


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.

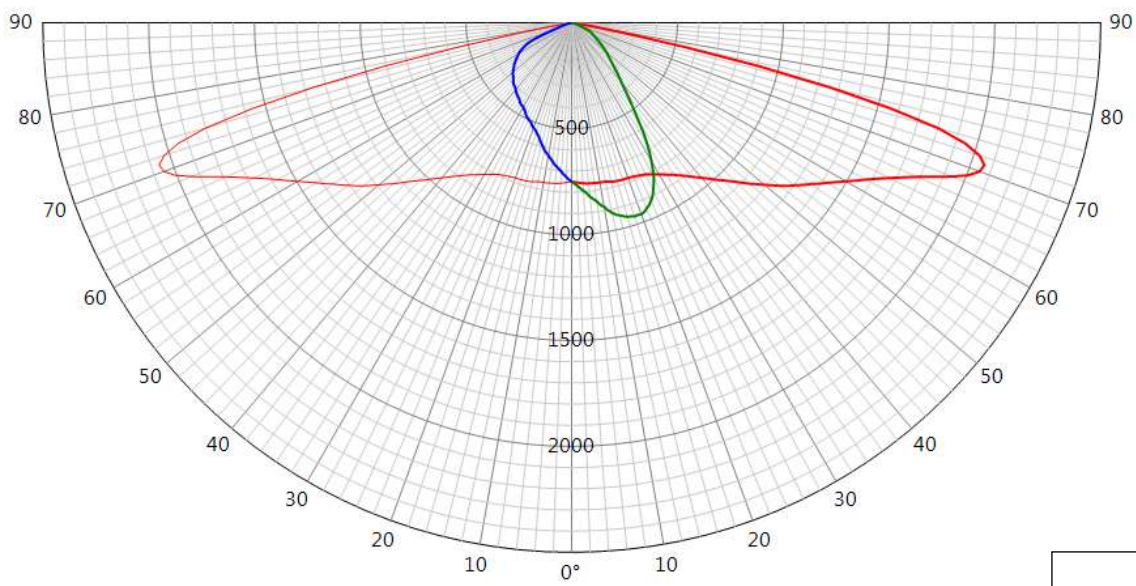
LED

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire VOLTANA 2		Request # FD36102	
Source							
Type LED	BIN Unknown	Trademark LG Innotek	Reference 3535 G4L	# LEDs 16	Reflector 5162		
Master		Reflector				No 5162	
Protector Refractor Lens							
Protector Glass Extra Clear Flat Smooth Lens Gaggione 5162 MS1002							
Laboratory observation							
VOLTANA 2 with 16 LG 3535 G4-L Used flux for efficiency matrix calculation = 2825 lm - CCT = 4057 K - CRI = 72.89 (see sphere test report 2016/374 on appendix).							
Purpose DOC				Sample date 13/06/2014		Sample # 34R142	
Observation							
DOC VOLTANA 2 with lenses 5162 MS1002							
Flux coefficient multiplicator (only for efficiency matrix): From 350 to 500 mA : 1,386 From 350 to 700 mA : 1,869 From 350 to 1000 mA : 2,535 From 350 to 1200mA : 2,944 From 350 to 1400mA : 3.322							
Fixture powered @350/500/700mA with 1 driver LG INNOTEK LLP 40W PISE A040D (dali) Fixture powered @1000mA with 1 driver LG INNOTEK LLP 55W 1A PISE A055A Fixture powered @1200/1400mA with DC powersupply Delta Electronica							
Asked by LME	Measured by FCE	Approved by LME	Appendix 1	 226-TEST NBN EN ISO/IEC 17025 : 2005		38909	

LUMINOUS INTENSITY DIAGRAM

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire VOLTANA 2		Request # FD36102	
Source	Type LED	BIN Unknown	Trademark LG Innotek	Reference 3535 G4L	# LEDs 16	Reflector 5162	
Reflector	Gaggione Led assembly Road lighting Assembled 0.0°					No	5162
Matrices	389091 Φ 0-90° = 2334lm - 90-180° = 0lm					Absolute measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 2 Lens 16 x Gaggione 5162 MS1002						
Observation	<p>Matrix in total flux @350 mA</p> <p>Light losses due to thermal stabilisation : 0.6 %</p> <p>Electrical measurement on LED (#1): Voltage = 44.35 V Current = 0.350 A Power = 15.58 W</p> <p>Electrical measurement on driver (#1): Voltage = 230.00 V Current = 0.097 A Power = 19.60 W PF = 0.872</p> <p>Total luminaire power = 19.60 W : Lm/Watt = 119.09 lm/W</p> <p>Driver #1 : See observations for driver details -</p>						

Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	↕
10 - 170	2063	71	S				
90	962	20	D				
270	750	0	G	750	25.0°	15/07/2016	

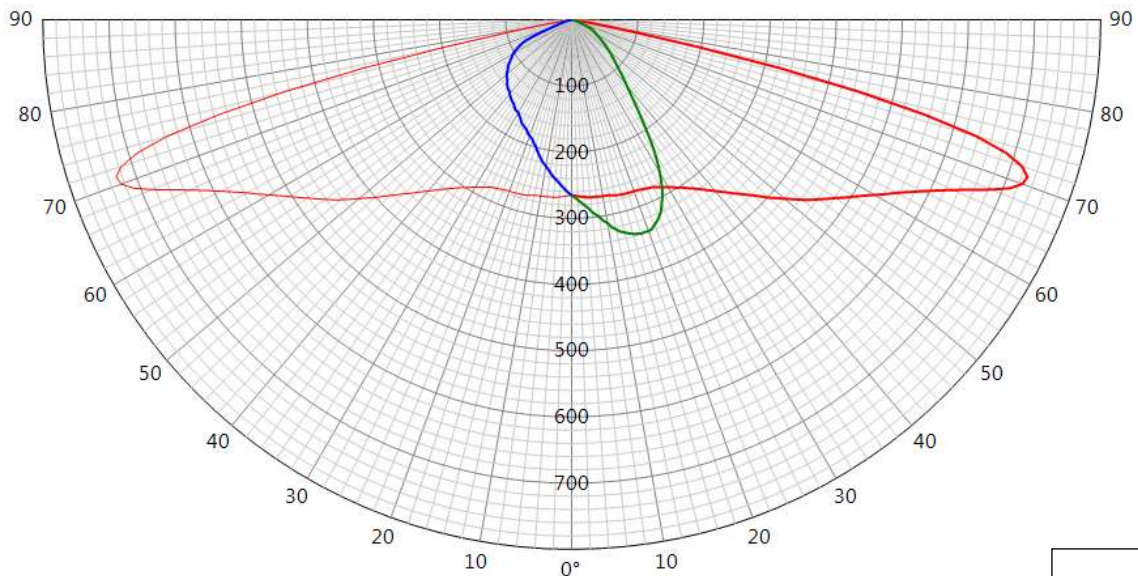


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LUMINOUS INTENSITY DIAGRAM

Origin Tungsrám-Schröder Plc. Hungary		Production Tungsrám-Schröder Plc. Hungary		Luminaire VOLTANA 2		Request # FD36102	
Source	Type LED	BIN Unknown	Trademark LG Innotek	Reference 3535 G4L	# LEDs 16	Reflector 5162	
Reflector	Gaggione Led assembly Road lighting Assembled 0.0°					No	5162
Matrices	389092 η 0-90° = 82.5% - 90-180° = 0.0%					Relative measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 2 Lens 16 x Gaggione 5162 MS1002						
Observation	<p>Matrix in efficiency @350 mA</p> <p>Light losses due to thermal stabilisation : 0.6 %</p> <p>Electrical measurement on LED (#1): Voltage = 44.35 V Current = 0.350 A Power = 15.58 W</p> <p>Electrical measurement on driver (#1): Voltage = 230.00 V Current = 0.097 A Power = 19.60 W PF = 0.872</p> <p style="text-align: center;">Total luminaire power = 19.60 W</p> <p>Driver #1 : See observations for driver details -</p>						

Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	↕
10 - 170	729	71	S				
90	340	20	D				
270	265	0	G	265	25.0°	15/07/2016	

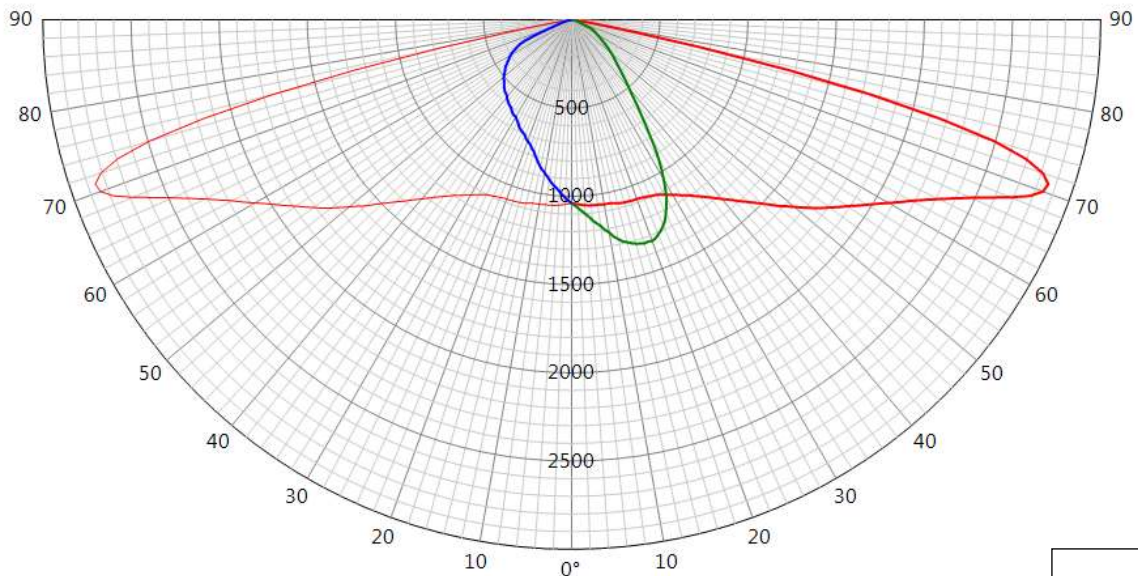


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LUMINOUS INTENSITY DIAGRAM

Origin Tungsrám-Schröder Plc. Hungary		Production Tungsrám-Schröder Plc. Hungary		Luminaire VOLTANA 2		Request # FD36102	
Source	Type LED	BIN Unknown	Trademark LG Innotek	Reference 3535 G4L	# LEDs 16	Reflector 5162	
Reflector	Gaggione Led assembly Road lighting Assembled 0.0°					No	5162
Matrices	389093 Φ 0-90° = 3235lm - 90-180° = 0lm					Absolute measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 2 Lens 16 x Gaggione 5162 MS1002						
Observation	<p>Matrix in total flux @500 mA</p> <p>Light losses due to thermal stabilisation : 0.9 %</p> <p>Electrical measurement on LED (#1): Voltage = 44.89 V Current = 0.500 A Power = 22.44 W</p> <p>Electrical measurement on driver (#1): Voltage = 230.00 V Current = 0.126 A Power = 26.90 W PF = 0.928</p> <p>Total luminaire power = 26.90 W : Lm/Watt = 120.27 lm/W</p> <p>Driver #1 : See observations for driver details -</p>						

Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	↕
10 - 170	2859	71	S				
90	1333	20	D				
270	1039	0	G	1039	25.0°	15/07/2016	

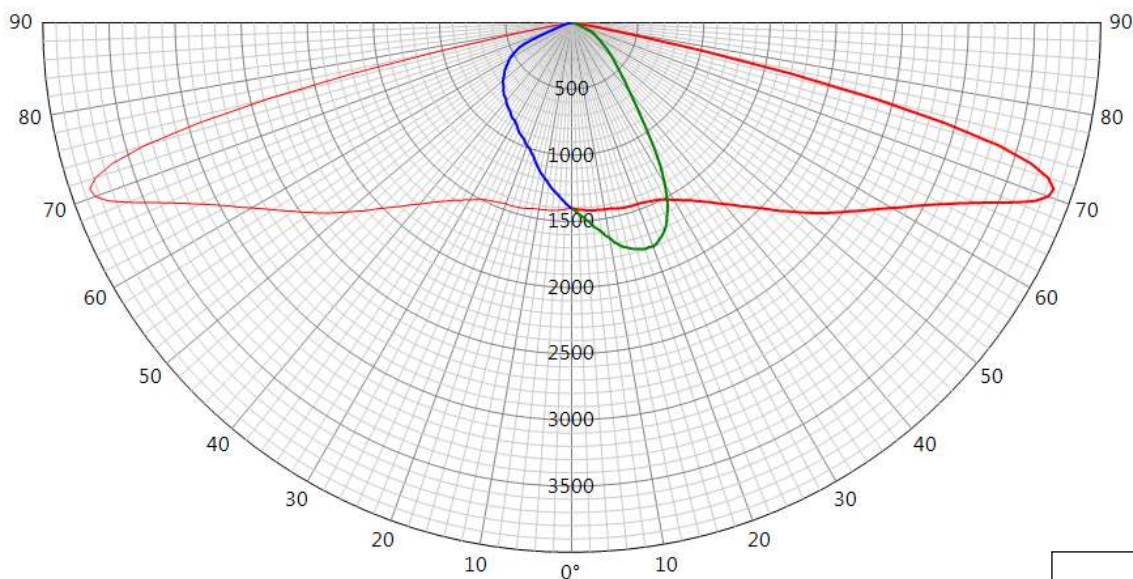


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LUMINOUS INTENSITY DIAGRAM

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire VOLTANA 2	Request # FD36102	
Source	Type LED	BIN Unknown	Trademark LG Innotek	Reference 3535 G4L	# LEDs 16	Reflector 5162
Reflector	Gaggione Led assembly Road lighting Assembled 0.0°				No	5162
Matrices	389094 Φ 0-90° = 4363lm - 90-180° = 0lm				Absolute measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 2 Lens 16 x Gaggione 5162 MS1002					
Observation	<p>Matrix in total flux @700 mA</p> <p>Light losses due to thermal stabilisation : 1.4 %</p> <p>Electrical measurement on LED (#1): Voltage = 45.68 V Current = 0.700 A Power = 31.98 W</p> <p>Electrical measurement on driver (#1): Voltage = 230.00 V Current = 0.168 A Power = 37.30 W PF = 0.961</p> <p>Total luminaire power = 37.30 W : Lm/Watt = 116.96 lm/W</p> <p>Driver #1 : See observations for driver details -</p>					

Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	↕
10 - 170	3855	71	S				
90	1797	20	D				
270	1401	0	G	1401	25.0°	15/07/2016	

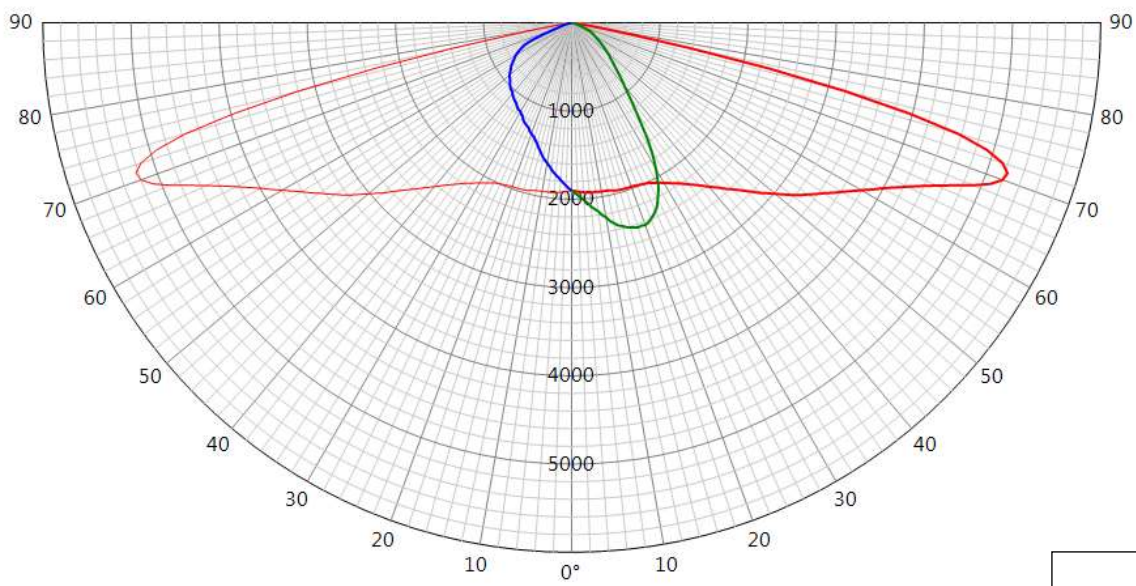


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LUMINOUS INTENSITY DIAGRAM

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire VOLTANA 2		Request # FD36102	
Source	Type LED	BIN Unknown	Trademark LG Innotek	Reference 3535 G4L	# LEDs 16	Reflector 5162	
Reflector	Gaggione Led assembly Road lighting Assembled 0.0°					No	5162
Matrices	389095 Φ 0-90° = 5917lm - 90-180° = 0lm					Absolute measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 2 Lens 16 x Gaggione 5162 MS1002						
Observation	<p>Matrix in total flux @1000 mA</p> <p>Light losses due to thermal stabilisation : 2 %</p> <p>Electrical measurement on LED (#1): Voltage = 46.37 V Current = 1.000 A Power = 46.51 W</p> <p>Electrical measurement on driver (#1): Voltage = 230.00 V Current = 0.241 A Power = 53.40 W PF = 0.962</p> <p>Total luminaire power = 53.40 W : Lm/Watt = 110.81 lm/W</p> <p>Driver #1 : See observations for driver details -</p>						

Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	↕
10 - 170	5229	71	S				
90	2438	20	D				
270	1900	0	G	1900	25.0°	20/07/2016	

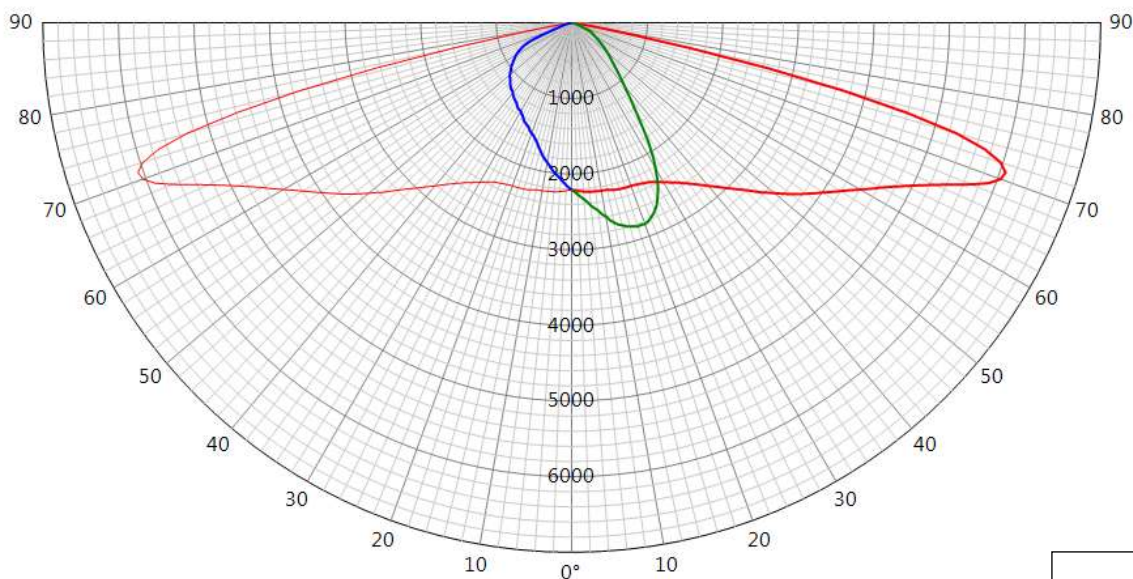


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LUMINOUS INTENSITY DIAGRAM

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire VOLTANA 2	Request # FD36102	
Source	Type LED	BIN Unknown	Trademark LG Innotek	Reference 3535 G4L	# LEDs 16	Reflector 5162
Reflector	Gaggione Led assembly Road lighting Assembled 0.0°					No 5162
Matrices	389096 Φ 0-90° = 6872lm - 90-180° = 0lm					Absolute measurement
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 2 Lens 16 x Gaggione 5162 MS1002					
Observation	<p>Matrix in total flux @1200 mA</p> <p>Light losses due to thermal stabilisation : 3.4 %</p> <p>Electrical measurement on LED (#1) : Voltage = 47.43 V Current = 1.200 A Power = 56.95 W</p> <p>Driver #1 : See observations for driver details -</p>					

Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	↕
10 - 170	6072	71	S				
90	2831	20	D				
270	2207	0	G	2207	25.0°	20/07/2016	

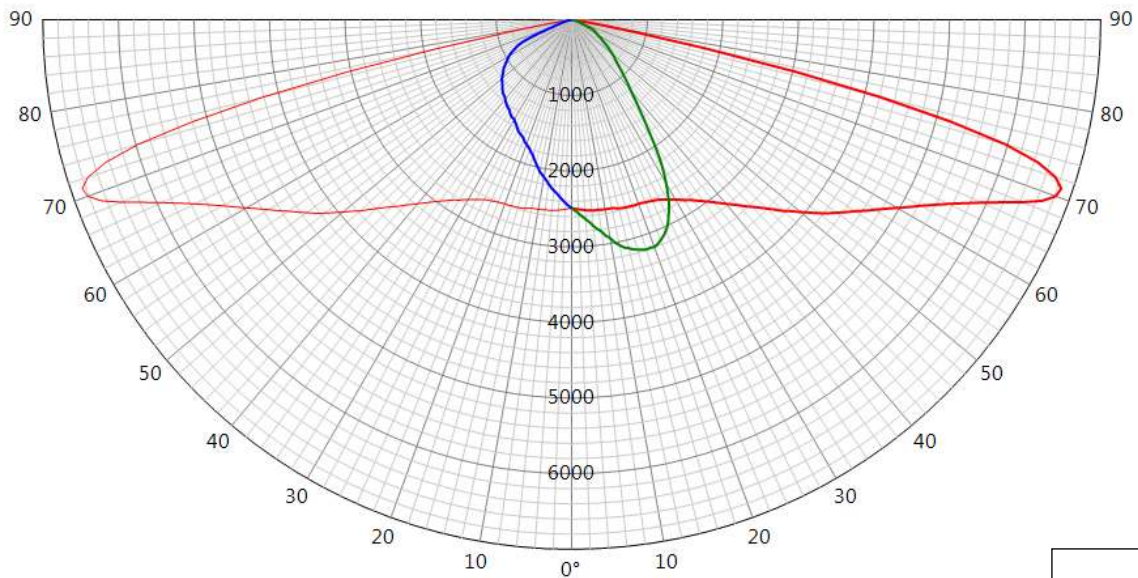


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LUMINOUS INTENSITY DIAGRAM

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire VOLTANA 2		Request # FD36102	
Source	Type LED	BIN Unknown	Trademark LG Innotek	Reference 3535 G4L	# LEDs 16	Reflector 5162	
Reflector	Gaggione Led assembly Road lighting Assembled 0.0°					No	5162
Matrices	389097 Φ 0-90° = 7754lm - 90-180° = 0lm					Absolute measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 2 Lens 16 x Gaggione 5162 MS1002						
Observation	<p>Matrix in total flux @1400 mA</p> <p>Light losses due to thermal stabilisation : 4.5 %</p> <p>Electrical measurement on LED (#1) : Voltage = 48.09 V Current = 1.400 A Power = 67.34 W</p> <p>Driver #1 : See observations for driver details -</p>						

Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	↕
10 - 170	6852	71	S				
90	3195	20	D				
270	2490	0	G	2490	25.0°	20/07/2016	



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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 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%

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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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