

## CUSTOMER SATISFACTION EVALUATION FORM

COMPANY NAME : \_\_\_\_\_

LABORATORY USED : \_\_\_\_\_

DATE : \_\_\_\_\_

CUSTOMER NAME : \_\_\_\_\_

Rating Scale: 1 = Unsatisfactory Performance

2 = Needs Improvement

3 = Effective Performance

4 = Exceeds Expectations

5 = Exceptional Performance

	1	2	3	4	5
<b>JOB REQUEST ADMINISTRATION</b>					
• Availability of staff in responding to enquiries telephonically					
• Promptness of responding to your initial enquiry					
• Professionalism of the administration staff					
AVERAGE:			(OFFICE USE)		
<b>QUALITY OF SERVICE</b>					
• How satisfied are you with the turnaround time of service delivery					
• How satisfied are you with the communication that you had with us					
• How satisfied are you with the intervention of management where required					
• How satisfied are you with the way we do business					
AVERAGE:			(OFFICE USE)		
<b>TEST / CALIBRATION SERVICE</b>					
• Testing progress tracking: Ability to track the progress of testing					
• Turnaround time: ability to achieve agreed turnaround time					
• Feedback received when agreed turnaround time not met					
AVERAGE:			(OFFICE USE)		
<b>REPORTING OF RESULTS</b>					
• Test results: received as per agreed turnaround time					
• Test results: reporting format clear and unambiguous					
• Test results: reporting format meet your requirements (eg. International recognition)					
AVERAGE:			(OFFICE USE)		
<b>TECHNICAL STAFF</b>					
• Technical expertise of staff: meeting your expectation					
• Promptness of responding to your testing enquiries					
• Professionalism of the technical staff					
AVERAGE:			(OFFICE USE)		
<b>FINANCIAL PROCESS</b>					
• Quality of quotation: information clear and complete as per request					
• Quotation acceptance: simplicity of complete financial process					
• Pricing: price of test / calibration competitive					
• Promptness of responding to your request for quotation					
• Professionalism of the financial administrators					
Y			N		
• Would you recommend the service of this laboratory?					
Comments/Suggestions					

"SABS Commercial hereby agree that all information in relation to the Client, will be treated as confidential information and will not be reproduced or disclosed to any external person or organization."

SABS COMMERCIAL SOC Ltd – Reg. No. 2000/013581/07

Directors: Mr CB Sibisi, Dr B Mehlomakulu, Dr T Demana, Dr MJ Elliman, Mr WK Masvikwa, Ms B Masako, Mr ME Mkwana, Ms WIJ Poulton, Ms W de Witt (company Secretary)

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SCF014L 2012-02-28

## TEST REPORT

<b>SANS (IEC) 60598-2-1</b> <b>Luminaires</b> <b>Part 2: Particular requirements:</b> <b>Section One – Fixed general purpose luminaires</b>	
Report Reference No.....	2330/GE447
Tested by .....	SD Matloga Student Test Officer
Checked by .....	NP Mokoena Test Officer
Approved by .....	T Fourie Technical Signatory
Date of issue .....	2013-08-23
This report is based on a blank test report that was prepared by SGS Fimko Ltd using information obtained from the TRF originator (see below).	
Testing Laboratory Name .....	Lighting Technology
Address .....	Private Bag X191
Testing location .....	PRETORIA, 0001
Applicant's name .....	ELEXPERS (PTY) LTD
Address .....	P O BOX 4069
	RANDBURG, 2125
Summary of test results .....	The luminaire <u>complied</u> with the requirements of standard SANS 60 598-2-1:1979 and standard SANS 60 598-1:2009 for which it was tested.
<b>Test specification:</b> Standard .....	
SANS 60598-2-1:1979 used in conjunction with SANS 60598-1:2009	
Non-standard test method .....	N/A
Test Report Form No.....	IEC60598_2_1B
Test Report Form(s) Originator.....	Intertek Semko AB
Master TRF .....	2009-03
Test item description .....	LED LOWBAY
Trade Mark.....	ELEXPERS
Manufacturer.....	ELEXPERS
Model/Type reference .....	EL-LB-001
Ratings.....	230 V, 50 Hz, 150 W, IP 20

1 Dr Lategan Road, Groenkloof, Private Bag X191, Pretoria, 0001.  
 Tel +27 12 428 7911. Fax +27 12 344 1568

SABS Commercial SOC Ltd conducted a conformity assessment pertaining to a sample of the product, commodity or system identified and the outcome recorded in this test report only relates to that specified sample. The conformity assessment outcomes recorded in the test report do not imply SABS Approval of the quality and/or performance of the sample(s) in question and the test results do not apply to any similar sample that has not been tested. (Refer also to the conditions of test printed on the back of this page.) This report may not be reproduced except in full. The authenticity of this report and its contents can be confirmed by contacting the person who signed it.

**sanas**  
 Testing Laboratories



**Possible test case verdicts:**-test case does not apply to the test object.: **N/A or N**-test object does not meet the requirement...: **P (Pass)**-test object does not meet the requirement...: **F (Fail)**Test item/clause not tested.....: **NT (Not tested)**Accreditation.....: **SANAS Accreditation Testing Laboratory No. T0085****Testing .....**Date of receipt of test item.....: **2013-07-25**Date (s) of performance of tests .....: **2013-07-25 - 2013-08-20****General remarks:**

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

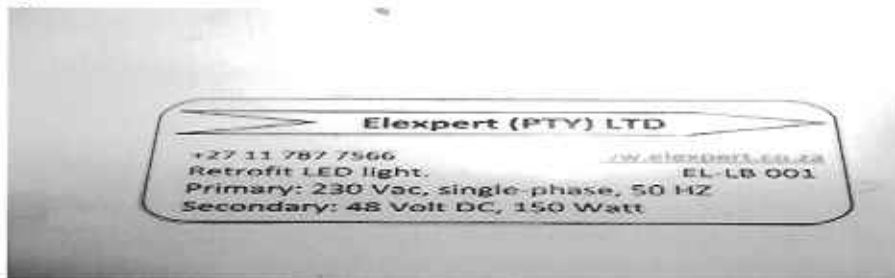
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

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

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

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

Clause numbers between brackets refer to clauses in SANS 60598-1

**The sample was received in conditions suitable for testing.****Copy of marking plate:****REMARKS:**

1. Measured power factor: **0,95**

TRF No.: I598201D

TP40013946

TRF originator: SEMKO

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
<b>1.2 (0)</b>	<b>GENERAL TEST REQUIREMENTS</b>		
1.2 (0.1)	Information for luminaire design considered	Standard Yes	—
1.2 (0.3)	More sections applicable .....	No	—

<b>1.4 (2)</b>	<b>CLASSIFICATION</b>		
1.4 (2.2)	Type of protection (Class 0 excluded) .....	Class I	—
1.4 (2.3)	Degree of protection (Requirement: Ordinary) .....	IP 20	—
1.4 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces .....	Yes	—
	Luminaire not suitable for direct mounting on normally flammable surfaces .....	No	—
1.4 (2.5)	Luminaire for normal use .....	Yes	—
	Luminaire for rough service .....	No	—

<b>1.5 (3)</b>	<b>MARKING</b>		
1.5 (3.2)	Mandatory markings		P
	Position of the marking		P
	Format of symbols/text		P
1.5 (3.3)	Additional information		
	Language of instructions	English	P
1.5 (3.3.1)	Combination luminaires		N
1.5 (3.3.2)	Nominal frequency in Hz	50	P
1.5 (3.3.3)	Operating temperature		N
1.5 (3.3.4)	Symbol or warning notice		N
1.5 (3.3.5)	Wiring diagram		N
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	IP 20	P
1.5 (3.3.11)	Luminaires with remote control		N

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## IEC 60598-2-1

Clause	Requirement + Test	Result - Remark	Verdict
1.5 (3.3.12)	Clip-mounted luminaire – warning		N
1.5 (3.3.13)	Specifications of protective shields		N
1.5 (3.3.14)	Symbol for nature of supply	~/ AC	P
1.5 (3.3.15)	Rated current of socket outlet		N
1.5 (3.3.16)	Rough service luminaire		N
1.5 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments		N
1.5 (3.3.18)	Non-ordinary luminaires with PVC cable		N
1.5 (3.3.19)	Protective conductor current in instruction if applicable		N
1.5 (3.3.20)	Provided with information if not intended to be mounted within arms reach		N
1.5 (3.4)	Test with water		P
	Test with hexane		P
	Legible after test		P
	Label attached		P

<b>1.6 (4)</b>	<b>CONSTRUCTION</b>	
1.6 (4.2)	Components replaceable without difficulty	P
1.6 (4.3)	Wireways smooth and free from sharp edges	P
1.6 (4.4)	Lampholders	
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
	After test the lampholder comply with relevant standard sheets and show no damage	N
	After test on single-capped lampholder the lampholder have not moved from its position and show no permanent deformation	N
	- bending test (N) .....	N

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	After test the lampholder have not moved from its position and show no permanent deformation		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 resistant to tracking		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		
	Starter holder in luminaires other than class II		N
	Starter holder class II construction		N
1.6 (4.6)	Terminal blocks		
	Tails		N
	Unsecured blocks		N
1.6 (4.7)	Terminals and supply connections		
1.6 (4.7.1)	Contact to metal parts		N
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:		
	- stranded or solid conductor		N
	- 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
	- heat 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		N
1.6 (4.7.6)	Multi-pole plug		N
	- test at 30 N		N
1.6 (4.8)	Switches:		

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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		
1.6 (4.9.1)	Retainment		N
	Method of fixing.....:		N
1.6 (4.9.2)	Insulated linings and sleeves		
	Resistant to a temperature > 20 °C to the wire temperature or		N
	a) & c) Insulation resistance and electric strength		N
	b) Ageing test. Temperature (°C).....:		N
1.6 (4.10)	Insulation of Class II luminaires		
1.6 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		N
	Safe installation fixed luminaires		N
	Capacitors and switches		N
	Interference suppression capacitors according to IEC 60384-14		N
1.6 (4.10.2)	Assembly gaps:		
	- not coincidental		N
	- no straight access with test probe		N
1.6 (4.10.3)	Retainment of insulation:		
	- fixed		N
	- unable to be replaced; luminaire inoperative		N
	- sleeves retained in position		N
	- lining in lampholder		N
1.6 (4.11)	Electrical connections		
1.6 (4.11.1)	Contact pressure		N
1.6 (4.11.2)	Screws:		
	- self-tapping screws		N

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- thread-cutting screws		N
1.6 (4.11.3)	Screw locking:		
	- spring washer		N
	- rivets		N
1.6 (4.11.4)	Material of current-carrying parts		N
1.6 (4.11.5)	No contact to wood or mounting surface		P
1.6 (4.11.6)	Electro-mechanical contact systems		N
1.6 (4.12)	Mechanical connections and glands		
1.6 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		N
	Torque test: torque (Nm); part .....		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) .....		N
	- lampholder; torque (Nm) .....		N
	- push-button switches; torque 0,8 Nm .....		N
1.6 (4.12.5)	Screwed glands; force (Nm) .....		N
1.6 (4.13)	Mechanical strength		
1.6 (4.13.1)	Impact tests:		
	- fragile parts; energy (Nm) .....		N
	- other parts; energy (Nm) .....	Housing; 0,35	P
	1) live parts		P
	2) linings		N
	3) protection		P
	4) covers		P
1.6 (4.13.3)	Straight test finger		P
1.6 (4.13.4)	Rough service luminaires		
	- IP54 or higher		N
	a) fixed		N

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	b) hand-held		N
	c) delivered with a stand		N
	d) for temporary installations and suitable for mounting on a stand		N
1.6 (4.13.6)	Tumbling barrel		N
1.6 (4.14)	Suspensions and adjusting devices		
1.6 (4.14.1)	Mechanical load:		
	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
	E) clip-mounted luminaires, glass-shelf. 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 <sup>2</sup> ) .....		N
	Mass (kg) of semi-luminaire .....		N
	Bending moment (Nm) of semi-luminaire .....		N
1.6 (4.14.3)	Adjusting devices:		
	- flexing test; number of cycles .....		N
	- strands broken		N
	- electric strength test afterwards		N
1.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N
1.6 (4.14.5)	Guide pulleys		N
1.6 (4.14.6)	Strain on socket-outlets		N
1.6 (4.15)	Flammable materials:		
	- glow-wire test 650 °C		N
	- spacing ≥ 30 mm		N

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- 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 for mounting on normally flammable surfaces		
	No lamp control gear	(compliance with Section 12)	N
1.6 (4.16.1)	Lamp control gear spacing:		
	- spacing 35 mm		N
	- spacing 10 mm		P
1.6 (4.16.2)	Thermal protection:		
	- in lamp control gear		N
	- external		N
	- fixed position		P
	- temperature marked lamp control gear		P
1.6 (4.16.3)	Design to satisfy the test of 12.6	(see 12.6)	N
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		N
1.6 (4.21)	Protective shield:		
1.6 (4.21.1)	Shield fitted		N
	Shield of glass if tungsten halogen lamps		N

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
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		N
1.6 (4.23)	Semi-luminaires comply Class II		N
1.6 (4.24)	UV radiation for tungsten halogen lamps and metal halide lamps (Annex P)		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		N
1.6 (4.26.2)	Short-circuit test		N
1.6 (4.26.3)	Test chain according to Figure 29		N

<b>1.7 (11)</b>	<b>CREEPAGE DISTANCES AND CLEARANCES</b>		
	Working voltage (V).....:	250 V	—
	Voltage form	Sinusoidal	—
	PTI	< 600	—
	Impulse withstand category (Normal category II) (Category III Annex U)	Category II	—
	Rated pulse voltage (kV).....:	-	—
	(1) Current-carrying parts of different polarity: cr (mm); cl (mm).....:	Cr = 16,86 Cl = 28,88	P
	(2) Current-carrying parts and accessible parts: cr (mm); cl (mm).....:	Cr > 10 Cl > 10	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		—

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Clause	Requirement + Test	Result - Remark	Verdict
	(6) Current-carrying parts and supporting surface: cr (mm); cl (mm).....	Cr > 10 Cl > 10	P

<b>1.8 (7)</b>	<b>PROVISION FOR EARTHING</b>		
1.8 (7.2.1 + 7.2.3)	Accessible metal parts		P
	Metal parts in contact with supporting surface		P
	Resistance < 0,5 $\Omega$	0,0085 $\Omega$	P
	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
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		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		P
1.8 (7.2.7)	Electrolytic corrosion of the earth terminal		N
1.8 (7.2.8)	Material of earth terminal		P
	Contact surface bare metal		P
1.8 (7.2.10)	Class II luminaire for looping-in		N
	Double or reinforced insulation to functional earth		N
1.8 (7.2.11)	Earthing core coloured green-yellow		P
	Length of earth conductor		P
<b>1.9 (14)</b>	<b>SCREW TERMINALS</b>		
	Separately approved; component list	(see Annex 1)	N
	Part of the luminaire	(see Annex 3)	P
<b>1.9 (15)</b>	<b>SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS</b>		
	Separately approved; component list	(see Annex 1)	N

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

	Part of the luminaire	(see Annex 4)	N
--	-----------------------	---------------	---

<b>1.10 (5)</b>	<b>EXTERNAL AND INTERNAL WIRING</b>		
1.10 (5.2)	Supply connection and external wiring		
1.10 (5.2.1)	Means of connection .....	Supply Cable with plug	P
1.10 (5.2.2)	Type of cable .....	PVC	P
	Nominal cross-sectional area (mm <sup>2</sup> ) .....	1,16 mm <sup>2</sup>	P
	Cables equal to IEC 60227 or IEC 60245		P
1.10 (5.2.3)	Type of attachment, X, Y or Z	Type X	P
1.10 (5.2.5)	Type Z not connected to screws		N
1.10 (5.2.6)	Cable entries:		
	- suitable for introduction		P
	- adequate degree of protection		P
1.10 (5.2.7)	Cable entries through rigid material have rounded edges		P
1.10 (5.2.8)	Insulating bushings:		
	- suitably fixed		P
	- material in bushings		P
	- material not likely to deteriorate		P
	- tubes or guards made of insulating material		N
1.10 (5.2.9)	Locking of screwed bushings		N
1.10 (5.2.10)	Cord anchorage:		
	- covering protected from abrasion		N
	- clear how to be effective		N
	- no mechanical or thermal stress		N
	- 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:		
	a) at least one part fixed		N
	b) types of cable		N
	c) no damaging of the cable		N

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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		N
1.10 (5.2.10.3)	Tests:		
	- impossible to push cable; unsafe		N
	- pull test: 25 times; pull (N) .....		N
	- torque test: torque (Nm).....		N
	- displacement $\leq 2$ mm		N
	- no movement of conductors		N
	- no damage of cable or cord		N
1.10 (5.2.11)	External wiring passing into luminaire		N
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		N
1.10 (5.2.14)	Mains plug same protection		P
	Class III luminaire plug		N
1.10 (5.2.16)	Appliance inlets (IEC 60320)		N
	Appliance couplers of class II type		N
1.10 (5.2.17)	No standardized interconnecting cables properly assembled		N
1.10 (5.2.18)	Used plug in accordance with		
	- IEC 60083		P
	- other standard		N
1.10 (5.3)	Internal wiring		
1.10 (5.3.1)	Internal wiring of suitable size and type		P
	Through wiring		

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- not delivered/ mounting instruction		N
	- factory assembled		N
	- socket outlet loaded (A) .....		N
	- temperatures.....	(see Annex 2)	N
	Green-yellow for earth only		N
1.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		
	Cross-sectional area (mm <sup>2</sup> ) .....	1,2 mm <sup>2</sup>	P
	Insulation thickness	0,608 mm	P
	Extra insulation added where necessary		N
1.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		
	Adequate cross-sectional area and insulation thickness		N
1.10 (5.3.1.3)	Double or reinforced insulation for class II		N
1.10 (5.3.1.4)	Conductors without insulation		N
1.10 (5.3.1.5)	SELV current-carrying parts		N
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
	No twisting over 360°		P
1.10 (5.3.3)	Insulating bushings:		
	- suitable fixed		N
	- material in bushings		N
	- material not likely to deteriorate		N
	- cables with protective sheath		N
1.10 (5.3.4)	Joints and junctions effectively insulated		N
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		N

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
<b>1.11 (8)</b>	<b>PROTECTION AGAINST ELECTRIC SHOCK</b>		
1.11 (8.2.1)	Live parts not accessible with standard test finger		P
	Basic insulated parts not used on the outer surface without appropriate protection		P
	Basic insulated parts not accessible with standard test finger on portable and adjustable luminaires		N
	Basic insulated parts not accessible with Ø 50 mm probe from outside, within arms reach, on wall-mounted luminaires		N
	Lamp and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements		N
	Basic insulation only accessible under lamp or starter replacement		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 (8.2.3.a)	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
1.11 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		N
1.11 (8.2.3.c)	Class III luminaires with exposed SELV parts:		
	Ordinary luminaire:		
	- touch current .....		N
	- no-load voltage .....		N
	Other than ordinary luminaire:		

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- nominal voltage .....		N
1.11 (8.2.4)	Portable luminaire:		
	- 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		N
1.11 (8.2.7)	Discharging of capacitors $\geq 0,5 \mu\text{F}$		N
	Portable plug connected luminaire with capacitor		N
	Other plug connected luminaire with capacitor		N
	Discharge device on or within capacitor		N
	Discharge device mounted separately		N

1.12 (12)	<b>ENDURANCE TEST AND THERMAL TEST</b>		
1.12 (12.3)	Endurance test:		
	- mounting-position.....	Normal use	—
	- test temperature (°C) .....	35 ± 2	—
	- total duration (h).....	240	—
	- supply voltage: Un factor; calculated voltage (V):	253	—
	- lamp used .....	LED 150 W x1	—
1.12 (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
1.12 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
1.12 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	N
1.12 (12.6)	Thermal test (failed lamp control gear condition):		

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.12 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A) .....		—
	- case of abnormal conditions .....		—
	- electronic lamp control gear		N
	- 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		
	- 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):		
1.12 (12.7.1)	Luminaire without temperature sensing control		
1.12 (12.7.1.1)	Luminaire with fluorescent lamp ≤ 70W		
	Test method 12.7.1.1 or Annex V .....		—
	Test according to 12.7.1.1:		
	- case of abnormal conditions		—
	- Ballast failure at supply voltage (V) .....		—
	- Components retained in place after the test		N
	- Test with standard test finger after the test		N
	Test according to Annex V:		
	- case of abnormal conditions		—
	- measured winding temperature (°C): at 1,1 Un ..		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un .....		—

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- calculated temperature of fixing point/exposed part (°C).....		—
	Ball-pressure test:		
	- part tested; temperature (°C).....		N
	- part tested; temperature (°C).....		N
1.12 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		
	- case of abnormal conditions		—
	- measured winding temperature (°C): at 1,1 Un...		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un.....		—
	- calculated temperature of fixing point/exposed part (°C).....		—
	Ball-pressure test:		
	- part tested; temperature (°C).....		N
	- part tested; temperature (°C).....		N
1.12 (12.7.1.3)	Luminaire with short circuit proof transformers ≤ 10 VA		
	- case of abnormal conditions		—
	- Components retained in place after the test		N
	- Test with standard test finger after the test		N
1.12 (12.7.2)	Luminaire with temperature sensing control		
	- thermal link	No	—
	- manual reset cut-out	No	—
	- auto reset cut-out	No	—
	- case of abnormal conditions		—
	- highest measured temperature of fixing point/exposed part (°C): .....		—
	Ball-pressure test:		
	- part tested; temperature (°C).....		N
	- part tested; temperature (°C).....		N

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

<b>1.13 (9)</b>	<b>RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE</b>		
1.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		
	- classification according to IP .....	IP 20	—
	- mounting position during test .....	Normal use	—
	- fixing screws tightened; torque (Nm) .....	-	—
	- tests according to clauses .....	9.2	—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		N
	b) no talcum in dust-tight luminaire		N
	c) no trace of water on current-carrying parts or SELV parts 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)		P
	f) no entry into enclosure (IP 3X and IP 4X)		N
	f) no contact with live parts (IP3X and IP4X)		N
	g) no trace of water on part of lamp requiring protection from splashing water		N
	h) no damage of protective shield or glass envelope		N
1.13 (9.3)	Humidity test 48 h		P

<b>1.14 (10)</b>	<b>INSULATION RESISTANCE AND ELECTRIC STRENGTH</b>		
1.14 (10.2.1)	Insulation resistance test		
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø .....	Metal foil	—
	Insulation resistance (MΩ)	> 2 MΩ	—
	SELV:		
	- between current-carrying parts of different polarity .....		N

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- between current-carrying parts and mounting surface .....		N
	- between current-carrying parts and metal parts of the luminaire.....		N
	Other than SELV:		
	- between live parts of different polarity .....	> 100 MΩ	P
	- between live parts and mounting surface .....	> 100 MΩ	P
	- between live parts and metal parts .....	> 100 MΩ	P
	- between live parts of different polarity through action of a switch.....		N
1.14 (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:		
	- between live parts of different polarity .....	1860 V	P
	- between live parts and mounting surface .....	1860 V	P
	- between live parts and metal parts .....	1860 V	P
	- between live parts of different polarity through action of a switch.....		N
1.14 (10.3)	Touch current (mA) .....	0,228 mA	P
1.15 (13)	RESISTANCE TO HEAT, FIRE AND TRACKING		
1.15 (13.2.1)	Ball-pressure test:		
	- part tested; temperature (°C) .....		N

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- part tested; temperature (°C) .....		N
1.15 (13.3.1)	Needle flame test (10 s):		
	- part tested .....		N
	- part tested .....		N
1.15 (13.3.2)	Glow-wire test (650°C):		
	- part tested .....		N
	- part tested .....		N
1.15 (13.4.1)	Tracking test: part tested .....		N

<b>ANNEX 1: components</b>	
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object/part No.	code	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity
Lampholder	C	WACO	-	500V ,16A	-	VDE
Terminal block	C	-	PA10	2,5C 500V	-	VDE
LED controller	C	VOSSLOH SCHWABE	ELXd 180.605	ANNEX A	ANNEX A	ANNEX A
Wiring	C	-	-	300/500V	-	OVE,N,D,FI,V, DE,CEBEC, KEMA KEUR
Plug	C	GAP	W001	16 A ,250 V	-	-

The codes above have the following meaning:

- A - The component is replaceable with another one, also certified, with equivalent characteristics
- B - The component is replaceable if authorised by the test house
- C - Integrated component tested together with the appliance
- D - Alternative component

<b>ANNEX 2: temperature measurements, thermal tests of Section 12</b>	
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Type reference .....	EL-LB 001	—
Lamp used .....	1X 150 W LED	—
Lamp control gear used .....	Electronic ballast	—

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## IEC 60598-2-1

IEC 60598-2-1							
Clause	Requirement + Test				Result - Remark	Verdict	
	Mounting position of luminaire..... :				Normal use	—	
	Supply wattage (W) ..... :				146,51 W	—	
	Supply current (A)..... :				0,67 A	—	
	Calculated power factor..... :				0,95 (Measured)	—	
	Table: measured temperatures corrected for ta = 25 °C:						
	- abnormal operating mode ..... :				-	—	
	- test 1: rated voltage..... :				230 V	—	
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage ..... :				244 V	—	
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage..... :				-	—	
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage ..... :				-	—	
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :				-	—	
temperature (°C) of part		Clause 12.4 – normal			Clause 12.5 – abnormal		
		test 1	test 2	test 3	limit	test 4	limit
Lampholder		-	28,8	-	120	-	-
Wire		-	34,4	-	90	-	-
Terminal block 2		-	32,0	-	85	-	-
LED driver		-	44,1	-	90	-	-
Terminal block 1		-	30,8	-	85	-	-
Mounting surface		-	30,5	-	90	-	-

## ANNEX 3: screw terminals (part of the luminaire)

(14)	<b>SCREW TERMINALS</b>		
(14.2)	Type of terminal..... :	Pillar terminals	—
	Rated current (A)..... :	-	—
(14.3.2.1)	One or more conductors		P
(14.3.2.2)	Special preparation		N
(14.3.2.3)	Terminal size		P

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IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Cross-sectional area (mm <sup>2</sup> ).....	15,5 mm <sup>2</sup>	P
(14.3.3)	Conductor space (mm).....	4,45 mm	P
(14.4)	Mechanical tests		
(14.4.1)	Minimum distance		N
(14.4.2)	Cannot slip out		N
(14.4.3)	Special preparation		P
(14.4.4)	Nominal diameter of thread (metric ISO thread) ..	M 3	P
	External wiring		N
	No soft metal		P
(14.4.5)	Corrosion		P
(14.4.6)	Nominal diameter of thread (mm).....	2,9 mm	P
	Torque (Nm) .....	0,5 Nm	P
(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

	<b>ANNEX 4: screwless terminals (part of the luminaire)</b>	
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<b>(15)</b>	<b>SCREWLESS TERMINALS</b>		
(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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IEC 60598-2-1											
Clause	Requirement + Test						Result - Remark			Verdict	
(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										
	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 (4 samples); pull (N) .....									N	
(15.9)	Contact resistance test										
	Voltage drop (mV) after 1 h										
terminal		1	2	3	4	5	6	7	8	9	10
voltage drop (mV)											
		Voltage drop of two inseparable joints						N			
		Voltage drop after 10th alt. 25th cycle									N
		Max. allowed voltage drop (mV) .....									—

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IEC 60598-2-1										
Clause	Requirement + Test					Result - Remark				Verdict
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)										N
	Continued ageing: voltage drop after 10th alt. 25th cycle									N
	Max. allowed voltage drop (mV) .....									—
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										N
	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)										N

TRF No.: I598201D

TP40013946

TRF originator: SEMKO

This test was performed by SABS Commercial (SOC) Ltd.

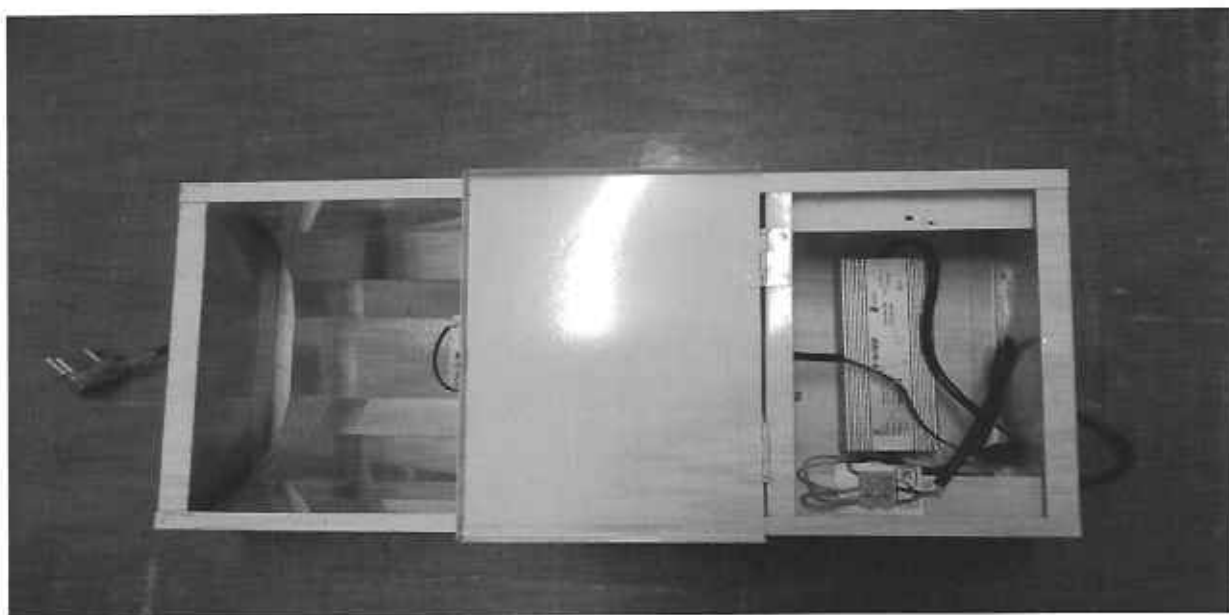
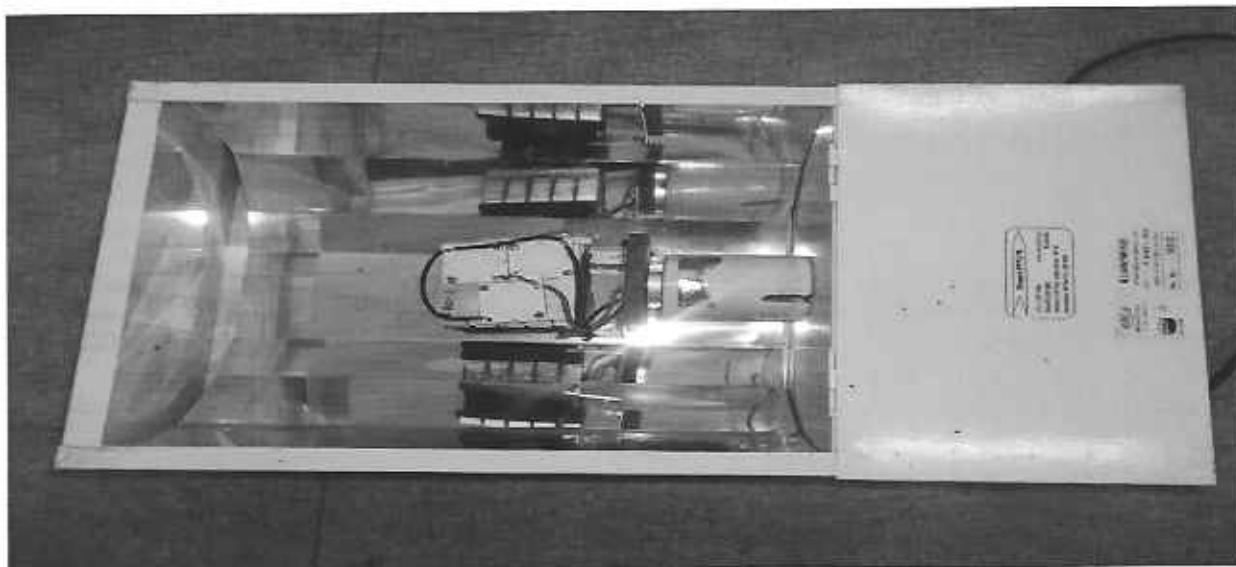
This report relates only to the specific sample(s) tested as identified herein. It does not imply SABS approval of the quality and/or performance of the item(s) in question and the test results do not apply to any similar item that has not been tested.

(Refer also to the complete conditions printed on the back of official test reports.)



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

**ANNEX A**  
**PHOTOGRAPHS OF THE SAMPLE**



TRF No.: I598201D

TP40013946

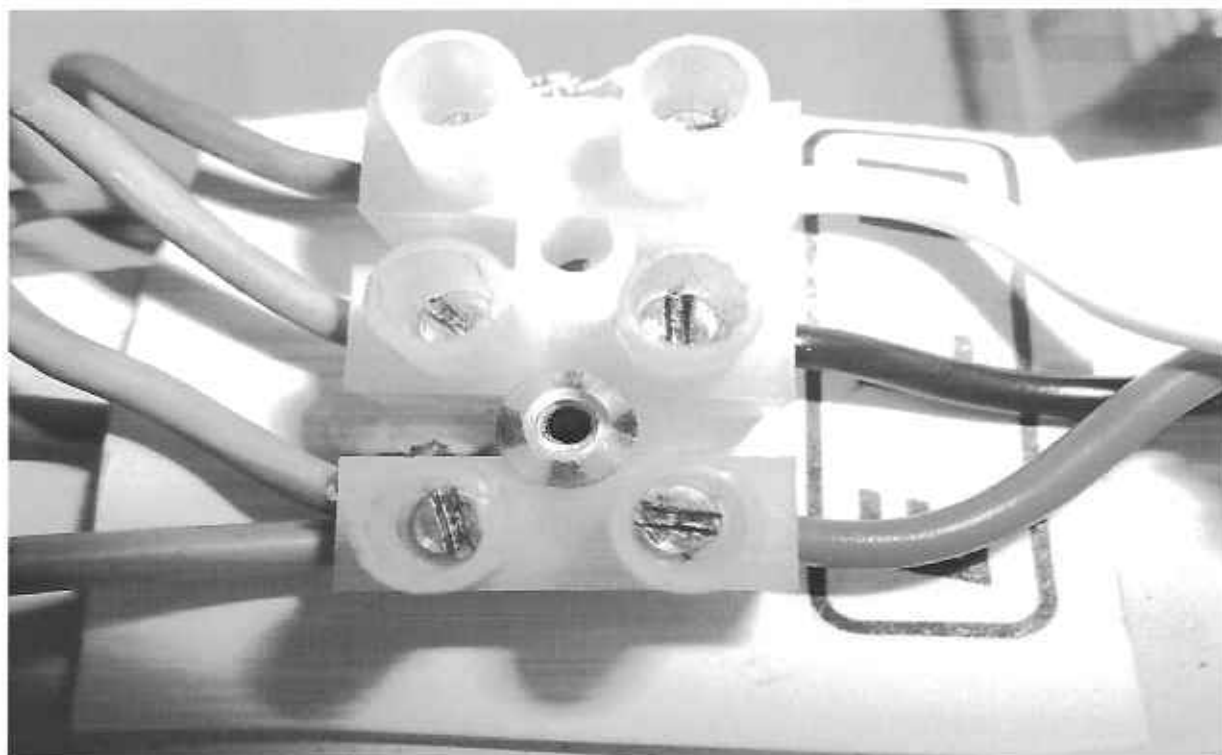
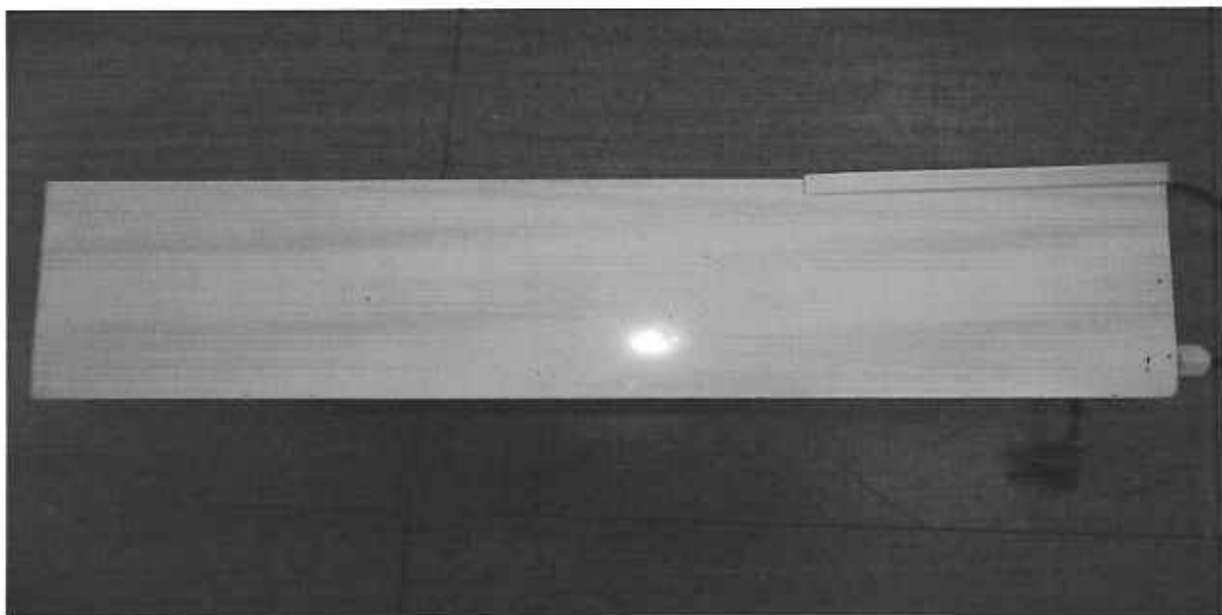
TRF originator: SEMKO

This test was performed by SABS Commercial (SOC) Ltd.

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



TRF No.: I598201D

TP40013946

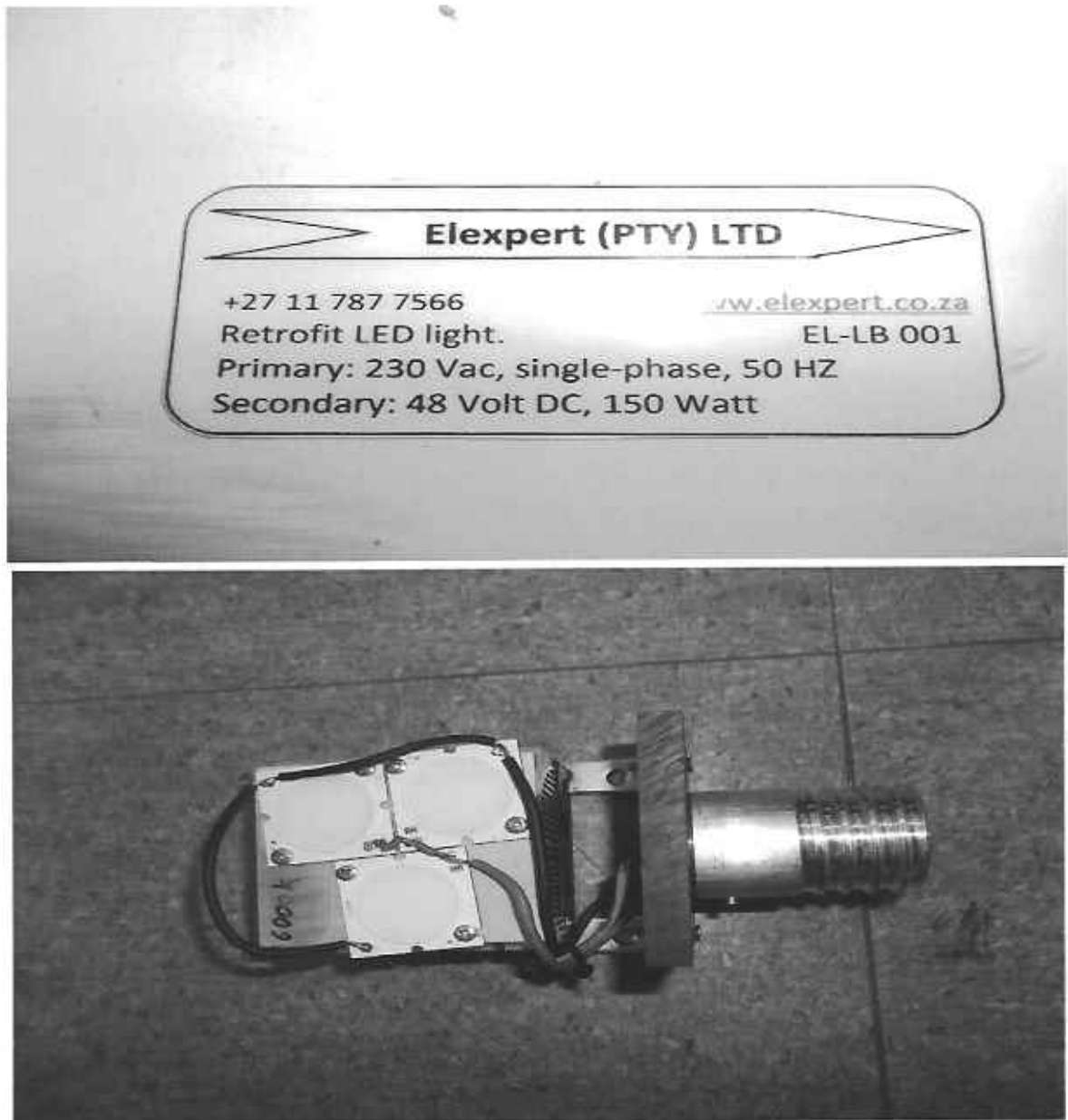
TRF originator: SEMKO

This test was performed by SABS Commercial (SOC) Ltd.

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



TRF No.: I598201D

TP40013946

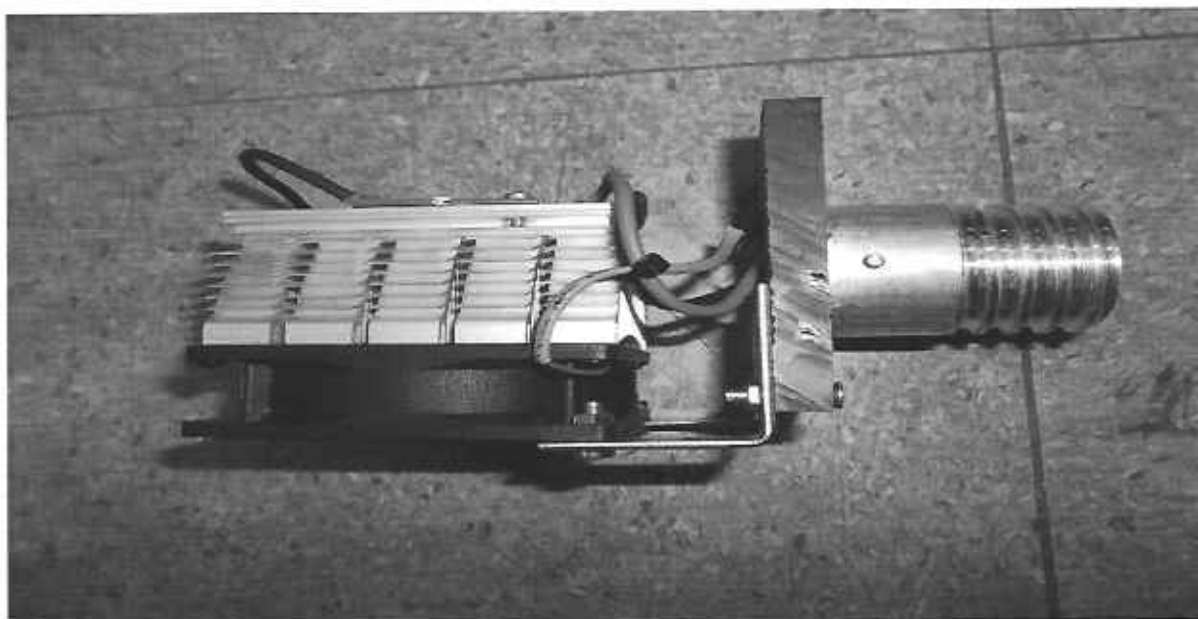
TRF originator: SEMKO

This test was performed by SABS Commercial (SOC) Ltd.

This report relates only to the specific sample(s) tested as identified herein. It does not imply SABS approval of the quality and/or performance of the item(s) in question and the test results do not apply to any similar item that has not been tested.

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



TRF No.: I598201D

TP40013946

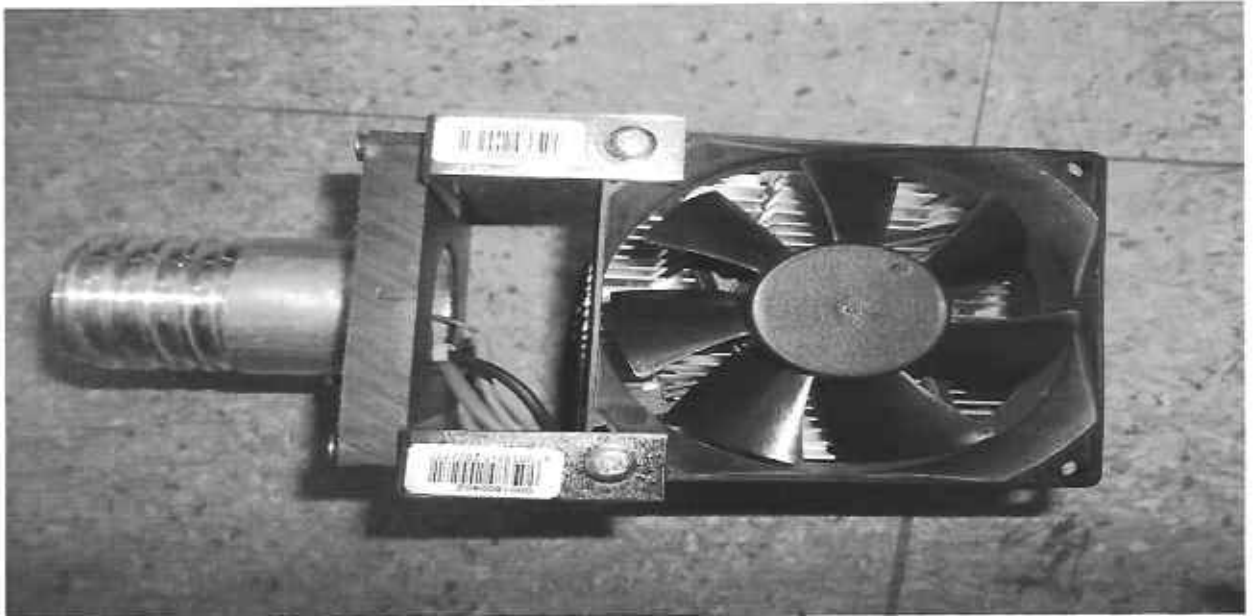
TRF originator: SEMKO

This test was performed by SABS Commercial (SOC) Ltd.

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



TRF No.: I598201D

TP40013946

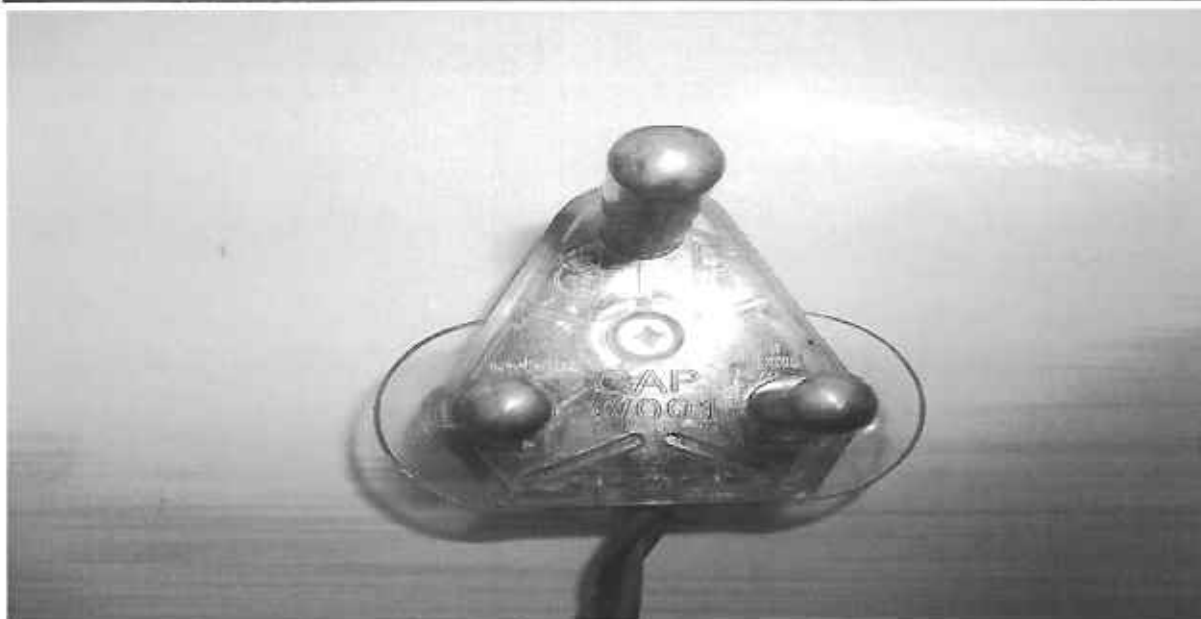
TRF originator: SEMKO

This test was performed by SABS Commercial (SOC) Ltd.

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



TRF No.: I598201D

TP40013946

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