

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.

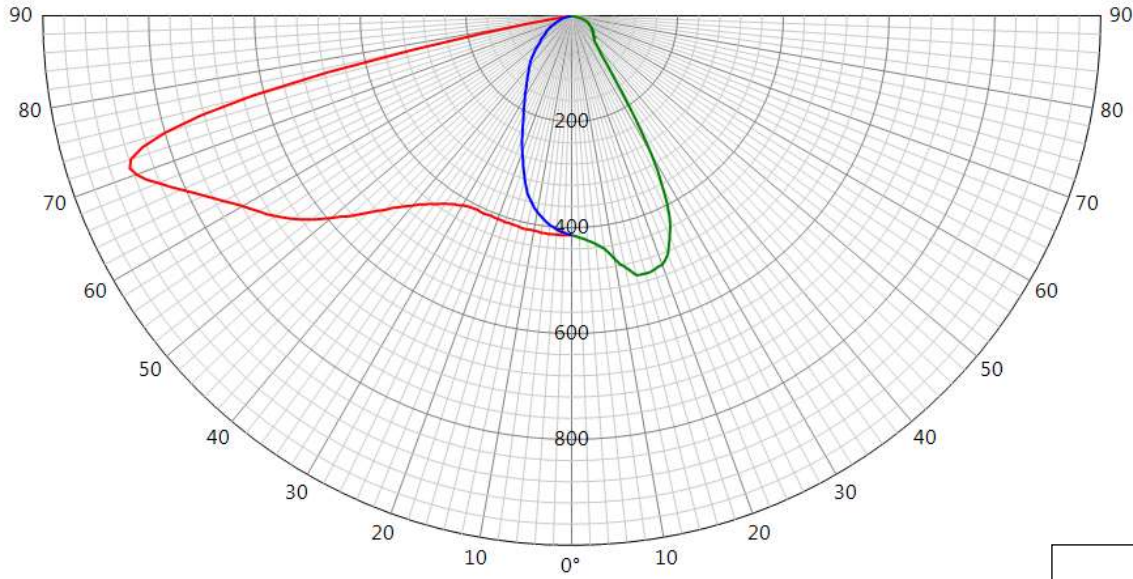
LED

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire VOLTANA 0		Request # FD36169	
Source							
Type LED	BIN X9-J32-9	Trademark LG Innotek	Reference 3535 Gen4	# LEDs 8	Reflector 5136		
Master Reflector							
Gaggione Led assembly Narrow Assembled 0,0°				No 5136			
Protector Refractor Lens							
Protector Glass Extra Clear Flat Smooth Lens Gaggione 5136 PMMA							
Laboratory observation							
VOLTANA 0 with 8 LG 3535Gen4 Used flux for efficiency matrix calculation = 1273 lm - CCT = 3995 K - CRI = 68,63 (see sphere test report 2015/324 on appendix).							
Purpose DOC				Sample date 19/10/2016		Sample # 36R255	
Observation							
DOC VOLTANA 0 with lenses 5136							
Flux coefficient multiplicator (only for efficiency matrix): From 350 to 500 mA : 1,350 From 350 to 700 mA : 1,763 From 350 to 1000 mA : 2,275							
Fixture powered with driver Philips Xitanium Xi FP 22W 0,3-1,0A SNLDAE 230V S175 sXt for matrix @350/500/700mA Fixture powered with driver LG INNOTEK 27W -1,0A model PISEA027A for matrix @1000mA							
Asked by LME		Measured by CLD		Approved by LME		Appendix 1	
 226-TEST NBN EN ISO/IEC 17025 : 2005						39522	

LUMINOUS INTENSITY DIAGRAM

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire VOLTANA 0		Request # FD36169	
Source	Type LED	BIN X9-J32-9	Trademark LG Innotek	Reference 3535 Gen4	# LEDs 8	Reflector 5136	
Reflector	Gaggione Led assembly Narrow Assembled 0,0°					No	5136
Matrices	395221 Φ 0-90° = 1070lm - 90-180° = 0lm					Absolute measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 1 Lens 8 x Gaggione 5136 PMMA						
Observation	Matrix in total flux @350 mA Light losses due to thermal stabilization: 2 % Electrical measurement on LED (#1) : Voltage = 23,26 V Current = 0,350 A Power = 8,14 W Electrical measurement on driver (#1) : Voltage = 230,00 V Current = 0,048 A Power = 10,63 W PF = 0,960 Total luminaire power = 10,63 W : Lm/Watt = 100,62 lm/W Driver #1 : See observations for driver details -						

Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	
5 - 175	884	71	G	414	25,2°	09/01/2017	
90	506	17	D				
270	414	0	G				

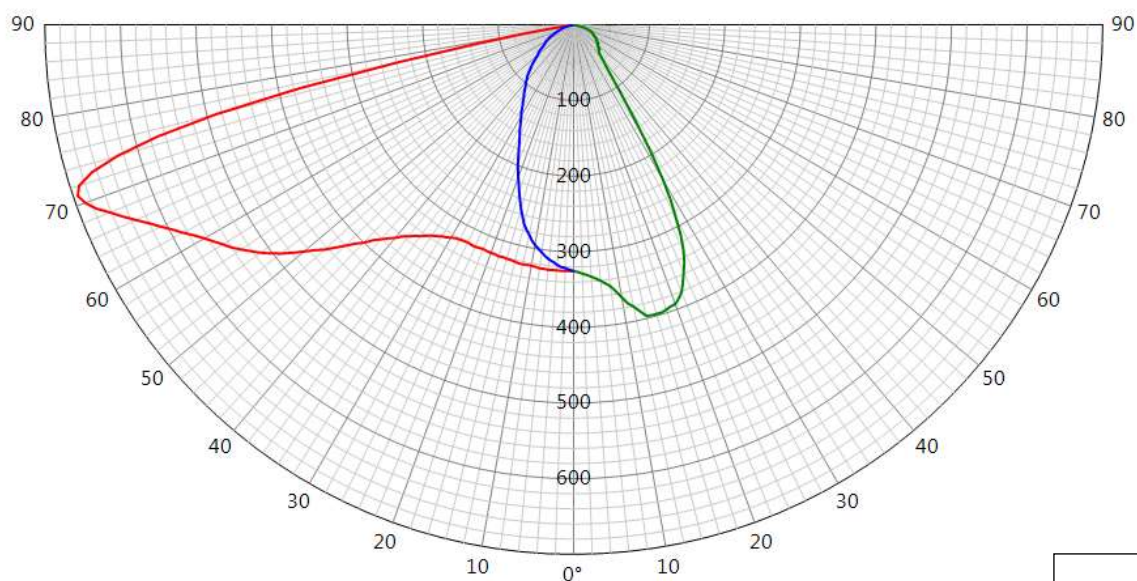


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LUMINOUS INTENSITY DIAGRAM

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire VOLTANA 0		Request # FD36169	
Source	Type LED	BIN X9-J32-9	Trademark LG Innotek	Reference 3535 Gen4	# LEDs 8	Reflector 5136	
Reflector	Gaggione Led assembly Narrow Assembled 0,0°					No	5136
Matrices	395222 η 0-90° = 84,0% - 90-180° = 0,0%					Relative measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 1 Lens 8 x Gaggione 5136 PMMA						
Observation	Matrix in efficiency @350 mA Light losses due to thermal stabilization: 2 % Electrical measurement on LED (#1) : Voltage = 23,26 V Current = 0,350 A Power = 8,14 W Electrical measurement on driver (#1) : Voltage = 230,00 V Current = 0,048 A Power = 10,63 W PF = 0,960 Total luminaire power = 10,63 W Driver #1 : See observations for driver details -						

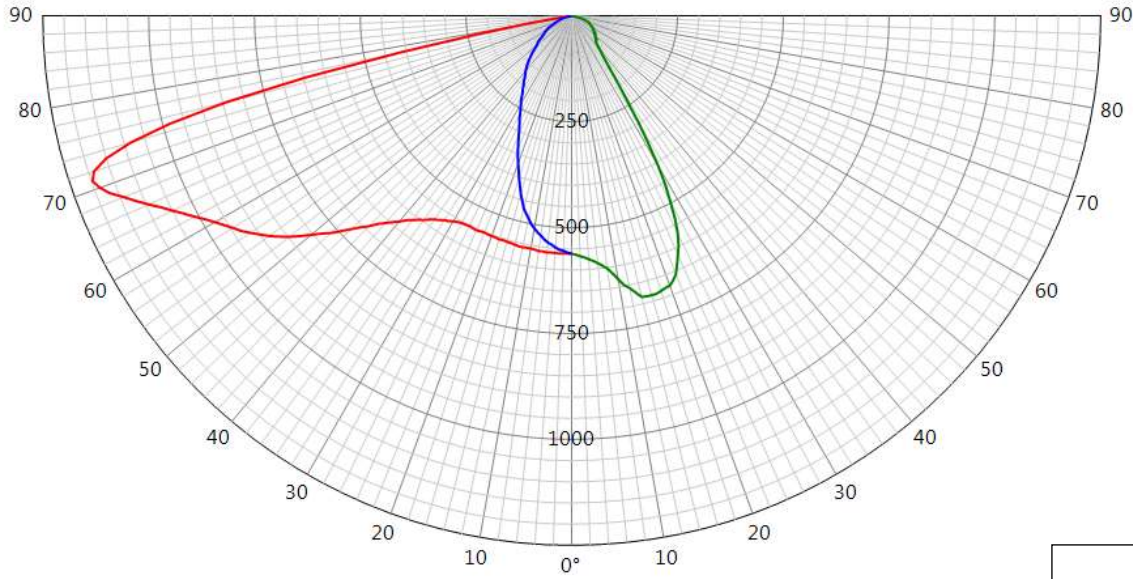
Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	
5 - 175	694	71	G				
90	398	17	D				
270	325	0	G	325	25,2°	09/01/2017	

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LUMINOUS INTENSITY DIAGRAM

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire VOLTANA 0		Request # FD36169	
Source	Type LED	BIN X9-J32-9	Trademark LG Innotek	Reference 3535 Gen4	# LEDs 8	Reflector 5136	
Reflector	Gaggione Led assembly Narrow Assembled 0,0°					No 5136	
Matrices	395223 Φ 0-90° = 1449lm - 90-180° = 0lm					Absolute measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 1 Lens 8 x Gaggione 5136 PMMA						
Observation	Matrix in total flux @500 mA Light losses due to thermal stabilization: 3 % Electrical measurement on LED (#1) : Voltage = 23,83 V Current = 0,500 A Power = 11,92 W Electrical measurement on driver (#1) : Voltage = 230,00 V Current = 0,065 A Power = 14,69 W PF = 0,976 Total luminaire power = 14,69 W : Lm/Watt = 98,66 lm/W Driver #1 : See observations for driver details -						

Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	
5 - 175	1198	71	G				
90	686	17	D				
270	561	0	G	561	25,2°	09/01/2017	

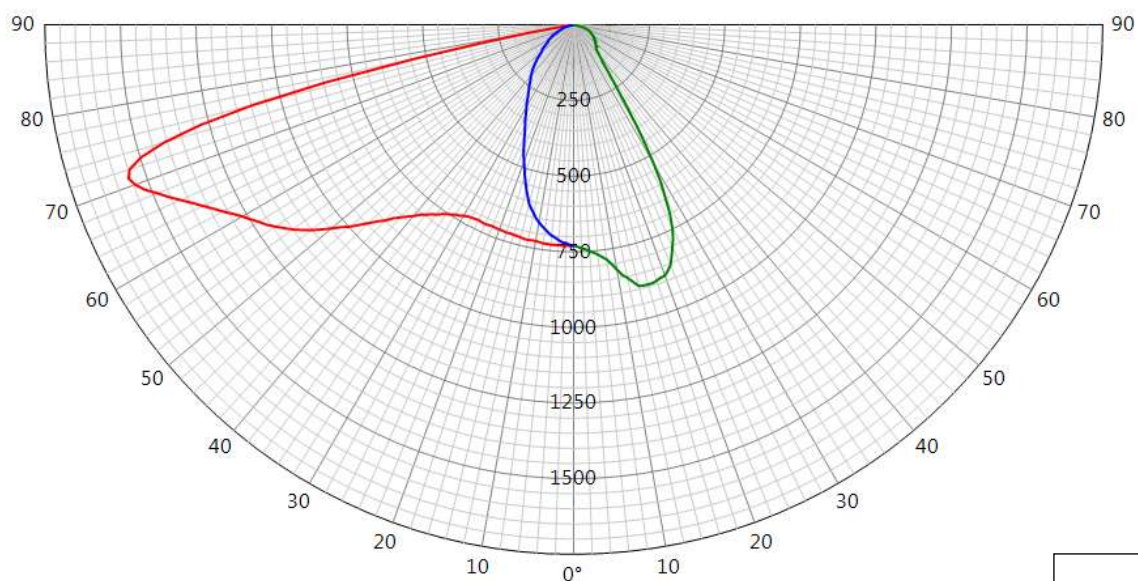


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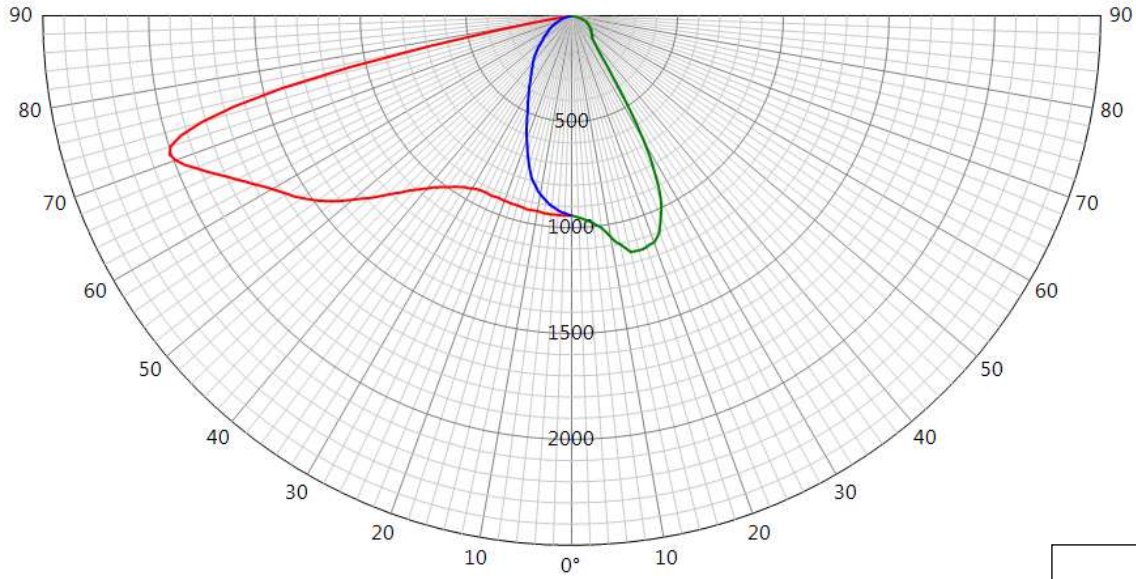
LUMINOUS INTENSITY DIAGRAM

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire VOLTANA 0		Request # FD36169	
Source	Type LED	BIN X9-J32-9	Trademark LG Innotek	Reference 3535 Gen4	# LEDs 8	Reflector 5136	
Reflector	Gaggione Led assembly Narrow Assembled 0,0°					No	5136
Matrices	395224 Φ 0-90° = 1886lm - 90-180° = 0lm					Absolute measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 1 Lens 8 x Gaggione 5136 PMMA						
Observation	Matrix in total flux @700 mA Light losses due to thermal stabilization: 4 % Electrical measurement on LED (#1) : Voltage = 24,55 V Current = 0,700 A Power = 17,20 W Electrical measurement on driver (#1) : Voltage = 230,00 V Current = 0,090 A Power = 20,42 W PF = 0,986 Total luminaire power = 20,42 W : Lm/Watt = 92,34 lm/W Driver #1 : See observations for driver details -						

Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	
5 - 175	1558	71	G				
90	892	17	D				
270	730	0	G	730	25,2°	09/01/2017	

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LUMINOUS INTENSITY DIAGRAM

Origin Tungsram-Schröder Plc. Hungary		Production Tungsram-Schröder Plc. Hungary		Luminaire VOLTANA 0		Request # FD36169	
Source	Type LED	BIN X9-J32-9	Trademark LG Innotek	Reference 3535 Gen4	# LEDs 8	Reflector 5136	
Reflector	Gaggione Led assembly Narrow Assembled 0,0°					No 5136	
Matrices	395225 Φ 0-90° = 2433lm - 90-180° = 0lm					Absolute measurement	
Protector Refractor Lens	Protector Glass Extra Clear Flat Smooth - VOLTANA 1 Lens 8 x Gaggione 5136 PMMA						
Observation	Matrix in total flux @1000 mA Light losses due to thermal stabilization: 6 % Electrical measurement on LED (#1) : Voltage = 25,53 V Current = 1,000 A Power = 25,53 W Electrical measurement on driver (#1) : Voltage = 230,00 V Current = 0,137 A Power = 30,69 W PF = 0,969 Total luminaire power = 30,69 W : Lm/Watt = 79,29 lm/W Driver #1 : See observations for driver details -						
Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	
5 - 175	2011	71	G	943	25,2°	11/01/2017	
90	1152	17	D				
270	943	0	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 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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