

RTECH-PHOTOMETRY LABORATORY

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

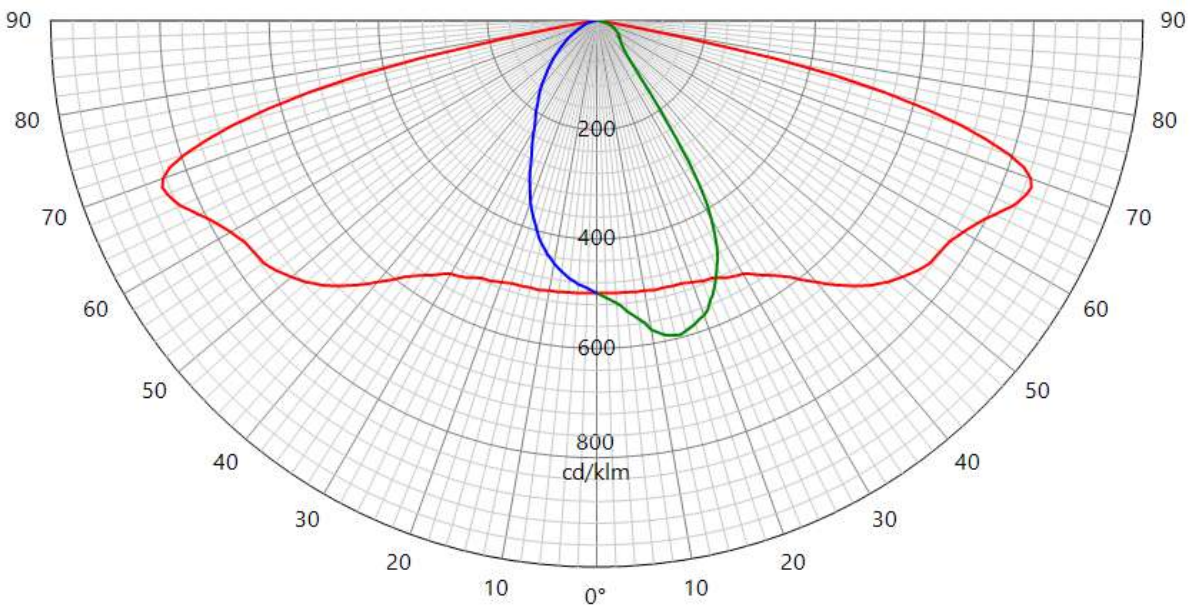
LED

Origin TUNGSRAM-Schröder Zrt. Hungary	Production TUNGSRAM-Schröder Zrt. Hungary	Luminaire VOLTANA 0	Inclination 0°	Request # FD39019
Type LED	BIN 40-70M-4-TB-RB	Source Trademark Samsung	Reference LH351C	# LEDs 8
Reflector 5136				
Master -	Reflector Schröder 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 SAMSUNG LH351C Used flux for efficiency matrix calculation = 1538 lm - CCT = 3841 K - CRI = 72,07 (see sphere test report 2019/58 on appendix).				
Purpose DOC	Sample date 08-01-2019		Sample # 39R005	
Observation				
DOC VOLTANA 0 with lenses 5136 Flux coefficient multiplier (only for efficiency matrix): From 350 to 500 mA : 1,379 From 350 to 700 mA : 1,849 From 350 to 1000 mA : 2,474 Fixture powered with driver Philips Xi FP 22W 0,3-1,0A SNLDAE 230V S175 sXt DALI for matrix @350/500/700mA Fixture powered with driver Philips Xi FP 40W 0,3-1,0A SNLDAE 230V S175 sXt DALI for matrix @1000mA				
Notes				
The publication of this report in another form than the original one is not allowed without agreement of the laboratory. This report concerns type tests on one or a series of specimens.				

Asked by RCA	Measured by CLD	Approved by RLABO	Appendix 1	  226-TEST NBN EN ISO/IEC 17025 : 2005	42550
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LUMINOUS INTENSITY DIAGRAM

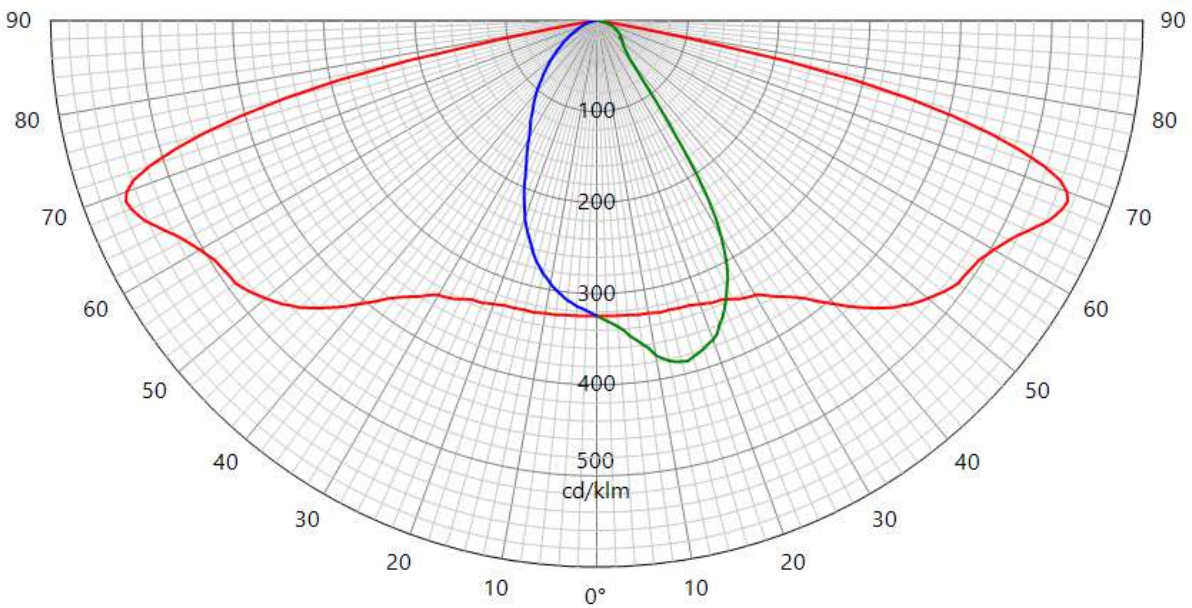
Origin TUNGSRAM-Schröder Zrt. Hungary		Production TUNGSRAM-Schröder Zrt. Hungary		Luminaire VOLTANA 0		Inclination 0°	Request # FD39019
Source	Type LED	BIN 40-70M-4-TB-RB	Trademark Samsung	Reference LH351C	# LEDs 8	Reflector 5136	
Reflector	Schröder Led assembly Narrow Assembled 0.0°					No	5136
Matrices	425501 Φ 0-90° = 1331lm - 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: 1 % Electrical measurement on LED (#1) : Voltage = 22.32 V Current = 0.350 A Power = 7.81 W Electrical measurement on driver (#1) : Voltage = 230.00 V Current = 0.046 A Power = 10.19 W PF = 0.957 Total luminaire power = 10.19 W : Lm/Watt = 130.60 lm/W Driver #1 : See observations for driver details - PCB 00-71-636 A						
Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	
5 - 175	852	69	S	499	25.4°	06-02-2019	
90	595	15	D				
270	499	0	G				



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LUMINOUS INTENSITY DIAGRAM

Origin TUNGSRAM-Schröder Zrt. Hungary		Production TUNGSRAM-Schröder Zrt. Hungary		Luminaire VOLTANA 0		Inclination 0°	Request # FD39019
Source	Type LED	BIN 40-70M-4-TB-RB	Trademark Samsung	Reference LH351C	# LEDs 8	Reflector 5136	
Reflector	Schreder Led assembly Narrow Assembled 0.0°					No	5136
Matrices	425502 η 0-90° = 86.5% - 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: 1 % Electrical measurement on LED (#1) : Voltage = 22.32 V Current = 0.350 A Power = 7.81 W Electrical measurement on driver (#1) : Voltage = 230.00 V Current = 0.046 A Power = 10.19 W PF = 0.957 Total luminaire power = 10.19 W Driver #1 : See observations for driver details - PCB 00-71-636 A						
Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	
5 - 175	554	69	S	324	25.4°	06-02-2019	
90	387	15	D				
270	324	0	G				



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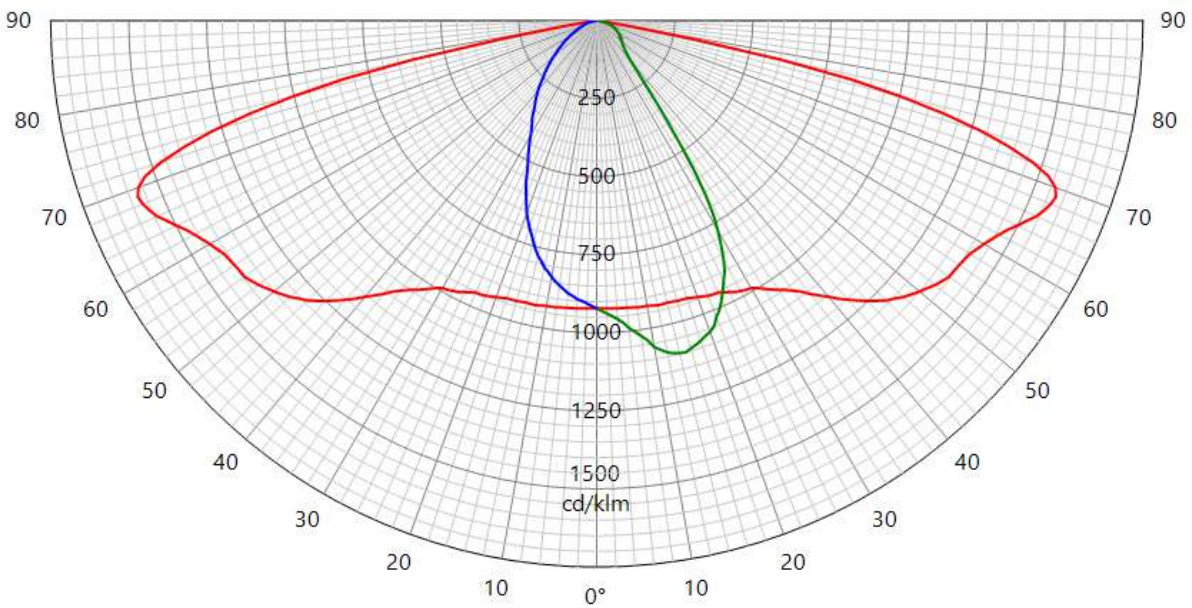
LUMINOUS INTENSITY DIAGRAM

Origin TUNGSRAM-Schröder Zrt. Hungary		Production TUNGSRAM-Schröder Zrt. Hungary		Luminaire VOLTANA 0		Inclination 0°	Request # FD39019
Source	Type LED	BIN 40-70M-4-TB-RB	Trademark Samsung	Reference LH351C	# LEDs 8	Reflector 5136	
Reflector	Schröder Led assembly Narrow Assembled 0.0°					No	5136
Matrices	425503 Φ 0-90° = 1835lm - 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: 1,5 % Electrical measurement on LED (#1) : Voltage = 22.76 V Current = 0.500 A Power = 11.38 W Electrical measurement on driver (#1) : Voltage = 230.00 V Current = 0.063 A Power = 14.16 W PF = 0.974 Total luminaire power = 14.16 W : Lm/Watt = 129.60 lm/W Driver #1 : See observations for driver details - PCB 00-71-636 A						
Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	
5 - 175	1175	69	S	688	25.4°	06-02-2019	
90	820	15	D				
270	688	0	G				

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LUMINOUS INTENSITY DIAGRAM

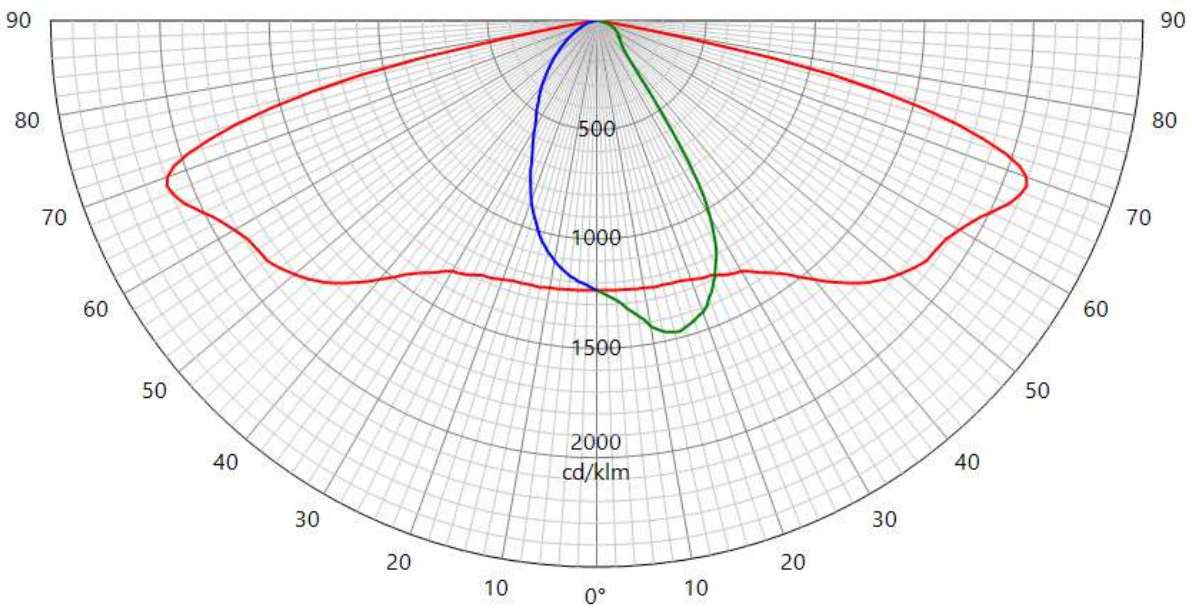
Origin TUNGSRAM-Schröder Zrt. Hungary		Production TUNGSRAM-Schröder Zrt. Hungary		Luminaire VOLTANA 0		Inclination 0°	Request # FD39019
Source	Type LED	BIN 40-70M-4-TB-RB	Trademark Samsung	Reference LH351C	# LEDs 8	Reflector 5136	
Reflector	Schreder Led assembly Narrow Assembled 0.0°					No	5136
Matrices	425504 Φ 0-90° = 2461lm - 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: 2 % Electrical measurement on LED (#1) : Voltage = 23.26 V Current = 0.700 A Power = 16.29 W Electrical measurement on driver (#1) : Voltage = 230.00 V Current = 0.087 A Power = 19.79 W PF = 0.985 Total luminaire power = 19.79 W : Lm/Watt = 124.34 lm/W Driver #1 : See observations for driver details - PCB 00-71-636 A						
Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	
5 - 175	1576	69	S	922	25.4°	06-02-2019	
90	1100	15	D				
270	922	0	G				



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LUMINOUS INTENSITY DIAGRAM

Origin TUNGSRAM-Schröder Zrt. Hungary		Production TUNGSRAM-Schröder Zrt. Hungary		Luminaire VOLTANA 0		Inclination 0°	Request # FD39019
Source	Type LED	BIN 40-70M-4-TB-RB	Trademark Samsung	Reference LH351C	# LEDs 8	Reflector 5136	
Reflector	Schröder Led assembly Narrow Assembled 0.0°					No	5136
Matrices	425505 Φ 0-90° = 3292lm - 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: 2,5 % Electrical measurement on LED (#1) : Voltage = 23.93 V Current = 1.000 A Power = 23.93 W Electrical measurement on driver (#1) : Voltage = 230.00 V Current = 0.128 A Power = 28.74 W PF = 0.978 Total luminaire power = 28.74 W : Lm/Watt = 114.56 lm/W Driver #1 : See observations for driver details - PCB 00-71-636 A						
Plane	I Peak	Peak position	Index	I zero	Laboratory ambient t°	Measurement date	
5 - 175	2108	69	S	1234	25.4°	06-02-2019	
90	1472	15	D				
270	1234	0	G				



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CONFORMITY STATEMENT

Measurement fulfil Standards:

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

Measurement quantities measured:

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

Electrical measurement, if not specified:

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

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

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

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

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

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

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

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

Intensity measurement: +/- 3%

Angle: +/- 0.5°

Flux: +/- 2.5%

Electrical DC

Power: +/- 0.25%

Voltage: +/- 0.15%

Current: +/- 0.15%

Electrical AC

Power: +/- 0.15%

Voltage: +/- 0.3%

Current: +/- 0.3%

Temperature: +/- 0.65%

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

lm/Watt: +/-3.5%

Measuring instruments in use:

Gonio 1

Type C with Moving mirror

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

Type: GO-DS 2000

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

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

Gonio 2

Type C

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

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

Photometric test distance: Near Field

Sphere n°1

4p geometry

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

Type: UL2000 + U1000 V-Lambda photometer

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

Sphere n°2

4p geometry

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

Type ISP2000 + Spectroradiometer CAS120 and CAS140

Calibration: traceable to NIST

Colorimetric portable spectroradiometer

Manufacturer: JETI Technische Instrumente GmbH, Tatzendpromenade 2 07745 Jena

Type: SPECBOS 1201

Calibration: traceable to NIST

Multimeters

Manufacturer: Agilent

Type: 34401A

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

Wattmeters

Manufacturer: Yokogawa

Type: WT210 and WT310

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

Thermometers

Amarell Precision

Type: Liquid in glass N63833

Calibration: traceable to LBT (Laboratoire Belge de Thermométrie)