX ZA	Normative references to international publications with their corresponding European publications		N
ANNEX ZB	EXPOSURE LIMITS (EL'S)	See ANNEX ZB above	P



ANNEX A:

Photo-documentation



Photo 1 View of EUT



Photo 2 View of EUT





Photo 3 View of EUT

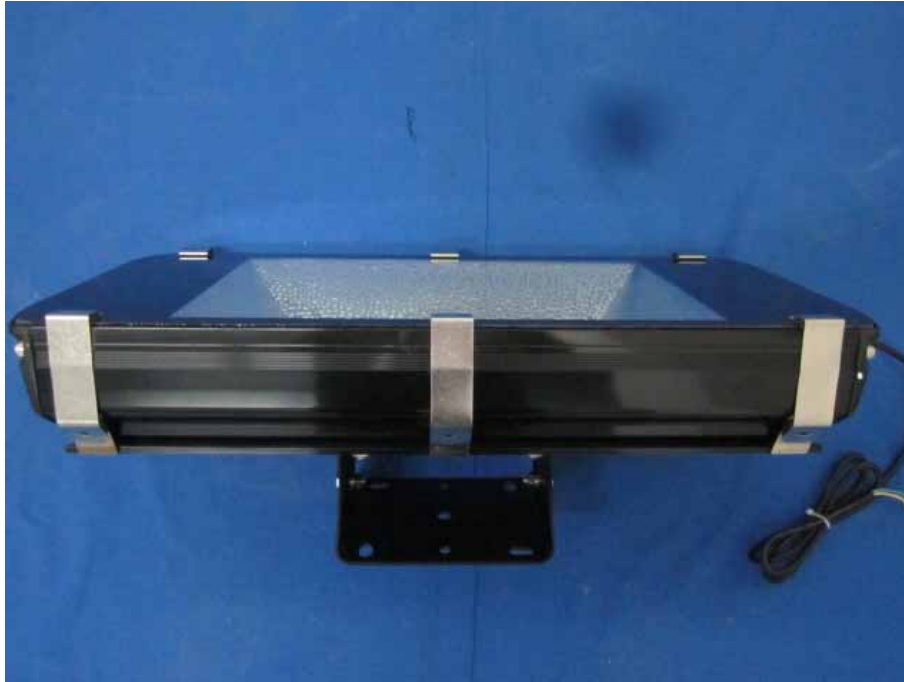


Photo 4 View of EUT

