

Lumen maintenance report

LED information

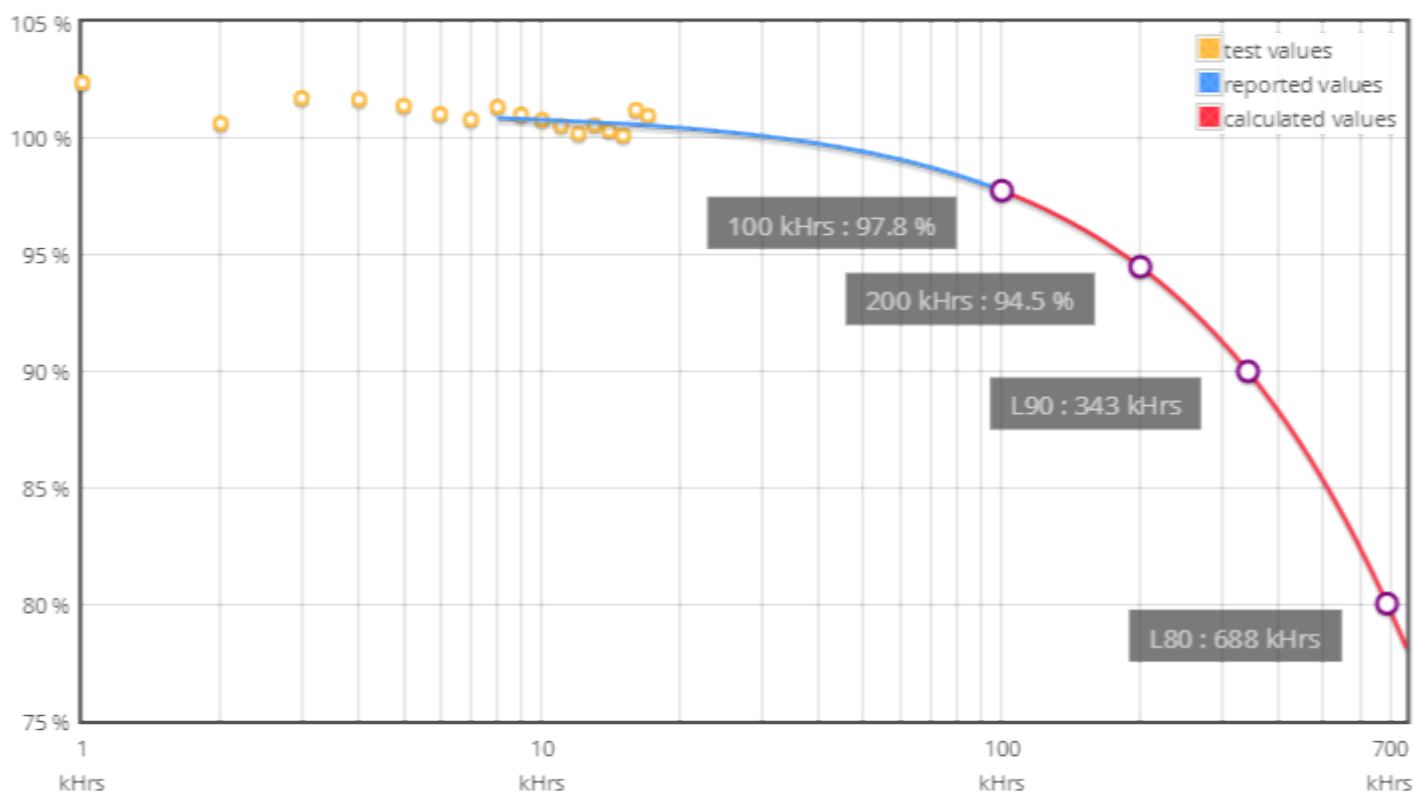
LED type 3535 Gen4
LED current 700 mA
Ts 55°C
Description lgit-14-044-02

Projection data

Test duration 17000 hrs **α** 3.406E-007
Time used for projection 8000 to 17000hrs **β** 1.012

L (%)	Time (kHrs)
80.0	689
90.0	343
94.5	200
97.8	100

Projection graphic



LxB50 results according to LM-80 and TM-21 procedures and norms.

LxBy results derived from LxB50 according to IEC 62717 Annex C.

DECLARAȚIE DE CONFORMITATE



SCHRÉDER ROMANIA S.R.L., cu sediul în Cluj - Napoca, str. Corneliu Coposu, nr. 167A, Jud. Cluj, România, înregistrată la Registrul Comerțului cu nr. J12/1759/1998, membră a SCHRÉDER GROUP, în calitate de furnizori de aparate de iluminat marca SCHRÉDER

Declarăm pe propria răspundere că aparatul de iluminat: **VOLTANA 2**

Versiune: 16 LED-uri

Clasă electrică: I sau II

Balast: electronic

Tensiune nominală: 230V / 50Hz

Caracteristici: Max. 1000mA

Etanșeitate compartiment optic: IP 66

Etanșeitate compartiment aparat: IP 66

Cu condiția ca acesta să fie instalat, întreținut și utilizat în conformitate cu standardele de instalare și instrucțiunile producătorului. Este în conformitate cu următoarele directive sau standarde:

- EN 60598-1 (2015)
- EN 60598-2-1 (1979)
- EN 60598-2-3 (2003 + A1 2011)
- EN 61547 (2009)
- EN 61347 (2015)
- EN 55015 (2013)
- EN 61000-3-2 (2014) & 3-3 (2013)
- EN 62471 (2008)
- EN 62493 (2010)
- Directiva 2014/30/EU
- Directiva 2014/35/EU
- Directiva 2009/125/EC
- Directiva 2012/19/EU
- Directiva 2003/108/EC
- Directiva RoHS 2011/65/EU (RoHS 2)
- R.D. 1890/2008, 14 Noiembrie
- R.D. 154/1.995, 3 Februarie
- R.D. 842/2002, 2 August

SCHRÉDER ROMANIA S.R.L.
Director General,

Alexandru SIRCA

Eliberat,
Martie 2019, Cluj-Napoca

LED Flux measurement

FORM-L-41 ED1 REV 2

Date : **16-01-19**

Operator : **FCE**

Filename : **2019_64.xml**



226 - TEST

NBN EN ISO/IEC 17025 : 2005

LEDs

Trademark : **Samsung**

Entry number : **39R006-4**

Type : **LH351C**

Power (Catalogue) : **0,00** W

BIN Description : **40-70M-4-TB-RB**

Flux : **0** lm/LED

Part number : **Unknown**

Color or CCT (Theoretical) : **NW**

Number of LEDs : **16**

Lenses

Trademark : **None**

Type : **None**

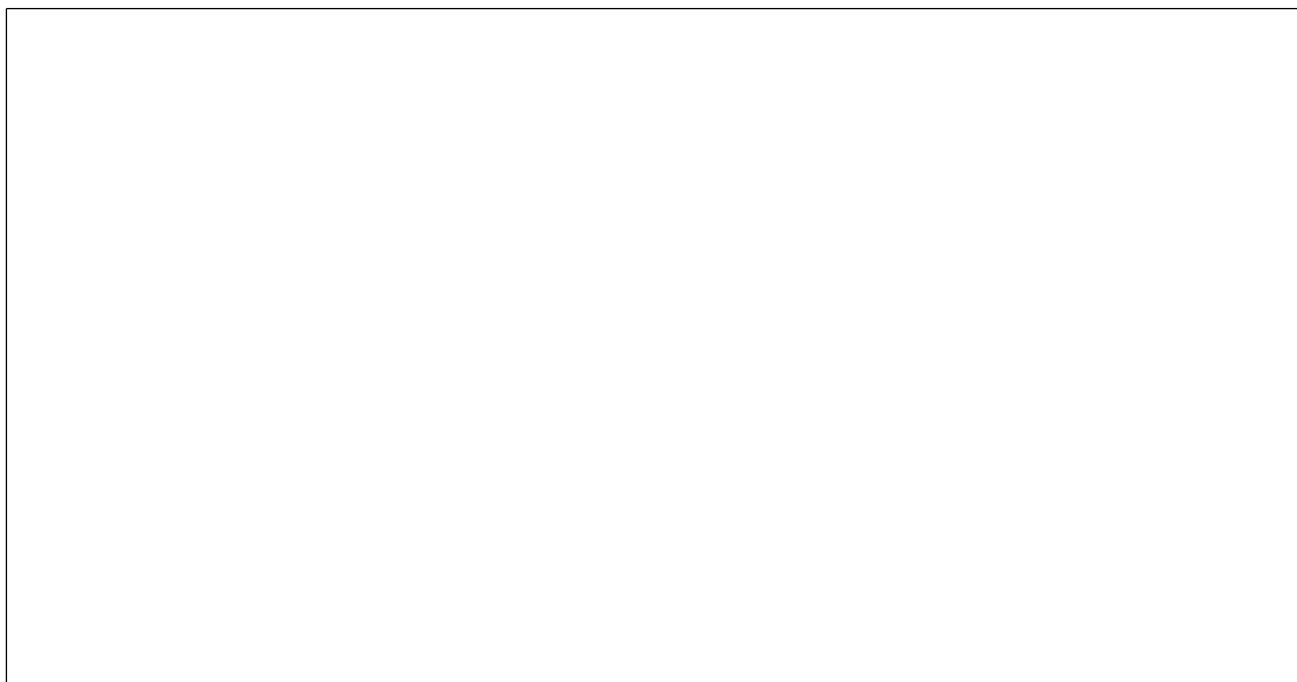
Power & Print

Type : **DELTA SM400-AR-4**

Print description : **00-71-627 A - Voltana 2**

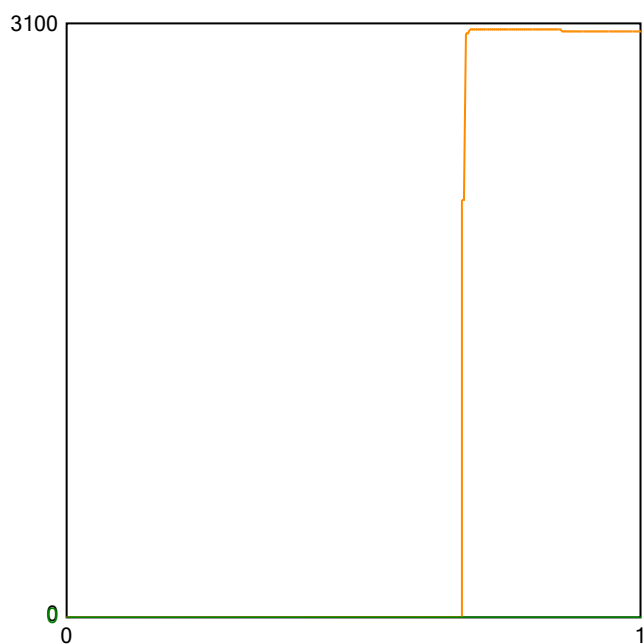
Active ☐

Picture



Sphere photometric measurement

Maximum flux : **3074** lumens



Operating condition

Position in sphere :



Ambient sphere T ° : **24,3**

Electrical measurement

● Secondary electrical measurement

Voltage : **44,90** V

Current : **0,350** A

Power : **15,70** Watt

→ LEDs light efficiency at 25° :

195,9 lm/W

192,1 lm/Led

● Primary electrical measurement

Voltage : **N/A** V

Current : **N/A** A

Power : **N/A** Watt

Cos φ : **N/A**

→ Driver losses : **N/A** %

→ LEDS & Driver light efficiency :

N/A lm/W

Description :

Flux @25°/350mA - pcb Voltana 2 - 16 Samsung LH351C - pcb N°4

Comment :

FORM-L-41 ED1 REV 2



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Approved by :

LED 2019/64

2/3

Colorimetry

[illegible]

RTECH-PHOTOMETRY LABORATORY

Testreport : Measurement of luminous intensity distribution related to the standard
NBN-EN 13032-1; NBN-EN 13032-4; CIE 121-1996; CIE S 025/E; IES LM-79-08 and procedures PT-P-01
and PT-P-02
rue de Mons, 3 B-4000 LIEGE - Tel : 04/224.71.40 - Fax : 04/224.25.90
Measurement for Schröder group.

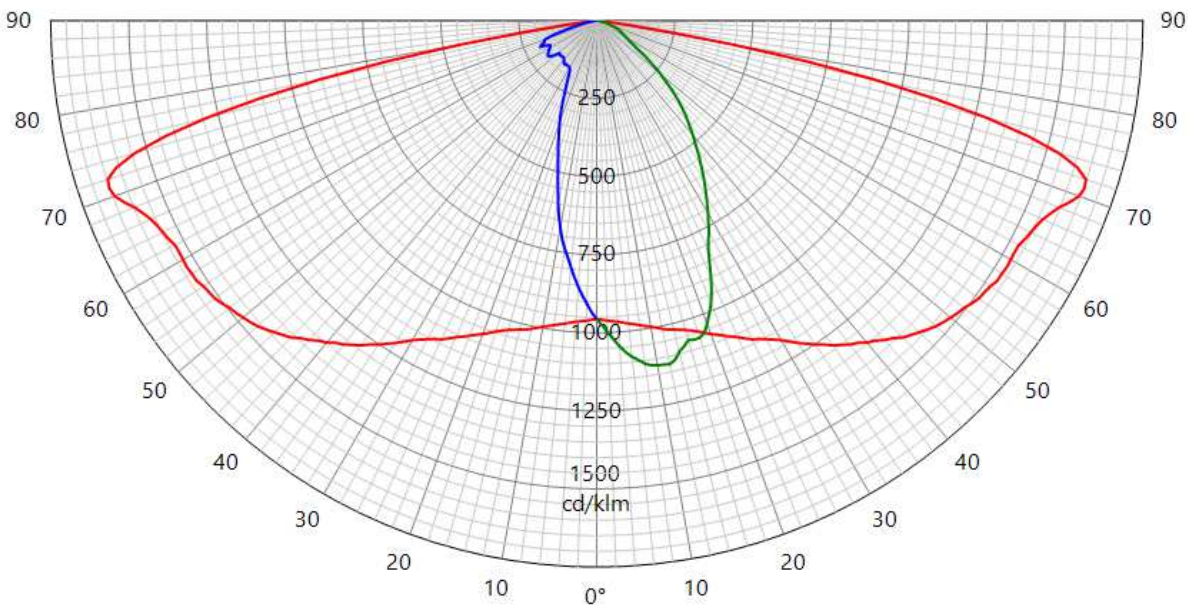
LED

Origin TUNGSRAM-Schröder Zrt. Hungary	Production TUNGSRAM-Schröder Zrt. Hungary	Luminaire VOLTANA 2	Inclination 0°	Request # FD39014
Type LED	BIN 40-70M-4-TB-RB	Source Trademark Samsung	Reference LH351C	# LEDs 16
Master -	Reflector Schröder Led assembly Road lighting Assembled 0.0°	Reflector No	5244	
Protector Refractor Lens				
Protector Glass Extra Clear Flat Smooth Lens Gaggione 5244 PMMA				
Laboratory observation VOLTANA 2 with 16 SAMSUNG LH351C Used flux for efficiency matrix calculation = 3074 lm - CCT = 3863 K - CRI = 72,23 (see sphere test report 2019/64 on appendix).				
Purpose DOC	Sample date 08-01-2019		Sample # 39R006	
Observation DOC VOLTANA 2 with lenses 5244 Flux coefficient multiplicator (only for efficiency matrix): From 350 to 500 mA : 1,380 From 350 to 700 mA : 1,840 From 350 to 1000 mA : 2,453 Fixture powered with driver Osram OT40/120-277/1A0 4DIM LT2E for matrix @350/500/700mA Fixture powered with driver Philips Xitanium LP 75W 0,3 - 1,0A SNLDAE 230V C133 sXt for matrix @1000mA				
Notes The publication of this report in another form than the original one is not allowed without agreement of the laboratory. This report concerns type tests on one or a series of specimens.				

Asked by RCA	Measured by BMA	Approved by RLABO	Appendix 1	  226-TEST NBN EN ISO/IEC 17025 : 2005	42473
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LUMINOUS INTENSITY DIAGRAM

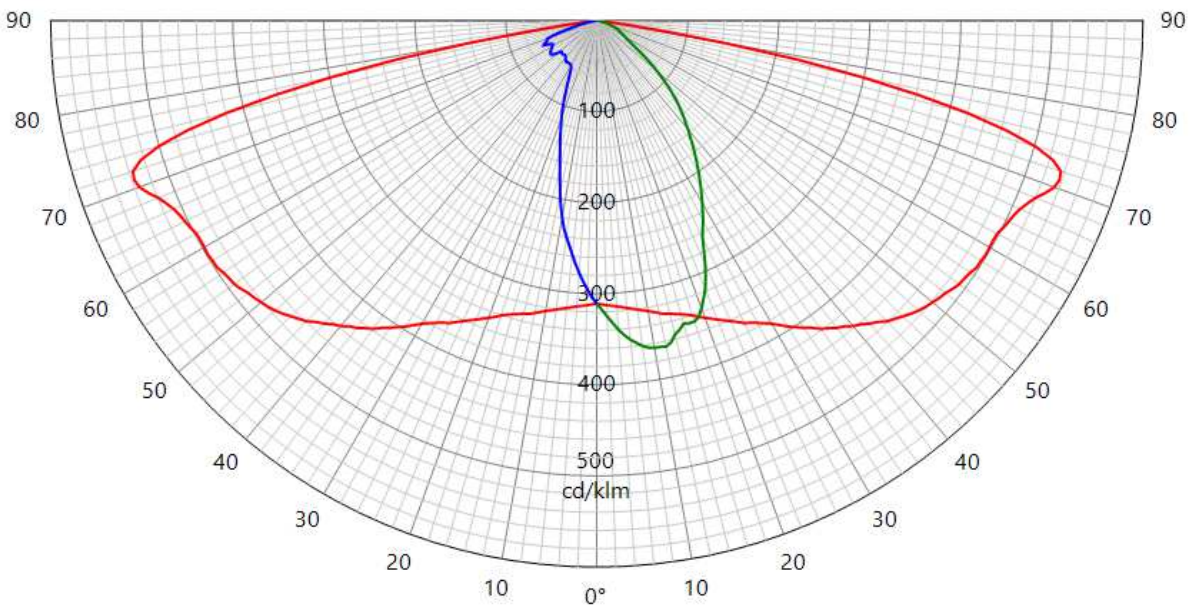
Origin TUNGSRAM-Schröder Zrt. Hungary		Production TUNGSRAM-Schröder Zrt. Hungary		Luminaire VOLTANA 2		Inclination 0°	Request # FD39014
Source	Type LED	BIN 40-70M-4-TB-RB	Trademark Samsung	Reference LH351C	# LEDs 16	Reflector 5244	
Reflector	Schreder Led assembly Road lighting Assembled 0.0°					No	5244
Matrices	424731 Φ 0-90° = 2542lm - 90-180° = 0lm					Absolute measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 2 Lens 16 x Gaggione 5244 PMMA						
Observation	Matrix in total flux @350 mA Light losses due to thermal stabilization: 1 % Electrical measurement on LED (#1) : Voltage = 44.68 V Current = 0.350 A Power = 15.61 W Electrical measurement on driver (#1) : Voltage = 230.00 V Current = 0.091 A Power = 18.91 W PF = 0.902 Total luminaire power = 18.91 W : Lm/Watt = 134.43 lm/W Driver #1 : See observations for driver details - PCB 00-71-627 A						
Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	
5 - 175	1652	71	S	956	25.6°	31-01-2019	
90	1125	12	D				
270	956	0	G				



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LUMINOUS INTENSITY DIAGRAM

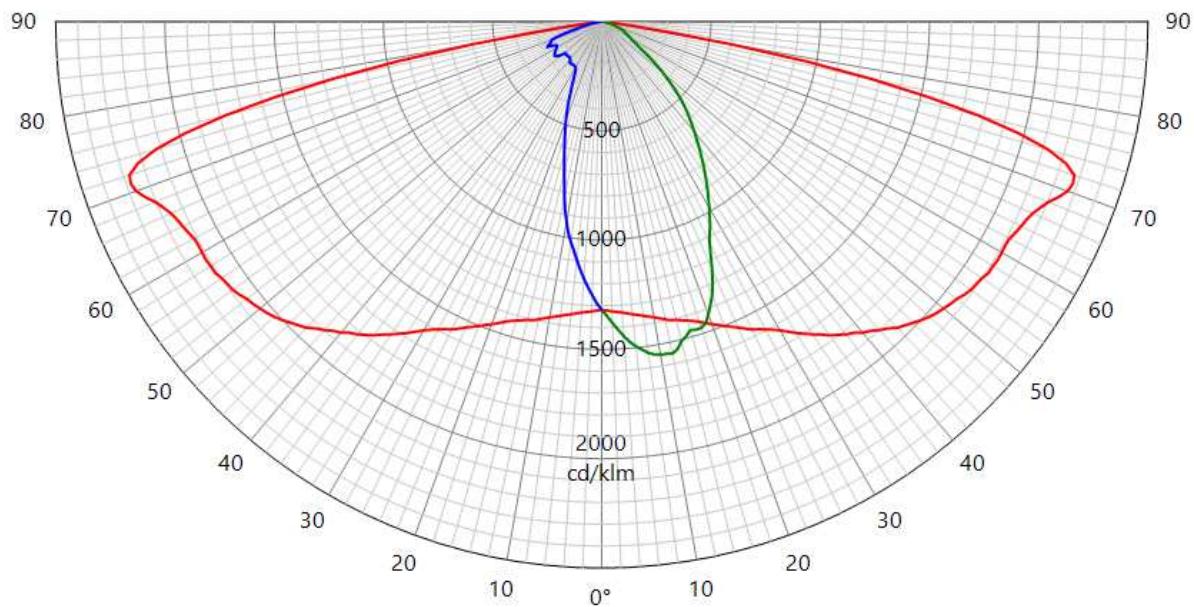
Origin TUNGSRAM-Schröder Zrt. Hungary		Production TUNGSRAM-Schröder Zrt. Hungary		Luminaire VOLTANA 2		Inclination 0°	Request # FD39014
Source	Type LED	BIN 40-70M-4-TB-RB	Trademark Samsung	Reference LH351C	# LEDs 16	Reflector 5244	
Reflector	Schreder Led assembly Road lighting Assembled 0.0°					No	5244
Matrices	424732 η 0-90° = 82.7% - 90-180° = 0.0%					Relative measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 2 Lens 16 x Gaggione 5244 PMMA						
Observation	Matrix in efficiency @350 mA Light losses due to thermal stabilization: 1 % Electrical measurement on LED (#1) : Voltage = 44.68 V Current = 0.350 A Power = 15.61 W Electrical measurement on driver (#1) : Voltage = 230.00 V Current = 0.091 A Power = 18.91 W PF = 0.902 Total luminaire power = 18.91 W Driver #1 : See observations for driver details - PCB 00-71-627 A						
Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	
5 - 175	537	71	S	311	25.6°	31-01-2019	
90	366	12	D				
270	311	0	G				



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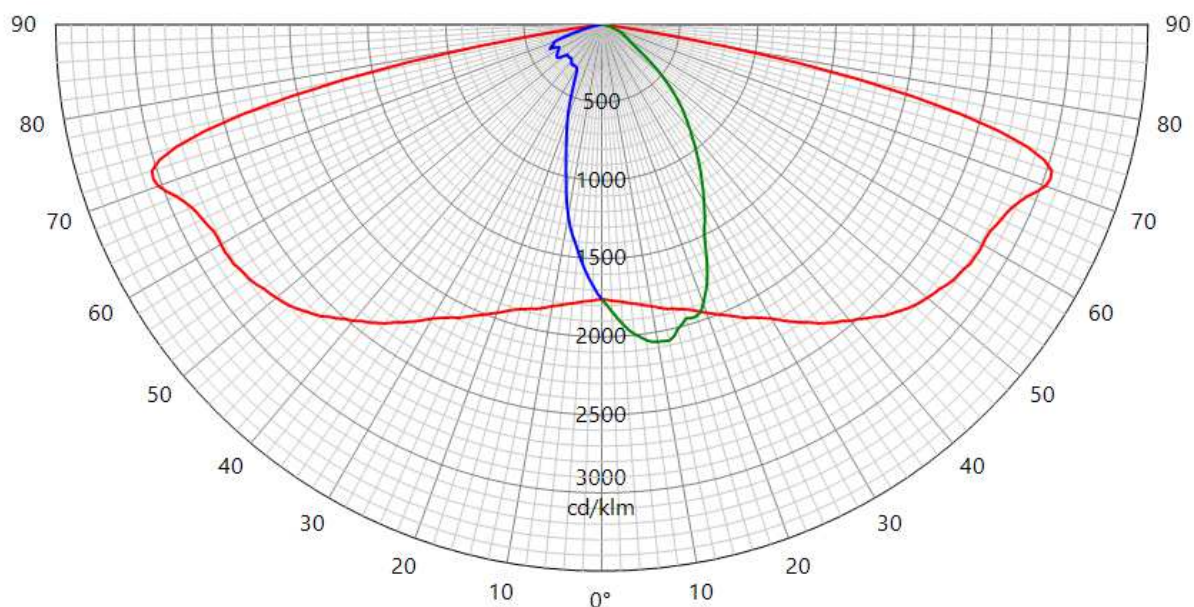
LUMINOUS INTENSITY DIAGRAM

Origin TUNGSRAM-Schröder Zrt. Hungary		Production TUNGSRAM-Schröder Zrt. Hungary		Luminaire VOLTANA 2		Inclination 0°		Request # FD39014		
Source	Type LED	BIN 40-70M-4-TB-RB		Trademark Samsung		Reference LH351C		# LEDs 16	Reflector 5244	
Reflector	Schreder Led assembly Road lighting Assembled 0.0°								No	5244
Matrices	424733	Φ 0-90° = 3508lm - 90-180° = 0lm							Absolute measurement	
Protector Refractor Lens		Protector Glass Extra Clear Flat Smooth - VOLTANA 2 Lens 16 x Gaggione 5244 PMMA								
Observation		Matrix in total flux @500 mA								
		Light losses due to thermal stabilization: 1,5 %								
		Electrical measurement on LED (#1) : Voltage = 45.54 V Current = 0.500 A Power = 22.74 W Electrical measurement on driver (#1) : Voltage = 230.00 V Current = 0.120 A Power = 26.40 W PF = 0.954 Total luminaire power = 26.40 W : Lm/Watt = 132.88 lm/W								
		Driver #1 : See observations for driver details - PCB 00-71-627 A								
Plane	I Peak	Peak position	Index	I zero 1319	Laboratory ambient t° 25.6°		Measurement date 31-01-2019			
5 - 175	2280	71	S							
90	1553	12	D							
270	1319	0	G							

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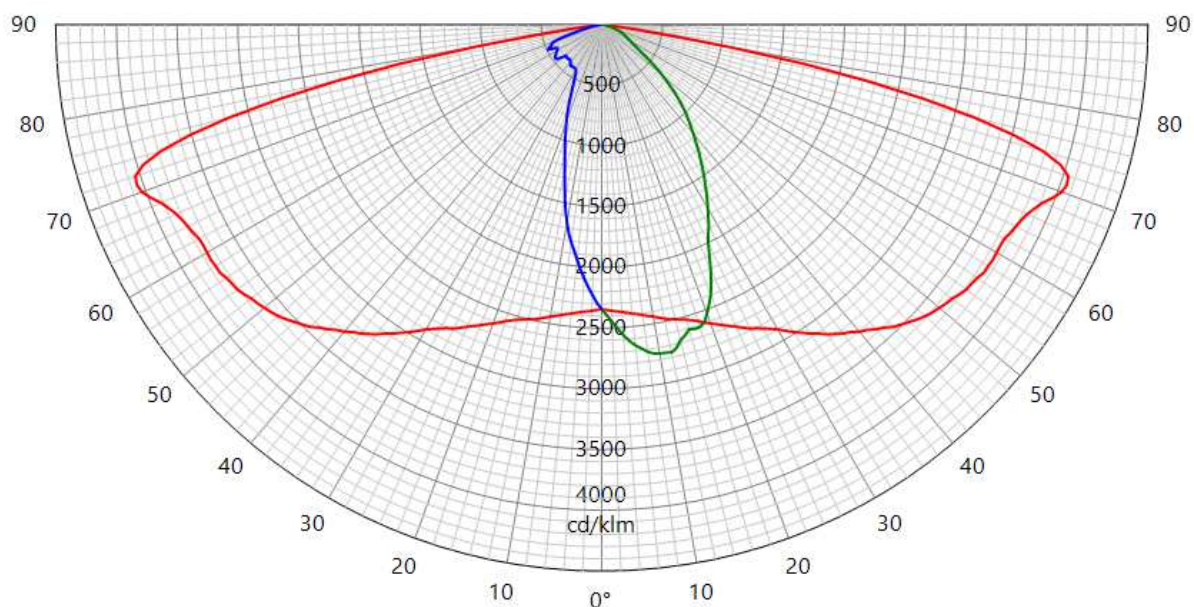
LUMINOUS INTENSITY DIAGRAM

Origin TUNGSRAM-Schröder Zrt. Hungary		Production TUNGSRAM-Schröder Zrt. Hungary		Luminaire VOLTANA 2		Inclination 0°	Request # FD39014
Source	Type LED	BIN 40-70M-4-TB-RB		Trademark Samsung	Reference LH351C	# LEDs 16	Reflector 5244
Reflector	Schreder Led assembly Road lighting Assembled 0.0°					No	5244
Matrices	424734 Φ 0-90° = 4677lm - 90-180° = 0lm Absolute measurement						
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 2 Lens 16 x Gaggione 5244 PMMA						
Observation	Matrix in total flux @700 mA Light losses due to thermal stabilization: 2,6 % Electrical measurement on LED (#1) : Voltage = 46.53 V Current = 0.700 A Power = 32.52 W Electrical measurement on driver (#1) : Voltage = 230.00 V Current = 0.165 A Power = 36.87 W PF = 0.973 Total luminaire power = 36.87 W : Lm/Watt = 126.86 lm/W						
	Driver #1 : See observations for driver details - PCB 00-71-627 A						
	Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date
5 - 175	3040	71	S	1759	25.6°	31-01-2019	
90	2070	12	D				
270	1759	0	G				

**42473**

LUMINOUS INTENSITY DIAGRAM

Origin TUNGSRAM-Schröder Zrt. Hungary		Production TUNGSRAM-Schröder Zrt. Hungary		Luminaire VOLTANA 2		Inclination 0°		Request # FD39014		
Source	Type LED	BIN 40-70M-4-TB-RB		Trademark Samsung		Reference LH351C		# LEDs 16	Reflector 5244	
Reflector	Schreder Led assembly Road lighting Assembled 0.0°								No	5244
Matrices	424735	Φ 0-90° = 6236lm - 90-180° = 0lm							Absolute measurement	
Protector Refractor Lens		Protector Glass Extra Clear Flat Smooth - VOLTANA 2 Lens 16 x Gaggione 5244 PMMA								
Observation		Matrix in total flux @1000 mA								
		Light losses due to thermal stabilization: 3,6 %								
		Electrical measurement on LED (#1) :			Voltage = 47.84 V		Current = 1.000 A		Power = 47.84 W	
		Electrical measurement on driver (#1) :			Voltage = 230.00 V		Current = 0.236 A		Power = 53.37 W PF = 0.982	
		Total luminaire power = 53.37 W : Lm/Watt = 116.84 lm/W								
Driver #1 : See observations for driver details - PCB 00-71-627 A										
Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°		Measurement date			
5 - 175	4053	71	S							
90	2760	12	D							
270	2345	0	G							

**42473**

CONFORMITY STATEMENT

Measurement fulfil Standards:

NBN-EN 13032-1
NBN-EN 13032-4
NBN-EN 17025:2005
CIE 121-1996
LM79-08
CIE S 025

Measurement quantities measured:

Light distribution in relative or absolute photometry
Led alone cold lumen package
Led CCT and CRI
Power consumption of the fitting
Lm/watt

Electrical measurement, if not specified:

Primary values are AC with 50Hz frequency
Secondary values on SSL are DC

CCT, CRI and chromaticity coordinates: are measured in Ulbricht sphere.
If specified Main test report refer to sphere extra test report.

Light distribution are measured on gonio. If not otherwise specified, measurement is done at 50 Hz

Number of hours operated prior to measurement: if not otherwise specified, 0 hours (no aging).

Stabilization time: If not otherwise specified, a minimal stabilization time of 0.5 hour is applied; and measurement will start when it exists no more variation above 0.5% in 15 minutes

Total operating time of the product including stabilization:
45 minutes have to be added by measurement.
Minimal operating time is 75 minutes

Luminous intensity distribution: available on electronic file with
.mat format (internal Schröder format)
.ldt format (European standard)
.IES format (American standard)

Statement of uncertainties (K=2, 95% of confidence level):
Uncertainties calculated based on a typical Schröder fitting and PCBA

Intensity measurement: +/- 3%

Angle: +/- 0.5°

Flux: +/- 2.5%

Electrical DC

Power: +/- 0.25%

Voltage: +/- 0.15%

Current: +/- 0.15%

Electrical AC

Power: +/- 0.15%

Voltage: +/- 0.3%

Current: +/- 0.3%

Temperature: +/- 0.65%

ISP2000	JETI	
CCT:	+/- 5%	+/-7.5%
CRI:	+/- 2%	+/-2.75%
x/y:	+/- 2%	+/-4.6%

lm/Watt: +/-3.5%

Measuring instruments in use:

Gonio 1

Type C with Moving mirror

Manufacturer: LMT Lichtmesstechnik GmbH Berlin, Helmholtzstrasse 9 10587 Berlin, Germany

Type: GO-DS 2000

Calibration: traceable to PTB (Physikalisch-Technische Bundesanstalt D-Braunschweig) and METAS (Federal Institute of Metrology, CH-Bern)

Photometric test distance: By default 10 meter, on request 30 meter.

Gonio 2

Type C

Manufacturer: Technoteam Bildverarbeitung, Werner-von-Siemens-Strasse 5 98693 Ilmenau, Germany

Calibration: traceable to BIPM (Bureau International des Poids et Mesures F-Sèvres)

Photometric test distance: Near Field

Sphere n°1

4p geometry

Manufacturer: LMT Lichtmesstechnik GmbH, Helmholtzstrasse 9 10587 Berlin, Germany

Type: UL2000 + U1000 V-Lambda photometer

Calibration: traceable to BIPM (Bureau International des Poids et Mesures F-Sèvres)

Sphere n°2

4p geometry

Manufacturer: Instrument Systems GmbH, Neumarkter Str. 83, 81673 Muenchen, Germany

Type ISP2000 + Spectroradiometer CAS120 and CAS140

Calibration: traceable to NIST

Colorimetric portable spectroradiometer

Manufacturer: JETI Technische Instrumente GmbH, Tatzendpromenade 2 07745 Jena

Type: SPECBOS 1201

Calibration: traceable to NIST

Multimeters

Manufacturer: Agilent

Type: 34401A

Calibration: traceable to BIPM (Bureau International des Poids et Mesures F-Sèvres)

Wattmeters

Manufacturer: Yokogawa

Type: WT210 and WT310

Calibration: traceable to BIPM (Bureau International des Poids et Mesures F-Sèvres)

Thermometers

Amarell Precision

Type: Liquid in glass N63833

Calibration: traceable to LBT (Laboratoire Belge de Thermométrie)

VOLTANA 2

5244

Optic	5244
Protector	Flat glass
Source	16 Samsung LH351C
Matrix	424732



Characteristics

518	240	109	4.6	IP 66	IK 08	I EU, II EU	0.019
Length (mm)	Width (mm)	Height (mm)	Weight (kg)	Tightness level*	Impact resistance*	Electrical class*	CxS (m²)

* According to IEC-EN60598 and IEC-EN62262

Features

The ultimate, cost-effective, performing family of luminaires that pays for itself

- Cost-effective and efficient lighting solution for a fast return on investment
- High performance with safety and comfort
- 5 sizes for flexibility
- IP 66 tightness level
- ThermiX® to withstand high temperatures
- Designed to incorporate the Owllet range of control solutions

Types of application

- Square and park
- Roundabout
- Residential road
- Urban road

Information for 1000 lm matrix

Efficacy (%)	82.7	G Class (EN 13201-2)	G1	I 70-80-90-95 (cd)	535 - 153 - X - X
DLOR (%)	82.7	G* (EN 13201 2015)	G*1	CIE flux code N 1→5 (%)	46.7 - 78.2 - 96.7 - 100.0 - 82.7
ULOR (%)	0.0	Imax (cd)	537	Gradient 90°	15cd
ULR (%)	0.0	Aperture 0-180°	78 - 78	Gradient 270°	14cd
Incl ULR 4%	-38/42°	Aperture 90-270°	26 - 5		

Photometrical characteristics

LED count	Colour code	Current (mA)	Luminaire power (W)	Source flux (lm)	Luminaire output flux (lm)	Luminaire efficacy (lm/W)	Peak (cd)	BUG Rating	Voltage (V)
			Ambient temp = 25°						
16	NW 740	350	18	3040	2514	140	1634	B1 U0 G1	230
16	NW 740	500	26	4195	3469	133	2255	B1 U0 G1	230
16	NW 740	700	37	5594	4626	125	3006	B1 U0 G1	230
16	NW 740	1000	53	7457	6167	116	4008	B2 U0 G1	230
16	NW 740	1050	58	7737	6398	110	4158	B2 U0 G1	230
16	WW 730	350	18	2880	2382	132	1548	B1 U0 G1	230
16	WW 730	500	26	3974	3287	126	2136	B1 U0 G1	230
16	WW 730	700	37	5299	4382	118	2848	B1 U0 G1	230
16	WW 730	1000	53	7065	5842	110	3797	B2 U0 G1	230
16	WW 730	1050	58	7330	6061	105	3939	B2 U0 G1	230

Tolerance on flux +- 7% - Tolerance on power +- 5%

Summary

CONCEPT

Family of 6 road LED luminaires

Recommended installation height: between 4.00 and 12.00m

For optimal heat dissipation, the driver and LED engine are in separate compartments and juxtaposed in a horizontal section

HOUSING & FINISH

- Housing in high-pressure, die-cast aluminium, polyester powder coated
- Colour: RAL 7038

INSTALLATION

- Luminaire can be fixed by side-entry with a clamp, suitable for 42-60mm diameter
- Built-in inclination steps: -10°, -5°, 0°, 5°
- Post-top adapter diameter 48-60mm or 76mm, tightened with 2 stainless steel screws
- Direct access to the driver compartment with screws for easy maintenance on-site

OPTICAL UNIT

- Protected against lens degradation by 5mm thick extra-clear hardened glass
- Flatbed PCB with acrylic lens overlay principle
- Various photometric distributions: from narrow road to motorway, medium and large area
- CRI > 70
- ULOR: 0%

LED lumen depreciation

- Lifetime residual flux @ T_q=25°C @ 100.000 hrs: 350mA & 500mA: 90%; 700mA: 80%; 1A: 70%

ELECTRICAL

- Class I or Class II
- Input voltage: 120-277V - 50-60Hz
- Power factor > 90% at full load
- Surge protection: 4kV minimum (10kV + 10kA optional)
- Thermal protection on LED PCBA (see Thermix concept)

STANDARDS & CERTIFICATIONS

- CE
- ENEC
- LM79-80
- ROHS
- Certified for 3G vibration
- All measurements in ISO17025 accredited laboratory

OPTIONS

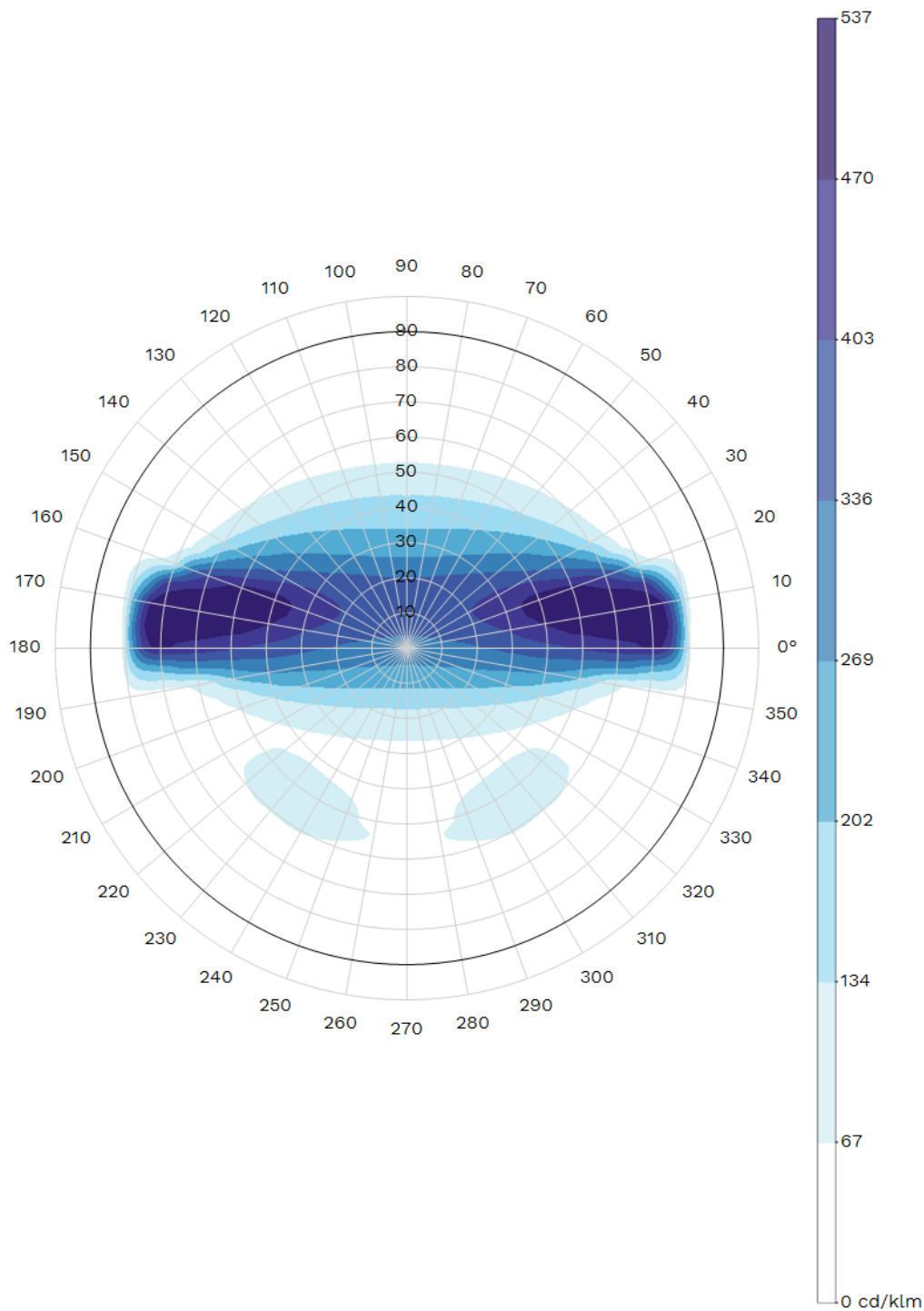
- Other RAL or AKZO colours
- Back Light control system
- OWLET remote management
- Custom dimming profile

VOLTANA 2 - 5244 - 16 Samsung LH351C - Flat glass - 424732

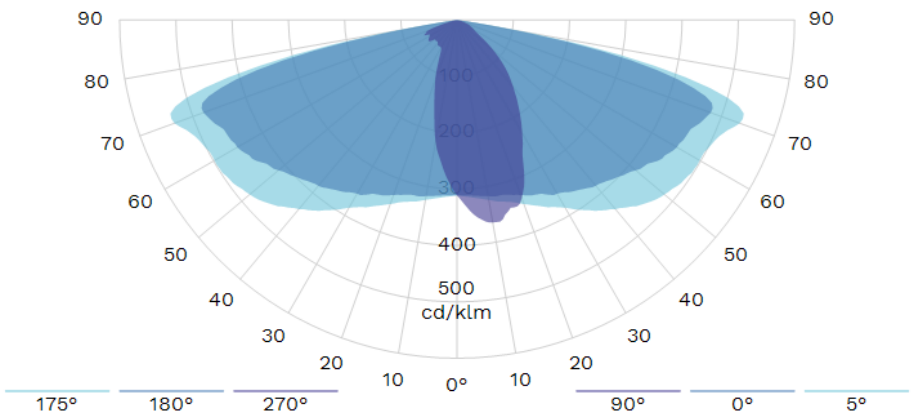
24/10/2020

Schröder

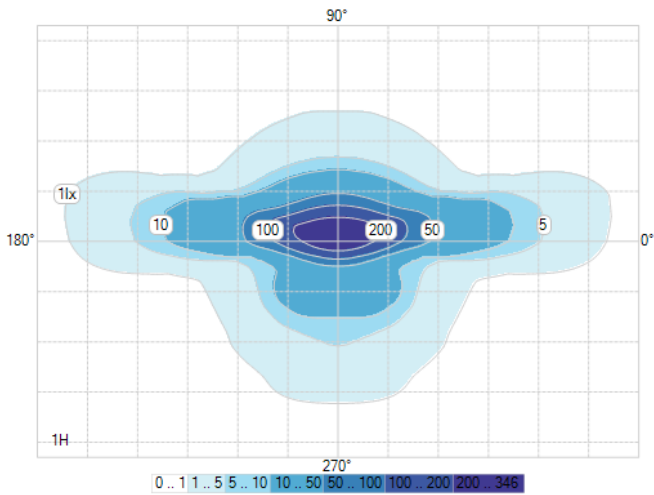
- Photocell



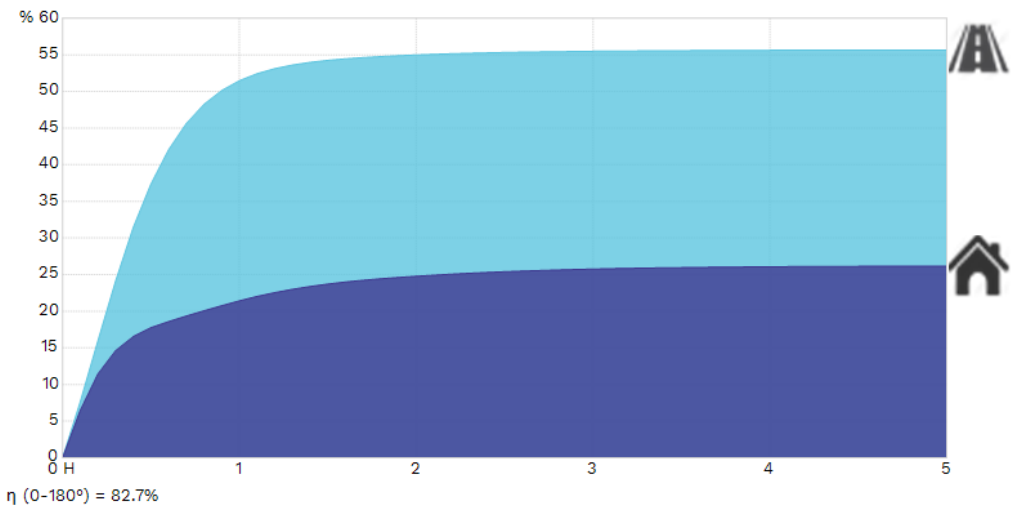
Polar/Cartesian diagram



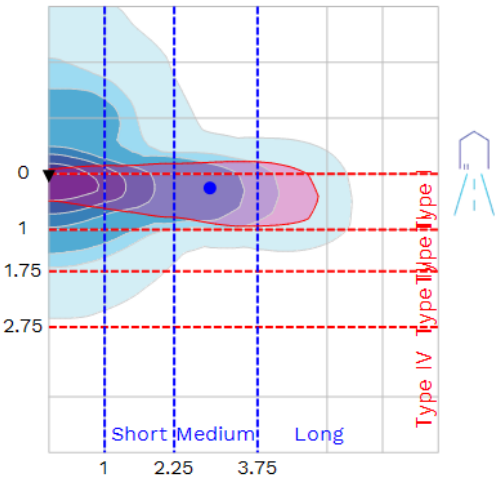
Isolux



K-Curve

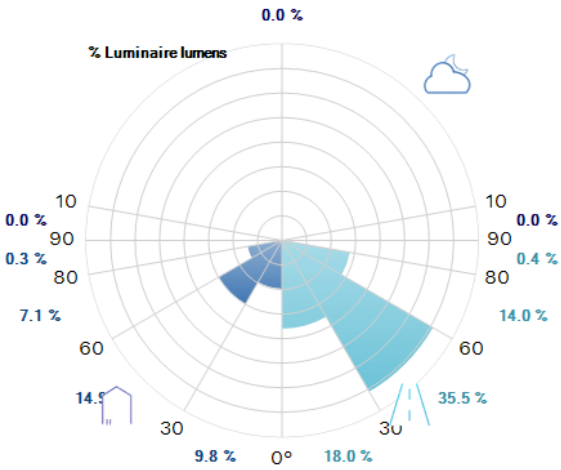


IES Roadway Classification / Nema Classification

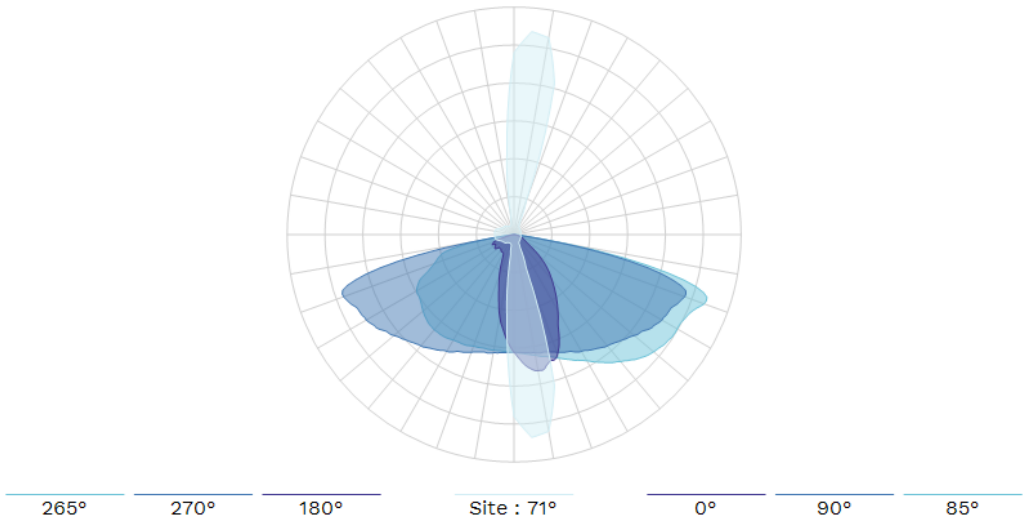


I - Medium

Luminaire classification system (LCS)



Intensity diagram in max Cone and in CPlane



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<http://www.schreder.com>

SGS

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LICENCE

to use the ENEC+ Mark



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Schreder S.A.
Rue de Lusambo, 67
1190 BRUXELLES
Belgium

For the product:

Road and street lighting

Trade name(s):

SCHREDER

Type(s)/Model(s):

VOLTANA 1, VOLTANA 2, VOLTANA 3, VOLTANA 4, VOLTANA 5 ranges

Complying with the following European Standards for safety and the EPRS for performance:

EN 60598-1:2015, EN 60598-2-3:2003 + A1:2011

PD EPRS 003:2014-12 (application of IEC 62722-2-1:2014)

Based on test reports n° : P1540-3535-012017, P1541-3535-012017, P1542-3535-012017, P1543-3535-012017, P1544-3535-012017.

This licence is conditional to the validity of the ENEC Licence No.: ENEC 02 N° 20113 and 20114

Date: 2017-04-13

Signature:

Name: Calogero LANA

Position: Certification Manager

Laboratory Service PHYSICAL TEST REPORT



R-Tech
Rue de Mons 3 – B-4000 Liège – Belgium
Tel.: +32 4 224 71 40 – Fax: +32 4 224 25 90
Member of Schröder Group

Subject: VOLTANA-2 16 Led's

Sample n°: P-E14361

Test purpose: Electrical measurements @ 1A

Remarks:

Test request n°: P-D14674

Folder n°: P-F14058

TEST CONDITIONS:

Operator: CLOSSET Frédéric

Driver: LG Innotek PISE-A055A, 1A driver

Load: 16 led's (Typical Vf: 3,18 V)

Power Supply:

Elgar Tw 3500-4

Supply voltage: 230 V 50 Hz

Measurement device:

Fluke Norma 4000 (HF Powermeter, User 10, filter OFF)

CONCLUSIONS:

- Efficiency: 87,0 %
- PF: 0,97
- THD: 8,6 %
- Harmonics distribution complies with the IEC/EN 61000-3-2 Standard.

Duplicate to: Mr M. Thijs

LAB 16/09/2014

J.P. Harchies

A handwritten signature in blue ink, appearing to read "J.P. Harchies".

//P-14E674

Laboratory Service PHYSICAL TEST REPORT



R-Tech
Rue de Mons 3 – B-4000 Liège – Belgium
Tel.: +32 4 224 71 40 – Fax: +32 4 224 25 90
Member of Schröder Group

Subject: VOLTANA-2 16 led's @ 1A class I

Sample n°:

Test purpose: EMC tests according to EN 55015 & EN 61547 Standards

Remarks:

Test request n°: P-D14700

Folder n°: P-F14058

TEST CONDITIONS:

Operator: ULg - EMC

Test Summary

EN 55015 & EN 61547 Standards

Emission

Standard	Limit / Level	Result	
		PASS	FAIL
EN 55015 Conducted Emission 9kHz- 30 MHz		X	
EN 55015 Annex B 30 MHz – 300 MHz		X	

Immunity

Standard	Limit / Level	Result	
		PASS	FAIL
EN 61000-4-5	0.5 , 1 , 2 & 4 kV M.D. Impulse + @ 90° Impulse - @ 270° 20' between impulse Criteria B required	X	

Driver: LG Innotek PISE-A 055A – 55W 1A (Rev-04)

EMC Auxiliaries: Ferrite W-E 742 700 55

CONCLUSIONS:

VOLTANA-2 16 led's driven @ 1A by LG Innotek 55 W driver complies with the CISPR/EN 55015 and EN 61547 Standards.

Remark: Surge protection tested OK up to 4 KV for both Differential & Common modes (Max ULg facilities).

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LAB 23/09/2014
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//P-14E700

Laboratory Service PHYSICAL TEST REPORT



R-Tech
Rue de Mons 3 – B-4000 Liège – Belgium
Tel.: +32 4 224 71 40 – Fax: +32 4 224 25 90
Member of Schröder Group

Subject: VOLTANA-2 Extra Clear glass protectors

Sample n°: P-E15378

Test purpose: Fragmentation test following IEC/EN 60598-2-3 Standard

Remarks:

Test request n°: P-D15559

Folder n°: P-F14058

TEST CONDITIONS:

Operator: BOMBIL Patrick

3 samples under test
Glass thickness: 5 mm



Fragmentation test

- An adhesive sheet is scotched on the protector internal side to hold the particles after breakage.
- Impact with spring punch hammer
- Impact on the external side of protector
- Impact at 3 cm from the mid-point of the longest edge.
- Counting of the particles in the coarsest area in a 5 cm side square within 5 minutes after breakage.

Results:

Sample 1: 117 pieces

Sample 2: 116 pieces

Sample 3: 118 pieces

CONCLUSIONS:

VOLTANA-2 Extra Clear Glass protector complies with fragmentation test following IEC/EN 60598-2-3 Standard.

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LAB 21/08/2015

L. Maghe

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//P-15CR559

Laboratory Service PHYSICAL TEST REPORT



R-Tech
Rue de Mons 3 – B-4000 Liège – Belgium
Tel.: +32 4 224 71 40 – Fax: +32 4 224 25 90
Member of Schröder Group

Subject: VOLTANA-2

Sample n°: P-E14362

Test purpose: Mechanical impact resistance test following IEC/EN 62262 Standard

Remarks:

Test request n°: P-D14698

Folder n°: P-F14058

TEST CONDITIONS:

Operator: BOMBIL Patrick

Smooth extra clear glass
Glass thickness: 5 mm

At pendulum hammer

5 impact points distributed on protector surface
One impact on each point

Test on 5 samples

Test

IK08 : Impact energy: 5 joules
Hammer weight: 1,7 kg
Height of fall: 29,4 cm

Result

OK for the 5 samples for all tested points

CONCLUSIONS:

VOLTANA-2 satisfies the IK08 test following IEC/EN 62262 Standard.

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LAB 23/09/2014
J.P. Harchies

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Laboratory Service PHYSICAL TEST REPORT



R-Tech
Rue de Mons 3 – B-4000 Liège – Belgium
Tel.: +32 4 224 71 40 – Fax: +32 4 224 25 90
Member of Schröder Group

Subject: VOLTANA-2 16 led's @ 1A

Sample n°:

Test purpose: Tightness test IP66 following IEC/EN 60598-1 Standard

Remarks:

Test request n°: P-D14696

Folder n°: P-F14058

TEST CONDITIONS:

Operator: BOMBIL Patrick

Preconditioning: endurance test

Test	Result
IP6X : -Luminaire switched ON until stable T° -Talcum in suspension (blowing ON) -After 1', luminaire OFF -Talcum for 3 hours	OK.
IPX6 : - Luminaire switched ON until stable T° - Luminaire switched OFF and immediately sprayed with water jet - Hose Φ 12,5 mm - Water pressure: 1 kg/cm ² - Spraying distance: 3 m - Duration of test: 3 minutes	OK.

CONCLUSIONS:

VOLTANA-2 16 led's @ 1A satisfies the IP66 test following IEC/EN 60598-1 Standard.

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//P-14E696

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Laboratory Service PHYSICAL TEST REPORT



R-Tech
Rue de Mons 3 – B-4000 Liège – Belgium
Tel.: +32 4 224 71 40 – Fax: +32 4 224 25 90
Member of Schröder Group

Subject: VOLTANA-2 16 Led's

Sample n°: P-E14361

Test purpose: Thermal test evaluation @ 1A

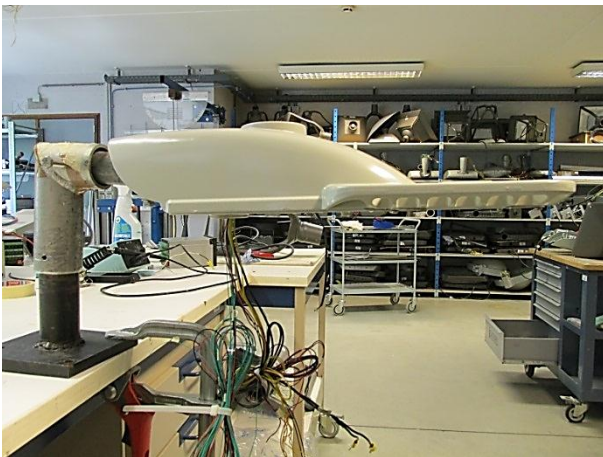
Remarks:

Test request n°: P-D14697

Folder n°: P-F14058

TEST CONDITIONS:

Operator: CLOSSET Frédéric



Load: 16 led's

Driver: LG Innotek LLP 55 W 1,0 A
PISE-A055A
Tc 80 °C

Measurement device:

Yokogawa TX10: thermal measurement

Yokogawa WT 210: primary EM

Fluke 87: secondary and led's EM

Junction Temperature measurement method

Junction temperature measurement by base temperature measurement and electrical measurement.

$$T^{\circ}_j = T^{\circ}_b + R_{jb} \times P_{led}$$

CONCLUSIONS:

According to "Led's Lumen Maintenance Criterion" LM80 extrapolation 6.000 hrs, we can state VOLTANA-2 16 led's driven @ 1A by LG Innotek driver LLP 55 W PISE-A055A driver satisfies:

Tq (CEI): 35 °C for led's with L80 – 100 Khrs target

Tq (CEI): 35 °C for lenses in Diakon material

Tq (CEI): 35 °C for driver PISE-A055A

Ta (CEI): 55 °C

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Laboratory Service PHYSICAL TEST REPORT



R-Tech
Rue de Mons 3 – B-4000 Liège – Belgium
Tel.: +32 4 224 71 40 – Fax: +32 4 224 25 90
Member of Schröder Group

Subject: VOLTANA-2 – Side entry Configuration

Sample n°: P-E14365

Test purpose: Vibrations test: "Street Lighting Luminaires" testing protocol

Remarks:

Test request n°: P-D14801

Folder n°: P-F14058

TEST CONDITIONS:

Operator: V2i

Testing protocol

"Street Lighting Luminaires" testing protocol

Test Item	Post-top and Side-entry Luminaire
Excitation Direction	3 directions
Search for frequencies and quality factor Q	Excitation: sine sweep Frequency band: 5 - 55 Hz Sweep speed: 1 octave/min. Acceleration: 0.5g
Test	Q < 2 (no natural frequency) Excitation: RANDOM (*) Frequency band: 5 - 55 Hz Acceleration: 0.84g _{RMS} Duration: 1h
	Q > 2 Excitation : sine dwell Frequency : f ₀ (Q _{max}) Acceleration : 0.5g Duration : 30 minutes
Search for frequencies and quality factor Q	Excitation: sine sweep Frequency band: 5 - 55 Hz Sweep speed: 1 octave/min. Acceleration: 0.5g

(*) The RANDOM equivalent test consist in an accelerated ageing process of one hour which presents, on a reference one-degree-of-freedom system, an equivalent fatigue damage spectrum than 20 years of mean wind and 90 hours of storms.

CONCLUSIONS:

VOLTANA-2 side entry configuration satisfies the Vibration tests following "Street Lighting Luminaires" testing protocol.

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LAB 21/10/2014
J.P. Harchies

//P-14E801

Laboratory Service PHYSICAL TEST REPORT



R-Tech
Rue de Mons 3 – B-4000 Liège – Belgium
Tel.: +32 4 224 71 40 – Fax: +32 4 224 25 90
Member of Schröder Group

Subject: VOLTANA-2

Sample n°: P-E14363

Test purpose: Aerodynamic wind test

Remarks:

Test request n°: P-D14699

Folder n°: P-F14058

TEST CONDITIONS:

Operator: ULg – CAT Soufflerie

2 tests realized:

- 1) Aerodynamic Coefficient determination
- 2) Endurance test

1) Aerodynamic coefficient determination

	<u>Value (m²)</u>		
<u>Wind Direction</u>	<u>Cd.S (drag)</u>	<u>Cs.S (Side)</u>	<u>Cl.S (Lift)</u>
Front	0,004	-0,004	0,002
Side	0,019	0,019	0,019

2) Endurance test: wind qualification test

Wind direction: Side

Wind resistance: 10' at 180 km/h

Result: OK

CONCLUSIONS:

VOLTANA-2 satisfies the wind speed test 180 Km/h for 10 minutes.
See Aerodynamic coefficients here above.

Duplicate to: Mr M. Thijs
LAB 23/09/2014
J.P. Harchies

//P-14E699