RTECH-PHOTOMETRY LABORATORY

Testreport : Measurement of luminous intensity distribution related to the standard
NBN-EN 13032-1; CIE 121-1996; 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 Schréder group.

LED

Origin	Production	Luminaire	Request #
Socelec SA	Socelec SA	AXIA 2.1	FD36045

Source

Type	BIN	Trademark	Reference	# LEDs	Reflector
LED	SM405D300R70	Nichia	NVSL219CT	24	5178

Master Reflector

Gaggione Led assembly Road lighting Assembled 0,0° No 5178

Protector Refractor Lens

Protector Without protector
Lens Gaggione 5178 PC

Laboratory observation

Axia 2.1 with 24 Nichia NVSL219CT
Mounting screws tightened : 1.5Nm
Used flux for efficiency matrix calculation = 4006lm - CCT = 3945K - CRI = 73,19 (see sphere test report 2015/1424 on appendix)

Purpose	Sample date	Sample #
DOC	30/09/2015	35R264

Observation

Axia 2.1 with lenses 5178

Flux coefficient multiplicator (only for efficiency matrix):
From 350 to 500 mA : 1,373
From 350 to 700 mA : 1,825
From 350 to 1000 mA : 2,428

Fixture powered with driver OSRAM optotronic OT60/120-240/1A0 4DIMLT2E for matrix @350/500/700mA
Fixture powered with driver OSRAM optotronic OT90/120-240/1A0 4DIMLT2E for matrix @1000mA

Digitally signed by Galciuc Igor
Date: 2019.02.26 09:38:56 EET
Reason: MoldSign Signature
Location: Moldova

Asked by	Measured by	Approved by	Appendix		
PVN	CLD	LME	1	226-TEST NBN EN ISO/IEC 17025 : 2005	38342

LUMINOUS INTENSITY DIAGRAM

Origin	Production	Luminaire	Request #
Socelec SA	Socelec SA	AXIA 2.1	FD36045

Source	Type	BIN	Trademark	Reference	# LEDs	Reflector
	LED	SM405D300R70	Nichia	NVSL219CT	24	5178

Reflector	Gaggione Led assembly Road lighting Assembled 0,0°	No	5178
Matrices	**383421** Φ 0-90° = 3620lm - 90-180° = 0lm		Absolute measurement
Protector Refractor Lens	Protector Without protector Lens 24 x Gaggione 5178 PC		

Observation

Matrix in total flux @350 mA

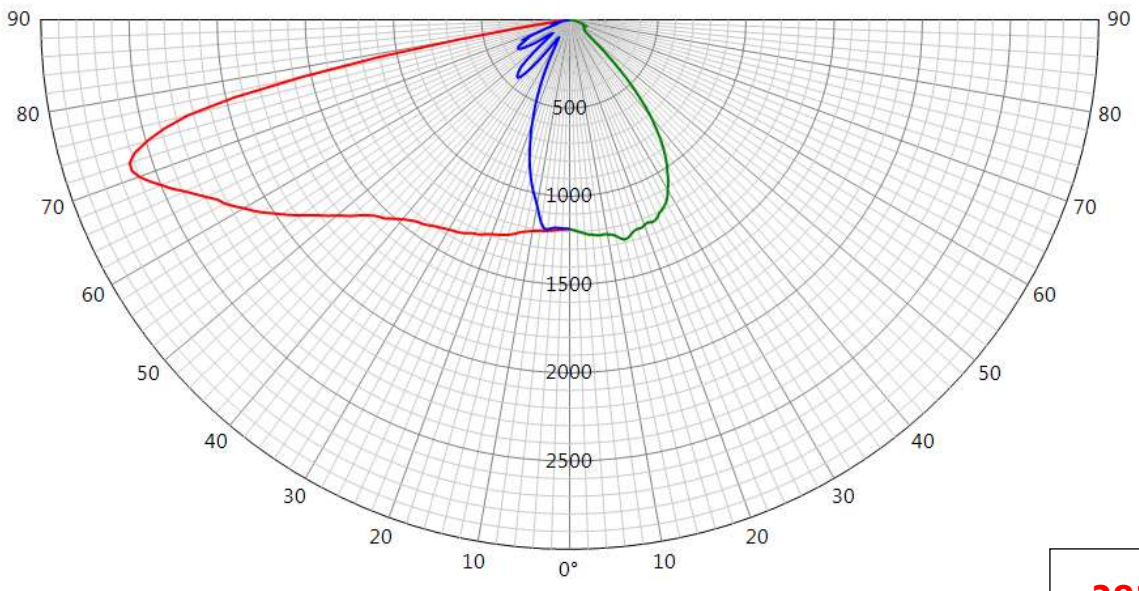
Electrical measurement on LED (#1) : Voltage = 67,43 V Current = 0,350 A Power = 23,63 W

Electrical measurement on driver (#1) : Voltage = 230,00 V Current = 0,128 A Power = 27,80 W PF = 0,942

Total luminaire power = 27,80 W : Lm/Watt = 130,21 lm/W

Driver #1 : See observations for driver details - Pcb Réf.: 00-17-504-Rev.A

Plane	I Peak	Peak position	Index	I zero	Laboratory ambiant t°	Measurement date
10	2627	71	G	1185	25,0°	17/03/2016
90	1283	14	D			
270	1193	6	G			



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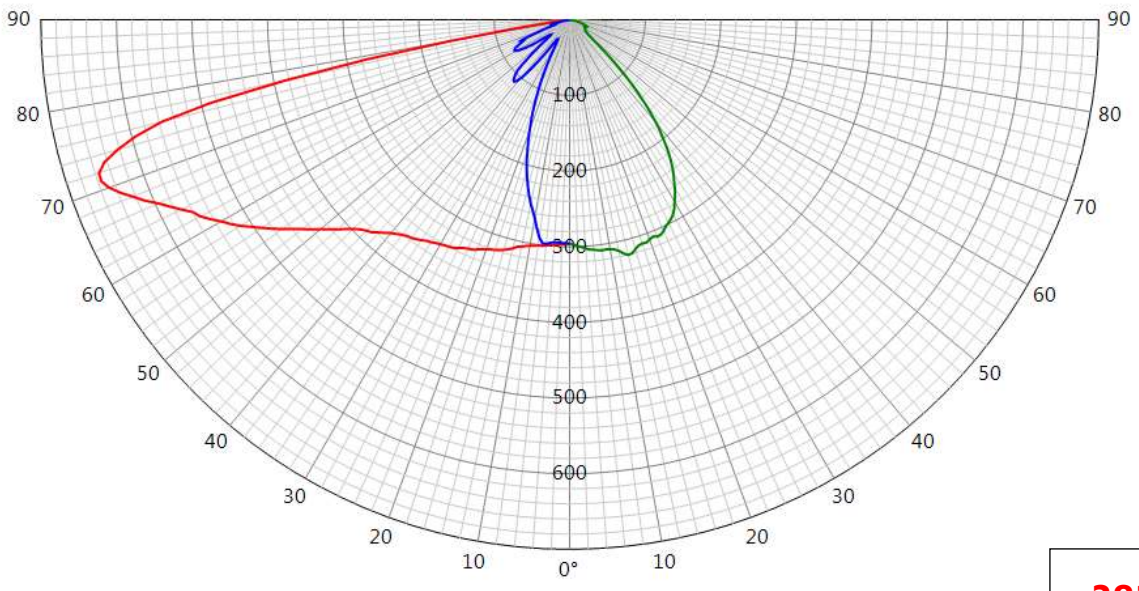
LUMINOUS INTENSITY DIAGRAM

Origin	Production	Luminaire	Request #
Socelec SA	Socelec SA	AXIA 2.1	FD36045

Source	Type	BIN	Trademark	Reference	# LEDs	Reflector
	LED	SM405D300R70	Nichia	NVSL219CT	24	5178

Reflector	Gaggione Led assembly Road lighting Assembled 0,0°	No	5178
Matrices	**383422** η 0-90° = 90,4% - 90-180° = 0,0%	Relative measurement	
Protector Refractor Lens	Protector Without protector Lens 24 x Gaggione 5178 PC		
Observation	Matrix in efficiency @350 mA Electrical measurement on LED (#1) : Voltage = 67,43 V Current = 0,350 A Power = 23,63 W Electrical measurement on driver (#1) : Voltage = 230,00 V Current = 0,128 A Power = 27,80 W PF = 0,942 **Total luminaire power = 27,80 W** Driver #1 : See observations for driver details - Pcb Réf.: 00-17-504-Rev.A		

Plane	I Peak	Peak position	Index	I zero	Laboratory ambiant t°	Measurement date
10	656	71	G	296	25,0°	17/03/2016
90	320	14	D			
270	298	6	G			



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LUMINOUS INTENSITY DIAGRAM

Origin	Production	Luminaire	Request #
Socelec SA	Socelec SA	AXIA 2.1	FD36045

Source	Type	BIN	Trademark	Reference	# LEDs	Reflector
	LED	SM405D300R70	Nichia	NVSL219CT	24	5178

Reflector	Gaggione Led assembly Road lighting Assembled 0,0°	No	5178
Matrices	**383423** Φ 0-90° = 4970lm - 90-180° = 0lm		Absolute measurement
Protector Refractor Lens	Protector Without protector Lens 24 x Gaggione 5178 PC		

Observation

Matrix in total flux @500 mA

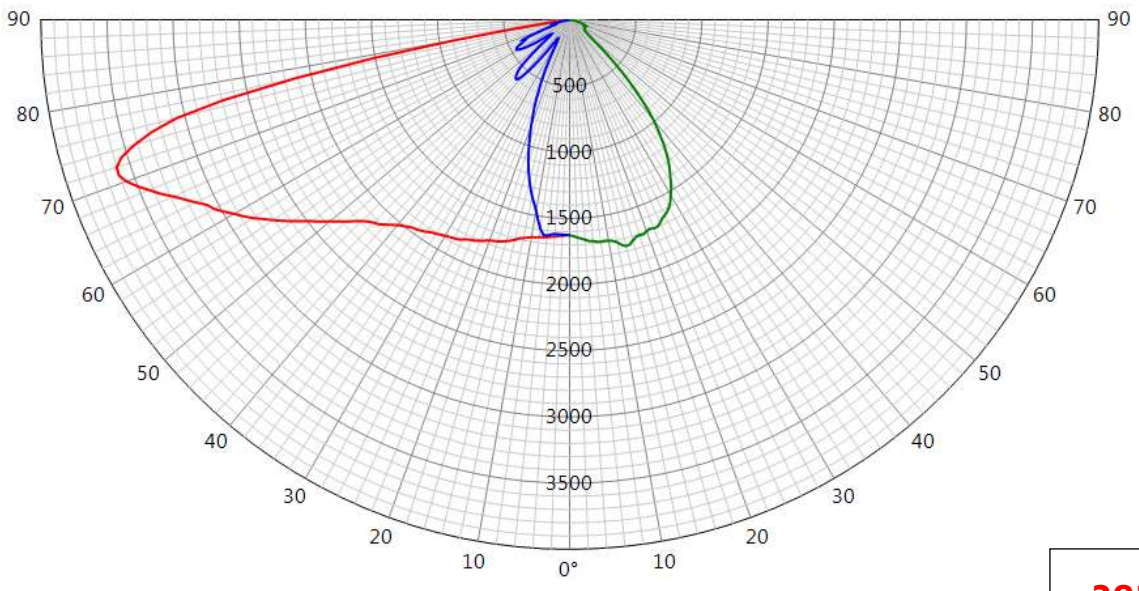
Electrical measurement on LED (#1) : Voltage = 68,59 V Current = 0,500 A Power = 34,26 W

Electrical measurement on driver (#1) : Voltage = 230,00 V Current = 0,175 A Power = 38,85 W PF = 0,965

Total luminaire power = 38,85 W : Lm/Watt = 127,93 lm/W

Driver #1 : See observations for driver details - Pcb Réf.: 00-17-504-Rev.A

Plane	I Peak	Peak position	Index	I zero	Laboratory ambiant t°	Measurement date
10	3607	71	G	1627	25,0°	17/03/2016
90	1762	14	D			
270	1638	6	G			



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LUMINOUS INTENSITY DIAGRAM

Origin	Production	Luminaire	Request #
Socelec SA	Socelec SA	AXIA 2.1	FD36045

Source	Type	BIN	Trademark	Reference	# LEDs	Reflector
	LED	SM405D300R70	Nichia	NVSL219CT	24	5178

Reflector	Gaggione Led assembly Road lighting Assembled 0,0°	No	5178
Matrices	**383424** Φ 0-90° = 6606lm - 90-180° = 0lm		Absolute measurement
Protector Refractor Lens	Protector Without protector Lens 24 x Gaggione 5178 PC		

Observation

Matrix in total flux @700 mA

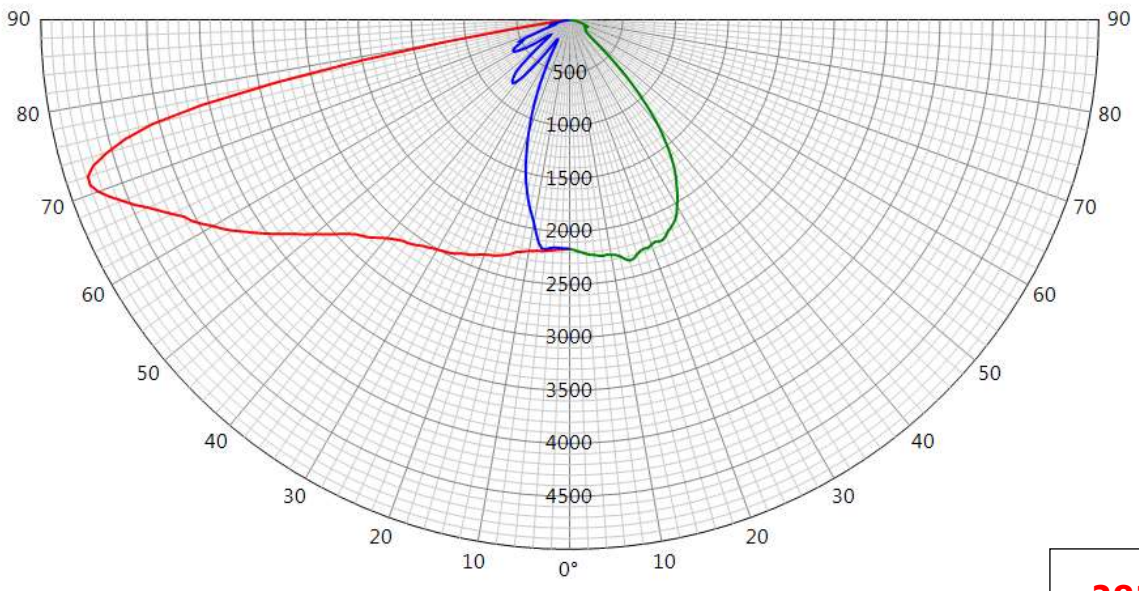
Electrical measurement on LED (#1) : Voltage = 69,88 V Current = 0,700 A Power = 48,96 W

Electrical measurement on driver (#1) : Voltage = 230,00 V Current = 0,240 A Power = 54,30 W PF = 0,984

Total luminaire power = 54,30 W : Lm/Watt = 121,66 lm/W

Driver #1 : See observations for driver details - Pcb Réf.: 00-17-504-Rev.A

Plane	I Peak	Peak position	Index	I zero	Laboratory ambiant t°	Measurement date
10	4794	71	G	2162	25,0°	17/03/2016
90	2341	14	D			
270	2177	6	G			



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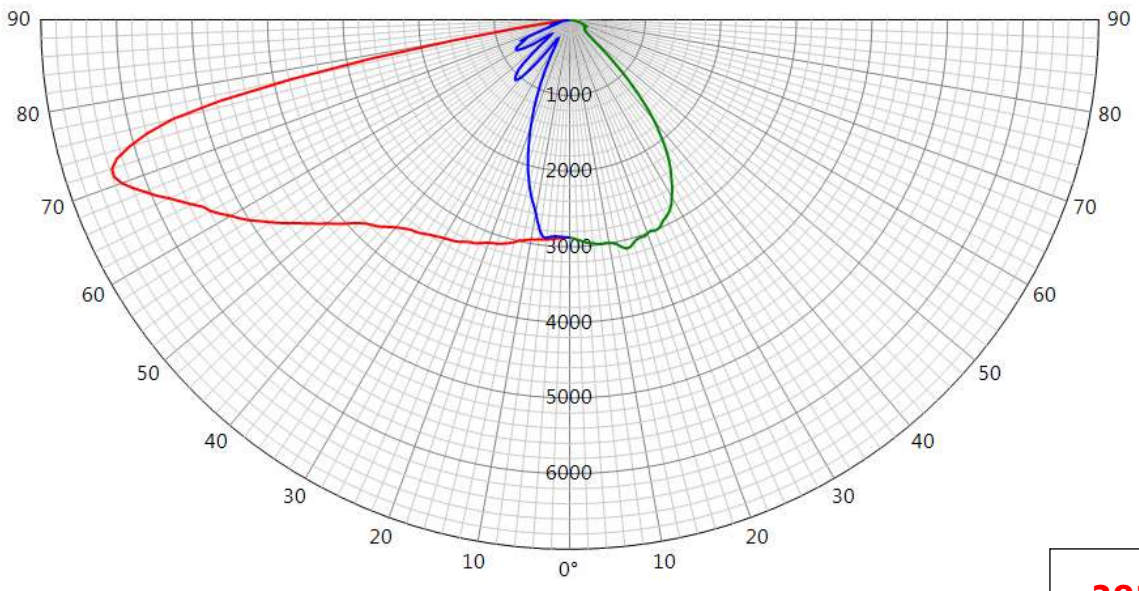
LUMINOUS INTENSITY DIAGRAM

Origin	Production	Luminaire	Request #
Socelec SA	Socelec SA	AXIA 2.1	FD36045

Source	Type	BIN	Trademark	Reference	# LEDs	Reflector
	LED	SM405D300R70	Nichia	NVSL219CT	24	5178

Reflector	Gaggione Led assembly Road lighting Assembled 0,0°	No	5178
Matrices	**383425** Φ 0-90° = 8789lm - 90-180° = 0lm		Absolute measurement
Protector Refractor Lens	Protector Without protector Lens 24 x Gaggione 5178 PC		
Observation	Matrix in total flux @1000 mA Electrical measurement on LED (#1) : Voltage = 71,36 V Current = 1,000 A Power = 71,36 W Electrical measurement on driver (#1) : Voltage = 230,00 V Current = 0,350 A Power = 78,60 W PF = 0,974 **Total luminaire power = 78,60 W : Lm/Watt = 111,82 lm/W** Driver #1 : See observations for driver details - Pcb Réf.: 00-17-504-Rev.A		

Plane	I Peak	Peak position	Index	I zero	Laboratory ambiant t°	Measurement date
10	6378	71	G	2877	25,0°	17/03/2016
90	3115	14	D			
270	2897	6	G			



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Measurement fulfil Standards:

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

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 measurment, If not specified:

- Primary values are AC with 50Htz frequency
- Secondary values on SSL are DC

CCT, CRI and chromaticity coordinates: are Measured on sphere.
if specified Main test report refer to sphere extra test report.

Light distribution : are measured on gonio.

Number of hours operated prior to measurement: If no other specified, 0 hours (no aging)

Stabilization time: If no other specified, a minimal stabilization time of 1 hour is applied.

Total operating time of the product including stabilization:
45 minutes have to be added by measurement.
Minimal operating time is 105 minutes

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

Statement of uncertainties (K=2 95% of confidence level):

Intensity measurement: +/- 3%
Angle: +/- 0.5°
Flux: +/- 2.5%
Electrical DC
Power: +/- 0.25%
Voltage: +/- 0.1%
Current: +/- 0.2%
Electrical AC
Power: +/- 0.1%

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Voltage: +/- 0.1%
Current: +/- 0.4%
Temperature: +/- 1.5%
CCT: +/- 5%
CRI: +/- 2%
x/y: +/- 2%

Measuring instruments in use:

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

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

Thermometers
Voltcraft K101 (Sphere IS2000)
LMT U1000 (Sphere LMT)
Gossen digem f96x48 CK/EK (gonio)
Calibration: traceable to PTB (Physikalisch-Technische Bundesanstalt)

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LED Flux measurement

FORM-L-41 ED1 REV 0

Date : **20/11/2015**

Operator : **FC**

Filename : **2015_1424.xml**

226 - TEST

NBN EN ISO/IEC 17025 : 2005

LEDs

Trademark : **Nichia**

Entry number : **35R264**

Type : **NVSL219CT**

Power (Catalogue) : **1.01** W

Flux : **170** lm/LED

BIN Description : **SM405D300R70**

Part number : **Unknown**

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

Number of LEDs : **24**

Lenses

Trademark : **None**

Type : **None**

Power & Print

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

Print description : **00-17-504 REV.A**

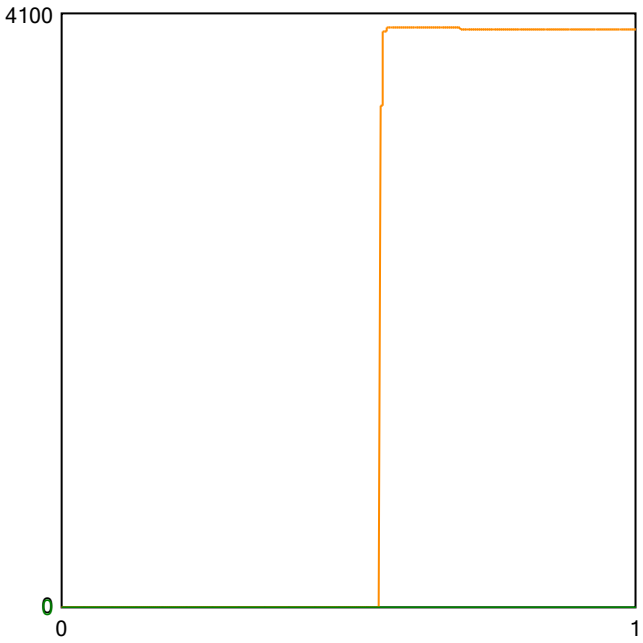
Active ☐

Picture

Sphere photometric measurement

Average flux : **1791** lumens

Maximum flux : **4006** lumens



Position in sphere : 

Electrical measurement

● Secondary electrical measurement

Voltage : **67.74** V

Current : **0.350** A

Power : **23.69** Watt

→ LEDs light efficiency at thermal stabilization :

75.6 lm/W

74.6 lm/Led

→ LEDs light efficiency at 25° :

169.1 lm/W

166.9 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°C/350mA - PCB 24 Nichia pour AXIA1 Gen2 - ctr of 2015/1194 + ctr lied to PH37681

Comment :

FORM-L-41 ED1 REV 0

226 - TEST

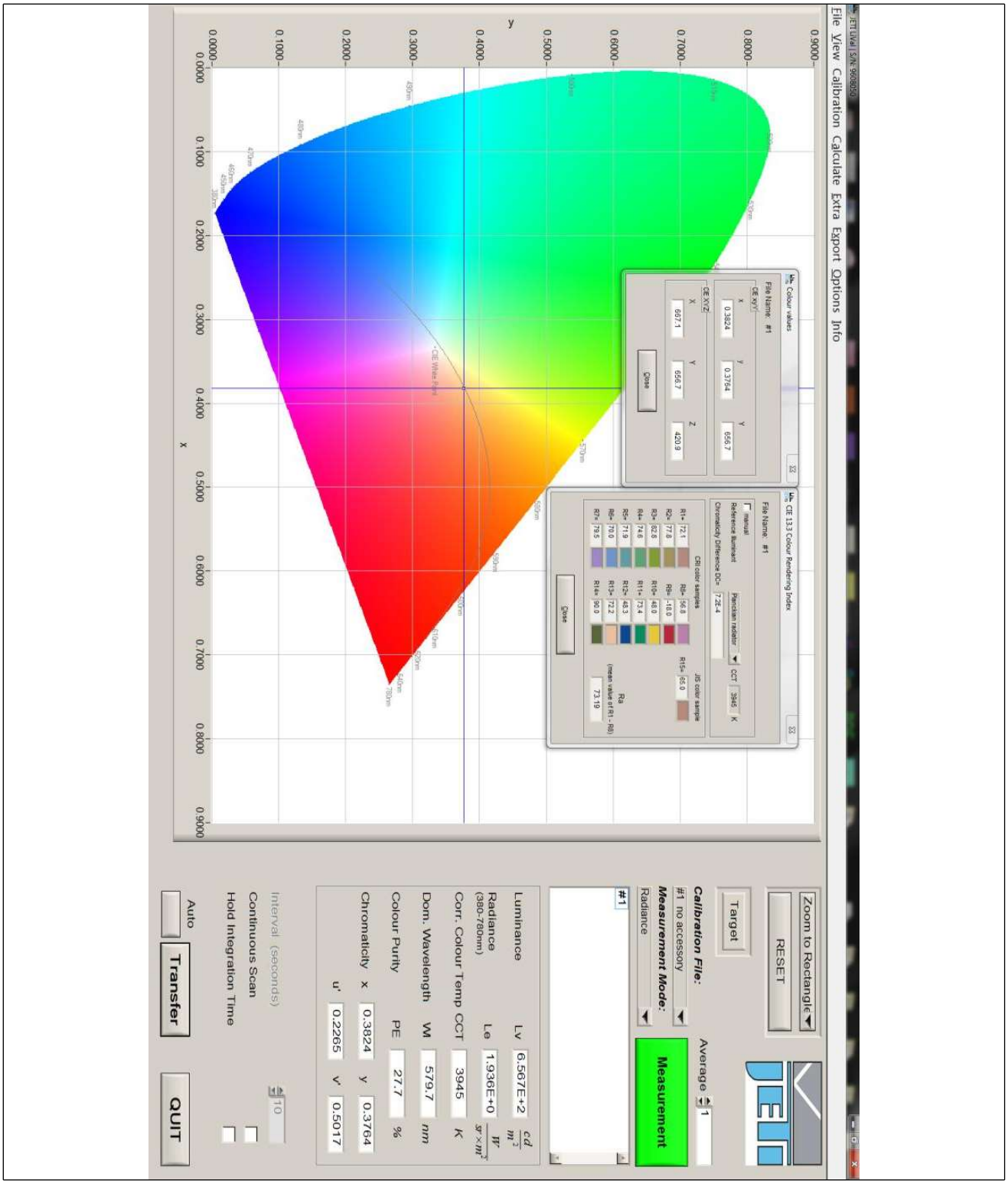
NBN EN ISO/IEC 17025 : 2005

Approved by :

Colorimetry

226 - TEST

NBN EN ISO/IEC 17025 : 2005



AENOR

ENEC Certification Body registered under ID # 01. For further information, please consult www.enec.com

LICENCE

to use the European Mark

ENEC 01

Licence Nr. ENEC/001028

Under the conditions given in the following pages of this document, the licence to use the ENEC Mark in conjunction with the suffix 01, as shown above, has been issued to:

SCHRÉDER GROUP
RUE DE LUSAMBO, 67
B-1190 BRUXELLES (Bélgica *Belgium*)

For the product(s):

Luminaire for road and street lighting

Trade name(s):

SCHRÉDER

Complying with the following European Standards:

EN 60598-1:2015; EN 60598-2-3:2003;
EN 60598-2-3:2003/A1:2011; EN 62262:2002

Date: 2017-02-01 **Signature:**

Name: Avelino Brito
Position: Chief Executive Officer

This licence has been issued under the presumption and conditional on the fact that the licensee holds all necessary legal rights with regard to the product presented for testing and certification.

AENOR INTERNACIONAL, S.A.U.
Cl Génova, 6
28004 MADRID (Spain)

AENOR

CERTIFICADO ENEC DE PRODUCTO

Tipo de producto / Type of Product	LUMINARIA PARA ALUMBRADO PÚBLICO
r1) Nº Certificado / Certificate nº	ENEC/001028
r2) Fecha Certificado / Date of the Certificate	2017-02-01
r3) Nº de Informe de ensayo / Test report nº	2016050306B1
r4) Nombre y dirección del licenciatario Name and address of the licensee	SCHRÉDER GROUP RUE DE LUSAMBO, 67 B-1190 BRUXELLES (Bélgica)
r5) Dirección de la factoría Address of the factory	AV ROANNE 66 - PI EL HENARES 19130 MARCHAMALO (Guadalajara - España)
r6) Referencia de la Norma Española Spanish Standard	UNE-EN 60598-1:2015; UNE-EN 60598-2-3:2003; UNE-EN 60598-2-3:2003/A1:2011; UNE-EN 62262:2002
r7) Referencia de la Norma Europea European Standard	EN 60598-1:2015; EN 60598-2-3:2003; EN 60598-2-3:2003/A1:2011; EN 62262:2002
r8) Referencia / Type reference	Ver Anexo I *refer to Annex I*
r9) Marca comercial / Trade mark	SCHRÉDER
r10) Tensión y frecuencia asignadas Rated voltage and frequency	230 V~; 50/60 Hz
r11) Nº de lámparas x potencia asignada Nº of lamps x rated wattage	Ver Anexo I *refer to Annex I*
r12) Tipo de lámparas y portalámparas Type of lamps and lampholder	LED (module); SMD
r13) Grado de protección / Degree of protection (IP)	IP 66; IK 08
r14) Medios de conexión a la red Means for power supply connection	Terminals
r15) Clasif. por material superficie apoyo Class. respect supporting material	Suitable for normally flammable surfaces
r16) Protección contra choques eléctricos (clase) Protection against electric shock (class)	Class I
r17) Limitaciones / Limitations	Horizontal mounting. Fixed to post or arm. Ta max. = 50 ºC. Min. clearance to illum. objects: 0,2 m
r18) Características generales / Technical data	AXIA 2.1 Series. Neutral white
Fecha de caducidad / Date of expiry	2021-06-14

Este certificado anula y sustituye al 007/001028, de fecha 2016-06-14.
This certificate supersedes certificate 007/001028, dated 2016-06-14.

Original Electrónico

AENOR INTERNACIONAL S.A.U.
Génova, 6. 28004 Madrid. España
Tel. 91 432 60 00.- www.aenor.es

Entidad de certificación de producto acreditada por ENAC con nº 01/C-PR275
Product certification body accredited by ENAC, number 01/C-PR275

AENOR

CERTIFICADO ENEC DE PRODUCTO

ANEXO I AL CERTIFICADO ENEC/001028
ANNEX I TO CERTIFICATE ENEC/001028

REFERENCIA *Type reference*	**Nº DE LÁMPARAS X POTENCIA ASIGNADA** *Nº of lamps x rated wattage*
AXIA 2.1 16 LED 21 W Cl. I	16 LED; 21 W; 390 mA
AXIA 2.1 16 LED 26 W Cl. I	16 LED; 26 W; 480 mA
AXIA 2.1 16 LED 32 W Cl. I	16 LED; 32 W; 600 mA
AXIA 2.1 16 LED 36 W Cl. I	16 LED; 36 W; 690 mA
AXIA 2.1 16 LED 40 W Cl. I	16 LED; 40 W; 760 mA
AXIA 2.1 24 LED 38 W Cl. I	24 LED; 38 W; 490 mA
AXIA 2.1 24 LED 41 W Cl. I	24 LED; 41 W; 540 mA
AXIA 2.1 24 LED 48 W Cl. I	24 LED; 48 W; 630 mA
AXIA 2.1 24 LED 53 W Cl. I	24 LED; 53 W; 690 mA
AXIA 2.1 24 LED 57 W Cl. I	24 LED; 57 W; 750 mA
AXIA 2.1 24 LED 68 W Cl. I	24 LED; 68 W; 890 mA
AXIA 2.1 4 LED 10 W Cl. I	4 LED; 10 W; 680 mA
AXIA 2.1 8 LED 13 W Cl. I	8 LED; 13 W; 480 mA
AXIA 2.1 8 LED 19 W Cl. I	8 LED; 19 W; 690 mA
AXIA 2.1 8 LED 22 W Cl. I	8 LED; 22 W; 820 mA

AENOR INTERNACIONAL S.A.U.
Génova, 6. 28004 Madrid. España
Tel. 91 432 60 00.- www.aenor.es

Entidad de certificación de producto acreditada por ENAC con nº 01/C-PR275
Product certification body accredited by ENAC, number 01/C-PR275

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 Schréder Group

Subject: **AXIA 2.1 / 24 led's @ 890 mA**
Sample n°: P-E15479

Test purpose: **Electrical measurements**

Remarks:
Test request n°: P-D15688
Folder n°: P-F15070

TEST CONDITIONS:

Operator: ABRY Marc

Load: 24 led's
Typical Vf: 2,94 V

Driver: OSRAM OPTOTRONIC OT90
Set on 890mA

Owlet: Luco LC-ADP UV1 06C

Surge Protector: CITEL MLPC1-230L-R / SCH

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: 90.1 %
- PF: 0.97
- THD: 10.8 %
- Harmonics distribution complies with the IEC/EN 61000-3-2 Standard.

Duplicate to: Mr M. Thijs
LAB 25/09/2015
L. Maghe

//P-15CR688

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 Schréder Group

Subject: **AXIA 2.1 / 24 led's @ 890mA + NEMA 7P – class I**
Sample n°: P-E15472

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

Remarks:
Test request n°: P-D15800
Folder n°: P-F15070

TEST CONDITIONS:

Operator: EMC - ULg

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. & M.C. Criteria C required	X	

Driver : Osram OT 90/170-240/ 1A0 4DIM LT2 E set 890mA

EMC Auxiliaries: Citel MLPC 1-230L-P/SCH
Luco P7 + Nema Socket
PIR detector

CONCLUSIONS:

AXIA 2.1 24 led's driven by OT90 driver @ 890 mA in class I protection complies with the CISPR/EN 55015 and EN 61547 Standards.

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

Duplicate to: Mr M. Thijs
LAB 05/11/2015
L. Maghe

//P-15CR800

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 Schréder Group

Subject: **AXIA 2.1**
Sample n°: P-E16101, P-E16102, P-E16103, P-E16104, P-E16105, P-E16106, P-E16107

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

Remarks:
Test request n°: P-D16158
Folder n°: P-F15070

TEST CONDITIONS:

Operator: LEONARD Philippe

At pendulum hammer
7 impact points distributed on protector surface
One impact on each point

Tests:

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

IK09 : Impact energy: 10 joules
Hammer weight: 5 kg
Height of fall: 20 cm

IK10: Impact Energy: 20 joules
Hammer Weight: 5 Kg
Height of fall: 40 cm

Results:

Lens	5165	5166	5167	5177	5178	5179	5187
Level	IK09	IK10	IK09	IK10	IK09	IK08	IK09

CONCLUSIONS:

AXIA 2.1 complies with Mechanical impact resistance test following IEC/EN 62262 Standard, according to levels indicated here above.

Duplicate to: Mr M. Thijs
LAB 09/03/2016
L. Maghe

//P-16CR158

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 Schréder Group

Subject: **AXIA 2.1 / 24 led's @ 890mA + Photocell 20 mm HL**
Sample n°: P-E15476

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

Remarks:
Test request n°: P-D15792
Folder n°: P-F15070

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/cm2 - Spraying distance: 3 m - Duration of test: 3 minutes	OK

CONCLUSIONS:

AXIA 2.1 / 24 led's @ 890mA + Photocell 20 mm HL complies with IP66 test following IEC/EN 60598-1 Standard.

Duplicate to: Mr M. Thijs
LAB 05/11/2015
L. Maghe

//P-15CR792

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 Schréder Group

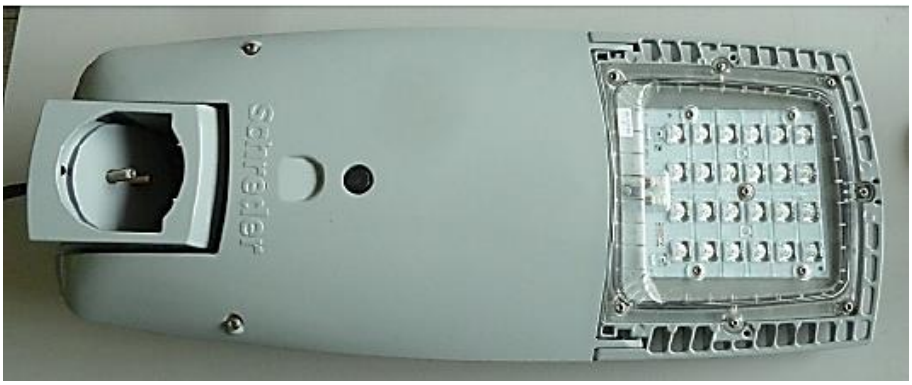
Subject: **AXIA 2.1 / 24 led's @ 890 mA**
Sample n°: P-E15480

Test purpose: **Photobiological safety tests following IEC-EN 62471 Standard**

Remarks:
Test request n°: P-D16010
Folder n°: P-F15070

TEST CONDITIONS: Operator: Laborelec

AXIA 2.1 24 led's NW or WW @ 890 mA



Test program:
Spectral radiance and irradiance measurements of the device under test in the following wavelength ranges:
- 200 to 400 nm : « Actinic UV skin & eye » irradiance
- 315 to 400 nm : « Eye UV-A » irradiance
- 300 to 700 nm : « Blue Light » radiance
- 380 to 1400 nm : « Thermal Retinal » radiance
- 780 to 1400 nm : « Thermal Retinal » radiance (weak visual stimulus)

Determination of the Risk Group classification for each hazard and recommendation about the marking of the product.

CONCLUSIONS:

Fitting is risk Group	2 at 200 mm	=> moderate risk for maintenance users
	1 at 215 mm	=> no risk for user
	0 at 2,2 m	=> no risk for user

Duplicate to: Mr M. Thijs
LAB 20/01/2016 **//P-16CR010**
L. Maghe

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 Schréder Group

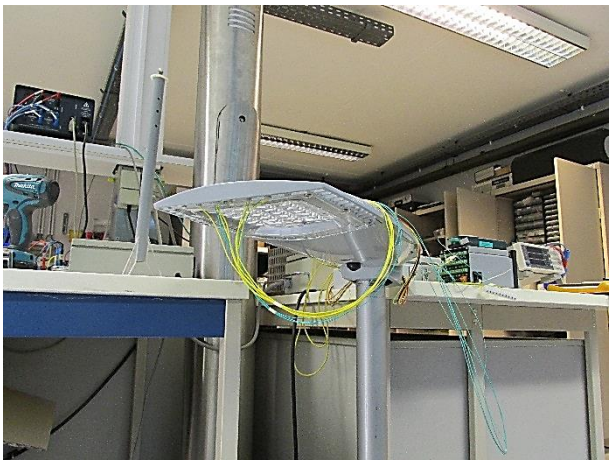
Subject: **AXIA 2.1 / 24 led's @ 890 mA**
Sample n°:P-E15479

Test purpose: **Thermal test evaluation following IEC/EN 60598-1 Standard**

Remarks:
Test request n°: P-D15687
Folder n°: P-F15070

TEST CONDITIONS:

Operator: ABRY Marc



Load: 24 led's

Driver: OSRAM Optotronic
OT90/170-240/1A0 4DIM LT2 E
Set on 890mA
Tc 90°C

OWLET: LUCO LC-ADP UV1 06C
Ta -40/+80°C

SPD: CITEL MLPC1-230L-R / SCH

Measurement device:
Yokogawa TX10: thermal measurement
Yokogawa WT 210: primary EM
Fluke 87: secondary & Led EM

Junction Temperature measurement method
Junction temperature measurement by base temperature measurement and electrical measurement.
$T°_j = T°_b + R_{jb} \times P_{led}$

CONCLUSIONS:

Ta (IEC): 55 °C limited by Driver
Tq (IEC): 35 °C limited by Driver

Tq given for 85 khrs of lifetime
T° given without wind effect to comply with IEC 62722-2-1

Duplicate to: Mr M. Thijs
LAB 25/09/2015
L. Maghe

//P-15CR687

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 Schréder Group

Subject: **AXIA 2.1 - Side entry configuration for pole ∅ 60 mm**
Sample n°: P-E15470

Test purpose: **Vibration test following ANSI C 136-31 Standard (3G)**

Remarks:
Test request n°: P-D16456
Folder n°: P-F15070

TEST CONDITIONS:

Operator: V2i

Testing protocol

	ANSI C 136-31 Standard Amplitude: 3,0g
Test Item	Luminaire for bridge and overpass applications
Excitation Direction	3 directions
Search for frequencies	Excitation: sine sweep Frequency band: 5 - 100 Hz Sweep speed: 1 octave/min. Acceleration: 0.5g
Test	Excitation: sine dwel Frequency: at or near f_0 Amplitude: 3,0g at gravity center Duration: 100,000 cycles
N.B.	A separate sample luminaire may be used for each excitation direction
Search for frequencies	Excitation: sine sweep Frequency band: 5 - 100 Hz Sweep speed : 1 oct/min. Acceleration : 0.5g

CONCLUSIONS:

AXIA 2.1 in Side-Entry configuration for pole ∅ 60 mm complies with vibrations test following ANSI C 136-31 Standard (3G).

Duplicate to: Mr Thijs
LAB, 02/08/2016
L. Maghe

//P-16CR456

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 Schréder Group

Subject: **AXIA 2.1**
Sample n°: P-E15481

Test purpose: **Vibration test following "Street Lighting Luminaires" testing protocol**

Test request n°: P-D15748
Folder n°: P-F15070

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 : f0 (Qmax) 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:

AXIA 2.1 complies with vibrations test "Street Lighting Luminaires" testing protocol.

Duplicate to: Mr M. Thijs
LAB 14/10/2015
L. Maghe

//P-15CR748

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 Schréder Group

Subject: **AXIA 2.1**
Sample n°: P-E15474

Test purpose: **Aerodynamic wind test**

Remarks:
Test request n°: P-D15749
Folder n°: P-F15070

TEST CONDITIONS: Operator: ULg – CAT Soufflerie

2 tests realized:

1) Aerodynamic Coefficient determination
2) Endurance test

1) Aerodynamic coefficient determination

	Value (m²)		
Wind Direction	**Cd.S (drag)**	**Cs.S (Side)**	**Cl.S (Lift)**
Front 0°	0,012	0,002	0,010
Front 15°	0,025	0,007	0,054
Side	0,037	0,005	0,028

2) Endurance test: wind qualification test

Wind direction: Front 15°

Wind resistance: 10' at 188 km/h

Result: OK

CONCLUSIONS:

AXIA 2.1 satisfies the wind speed test 188 Km/h for 10 minutes.

See Aerodynamic coefficients here above.

Duplicate to: Mr M. Thijs
LAB 26/01/2016
L. Maghe

//P-15CR749

AXIA 2.1

5178

Optic: 5178
Protector: Integrated lenses
Source: 24 Nichia NVSL219CT
Matrix: 383422

Features

Comprehensive LED lighting for road & urban applications

- Energy savings of up to 75% compared with traditional light sources
- Cost-effective and efficient lighting solution for a fast return on investment
- Designed to incorporate Owlet range of control solutions: stand-alone (PIR, photocell...), autonomous network and interoperable network
- Integrated lenses for performing photometry adapted to various applications
- ThermiX® and LEDSafe® for long lasting performance
- IP 66 tightness level
- FutureProof : smart upgradability
- 2 sizes for flexibility
- Surge protection 10kV
- Universal fixation

Types of application

- Squares and pedestrian areas
- Parks
- Pedestrian crossings
- Roads and highways
- Railways stations and metros
- Urban roads and streets
- Bridges
- Roundabouts
- Car parks
- Residential streets
- Bike paths

Information for 1000 lm matrix

Efficacy (%): 90.4
ULOR (%): 0.0
DLOR (%): 90.4
UWLR (%): 0.0

G Class (EN 13201-2): G1
Imax (cd): 656
Aperture 0-180°: 24 - 24
Aperture 90-270°: X - X
I 70-80-90-95 (cd): 649 - 199 - X - X

Summary

CONCEPT
Luminaire specifically designed for LEDs

Recommended installation height: between 5-8m for AXIA 2.1and 6-10m for AXIA 2.2
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, with a flat area for a photoelectric cell.
- Housing is surrounded by lateral cooling fins for optimal heat extraction.
- Colour: RAL grey 7040 or black RAL 9005.

INSTALLATION
- Incorporated universal fixation with adjustable inclination in 2.5° steps
- Fixation with tiltable clamp and 2 Allen grub screws M8x45 in stainless steel
- Post-top 48-60mm and 76mm spigot at 5° inclination, allows tilt on a vertical pole from 0 to +10° by 2.5° steps
- Lateral mounting on 32 (with sleeve), 42, 48 or 60mm spigot at 0°, allows tilt on horizontal spigot from +5° to -10° by 2.5° steps
- Cover opens via 2 stainless screws positioned on the lower side of the housing to prevent dirt and corrosion build up

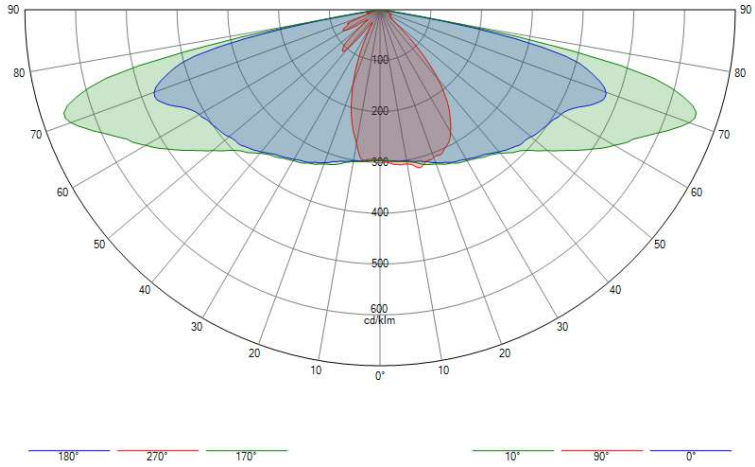
OPTICAL UNIT
- Flatbed PCB with polycarbonate lens overlay principle offering various photometric distributions from narrow, medium to wide road; the IP 66 level allows long lasting performance
- CRI > 70
- ULOR: 0%
- Lifetime residual flux @ Tq=25°C @ 100.000 hrs: 90%

ELECTRICAL
- Class I or Class II (size 2 only)
- Input voltage: 230V ± 10% - 50-60Hz
- Power factor > 85% at full load
- 10kV, 10kA surge protection

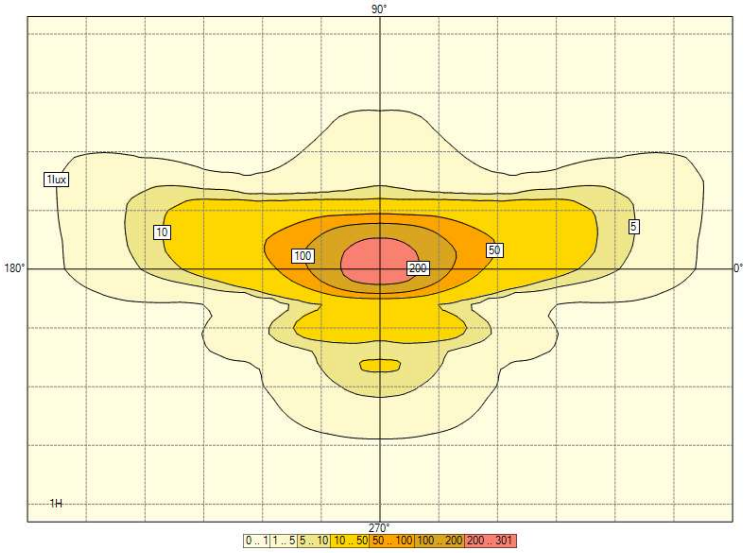
STANDARDS & CERTIFICATIONS
- CE
- ENEC
- LM79-80
- ROHS
- All measurements in ISO17025 accredited laboratory

OPTIONS
- Other RAL or AKZO colours
- Owlet remote management
- Custom dimming profile; Constant Light Output (CLO); Dali; 0-10V
- Photocell
- Presence detection
- External light control louvres
- Supplied pre-cabled for easy installation

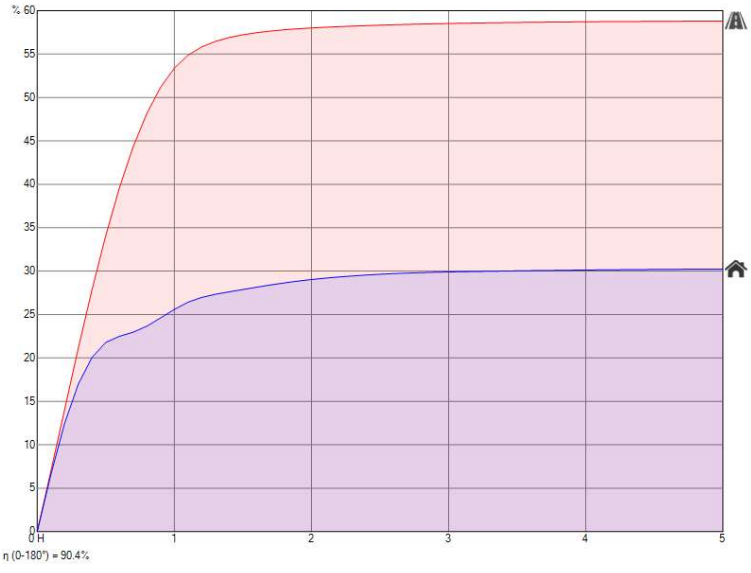
Polar/Cartesian diagram



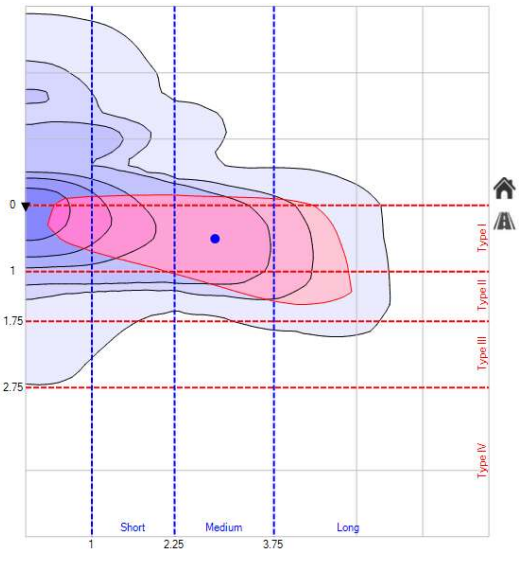
Isolux



K-Curve

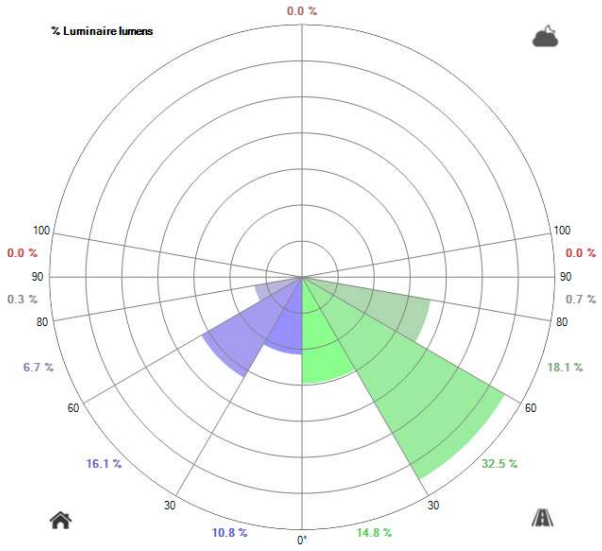


IES Roadway Classification / Nema Classification



II - Medium

Luminaire classification system (LCS)



Intensity diagram in max Cone and in CPlane