

Deutsche Akkreditierungsstelle GmbH

Entrusted according to Section 8 subsection 1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV

Signatory to the Multilateral Agreements of
EA, ILAC and IAF for Mutual Recognition

Accreditation



The Deutsche Akkreditierungsstelle GmbH attests that the certification body

DEKRA Certification GmbH
Handwerkstraße 15, 70565 Stuttgart

is competent under the terms of DIN EN ISO/IEC 17021:2011 to carry out certifications of management systems in the following fields:

- DIN EN ISO 14001:2009 Environmental Management Systems
- DIN EN ISO 9001:2008 Quality Management Systems
- Management requirements of the BGW for occupational health and safety (MAAS-BGW), Version 04/2013 – based on DIN EN ISO 9001:2008
- DIN EN ISO 50001:2011 Energy Management Systems (EnMS)
- DIN EN ISO 22000:2005 Certification of Food Safety Management Systems according to ISO/TS 22003:2007
- FSSC 22000 Certification scheme for food safety systems
- DIN ISO/IEC 27001:2013 Information technology - Security techniques - Information security management systems according to ISO/IEC 27006:2011
- BS OHSAS 18001:2007 Occupational Health and Safety Management Systems
- Normative SCC-Regelwerk: Version 2011 DGMK e.V. SHE-/SCC-Management Systems
- DIN ISO 29990:2010 Learning services for non-formal education and training – Basic requirements for service providers

The accreditation certificate shall only apply in connection with the notice of accreditation of 18.12.2014 with the accreditation number D-ZM-16029-01 and is valid until 17.12.2019. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 8 pages.

Registration number of the certificate: **D-ZM-16029-01-01**

Deutsche Akkreditierungsstelle GmbH

Annex to the Accreditation Certificate D-ZM-16029-01-01 according to DIN EN ISO/IEC 17021:2011

Period of validity: 18.12.2014 to 17.12.2019

Date of issue: 18.12.2014

Holder of certificate:

DEKRA Certification GmbH
Handwerkstraße 15, 70565 Stuttgart

Certifications of management systems in the fields:

DIN EN ISO 14001:2009 Environmental Management Systems

With the Branch Offices:

Cerdany 44
ES-08820 El Prat de Llobregat
Spain

265 West Street
Tuinhof Office Park, Karee Building
ZA-0157 Centurion
South Africa

Str. Constantin Brancusi Nr. 131
RO-400458 Cluj-Napoca
Romania

Via Fratelli Gracchi 27 – Torre Sud
IT-20092 Cinisello Balsamo (MI)
Italy

Türkova 1001/9
CZ-149 00 Praha 4
Czech Republic

Plac Solny 20
PL-50-063 Wrocław
Poland

Pannonhalmi út 14
HU-1118 Budapest
Hungary

Floor 14, International Sunyard
No. 1750 Jianghong Avenue
Binjiang District
310052 Hangzhou
China

Certification of management systems in the following fields:

DIN EN ISO 14001:2009 Environmental Management Systems

IAF/EA – Description of economic sectors

Scope

2	Mining and quarrying
3	Food products, beverages and tobacco
4	Textiles and textile products
6	Wood and wood products
7	Pulp, paper and paper products
8	Publishing companies
9	Printing companies
12	Chemical, chemical products and fibres
13	Pharmaceuticals
14	Rubber and plastic products
15	Non-metallic mineral products
16	Concrete, cement, lime, plaster, etc.
17/1	Basic metals
17/2	Fabricated metal products
18	Machinery and equipment
19	Electrical and optical equipment
22	Other transport equipment
23	Manufacturing of products not elsewhere classified
24	Recycling
25	Electricity supply
26	Gas supply
	Description of economic sectors

IAF/EA – Description of economic sectors

Scope

27	Water supply
28	Construction
29/1	Wholesale and retail trade
29/2	Repair of motor vehicles, motorcycles and personal and household goods
30	Hotels and restaurants
31/1	Transport, storage and logistics
31/2	Communication
32	Financial intermediation, real estate, renting of equipment
33	Information technology
34	Research institutes; engineering and architect offices
35	Other services
36	Public administration
37	Education
38/1	Health / veterinarian
38/2	Social work
39	Other social services

Certification of management systems in the following fields:

DIN EN ISO 9001:2008 Quality Management Systems

With the branch offices:

Cerdany 44
ES-08820 El Prat de Llobregat
Spain

265 West Street
Tuinhof Office Park, Karee Building
ZA-0157 Centurion
South Africa

Str. Constantin Brancusi Nr. 131
RO-400458 Cluj-Napoca
Romania

Via Fratelli Gracchi 27 – Torre Sud
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Türkova 1001/9
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Czech Republic

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Poland

Pannonhalmi út 14
HU-1118 Budapest
Ungarn

Floor 14, International Sunyard
No. 1750 Jianghong Avenue
Binjiang District
310052 Hangzhou
China

DIN EN ISO 9001:2008 Quality Management Systems

IAF/EA – Scope	Description of economic sectors
1	Agriculture, forestry and fishing
2	Mining and quarrying
3	Food products, beverages and tobacco
4	Textiles and textile products
5	Leather and leather products
6	Wood and wood products
7	Pulp, paper and paper products
8	Publishing companies
9	Printing companies
12	Chemical, chemical products and fibres
13	Pharmaceuticals
14	Rubber and plastic products
15	Non-metallic mineral products
16	Concrete, cement, lime, plaster, etc.
17	Basic metals and fabricated metal products
18	Machinery and equipment
19	Electrical and optical equipment
21	Aerospace
22	Other transport equipment
23	Manufacturing of products not elsewhere classified
24	Recycling
25	Electricity supply
26	Gas supply
27	Water supply
28	Construction
29/1	Wholesale and retail trade
29/2	Repair of motor vehicles, motorcycles and personal and household goods
30	Hotels and restaurants
31/1	Transport, storage and logistics
31/2	Communication
32/1	Financial intermediation, real estate
32/2	Renting of equipment
33	Information technology
34/1	Research institutes
34/2	Engineering and architect offices

IAF/EA – Scope	Description of economic sectors
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35	Other services
36	Public administration
37	Education
38/1	Health
38/2	Veterinarian
38/3	Social work
39	Other social services

Management requirements of the BGW for occupational health and safety (MAAS-BGW),
 Version 04/2013 – based on DIN EN ISO 9001:2008

DIN EN ISO 22000:2005 Certification of Food Safety Management Systems according to
 ISO/TS 22003:2007

DIN/ISO TS 22003 Category	Categories in accordance with Annex A ISO/TS 22003
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A	Farming 1 (Animals)
B	Farming 2 (Plants)
C	Processing 1 (Perishable animal products)
D	Processing 2 (Perishable vegetable products)
E	Processing 3 (Products with long shelf life at ambient temperature)
F	Feed production
G	Catering
H	Distribution
I	Services
J	Transport and Storage
K	Equipment manufacturing
L	(Bio-) chemical manufacturing
M	Packaging material manufacturing

FSSC 22000 Certification scheme for food safety systems according to ISO/TS 22003:2007

DIN/ISO

TS 22003 Categories in accordance with Annex A ISO/TS 22003

Category

C	Processing 1 (Perishable animal products)
D	Processing 2 (Perishable vegetable products)
E	Processing 3 (Products with long shelf life at ambient temperature)
L	(Bio-) chemical manufacturing
M	Packaging material manufacturing

DIN ISO/IEC 27001:2013 Information technology – Security techniques – Information security management systems according to ISO/IEC 27006:2011

DIN EN ISO 50001:2011 Energy Management Systems (EnMS)

Sector	Description of economic sectors
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A	Industrial EnMS (corresponds to EA-Scopes 1 – 28 and 29/2)
B	Non-industrial EnMS (corresponds to EA-Scopes 29/1 – 39)

BS OHSAS 18001:2007 Occupational Health and Safety Management Systems

Normative SCC-Regelwerk: Version 2011 DGMK e.V. SHE-/SCC-Management Systems in folgenden Scopes:

SCC (Contractors / Industrial Enterprises)

SCP (Temporary Employment Agencies)

Safety-, Health- and Environment Protection- SHE/SCC- according to current DGMK e. V. – SCC-scheme

DIN ISO 29990:2010 Learning services for non-formal education and training – Basic requirements for service providers

Abbreviations used:

DIN	Deutsches Institut für Normung e.V.
EA	European co-operation for Accreditation
EN	Europäische Norm
IAF	International Accreditation Forum
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
BS	British Standard
OHSAS	Occupational Health and Safety Assessment Series
SCC	Sicherheits Zertifikat Kontraktoren
DGMK	Deutsche Wissenschaftliche Gesellschaft für Erdöl, Erdgas und Kohle e. V.



CERTIFICAT

Schröder



BS OHSAS 18001:2007

DEKRA Certification GmbH certifică prin aceasta că

Schröder Romania S.R.L.

Domeniul de certificare:

Proiectare luminoasă și de sisteme de iluminat; comercializare echipamente electrice de iluminat

Locația certificată:

Str. Corneliu Coposu Nr.167A, RO-400228 Cluj-Napoca

a implementat și menține un sistem de management al sănătății și securității ocupaționale, conform standardului mai sus menționat și aplică acest sistem în mod eficace. Dovada a fost prezentată în cadrul auditului de certificare prin raportul nr. 314R1517.

Certificatul este valabil din 18.05.2017 până în 19.04.2018

Nr. înregistrare certificat: 270415022

Lothar Weimhofen



Lothar Weimhofen
DEKRA Certification GmbH Stuttgart, 18.05.2017



Deutsche
Akkreditierungsstelle
D-ZM-16029-01-01

LICENCE

No. 20113 replaces No.19525

Issued to:
Applicant:
R-Tech
Rue de Mons, 3
4000 LIEGE
Belgium



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



Product : road, square, street, flood lighting
Trade name(s) : SCHREDER
Type(s)/model(s) : VOLTANA 1, VOLTANA 2, VOLTANA 3, VOLTANA 4,
VOLTANA 5

The product and any acceptable variation thereto is specified in the annex to this licence and the documents therein referred to.

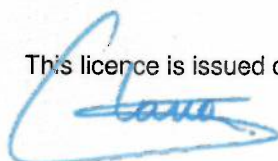
SGS CEBEC hereby declares that the above-mentioned product has been certified on the basis of:

- a type test according to the standard specified in annex
- an inspection of the production location
- a certification agreement with the number 1173

SGS CEBEC hereby grants the right to use the CEBEC certification mark

The ENEC/CEBEC certification mark may be applied to the product as specified in this licence for the duration of the ENEC/CEBEC certification agreement and under the conditions of the ENEC/CEBEC certification agreement.

This licence is issued on: 14/10/2016



ir. C. Lana,
Certification Manager

© Only integral publication of this certificate, including the annex, is allowed
This certificate is only valid combined with the publication on the following web address: www.sgs.com/ee



SGS Belgium NV-Division SGS CEBEC
Business Riverside Park
Bld Internationalelaan 55 Build. D
B-1070 Brussels
Tel.+32(0)2 556 00 20 Fax.+32(0)2 556 00 36

This certificate is issued by the company under its General Conditions for Certification Services accessible at http://www.sgs.com/terms_and_conditions.htm. Attention is drawn to the limitations of liability defined therein and in the Test Report herein mentioned which findings are reflected in this Certificate. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SPECIFICATION OF THE CERTIFIED PRODUCT

Product data

Product	: road, square, street, flood lighting
Trade name(s)	: SCHREDER
Type(s)/Model(s)	: VOLTANA 1, VOLTANA 2, VOLTANA 3, VOLTANA 4, VOLTANA 5
description	: Street lighting
rated voltage (Un)	: 100-240 V
rated frequency	: 50-60 Hz
rated secondary current (In SEC)	: 350, 500, 700, 1000 mA (LED)
class	: class I
degree of protection	: IP66
additional information	: IK08

Product data - type VOLTANA 1

rated power	: 10-15-20-31 W
lamp(s)	: 8 LED
temperature class	: Ta 45-55 °C

Product data - type VOLTANA 2

rated power	: 20-28-39-56 W
lamp(s)	: 16 LED
temperature class	: Ta 50-55 °C

Product data - type VOLTANA 3

rated power	: 28-41-55-80 W
lamp(s)	: 24 LED
temperature class	: Ta 45-55 °C

Product data - type VOLTANA 4

rated power	: 37-52-75-110 W
lamp(s)	: 32 LED
temperature class	: Ta 35-55 °C

Product data - type VOLTANA 5

rated power : 70-102-145-212 W
lamp(s) : 64 LED
temperature class : Ta 35-45-55°C

TESTS

Test requirements

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

Test results

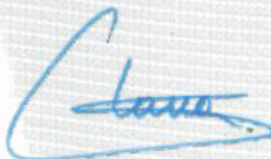
The test results are laid down in certification file 618719/03.

Remarks

This certificate is based on test report No. P1540-44-I.

Conclusion

The examination proved that all test requirements were met.

Checked by, project leader : Christian Maes - 14/10/2016
Department Manager, :
Product Certification :
Certification Manager :  2016-10-14

List of components

Component	Trade name	Type/model	Rating	Standard	Approval mark 1
Drivers	LG Innotek	LLP 110 W, 1A, (LG PISE A110A) 68-110 V	V in 120-277 VAC, max. 110 W, Vout : 68-110 Vdc, tc : 80°C	IEC/EN 61347-2-13	CB
Drivers	LG Innotek	LLP 55 W, 1A, (LG PISE A55A) 44-55 V	V in 120-277 VAC, max. 55 W, Vout : 44-55 Vdc, tc : 80°C	IEC/EN 61347-2-13	CB
Drivers	LG Innotek	LG PISE A027A	V in 120-277 VAC, max. 27 W, Vout : 22-27 Vdc, tc : 80°C	IEC/EN 61347-2-13	CB
Drivers	Tridonic	LCI 27W 1-10V	220-240 V, 50/60 Hz, Tc 70°C	IEC/EN 61347-2-13	CB
Drivers	Philips	Xi FP 40W 0.3-1.0 A SNLDAE 230 V S175 sXt	40 W, 50-60 Hz, 0.3-1.05 A, 198-264 V, Tc = 90°C	IEC 61347-2-13	CB
Drivers	Philips	Xi FP 40W 0.2-0.7 A SNLDAE 230 V S175 sXt	40 W, 50-60 Hz, 0.2-0.7 A, 198-264 V, Tc = 90°C	IEC 61347-2-13	CB

Component	Trade name	Type/model	Rating	Standard	Approval mark 1
Drivers	Philips	Xi LP 40W 0.3-1.0 A S1 230V S175 sXt	40 W, 50-60 Hz, 0.3-1.05 A, 198-264 V, Tc = 90°C	IEC 61347-2-13	CB
Drivers	Philips	Xi LP 40W 0.2-0.7 A S1 230V S175 sXt	40 W, 50-60 Hz, 0.2-0.7 A, 198-264 V, Tc = 90°C	IEC 61347-2-13	CB
Drivers	Philips	Xi LP 70W 0.2-0.7A SL 230V C150 sXt	70 W, 50-60 Hz, 0.2-0.7 A, 198-264 V, Tc = 85°C	IEC 61347-2-13	CB
Drivers	Philips	Xi FP 75W 0.2-0.7A SNLDAE 230V S240 sXt	75 W, 50-60 Hz, 0.2-0.7 A, 198-264 V, Tc = 85°C	IEC 61347-2-13	CB
Drivers	Philips	Xi FP 75W 0.3-1.0A SNLDAE 230V S240 sXt	75 W, 50-60 Hz, 0.3-1.05 A, 198-264 V, Tc = 85°C	IEC 61347-2-13	CB
Drivers	Philips	Xi LP 75W 0.3-1.0A S1 230V S240 sXt	75 W, 50-60 Hz, 0.3-1.05 A, 198-264 V, Tc = 85°C	IEC 61347-2-13	CB

Component	Trade name	Type/model	Rating	Standard	Approval mark 1
Drivers	Philips	Xi LP 75W 0.2-0.7A S1 230V S240 sXt	75 W, 50-60 Hz, 0.2-0.7 A, 198-264 V, Tc = 85°C	IEC 61347-2-13	CB
Drivers	Philips	Xi LP 150W 0.3-1.0A SL 230V S240 sXt	150 W, 50-60 Hz, 0.3-1.05 A, 198-264 V, Tc = 90°C	IEC 61347-2-13	CB
Drivers	Philips	Xi FP 150W 0.3-1.0A SNLDAE 230V S240 sXt	150 W, 50-60 Hz, 0.3-1.05 A, 198-264 V, Tc = 90°C	IEC 61347-2-13	CB
Drivers	Philips	Xi LP 150W 0.2-0.7A SL 230V S240 sXt	150 W, 50-60 Hz, 0.2-0.7 A, 198-264 V, Tc = 90°C	IEC 61347-2-13	CB
Drivers	Philips	Xi FP 150W 0.2-0.7A SNLDAE 230V S240 sXt	150W, 50-60 Hz, 0.2-0.7 A, 198-264 V, Tc = 90°C	IEC 61347-2-13	CB
Control device	Owlet	LuCo ADP	110-277 V, 50/60 Hz, Tmax = 80°C	IEC/EN 61347	CB / UL

Component	Trade name	Type/model	Rating	Standard	Approval mark 1
Control device	Owlet	LuCo NXP	110-277 V, 50/60 Hz, Tmax = 80°C	IEC/EN 61347	CB / UL
Control device	Owlet	LuCo P7	110-277 V, 50/60 Hz, Tmax = 75°C	IEC/EN 61347	CB / UL
Control device	Owlet	Shorting Cap	LuCo P7 Empty Body	IEC/EN 61347	Test report P-E16059
Connection device	TE	TE NEMA socket 7-pin	Power contacts : 15 A, 480 V, dimming contacts : 0.10 A, 10 V	IEC 61347-1, IEC 61347-2-11	CB
Surge protection device	Vossloh	SPC3/ 230/ 10K/i	100-277 V, 50/60 Hz, 10 kV, Tc = 80°C	IEC 61643-11	DEKRA
Fuse holder	Mersen	10x38 mm, CCR8-10 series	20-32 A, 400 V	IEC 60269-1 & -2	ENEC
Fuse holder	Camdenboss	CFTBN 5x20 mm	13 A, 250 V	IEC 60269-1 & -2	VDE / UL
Fuse	Mersen	FR10 10x38 mm	0.5-32 A, 400-500 V	IEC 60269-1 & -2	ENEC
Fuse	Littlefuse	5x20 mm, 213 series	0.2-6.3 A, 250 V	IEC 60269-1 & -2	VDE
Surge protection device	Vossloh	SPC3/ 230/ 10K/i	100-277 V, 50/60 Hz, 10 kV, Tc = 80°C	IEC 61643-11	DEKRA
Terminal	Wieland	GST18i S B	16 A/250 V, 2.5 mm ²	EN 60998-1 & 2-2	VDE / UL

Component	Trade name	Type/model	Rating	Standard	Approval mark 1
Terminal	Adels	LK980-01	2.5 mm ² , 450 V, 24 A	EN 60998-1 & 2-2	VDE / UL
Terminal	Adels	900-07/Q	0.5-4 mm ² , 450 V	EN 60998-1 & 2-2	VDE / UL
Terminal	Adels	AC-166 ST (D)/3	0.5-2.5 mm ² , 250-400 V	EN 60998-1 & 2-2	VDE / UL
Terminal	Wago	222 Series	0.08-2.5 mm ² , 20 A/400 V	EN 60998-1 & 2-2	ENEC / UL
Terminal	Wago	221 Series	0.2-4 mm ² , 32 A/450 V	EN 60998-1 & 2-2	ENEC / UL
Terminal	Wago	Connector 2 pole 294 model	24 A/500 V, 0.5-2.5 mm ²	EN 60998-1 & 2-2	ENEC
Cable gland	Hummel	HSK-K	IP68-10 bar M20x1.5	DIN EN 62444	VDE / UL
Led modules	LG	8-16-24-32 Leds LG3535	RG0, 1000 mA	IEC/EN 62031 - 62471	Tested in appliance
Led modules	LG	8-16-24-32 Leds G4TOP	RG, 1000 mA	IEC/EN 62031 - 62471	Tested in appliance
Led modules	LG	8-16-24-32 Leds G4	RG, 1000 mA	IEC/EN 62031 - 62471	Tested in appliance
Led modules	LG	8-16-24-32 Leds G4L	RG, 1000 mA	IEC/EN 62031 - 62471	Tested in appliance
Led modules	Schreder	2x12, 2x16, 24, 32 Leds XP-G2	RG0, 700 mA	IEC/EN 62031 - 62471	Tested in appliance
1) indicates a component tested as part of the appliance					

FACTORY LOCATION(S)

Schröder do Brasil Iluminação Ltda.
Rua Iracema Lucas, 415
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13280-000 SAO PAULO
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Schreder TOV
Vul. Mykulynetska 46B
46000 TERNOPIL
Ukraine

Schreder (China) Lighting Industrial Co., Ltd
No.40 Xinye 2 Street, Tianjin Economic Technological Development Zone West Zone,
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Socelec S.A.
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Belgium

Comatelec S.A.
Z.I.
18400 SAINT FLORENT S/CHER
France

Tungsram-Schröder Világítási Berendezések Zrt
Tópart 2
2084 PILISSZENTIVAN
Hungary

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

//P-14E674

A handwritten signature in blue ink, appearing to read "J.P. Harchies", with a stylized flourish at the end.

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).

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

//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.

Duplicate to: Mr M. Thijs

LAB 21/08/2015

L. Maghe

A handwritten signature in blue ink, appearing to read "L. Maghe".

//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.

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

//P-14E698

A handwritten signature in blue ink, appearing to read "J.P. Harchies", with a horizontal line drawn underneath it.

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.

Duplicate to: Mr M. Thijs

LAB 23/09/2014

J.P. Harchies

//P-14E696

A handwritten signature in blue ink, appearing to read "Harchies", with a horizontal line drawn underneath it.

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

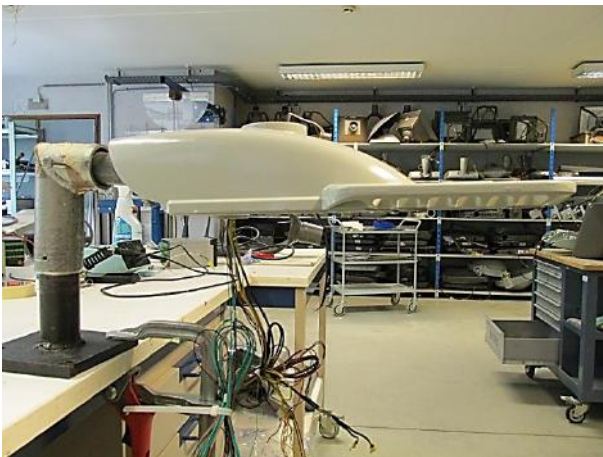
Remarks:

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

Duplicate to: Mr M. Thijs

LAB 23/09/2014

J.P. Harchies

//P-14E697

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

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 : 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:

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

Duplicate to: Mr M. Thijs
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

LED Flux measurement

FORM-L-41 ED1 REV 0

Date : **6/01/2015**

Operator : **FC**

Filename : **2015_1.xml**



226 - TEST

LEDs

NBN EN ISO/IEC 17025 : 2005

Trademark : **LG Innotek**

Entry number : **34R336**

Type : **3535 Gen4**

Power (Catalogue) : **1.00** W

BIN Description : **Unknown**

Flux : **160** lm/LED

Part number : **Unknown**

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

Number of LEDs : **16**

Lenses

Trademark : **None**

Type : **None**

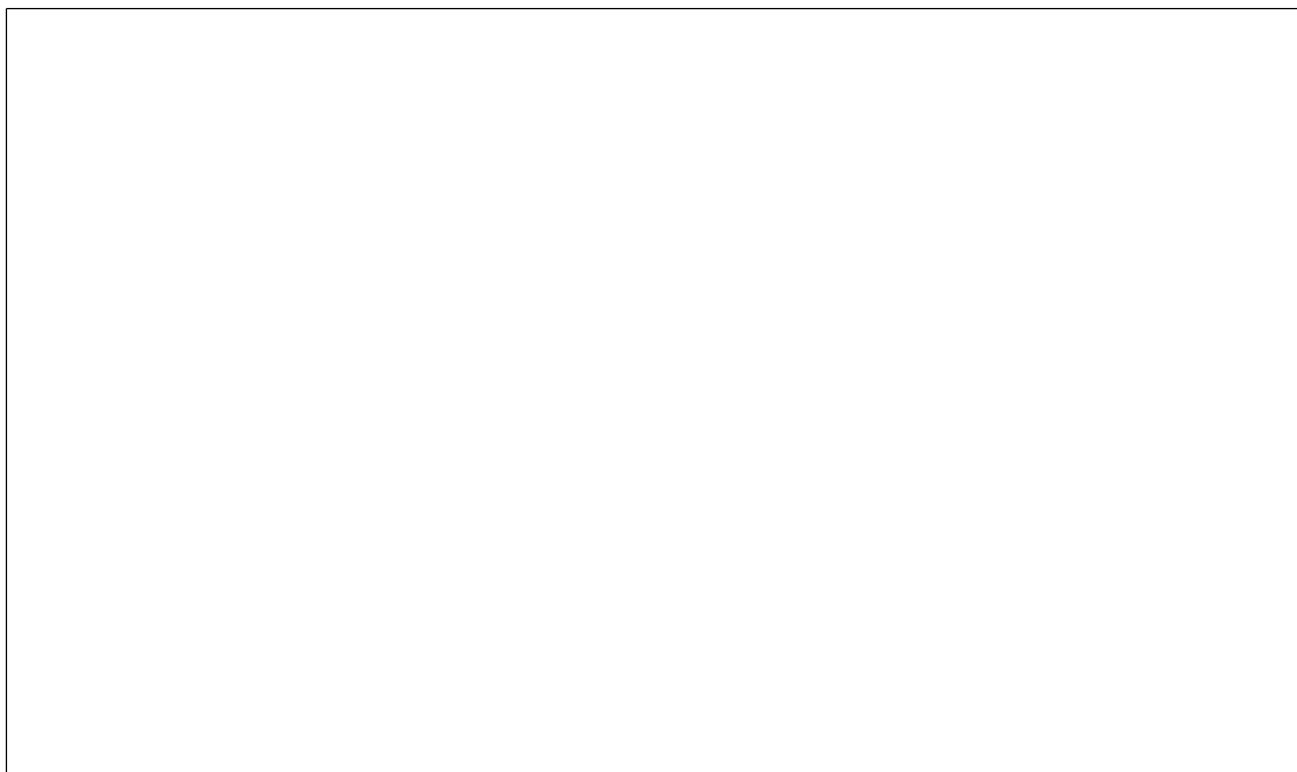
Power & Print

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

Print description : **00-07-909 Rev.A**

Active ☐

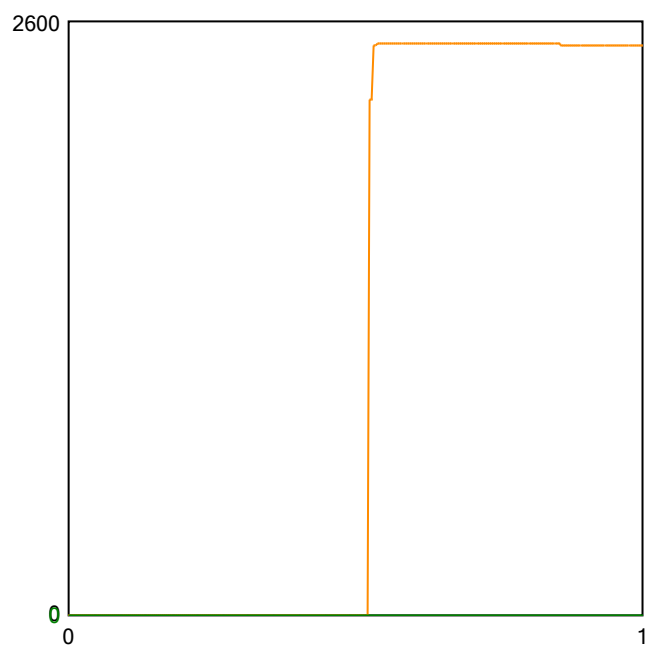
Picture



Sphere photometric measurement

Average flux : **1199** lumens

Maximum flux : **2508** lumens



Position in sphere :



Electrical measurement

● Secondary electrical measurement

Voltage : **46.56** V

Current : **0.350** A

Power : **16.30** Watt

→ LEDs light efficiency at thermal stabilization :

73.5 lm/W

74.9 lm/Led

→ LEDs light efficiency at 25° :

153.9 lm/W

156.8 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 16 LG 3535 Gen4 - Voltana 2 - pcb N°1/12 CTR du 2014/1005

Comment :

FORM-L-41 ED1 REV 0



226 - TEST

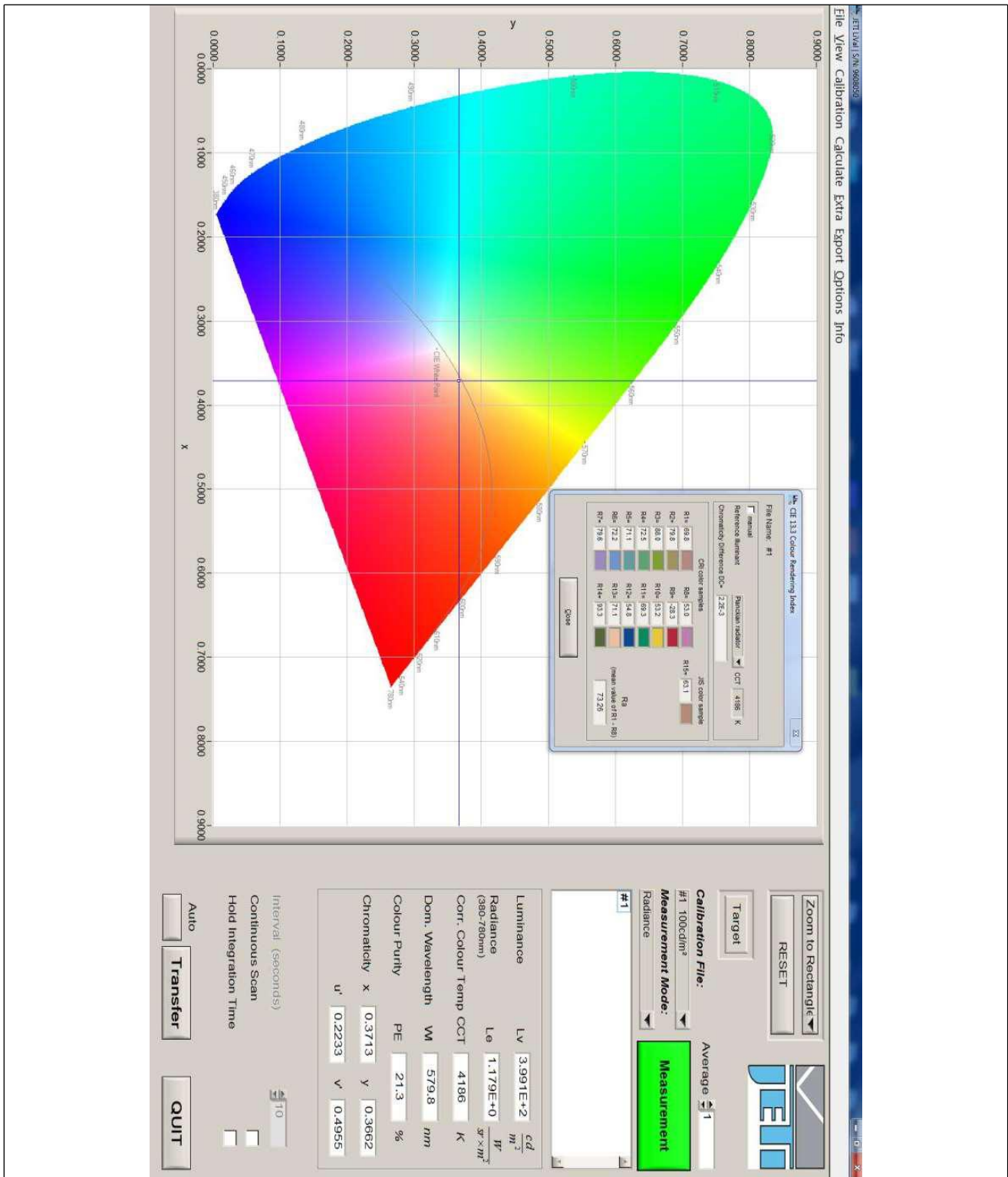
NBN EN ISO/IEC 17025 : 2005

Approved by :

LED 2015/1 2/3



Colorimetry



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 Schröder group.

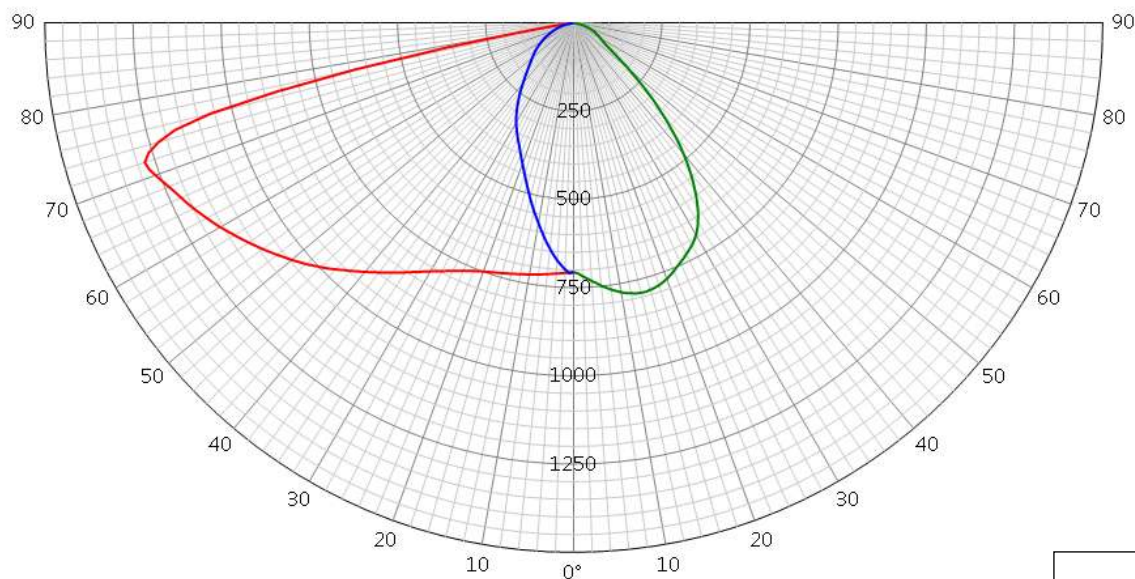
LED

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire VOLTANA 2		Request # FD35004	
Source							
Type LED	BIN Unknown	Trademark LG Innotek	Reference 3535 Gen4	# LEDs 16	Reflector 5102		
Master		Reflector					
		Led assembly Gaggione Medium 0,0°					No 5102
Protector Refractor Lens							
Protector Lens	Glass Extra Clear Flat Smooth Gaggione 5102 PMMA						
Laboratory observation							
VOLTANA 2 (serie 0) equipped with 16 LG 3535 Gen4 . Used flux for efficiency matrix calculation = 2508 lm - CCT= 4186K - CRI= 73,26 measured @ 350mA/25°C (see sphere test report 2015/1 on appendix).							
Purpose DOC				Sample date 13/06/2014		Sample # 34R142	
Observation							
DOC VOLTANA 2 with lenses 5102 flux coefficient multiplicator (only for efficiency matrix): From 350 to 500mA: 1,353 From 350 to 700mA: 1,777 From 350 to 1000mA: 2,333 Fixture powered @350/500/700mA by driver LG LLP 40W 0.7A 38/77Vdc model:PISE A040D Fixture powered @1000mA by driver LG LLP 55W 1A 44/55Vdc model:PISE A055A							
Asked by LMA	Measured by CL	Approved by LMA	Appendix 1	 226-TEST NBN EN ISO/IEC 17025 :2005		35605	

LUMINOUS INTENSITY DIAGRAM

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire VOLTANA 2		Request # FD35004
Source	Type LED	BIN Unknown	Trademark LG Innotek	Reference 3535 Gen4	# LEDs 16	Reflector 5102
Reflector	Led assembly Gaggione Medium 0,0°					No 5102
Matrices	356051 Φ 0-90° = 2147lm - 90-99° = 0lm					Absolute measurement
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 2 Lens 16 x Gaggione 5102 PMMA					
Observation	Matrix in total flux @350mA Light losses due to thermal stabilisation: 0,5 % Electrical measurement on LED (#1) : Voltage = 46,11 V Current = 0,350 A Power = 16,15 W Electrical measurement on driver (#1) : Voltage = 230,00 V Current = 0,100 A Power = 20,27 W PF = 0,844 Total luminaire power = 20,27 W : Lm/Watt = 105,91 lm/W Driver #1 : See observations for driver details 00-07-909 Rev.A					

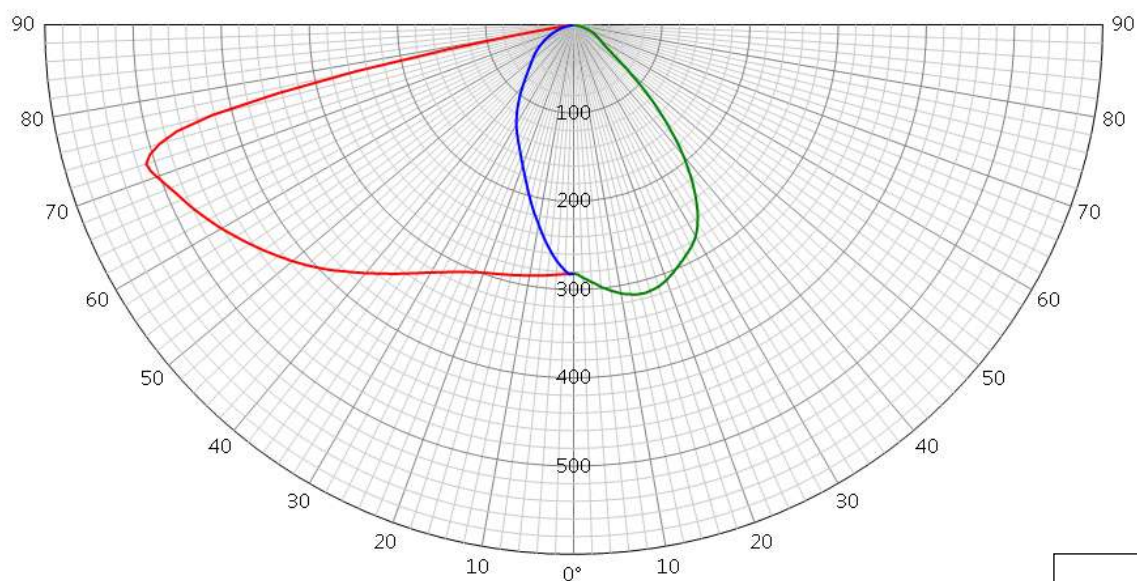
Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	
10 - 170	1279	72	G				
90	789	15	D				
270	709	1	G	706	25,0°	12/01/2015	

**35605**

LUMINOUS INTENSITY DIAGRAM

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire VOLTANA 2		Request # FD35004	
Source	Type LED	BIN Unknown	Trademark LG Innotek	Reference 3535 Gen4	# LEDs 16	Reflector 5102	
Reflector	Led assembly Gaggione Medium 0,0°					No	5102
Matrices	356052 η 0-90° = 85,6% - 90-99° = 0,0%					Relative measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 2 Lens 16 x Gaggione 5102 PMMA						
Observation	Matrix in efficiency @350mA Light losses due to thermal stabilisation: 0,5 % Electrical measurement on LED (#1) : Voltage = 46,11 V Current = 0,350 A Power = 16,15 W Electrical measurement on driver (#1) : Voltage = 230,00 V Current = 0,100 A Power = 20,27 W PF = 0,884 Total luminaire power = 20,27 W Driver #1 : See observations for driver details 00-07-909 Rev.A						

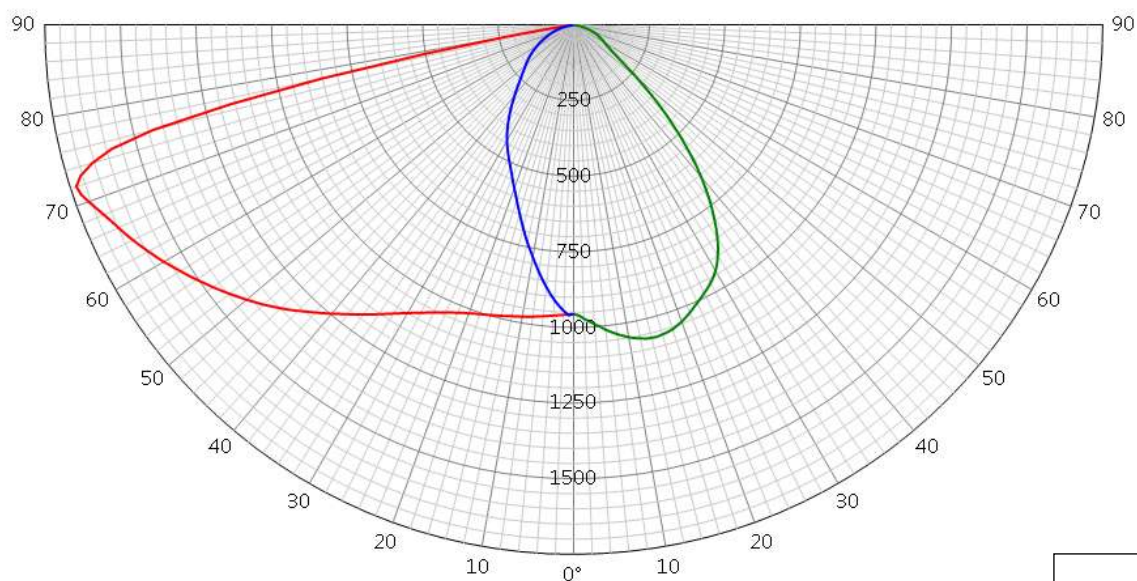
Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	
10 - 170	510	72	G				
90	314	15	D	282	25,0°	12/01/2015	
270	283	1	G				

**35605**

LUMINOUS INTENSITY DIAGRAM

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire VOLTANA 2		Request # FD35004	
Source	Type LED	BIN Unknown	Trademark LG Innotek	Reference 3535 Gen4	# LEDs 16	Reflector 5102	
Reflector	Led assembly Gaggione Medium 0,0°					No	5102
Matrices	356053 Φ 0-90° = 2905lm - 90-99° = 0lm					Absolute measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 2 Lens 16 x Gaggione 5102 PMMA						
Observation	Matrix in total flux @500mA Light losses due to thermal stabilisation: 0,75 % Electrical measurement on LED (#1) : Voltage = 47,14 V Current = 0,500 A Power = 23,56 W Electrical measurement on driver (#1) : Voltage = 230,00 V Current = 0,131 A Power = 27,17 W PF = 0,935 Total luminaire power = 27,17 W : Lm/Watt = 106,90 lm/W Driver #1 : See observations for driver details 00-07-909 Rev.A						

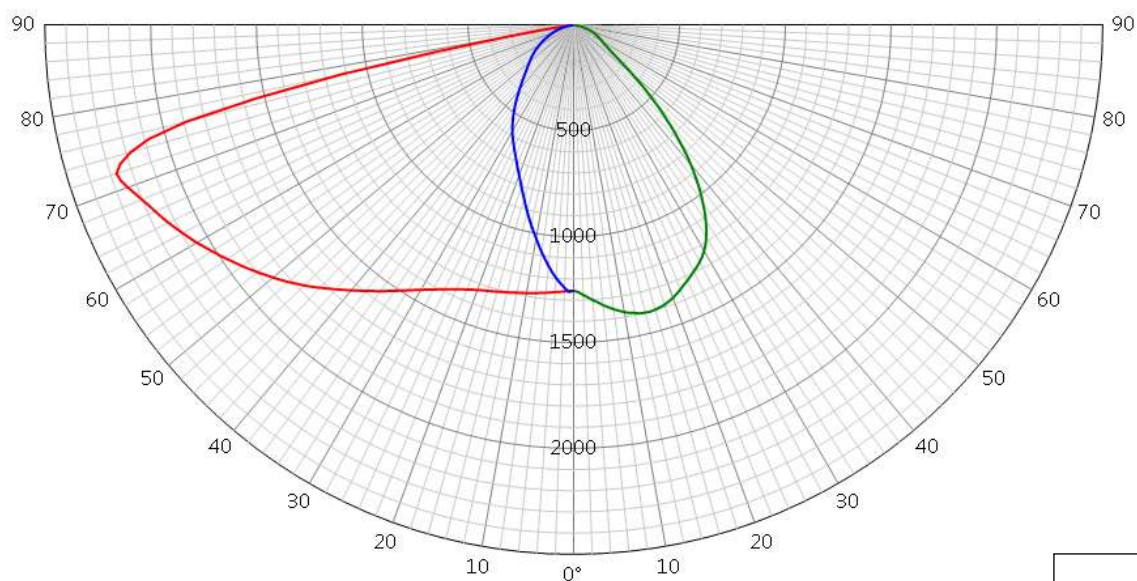
Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	
10 - 170	1731	72	G				
90	1067	15	D				
270	960	1	G	955	25,0°	12/01/2015	

**35605**

LUMINOUS INTENSITY DIAGRAM

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire VOLTANA 2		Request # FD35004
Source	Type LED	BIN Unknown	Trademark LG Innotek	Reference 3535 Gen4	# LEDs 16	Reflector 5102
Reflector	Led assembly Gaggione Medium 0,0°					No 5102
Matrices	356054 Φ 0-90° = 3815lm - 90-99° = 0lm					Absolute measurement
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 2 Lens 16 x Gaggione 5102 PMMA					
Observation	Matrix in total flux @700mA Light losses due to thermal stabilisation: 1,5 % Electrical measurement on LED (#1): Voltage = 48,38 V Current = 0,700 A Power = 33,85 W Electrical measurement on driver (#1): Voltage = 230,00 V Current = 0,177 A Power = 39,23 W PF = 0,965 Total luminaire power = 39,23 W : Lm/Watt = 97,24 lm/W Driver #1 : See observations for driver details 00-07-909 Rev.A					

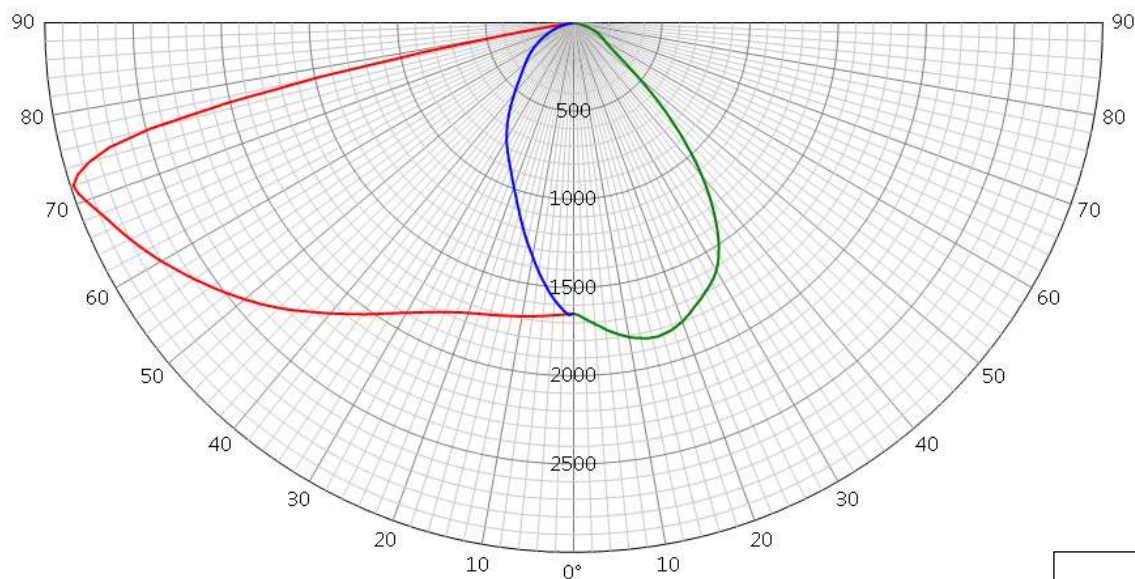
Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	
10 - 170	2273	72	G				
90	1401	15	D	1255	25,0°	12/01/2015	
270	1261	1	G				

**35605**

LUMINOUS INTENSITY DIAGRAM

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire VOLTANA 2		Request # FD35004	
Source	Type LED	BIN Unknown	Trademark LG Innotek	Reference 3535 Gen4	# LEDs 16	Reflector 5102	
Reflector	Led assembly Gaggione Medium 0,0°					No	5102
Matrices	356055 Φ 0-90° = 5008lm - 90-99° = 0lm					Absolute measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 2 Lens 16 x Gaggione 5102 PMMA						
Observation	Matrix in total flux @1000mA Light losses due to thermal stabilisation: 2,5 % Electrical measurement on LED (#1) : Voltage = 50,13 V Current = 1,000 A Power = 50,11 W Electrical measurement on driver (#1) : Voltage = 230,00 V Current = 0,259 A Power = 57,56 W PF = 0,963 Total luminaire power = 57,56 W : Lm/Watt = 87,01 lm/W Driver #1 : See observations for driver details 00-07-909 Rev.A						

Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	
10 - 170	2984	72	G				
90	1840	15	D	1648	25,0°	12/01/2015	
270	1655	1	G				

**35605**

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 50Hz 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%

35605

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)

35605

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 Schröder group.

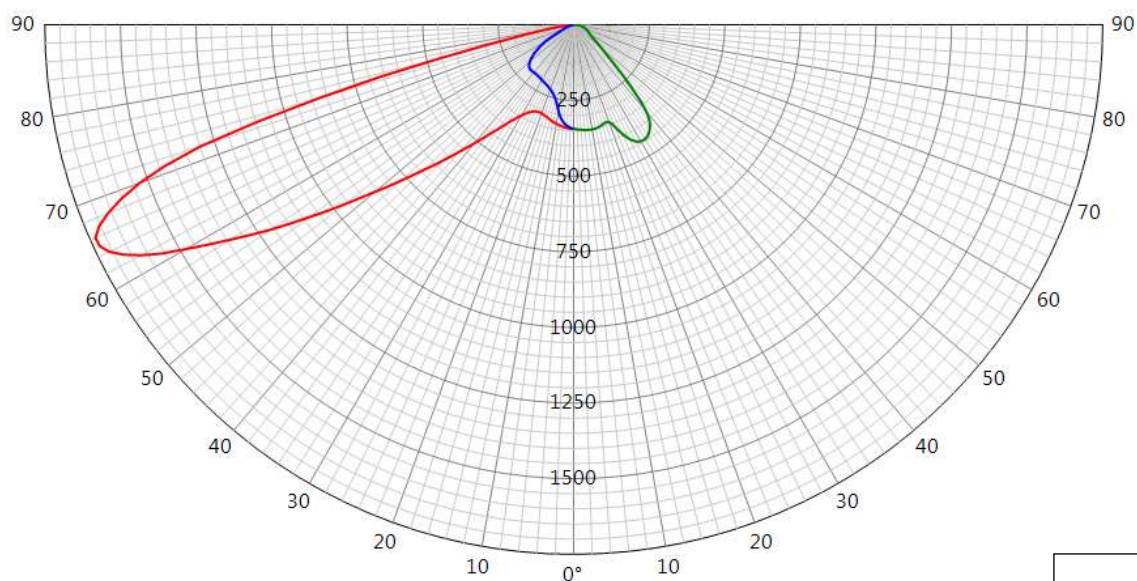
LED

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire SKIDO		Request # FD35100	
Type LED	BIN SM575D320R70	Source Trademark Nichia	Reference NVSW219CT	# LEDs 6	Reflector 5122		
Master		Reflector Keselec Schreder Pvt. Ltd India Led assembly Road lighting Assembled 0.0°				No 5122	
Protector Refractor Lens Protector PC Lum. shape-related Smooth Lens Schreder 5122 PC							
Laboratory observation SKIDO V2 with 6 NICHIA NVSW219CT. Used flux for efficiency matrix calculation = 1010 lm - CCT = 5400 K - CRI = 75.45 (see sphere test report 2015/1103 on appendix).							
Purpose DOC				Sample date 16/07/2015		Sample # 35R194	
Observation DOC SKIDO V2 with Nichia NVSW219CT. Matrix 1 : fixture powered with driver MEAN WELL PLD-16-700B (Uout: 16-24VDC Iout: 700mA) NOTE: this driver delivers 716mA. Matrix 2 : fixture powered with driver MEAN WELL PLD-25-1050 (Uout: 16-24VDC Iout: 1050mA) NOTE: this driver delivers 1096mA. Matrix 3 : DC Power supply for efficiency @350mA							
Asked by LMA		Measured by CL		Approved by LMA		Appendix 1	
 226-TEST NBN EN ISO/IEC 17025 : 2005						36920	

LUMINOUS INTENSITY DIAGRAM

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire SKIDO		Request # FD35100
Source	Type LED	BIN SM575D320R70	Trademark Nichia	Reference NVSW219CT	# LEDs 6	Reflector 5122
Reflector	Keselec Schreder Pvt. Ltd India Led assembly Road lighting Assembled 0.0°					No 5122
Matrices	369201 Φ 0-90° = 1542lm - 90-99° = 0lm					Absolute measurement
Protector Refractor Lens	Protector PC Lum. shape-related Smooth - SKIDO Lens 6 x Schreder 5122 PC					
Observation	Matrix in total flux @700mA I led measured : 716 mA Light losses due to thermal stabilization : 1,9 % Electrical measurement on LED (#1): Voltage = 17.46 V Current = 0.716 A Power = 12.27 W Electrical measurement on driver (#1): Voltage = 230.00 V Current = 0.065 A Power = 14.50 W PF = 0.959 Total luminaire power = 14.50 W : Lm/Watt = 106.37 lm/W Driver #1 : See observations for driver details - PCB Réf.: 7000877-001-Rev.D					

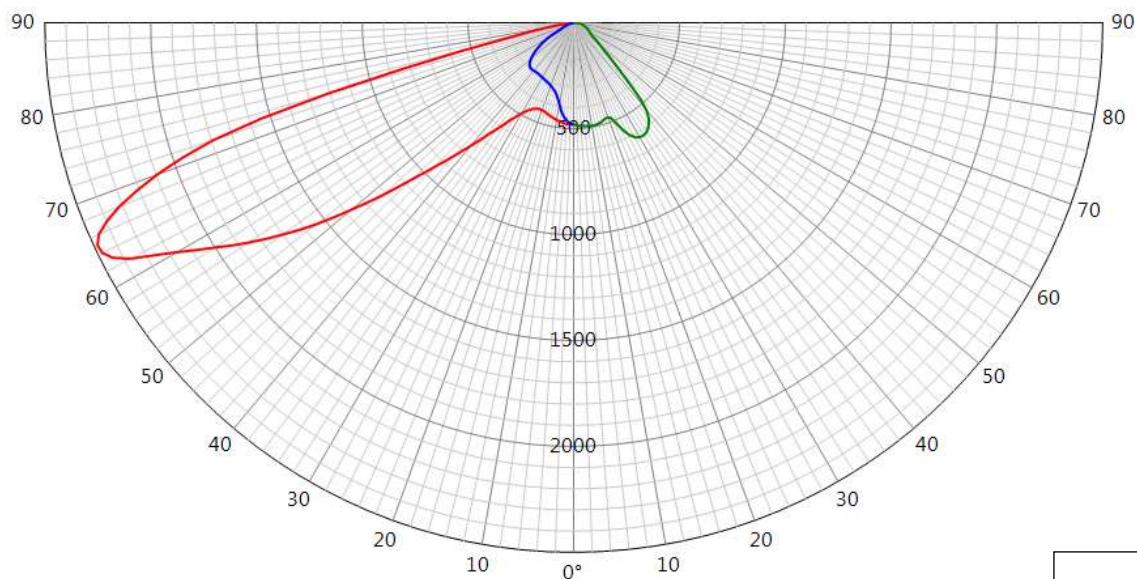
Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	
10 - 170	1733	66	G				
90	445	31	D	342	25.0°	23/07/2015	
270	343	1	G				

**36920**

LUMINOUS INTENSITY DIAGRAM

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire SKIDO		Request # FD35100
Source	Type LED	BIN SM575D320R70	Trademark Nichia	Reference NVSW219CT	# LEDs 6	Reflector 5122
Reflector	Keselec Schreder Pvt. Ltd India Led assembly Road lighting Assembled 0.0°					No 5122
Matrices	369202 Φ 0-90° = 2137lm - 90-99° = 0lm					Absolute measurement
Protector Refractor Lens	Protector PC Lum. shape-related Smooth - SKIDO Lens 6 x Schreder 5122 PC					
Observation	Matrix in total flux @1000mA I led measured : 1096 mA Light losses due to thermal stabilization : 2,7 % Electrical measurement on LED (#1): Voltage = 17.91 V Current = 1.096 A Power = 19.14 W Electrical measurement on driver (#1): Voltage = 230.00 V Current = 0.104 A Power = 22.86 W PF = 0.953 Total luminaire power = 22.86 W : Lm/Watt = 93.46 lm/W Driver #1 : See observations for driver details - PCB Réf.: 7000877-001-Rev.D					

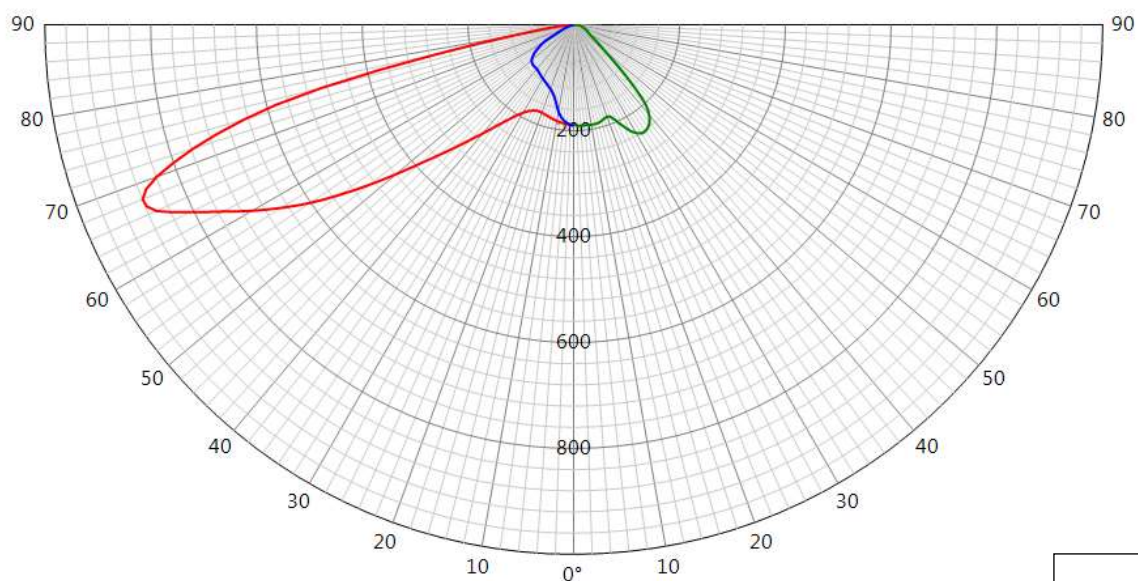
Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	
15 - 165	2485	65	G				
90	624	31	D	479	25.0°	23/07/2015	
270	479	1	G				

**36920**

LUMINOUS INTENSITY DIAGRAM

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire SKIDO		Request # FD35100
Source	Type LED	BIN SM575D320R70	Trademark Nichia	Reference NVSW219CT	# LEDs 6	Reflector 5122
Reflector	Keselec Schreder Pvt. Ltd India Led assembly Road lighting Assembled 0.0°					No 5122
Matrices	369203 η 0-90° = 85.1% - 90-99° = 0.0%					Relative measurement
Protector Refractor Lens	Protector PC Lum. shape-related Smooth - SKIDO Lens 6 x Schreder 5122 PC					
Observation	Matrix in efficiency @350mA. Electrical measurement on LED (#1) : Voltage = 16.86 V Current = 0.350 A Power = 5.90 W Driver #1 : See observations for driver details - PCB Réf.: 7000877-001-Rev.D					

Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	
15 - 165	879	68	G				
90	242	33	D	188	25.0°	26/08/2015	
270	190	1	G				

**36920**

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 50Hz 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%

36920

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)

36920

LED Flux measurement

FORM-L-41 ED1 REV 0

Date : **26/08/2015**

Operator : **AU**

Filename : **2015_1103.xml**



226 - TEST

LEDs

NBN EN ISO/IEC 17025 : 2005

Trademark : **Nichia**

Entry number : **35R194**

Type : **NVSW219CT**

Power (Catalogue) : **1.01** W

BIN Description : **SM575D320R70**

Flux : **176** lm/LED

Part number : **Unknown**

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

Number of LEDs : **6**

Lenses

Trademark : **None**

Type : **None**

Power & Print

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

Print description : **7000877-001 REV. D**

Active ☐

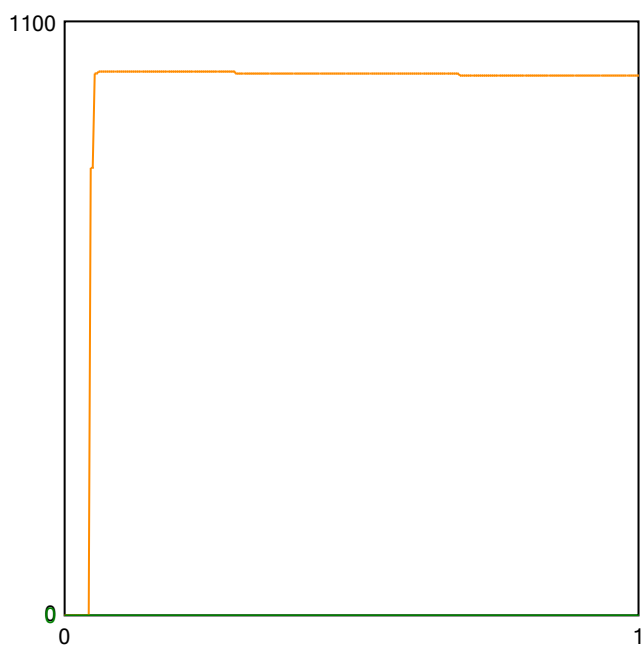
Picture



Sphere photometric measurement

Average flux : **957** lumens

Maximum flux : **1010** lumens



Position in sphere :



Electrical measurement

● Secondary electrical measurement

Voltage : **17.00** V

Current : **0.350** A

Power : **5.95** Watt

→ LEDs light efficiency at thermal stabilization :

160.8 lm/W

159.5 lm/Led

→ LEDs light efficiency at 25° :

169.7 lm/W

168.3 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 :

PCB from Skido PH36920

Comment :

FORM-L-41 ED1 REV 0



226 - TEST

NBN EN ISO/IEC 17025 : 2005

Approved by :

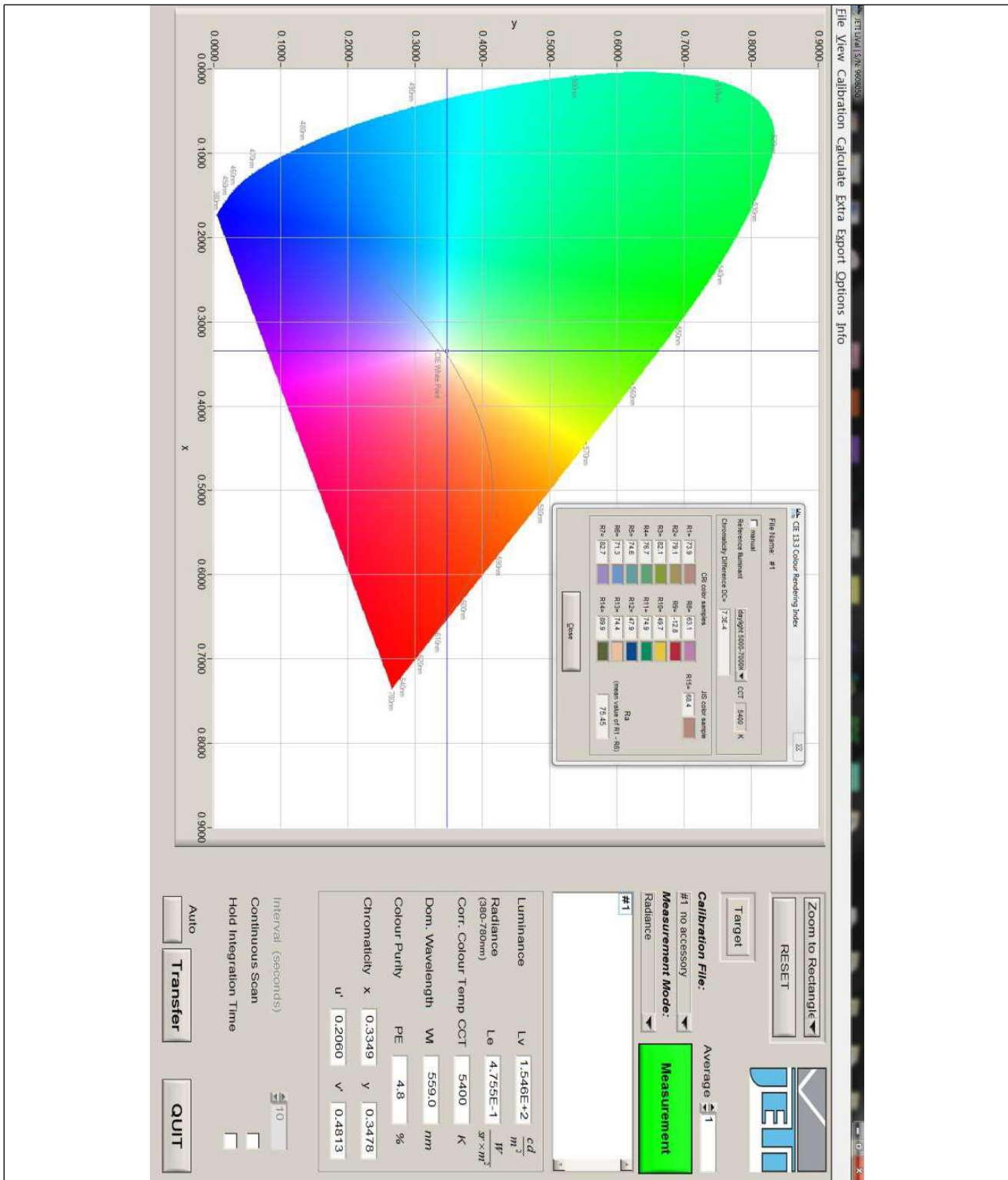
LED 2015/1103 2/3



226 - TEST

NBN EN ISO/IEC 17025 : 2005

Colorimetry



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 Schröder group.

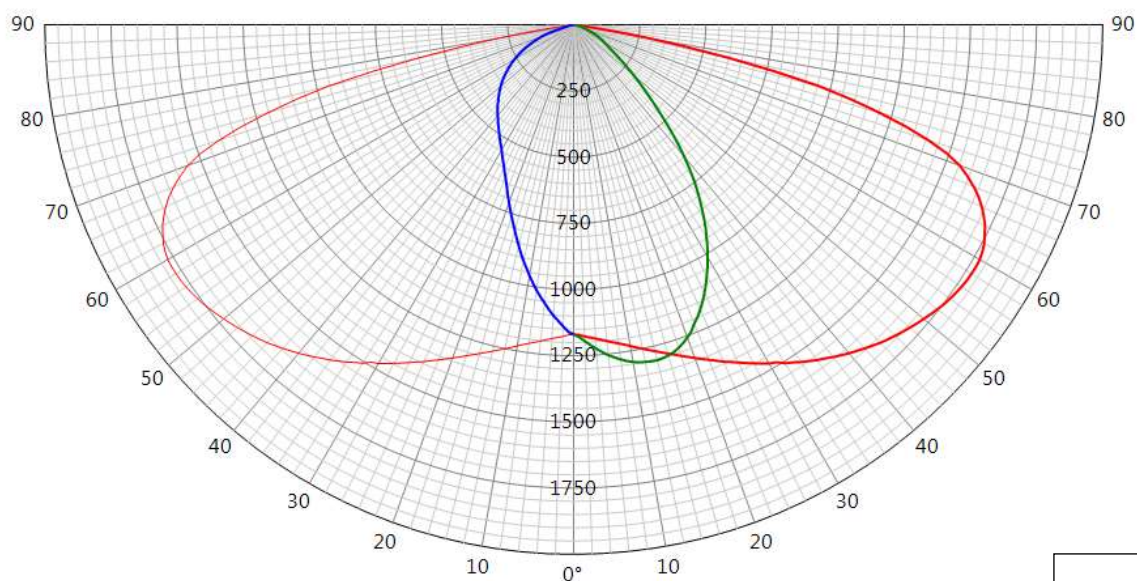
LED

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire VOLTANA 3		Request # FD36102	
Source							
Type LED	BIN Unknown	Trademark LG Innotek	Reference 3535 G4L	# LEDs 24	Reflector 5147		
Master		Reflector				No 5147	
Gaggione Led assembly Road lighting Assembled 0.0°							
Protector Refractor Lens							
Protector Glass Extra Clear Flat Smooth Lens Gaggione 5147 MS1002							
Laboratory observation							
VOLTANA 3 with 24 LG 3535 G4-L. Used flux for efficiency matrix calculation = 4230 lm - CCT = 4042 K - CRI = 72.80 (see sphere test report 2016/375 on appendix).							
Purpose DOC				Sample date 13/06/2014		Sample # 34R143	
Observation							
DOC VOLTANA 3 with 24 LG G4L and lenses 5147MS1002.							
Flux coefficient multiplicator (only for efficiency matrix): From 350 to 500 mA : 1,386 From 350 to 700 mA : 1,872 From 350 to 1000 mA : 2,534 From 350 to 1200mA : 2,931 From 350 to 1400mA : 3.294							
Fixture powered @350/500/700mA with 1 driver Philips Xitanium FP 75W 0.3-1.0A SNLDAE 230V S240 sXt (DALI) Fixture powered @1000mA with 1 driver Philips Xitanium FP 150W 0.3-1.0A SNLDAE 230V S240 sXt (DALI) Fixture powered @1200/1400mA with DC power supply Delta Elektronika.							
Asked by LME		Measured by FCE		Approved by LME		Appendix 1	
						226-TEST NBN EN ISO/IEC 17025 : 2005	
38991							

LUMINOUS INTENSITY DIAGRAM

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire VOLTANA 3		Request # FD36102	
Source	Type LED	BIN Unknown	Trademark LG Innotek	Reference 3535 G4L	# LEDs 24	Reflector 5147	
Reflector	Gaggione Led assembly Road lighting Assembled 0.0°					No	5147
Matrices	389911 Φ 0-90° = 3612lm - 90-99° = 0lm					Absolute measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 3 Lens 24 x Gaggione 5147 MS1002						
Observation	Matrix in total flux @350 mA Light losses due to thermal stabilisation : 2% Electrical measurement on LED (#1) : Voltage = 66.31 V Current = 0.350 A Power = 23.21 W Electrical measurement on driver (#1) : Voltage = 230.00 V Current = 0.125 A Power = 26.80 W PF = 0.930 Total luminaire power = 26.80 W : Lm/Watt = 134.78 lm/W Driver #1 : See observations for driver details - PCB LLRMADC-76N*O**						

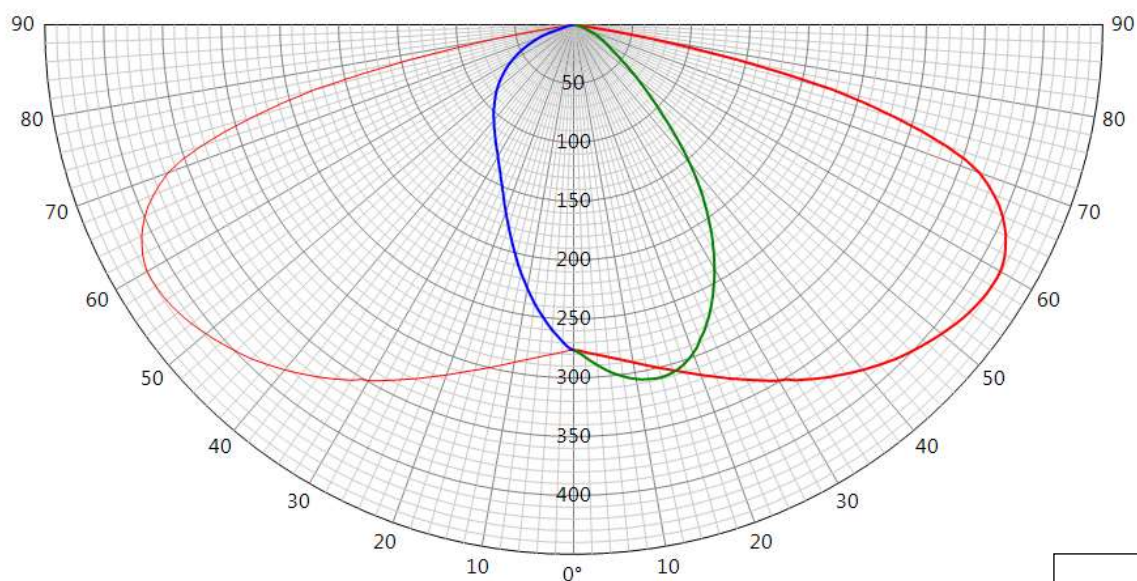
Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	
15 - 165	1774	59	S				
90	1305	14	D	1169	25.0°	05/08/2016	
270	1169	0	G				

**38991**

LUMINOUS INTENSITY DIAGRAM

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire VOLTANA 3		Request # FD36102	
Source	Type LED	BIN Unknown	Trademark LG Innotek	Reference 3535 G4L	# LEDs 24	Reflector 5147	
Reflector	Gaggione Led assembly Road lighting Assembled 0.0°					No	5147
Matrices	389912 η 0-90° = 85.4% - 90-99° = 0.0%					Relative measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 3 Lens 24 x Gaggione 5147 MS1002						
Observation	Matrix in efficiency @350 mA Light losses due to thermal stabilisation : 2% Electrical measurement on LED (#1) : Voltage = 66.31 V Current = 0.350 A Power = 23.21 W Electrical measurement on driver (#1) : Voltage = 230.00 V Current = 0.125 A Power = 26.80 W PF = 0.930 Total luminaire power = 26.80 W Driver #1 : See observations for driver details - PCB LLRMADC-76N*O**						

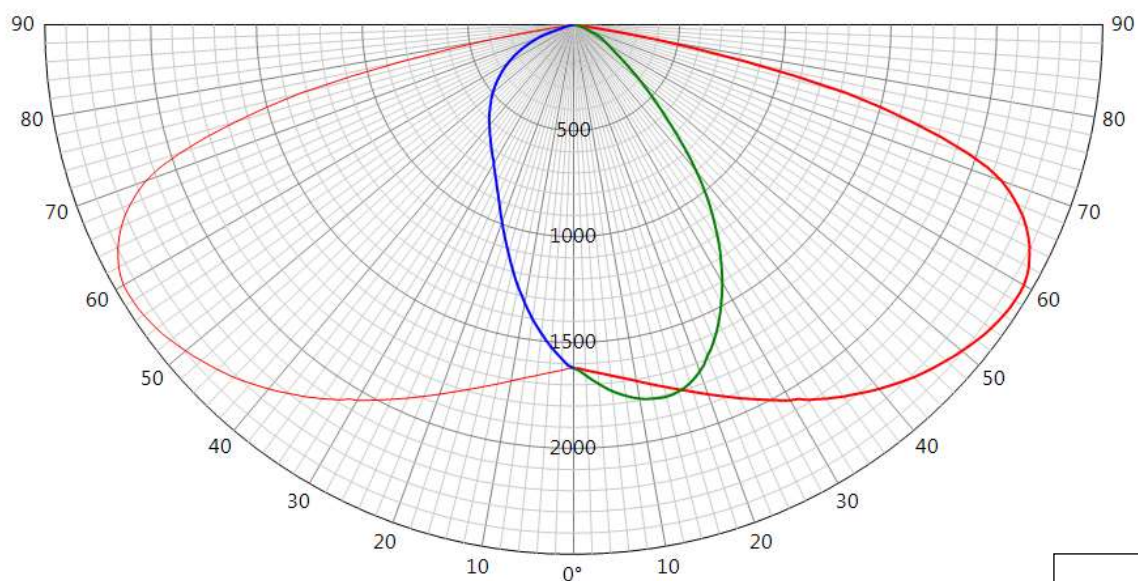
Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	
15 - 165	419	59	S				
90	309	14	D	276	25.0°	05/08/2016	
270	276	0	G				

**38991**

LUMINOUS INTENSITY DIAGRAM

Origin Tungram-Schröder Plc. Hungary		Production Tungram-Schröder Plc. Hungary		Luminaire VOLTANA 3		Request # FD36102
Source	Type LED	BIN Unknown	Trademark LG Innotek	Reference 3535 G4L	# LEDs 24	Reflector 5147
Reflector	Gaggione Led assembly Road lighting Assembled 0.0°					No 5147
Matrices	389913 Φ 0-90° = 5006lm - 90-99° = 0lm					Absolute measurement
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 3 Lens 24 x Gaggione 5147 MS1002					
Observation	Matrix in total flux @500 mA Light losses due to thermal stabilisation : 2,2% Electrical measurement on LED (#1): Voltage = 67.10 V Current = 0.500 A Power = 33.60 W Electrical measurement on driver (#1): Voltage = 230.00 V Current = 0.170 A Power = 37.50 W PF = 0.959 Total luminaire power = 37.50 W : Lm/Watt = 133.50 lm/W Driver #1 : See observations for driver details - PCB LLRMADC-76N*O**					

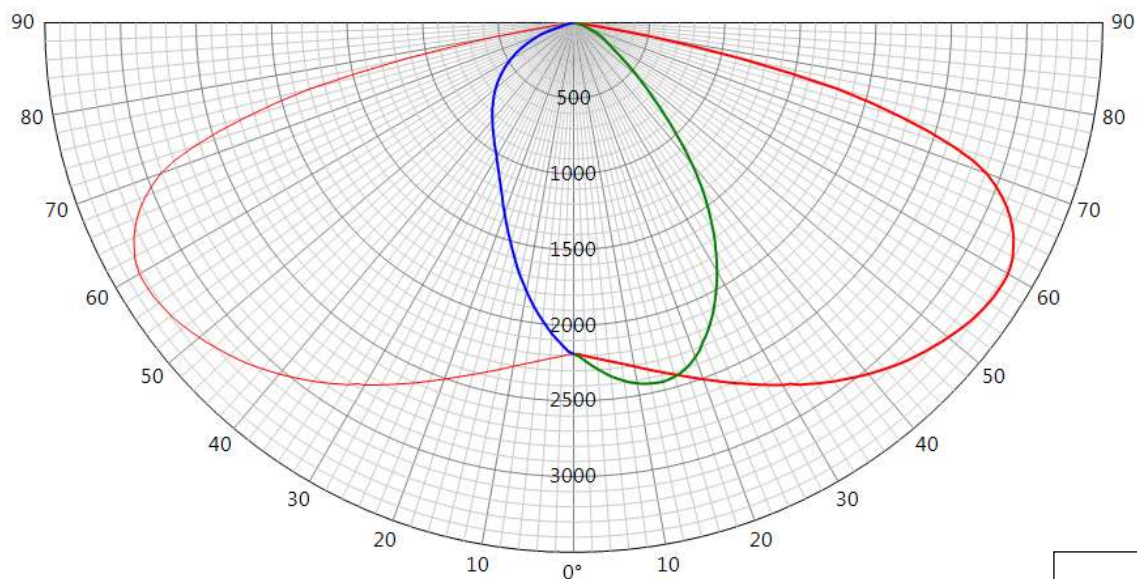
Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	
15 - 165	2459	59	S				
90	1809	14	D	1620	25.0°	17/08/2016	
270	1620	0	G				

**38991**

LUMINOUS INTENSITY DIAGRAM

Origin Tungsräm-Schröder Plc. Hungary		Production Tungsräm-Schröder Plc. Hungary		Luminaire VOLTANA 3		Request # FD36102
Source	Type LED	BIN Unknown	Trademark LG Innotek	Reference 3535 G4L	# LEDs 24	Reflector 5147
Reflector	Gaggione Led assembly Road lighting Assembled 0.0°					No 5147
Matrices	389914 Φ 0-90° = 6762lm - 90-99° = 0lm					Absolute measurement
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 3 Lens 24 x Gaggione 5147 MS1002					
Observation	Matrix in total flux @700 mA Light losses due to thermal stabilisation : 2.7% Electrical measurement on LED (#1) : Voltage = 67.99 V Current = 0.700 A Power = 47.57 W Electrical measurement on driver (#1) : Voltage = 230.00 V Current = 0.232 A Power = 52.20 W PF = 0.976 Total luminaire power = 52.20 W : Lm/Watt = 129.54 lm/W Driver #1 : See observations for driver details - PCB LLRMADC-76N*O**					

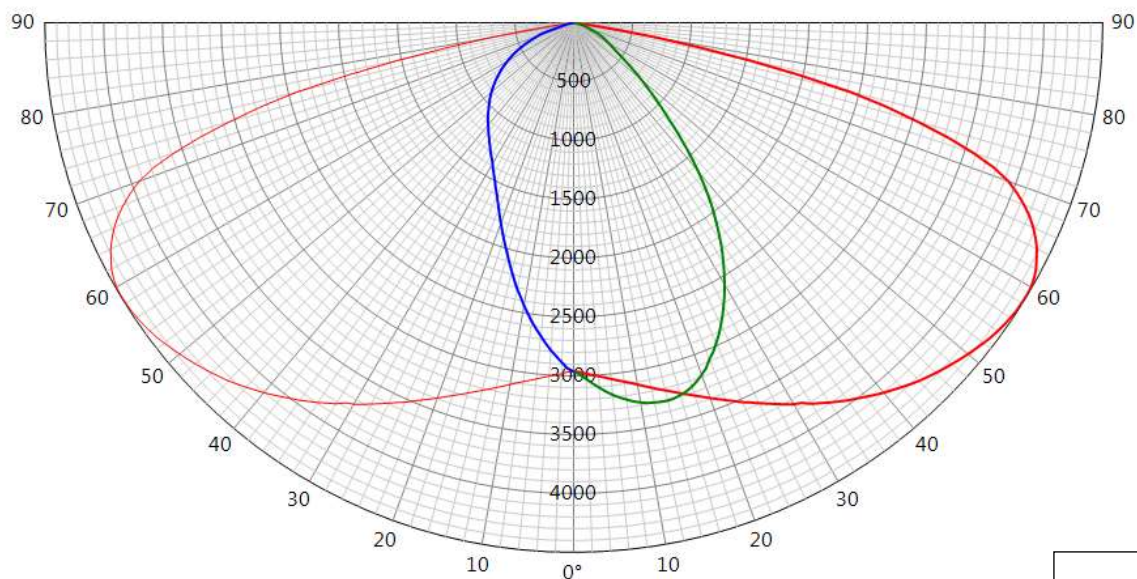
Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	
15 - 165	3321	59	S				
90	2444	14	D	2189	25.0°	17/08/2016	
270	2189	0	G				

**38991**

LUMINOUS INTENSITY DIAGRAM

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire VOLTANA 3		Request # FD36102	
Source	Type LED	BIN Unknown	Trademark LG Innotek	Reference 3535 G4L	# LEDs 24	Reflector 5147	
Reflector	Gaggione Led assembly Road lighting Assembled 0.0°					No	5147
Matrices	389915 Φ 0-90° = 9153lm - 90-99° = 0lm					Absolute measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 3 Lens 24 x Gaggione 5147 MS1002						
Observation	Matrix in total flux @1000 mA Light losses due to thermal stabilisation : 3.8% Electrical measurement on LED (#1) : Voltage = 69.22 V Current = 1.000 A Power = 69.21 W Electrical measurement on driver (#1) : Voltage = 230.00 V Current = 0.344 A Power = 77.00 W PF = 0.972 Total luminaire power = 77.00 W : Lm/Watt = 118.87 lm/W Driver #1 : See observations for driver details - PCB LLRMADC-76N*O**						

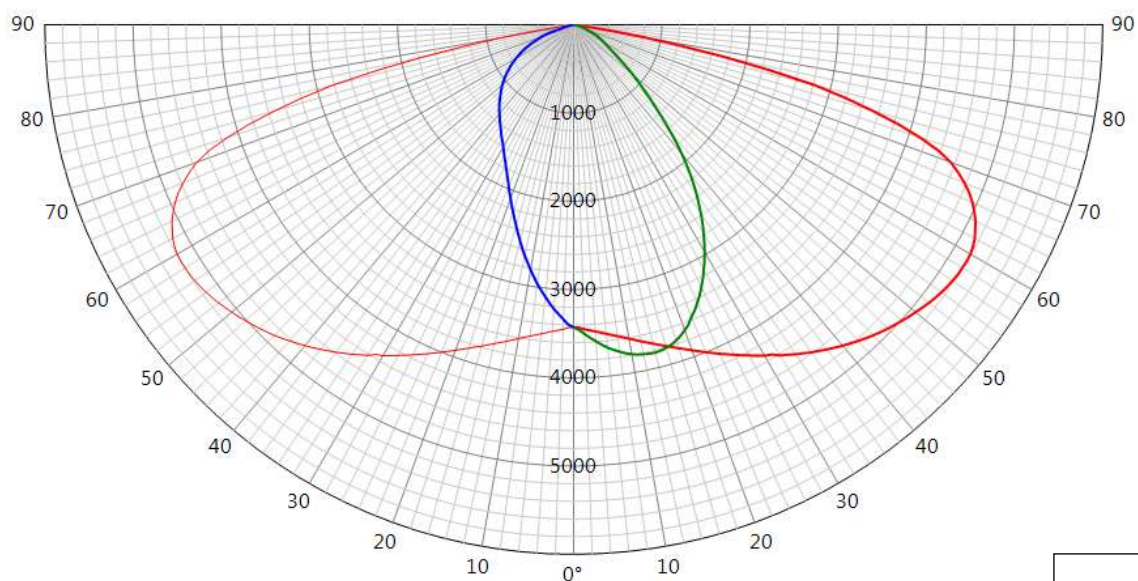
Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	
15 - 165	4496	59	S				
90	3308	14	D	2962	25.0°	17/08/2016	
270	2962	0	G				

**38991**

LUMINOUS INTENSITY DIAGRAM

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire VOLTANA 3		Request # FD36102	
Source	Type LED	BIN Unknown	Trademark LG Innotek	Reference 3535 G4L	# LEDs 24	Reflector 5147	
Reflector	Gaggione Led assembly Road lighting Assembled 0.0°					No	5147
Matrices	389916 Φ 0-90° = 10587lm - 90-99° = 0lm					Absolute measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 3 Lens 24 x Gaggione 5147 MS1002						
Observation	Matrix in total flux @1200 mA Light losses due to thermal stabilisation : 4.7% Electrical measurement on LED (#1) : Voltage = 69.83 V Current = 1.200 A Power = 83.80 W Driver #1 : See observations for driver details - PCB LLRMADC-76N*O**						

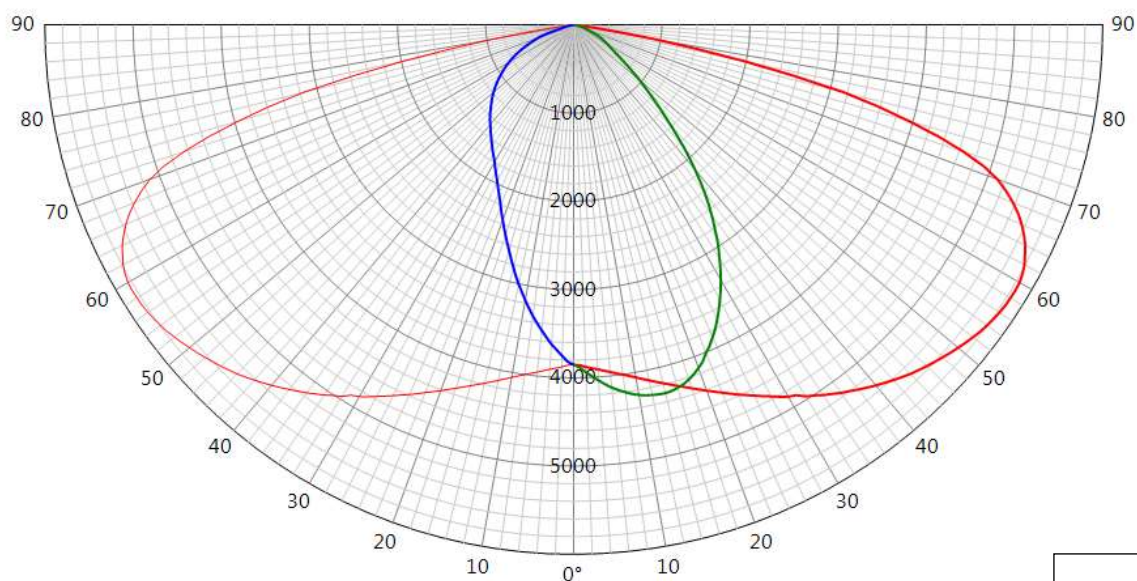
Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	
15 - 165	5200	59	S				
90	3826	14	D	3427	25.0°	18/08/2016	
270	3427	0	G				

**38991**

LUMINOUS INTENSITY DIAGRAM

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire VOLTANA 3		Request # FD36102	
Source	Type LED	BIN Unknown	Trademark LG Innotek	Reference 3535 G4L	# LEDs 24	Reflector 5147	
Reflector	Gaggione Led assembly Road lighting Assembled 0.0°					No	5147
Matrices	389917 Φ 0-90° = 11898lm - 90-99° = 0lm					Absolute measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 3 Lens 24 x Gaggione 5147 MS1002						
Observation	Matrix in total flux @1400 mA Light losses due to thermal stabilisation : 6.5% Electrical measurement on LED (#1) : Voltage = 70.50 V Current = 1.400 A Power = 98.70 W Driver #1 : See observations for driver details - PCB LLRMADC-76N*O**						

Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	
15 - 165	5844	59	S				
90	4300	14	D	3851	25.0°	18/08/2016	
270	3851	0	G				

**38991**

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 50Hz 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%

38991

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)

38991

VOLTANA 2

5102

Optic	5102
Protector	Flat, Glass Extra Clear, Smooth
Source	16 LG Innotek 3535 Gen4
Matrix	356052



Features

Long lasting performance and significant savings

- Cost-effective and efficient lighting solution for a fast return on investment
- LensoFlex®2 photometric engine with photometry adapted to various applications
- 5 sizes for flexibility
- Designed to incorporate Owllet control and sensor solutions
- ThermiX®: withstands high temperatures (Ta 50°C)
- Mounting : side entry (42-60 mm) with inclination steps -10° to +5°
- Surge protection 10kV (optional)

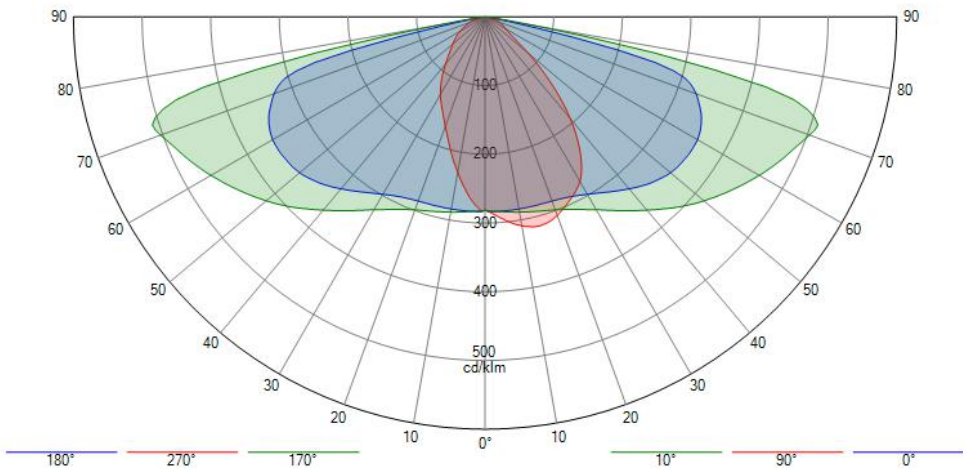
Types of application

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

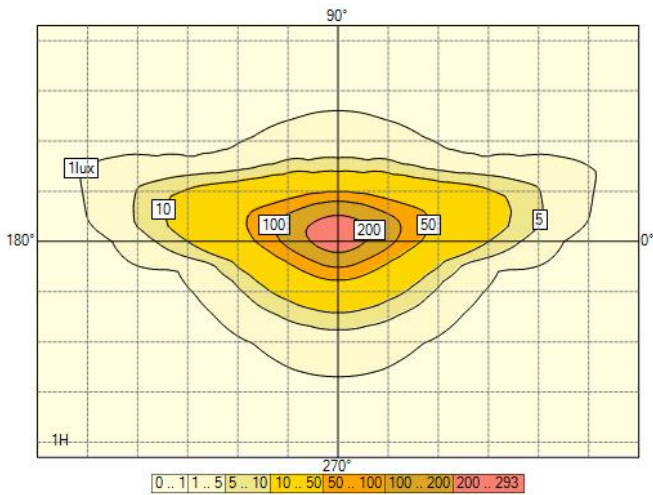
Information for 1000 lm matrix

Efficacy (%)	85.6	G Class (EN 13201-2)	G2	I 70-80-90-95 (cd)	503 - 109 - X - X
ULOR (%)	0.0	I_{max} (cd)	510		
DLOR (%)	85.6	Aperture 0-180°	75 - 75		
UWLR (%)	0.0	Aperture 90-270°	33 - 6		

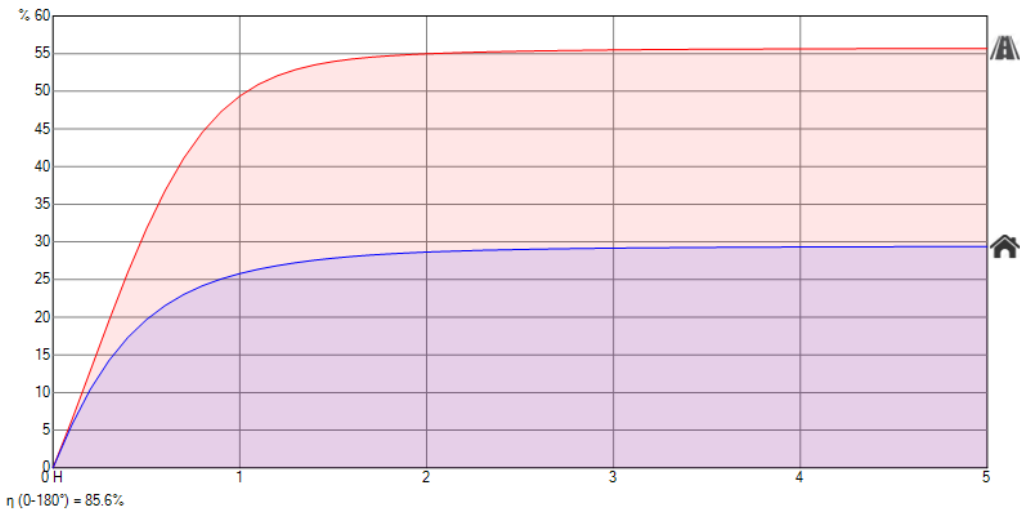
Polar/Cartesian diagram



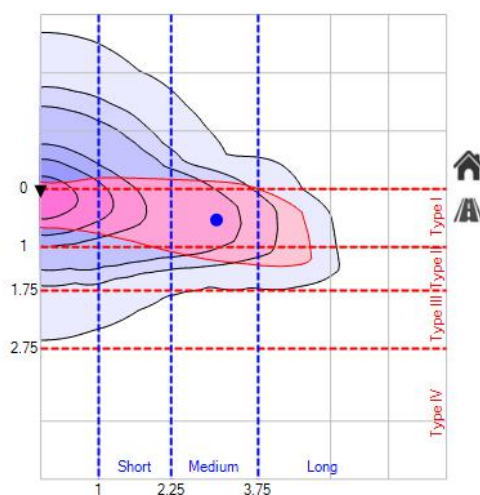
Isolux



K-Curve

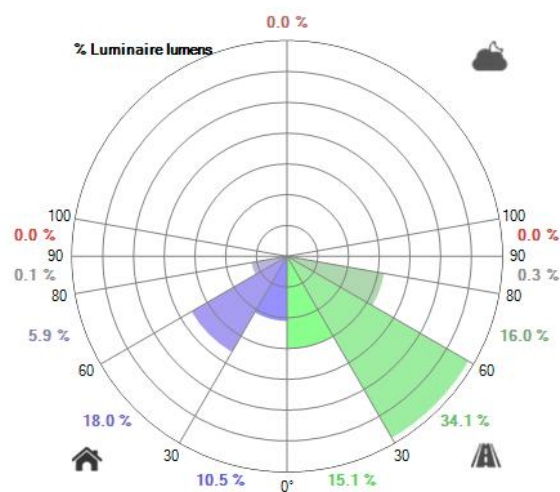


IES Roadway Classification / Nema Classification

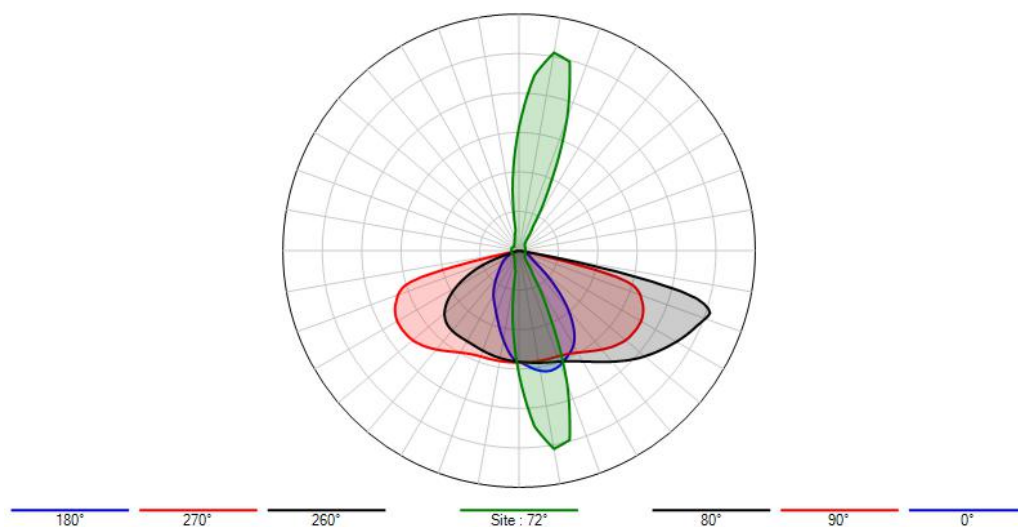


II - Medium

Luminaire classification system (LCS)



Intensity diagram in max Cone and in CPlane



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<http://www.schreder.com>

VOLTANA 3

5147

Optic	5147
Protector	Flat, Glass Extra Clear, Smooth
Source	24 LG Innotek 3535 G4L
Matrix	389912



Characteristics

							
655	518	240	7.5	IP 66	IK 08	I EU, II EU	0.021
Length (mm)	Width (mm)	Height (mm)	Weight (kg)	Tightness level*	Impact resistance*	Electrical class*	CxS (m ²)

* According to IEC-EN60598 and IEC-EN62262

Features

Entry Level cost-effective luminaire family

- Cost-effective and efficient lighting solution for a fast return on investment
- LensoFlex®2 photometric engine with photometry adapted to various applications
- 5 sizes for flexibility
- Designed to incorporate Owllet control and sensor solutions
- ThermiX®: withstands high temperatures (Ta 50°C)
- Mounting : side entry (42-60 mm) with inclination steps -10° to +5°
- Surge protection 10kV (optional)

Types of application

- Square and park
- Bridge
- Park
- Roundabout
- Car park
- Road and highway
- Residential road
- Bike path
- Urban road

Information for 1000 lm matrix

Efficacy (%)	85.4	G Class (EN 13201-2)	G4	Aperture 90-270°	34 - 13
DLOR (%)	85.4	G* (EN 13201 2015)	G*4	I 70-80-90-95 (cd)	379 - 67 - X - X
ULOR (%)	0.0	Imax (cd)	419		
UWLR (%)	0.0	Aperture 0-180°	76 - 76		

Photometrical characteristics

LED count	Colour code	Colour name	CCT	CRI	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°						
24	WW	Warm White	3000	80	350	28	3768	3218	115	1580	B1 U0 G1	230
24	WW	Warm White	3000	80	500	39	5238	4473	115	2197	B1 U0 G1	230
24	WW	Warm White	3000	80	700	56	7046	6017	107	2955	B2 U0 G1	230
24	WW	Warm White	3000	80	1000	83	9533	8141	98	3999	B2 U0 G2	230
24	NW	Neutral White	4000	70	350	28	4296	3669	131	1802	B1 U0 G1	230
24	NW	Neutral White	4000	70	500	39	5971	5099	131	2505	B2 U0 G1	230
24	NW	Neutral White	4000	70	700	56	8034	6860	123	3370	B2 U0 G2	230
24	NW	Neutral White	4000	70	1000	83	10869	9281	112	4559	B3 U0 G2	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

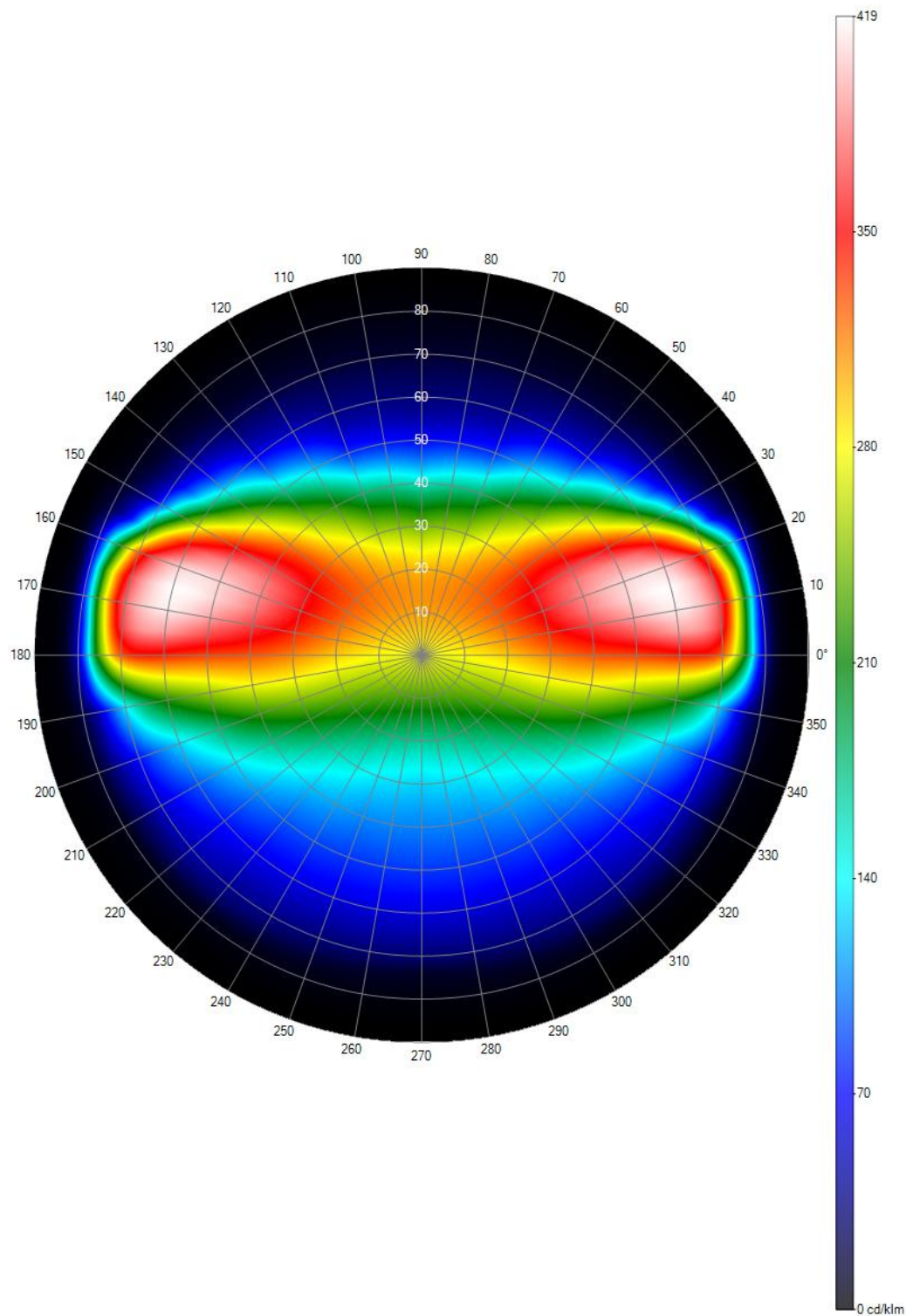
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- ROHS
- Certified for 3G vibration
- All measurements in ISO17025 accredited laboratory

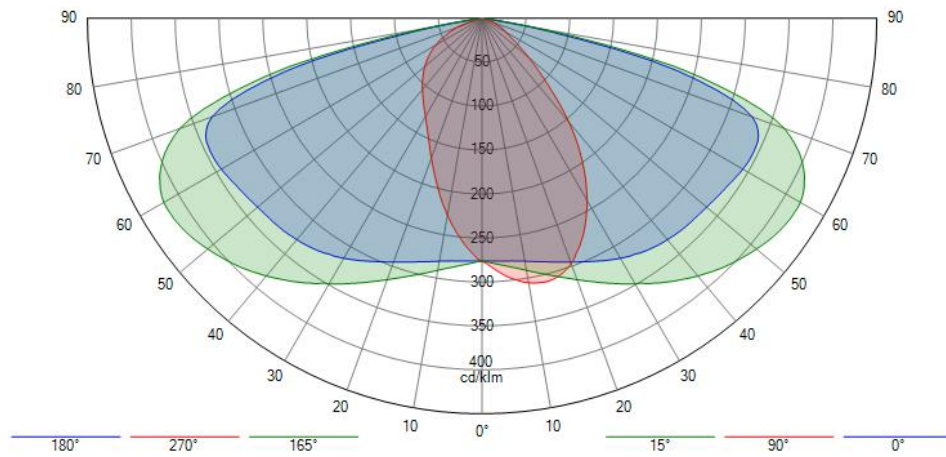
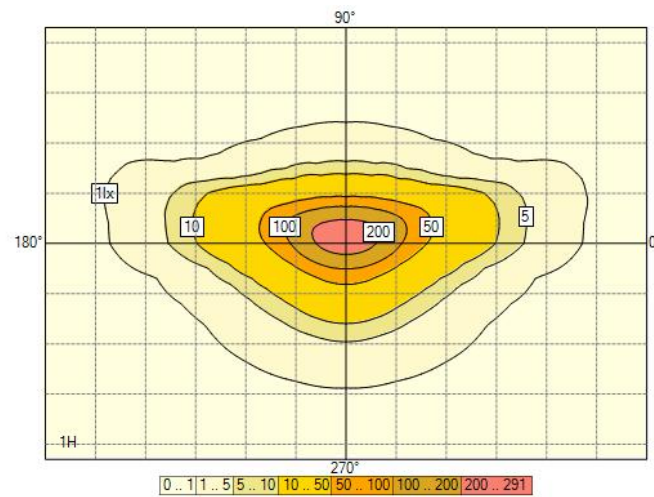
OPTIONS

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

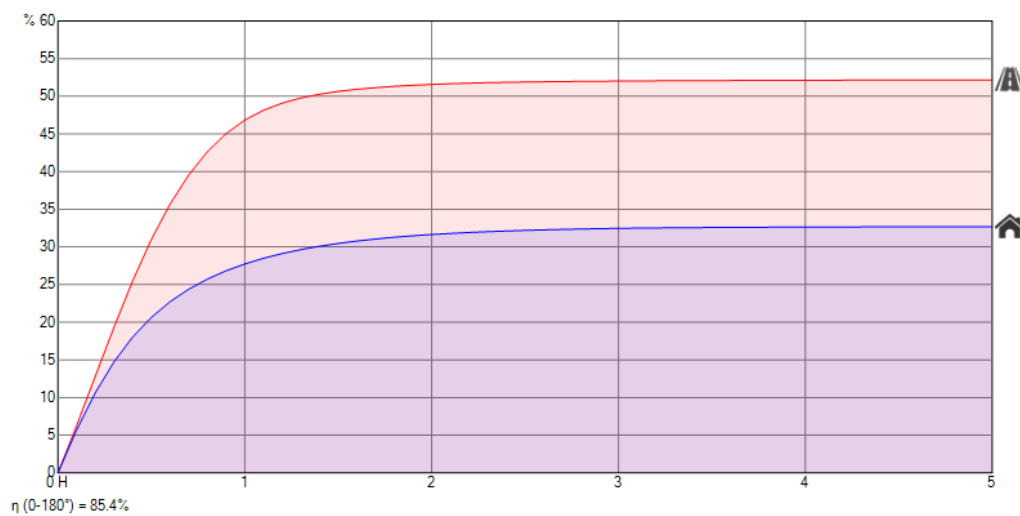
Hypergon view



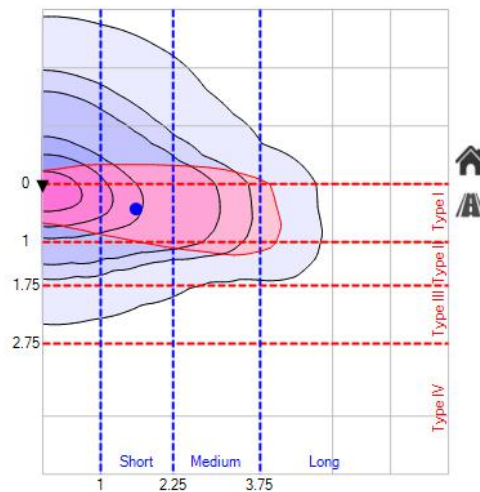
Polar/Cartesian diagram

**Isolux**

K-Curve

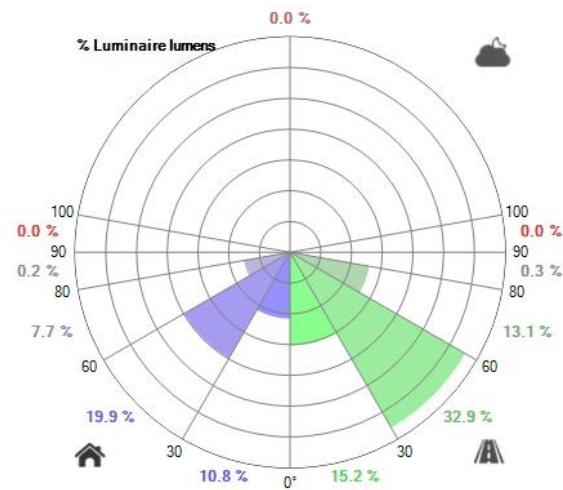


IES Roadway Classification / Nema Classification

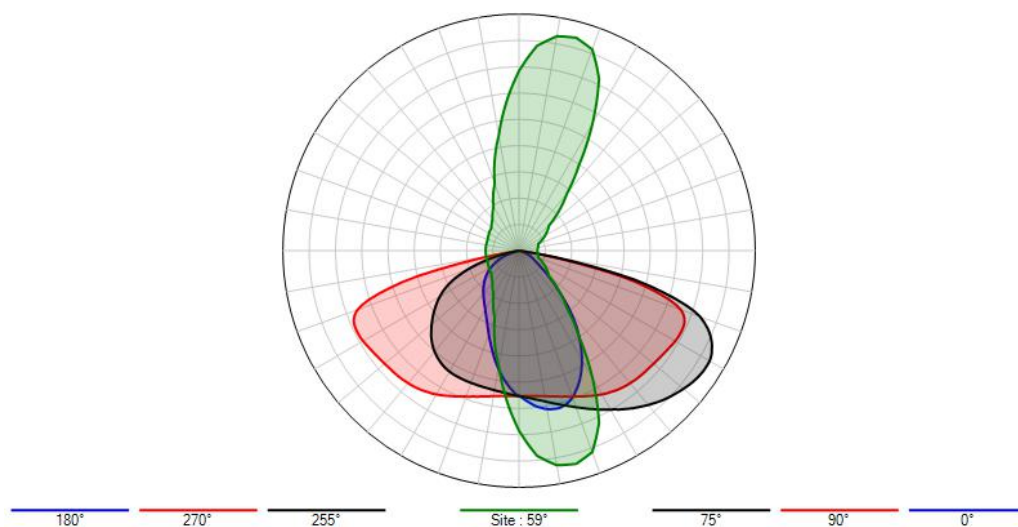


II - Short

Luminaire classification system (LCS)



Intensity diagram in max Cone and in CPlane



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