



High Precision Rotation Luminaire Goniospectroradiometer (LSG-1890BCCD/LSG-1800ACCD)

Brochure

Global Office of Lisun Electronics Inc.

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Leader in Lighting & Electrical Test Instruments

Rev. 6/3/2024

System Configuration

A. Goniophotometric System:

- Goniometric Rotating Console:
 - 1) LSG-1890BCCD: Japanese Mitsubishi Motor and German Angle encoder System to keep the test accuracy to 0.1degree
 - 2) LSG-1800ACCD: Taiwan Motor and Angle encoder System to keep the test accuracy to 0.2degree
- The LSG-1890BCCD has Goniometric Rotating Control Instrument in 19inch cabinet: It connects to the PC and was controlled by the software.
- The LSG-1890BCCD/LSG-1800ACCD has Goniometric Rotating Control Android App which can control it to rotate angle in the dark room easily.
- High Precision Photometer with Class A Constant Temperature Photo Detector (Option is Class L)
- Cross-beam Laser System for Calibrating
- English Measuring Software
- Three sets of luminaries Clamps: multi-functions
- Oversea Delivery and Packing: all of the instruments and accessories will be packed with Fumigation free three plywood, include the delivery cost to Shanghai sea port

B. SLS-150W DC Standard Light Intensity Lamp

C. Digital Power Meter:

- 1) LSG-1890BCCD has LS2050B Digital Power Meter: With LCD screen display, it is used to test AC/DC voltage, current, power, PF, DF and Harmonic
- 2) LSG-1800ACCD has LS2012 Digital Power Meter: It is used to test AC/DC voltage, current, power and PF

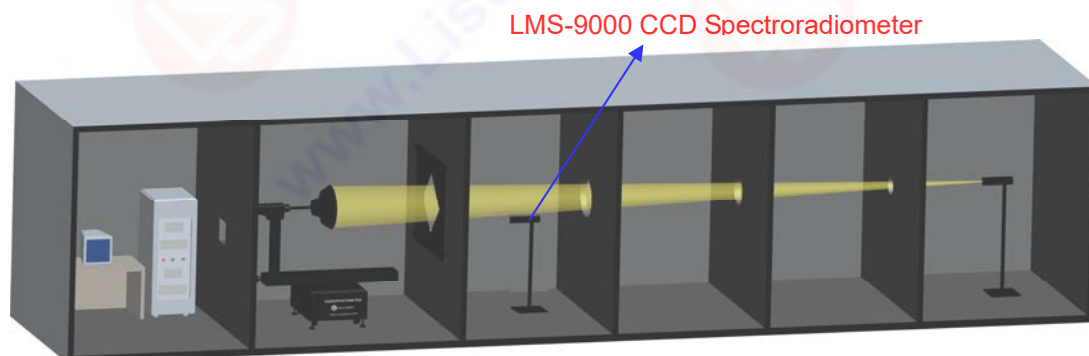
D. DC3010 CC & CV DC Power Source: DC3010 output is 30V/10A, Option can be DC6010 (output is 60V/10A) and DC12010 (output is 120V/10A)

E. AC Power Source: LSP-500VARC Pure Sine Wave AC Power Source with LCD Screen: 500VA Output. It can communicate with PC via software

F. CASE-19IN 19inch Standard Instruments Cabinet.

G. LMS-9000CG High Precision CCD Spectroradiometer

H. CLAMP-9000 Accessories and Adjustable Tripod for LMS-9000CG



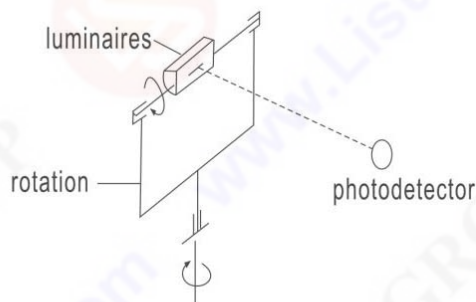
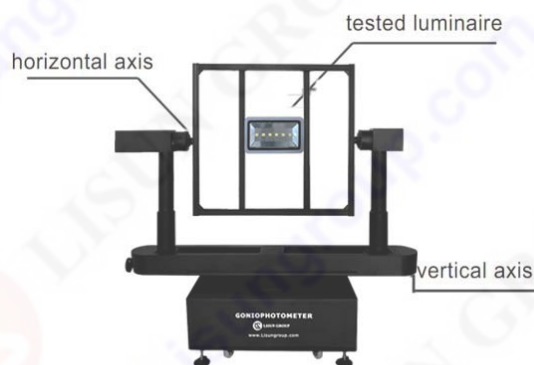
Note: PC and Printer prepared by the customer (request at least two USB ports)

2. Working Principle

Goniophotometric System carries out measuring methods of fixed location and rotating luminaries. The measured luminaries is installed on the rotating supported, the center of which is in line with the rotating supporter center with the help of Laser sight. The fixed photometry detector is testing the luminous intensity in various horizontal directions, while the light source rotating. The mechanical equipment allows turning the tested luminaries around a vertical axis and a horizontal axis. When the luminaries under test turn around horizontal axis, the detector which is at the same level with rotating table will measure the intensity of each direction at this surface. When rotating with vertical axis, the detector will measure the intensity at the vertical surface. The vertical and horizontal axis can be rotated continuously at $-180^{\circ} \sim +180^{\circ}$. According to the measurement requirements, the system can be operated in B- β , A- α and C- γ coordinates. When getting intensity distribution data, computer will calculate other photometric parameters automatically.

Double pillars structure (B- β , A- α coordinate system)

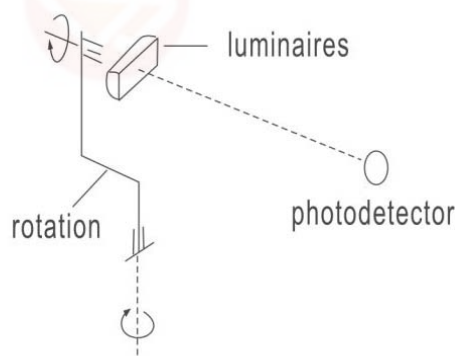
This type is applied to fixed grille lamp. The symmetry axis of lamp and the horizontal of rotating supporter is coaxial in the B- β coordinate system, and the two is vertical Cross in the A- α coordinate system.



Double pillars structure

Single pillar structure (C- γ coordinate and Conic coordinate)

The single column structure will be gotten when the assistant column is taken down from double columns structure. This type is applied to fixed tube lamp, spot lamp etc. The axis radiation of lamp and the horizontal of rotating supporter is coaxial.

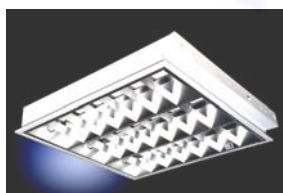


3. System Functions

LSG-1890BCCD/LSG-1800ACCD Goniophotometer is high precision automatic goniophotometric instrument for luminous intensity distribution measurements with facility for turning the light source. The LSG-1890BCCD uses a constant temperature detector, Japanese Motor and Germany precision angle coder which keep high test accuracy. It is for industrial laboratory measurements the photometric data of luminaries.

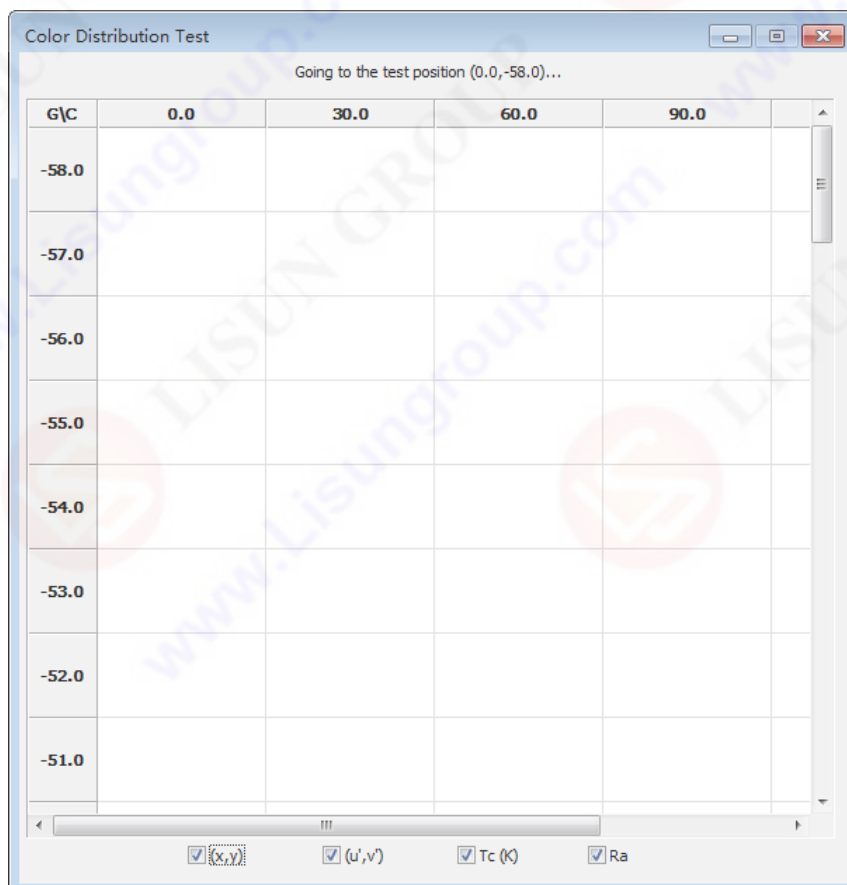


Be utilized to measure photometric parameters of luminaries for LED road lighting fixture, room lighting fixture and projecting lighting fixture, such as spatial intensity distribution curve, spatial iso-intensity curve, intensity distribution curve on each section (represent by right-angled coordinates or polar coordinates, luminance limitation curve, luminaries efficiency, glare grade, effective beam angle, upward luminous flux ratio, downward luminous flux ratio, total luminous flux, effective luminous flux, utilization factor and electric parameters voltage, current, wattage, power factor and etc. The measured data meets IES standard format and can be applied for lighting design by lighting design software. The measurement system fully satisfies the requirement of lighting design work.



4. Specifications

- Meets the requirements of CIE, IEC, IES LM-79 & GB standards
- The Goniospectroradiometer system=Goniophotometer+Spectroradiometer Integrating Sphere system
- Test Max Luminaires size and weight: LSG-1890BCCD is 2000mm/60kg and LSG-1800ACCD is 1600mm/50kg
- The tested luminaries rotates around an angle of $(\gamma)\pm 180^\circ$ (or 0-360°) and the tested luminaries rotates around itself with an angle of $(C)\pm 180^\circ$ (or 0-360°)
- Luminosity Testing Range: Illuminance 0.001lx~99,999lx; Light Intensity 1.0cd~ 10^7 cd(detector)
- Angle accuracy: LSG-1890BCCD is 0.1°, LSG-1800ACCD is 0.2°
- Work with high accuracy and quick CCD Spectroradiometer to measure spatial color parameters.
- Accuracy of chromaticity coordinate: ± 0.0015 or ± 0.0005 (under standard A lamp)
- Spectral Range Wavelength: 350nm ~800nm; Accuracy of wavelength: ± 0.5 nm
- The Hardware and Software can do the PAR, PPF and PPFD 3D distribution test, which can export IES/LDT files.
- Photometry Accuracy: CIE Class A (Class L is option)
- Testing Accuracy: 2%(Under Standard lamp); Stray Light: less than 0.1%
- English version software can run in Win7, Win8 or Win10, Win11



5. Laboratory Requirements

LISUN MODEL	Center Height (A)	Total Height (B)	Total Depth (C)	Total Width (D)	The max size for the Testing Lamp: Diameter(E)*Depth(F)	The max diameter of the mast rotating(G)	Max Testing Weight
LSG-1890BCCD	1510	1600	922	1750	∅2000×600max *	∅2000	60kg
LSG-1800ACCD	1370	1420	750	1650	∅1600×600max	∅1700	50kg

Table 1 The Dimensions of the Goniospectroradiometer Master

*Note: The max testing lamp size depends on the dark room height and special design jig (option)

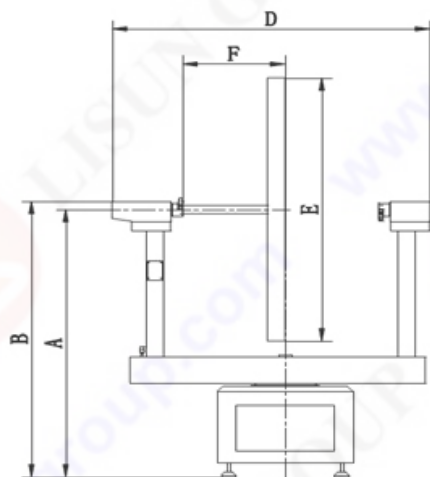


Figure 1 The Side View

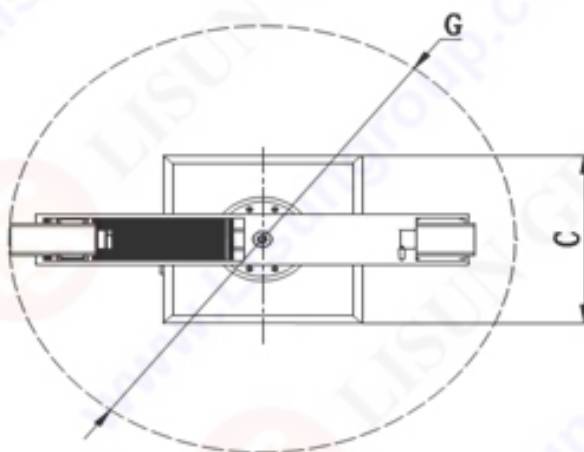
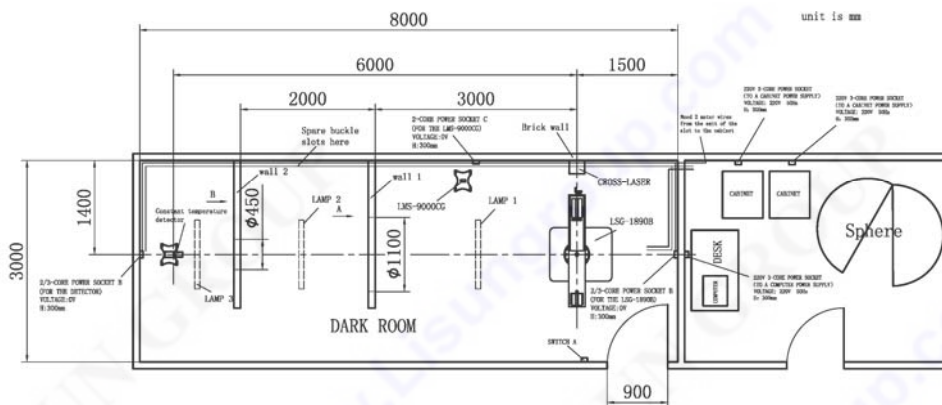


Figure 2 The Vertical View

- Dark Room size request (The G, A and E please refer to the above table 1 and figure 1 and 2): The darkroom Width $W=G+X$ (It recommends the X is min 500mm which can allow one person pass). The darkroom Height $H=A+0.5*E+Y$ (It recommends the Y is min 100mm to the ceiling). The darkroom Length $L=6*E$ (According to CIE, it requests at least 6times than the testing lamps).
- Control Room size request: min=2000*2000*2000mm
- The wall, ceiling and floor should be all coated with dull black paint or be covered by black cloth and black carpet.
- Air-conditioner should be set in the dark room to control the temperature around lamps to the standard value upon the CIE requirements
- LISUN engineer dept will submit the Lab Design support documents according to the customer's lab size after the purchase order was confirmed (The below are two Typical Lab Design reference for LSG-1890BCCD/LSG-1800ACCD).

NOTE: The longer dark room, the better test accuracy. LISUN recommends you to prepare as longer dark room as you can (max 30m)

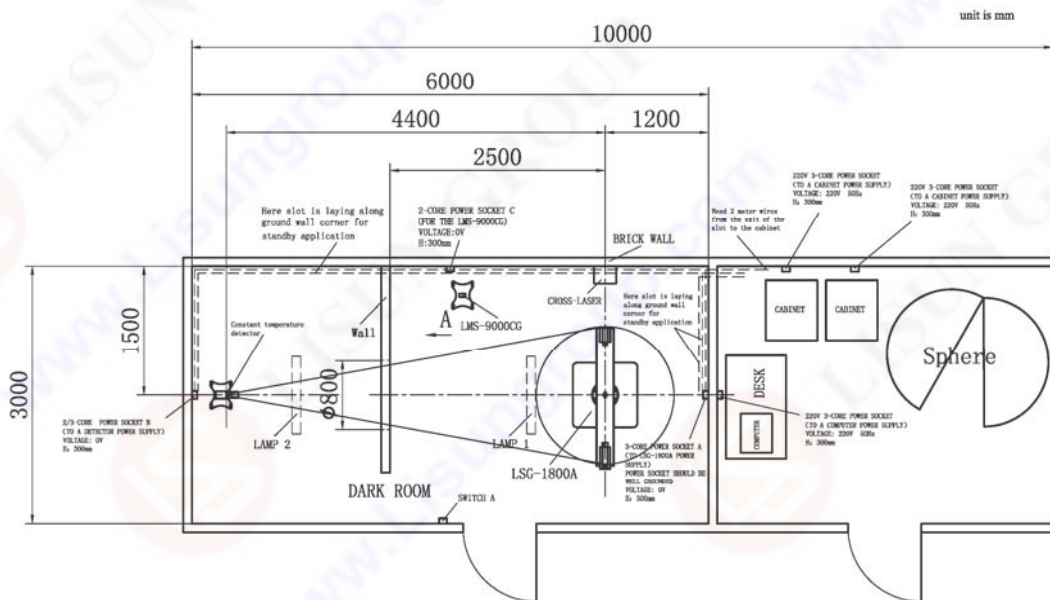
LSG-1890BCCD DARK ROOM VERTICAL VIEW



Technical requirements:

1. The walls and ceiling of the darkroom need to be painted matte black. Cover the floor with black carpet.
2. The wires for 3-core power socket A and 2/3-core power socket B are inside of the buckle slot from the cabinet. Need 2 meter wires from the exit of the slot to the cabinet. Another buckle slot at the same place for backup.
3. Switch A is for lamp 1, lamp 2 and lamp3. Lamps should be installed on the ceiling.
4. The 3-Core power socket for LSG-1890B must be well grounded or connected with the separate earthing terminal.
5. The dotted line buckle slot need to be easy tear open outfit and matte black.
6. The wall for cross laser is better to be brick. The cross laser together with the holder is about 5kg and need to be fixed on the wall.
7. Diameter of all wires are at least 2mm^2 .
8. The air conditioner outlet must not close to the luminaries being measured or the light path.
9. The windows need to be blocked or covered by matte black curtain.
10. The width of dark room door above 900mm, so that LSG-1890B could enter into dark room.

LSG-1800ACCD DARK ROOM VERTICAL VIEW



Technical requirement:

1. The walls, floors and ceilings of dark room must painted matt black paint and the ground spreads black carpet .
2. The power lines of three-core power socket A and two / three-core power socket B laying along the wall and into the operating room, requires power line head exposed ground 2 meter, the other slot laying along and enter into operating room for standby application.
3. SwitchA used to control lamp 1、 lamp 2 , Lamp installed in the ceiling.
4. Three-core power socket A (Power to LSG-1800A) must be well grounded, or separate ground terminal .
5. The slot where is referring by dotted line should be detachable, and the width of the slot should be not less than 50mm .
6. The wall to install cross laser must be brick wall.
7. The windows are sealed off in the darkroom to make sure light cannot leak absolutely.
8. In the dark room where LSG-1800A main machine placed, the air outlet of air set should not directly face to the tested lamp and the optical path.
9. All wire diameter $\geq 2\text{mm}^2$.

6. Typical oversea market customers:

There are many world famous companies and lab institute choose Lisun Goniophotometer, Please get the reference customers' information from Lisun Group Oversea Sales Dept.

7. Design Standard of Device

The construction, technical parameter, test & operate steps as well as data processing software of goniophotometer meet the following requirements:

- CIE Pub. NO.70, "The Measurement of Absolute Luminous Intensity Distributions"
- CIE DIV. II -TC10, "Photometry of Luminaires"
- IES LM-35-1989, "IES Approved Method for Photometric Testing of Floodlights"
- IES LM-31, "IES Approved Method for Photometric Testing of Roadway Luminaires"
- IES-LM-79-19, "Electrical and Photometric Measurements of Solid-State Lighting Products"
- GB/T 7002-1986, "Luminosity Test of Flood Luminaires"
- GB/T 9467-1988, "Luminosity Test of Indoor Luminaires"
- GB/T 9468-1988, "Luminosity Test of Street Luminaires"
- IES 61341 "Method of Measurement of Center Beam Intensity and Beam Angle(s) of Reflector Lamp"
- CIE Pub.NO.76, "Photometry-the CIE System of Physical Photometry"

8. Application Software

All control of the goniophotometer operations can be realized by the software, including gonophotometer movement, data acquisition and processing, real-time display on screen, report print and etc, thus enabling the measurement easy and secure.

This system can export data files as following formats:

```
IESNA Files (*.ies)
EULUMDAT Files (*.ldt)
CIEBSE TM14 Files (*.cib)
CIEBSE TM14 Files (*.tm4)
CIE Files (*.cie)
DIN CEN Files (*.cen)
Excel File (*.csv)
```

This kind of format files can be transferred by other illumination and luminaries design software such as DiaLux

Application software can also implement essential calculation for lighting design as iso-illuminance distribution curve on a working plane, luminance limitation curve, luminary's efficiency, effective beam angle, upward luminous flux ratio, downward luminous flux ratio, effective luminous flux, utilization factor curve etc.

The Next Page is the Test Report by software

Report No.: INDOOR-002

Test Time: 2023-01-03 15:40:15

Page 1 of 30

Lisun Goniophotometer Test Report

Product Info

 Luminaire Category: **Indoor**

 Luminaire: **ID-AC297**

 Lamp Category: **CREE**

 Lamp: **011507**

 Manufacturer: **Philips Lighting B.V.**

 Submitter: **Michael Aslami**

 Number of Lamps: **1**

 Lumens per Lamp: **3300 lm**

 Luminous Length: **595 mm**

 Luminous Width: **595 mm**

 Luminous Height: **0 mm**

Electric Parameters

 Voltage: **230.00 V** Current: **0.2089 A** Power: **46.95 W** Power Factor: **0.978** Frequency: **50.00 Hz**

Photometric Parameters

 CIE Class: **Direct**

 Measurement Flux: **3124.1 lm**

 Upward Ratio: **0.00 %**

 Maximum Intensity: **1083.51 cd**

 Central Intensity: **1083.42 cd**

 Luminaire Efficacy Rating (LER): **67**

 Conical Flux (90°): **1650.95 lm (52.8%)**

 Beam Angle (C0-C180,C90-C270): **113.5°, 110.5°**

 Field Angle (C0-C180,C90-C270): **165.2°, 164.4°**

 Divergence angle (50%): **H113.4°, V110.4°**

 Total Rated Lamp Lumens: **3300.0 lm**

 Efficiency: **94.67 %**

 Downward Ratio: **94.67 %**

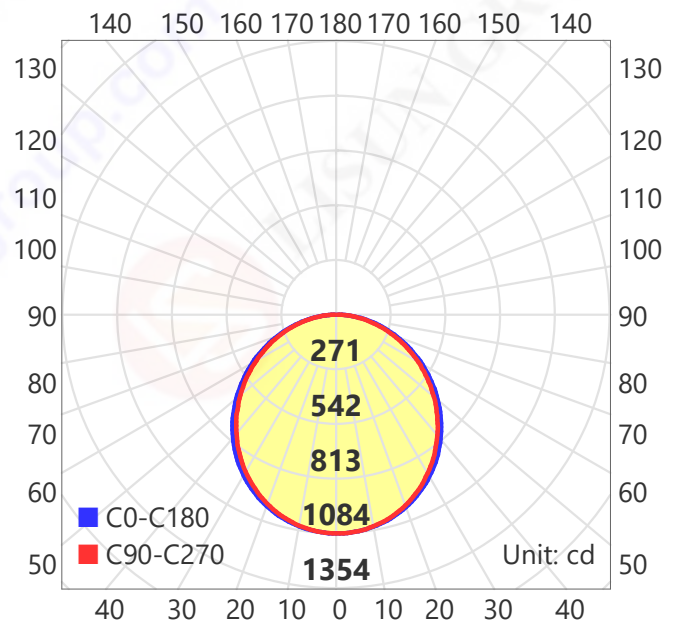
 Position Of Maximum Intensity: **C90° γ1°**

 S/MH(C0-C180,C90-C270): **1.26, 1.24**

 Energy Efficiency Class: **G (EU 2019/2015 η_{TM}:67lm/W)**

 Conical Flux (120°): **2422.76 lm (77.6%)**

 Beam Angle (C45-C225,C135-C315): **111.9°, 111.9°**

 Field Angle (C45-C225,C135-C315): **164.8°, 164.8°**


Average Beam Angle (50%): 111.9°

Test Type: Type C Test Distance: 8.460 m

Test Device: LSG-1890BCCD

Test Lab: Lisun Instruments Limited

Test By: Thomas Fiodorow

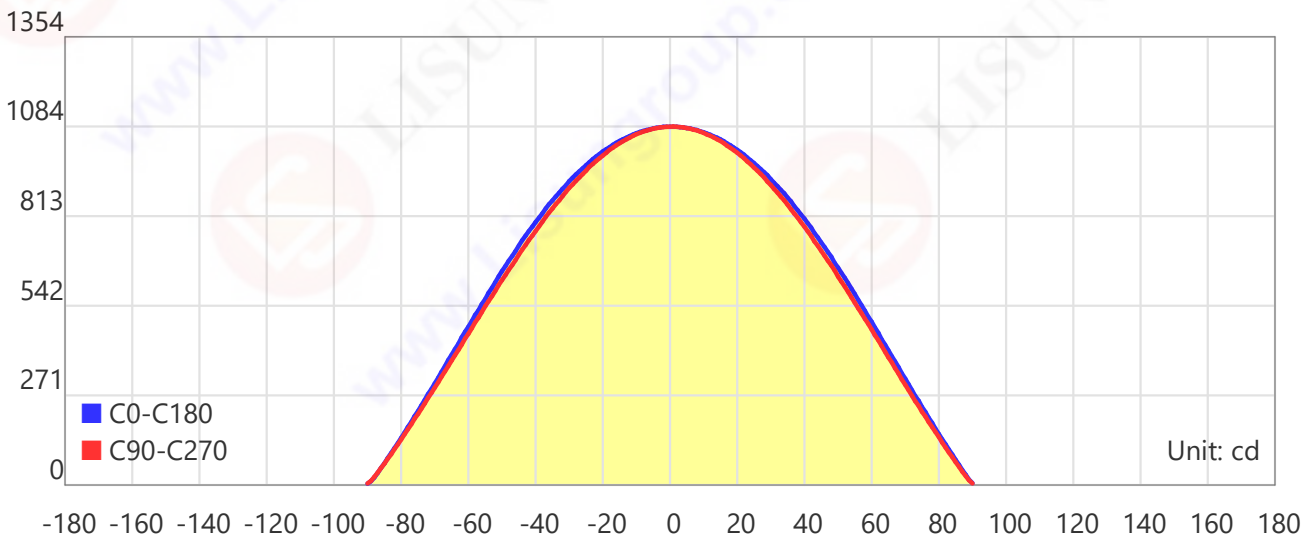
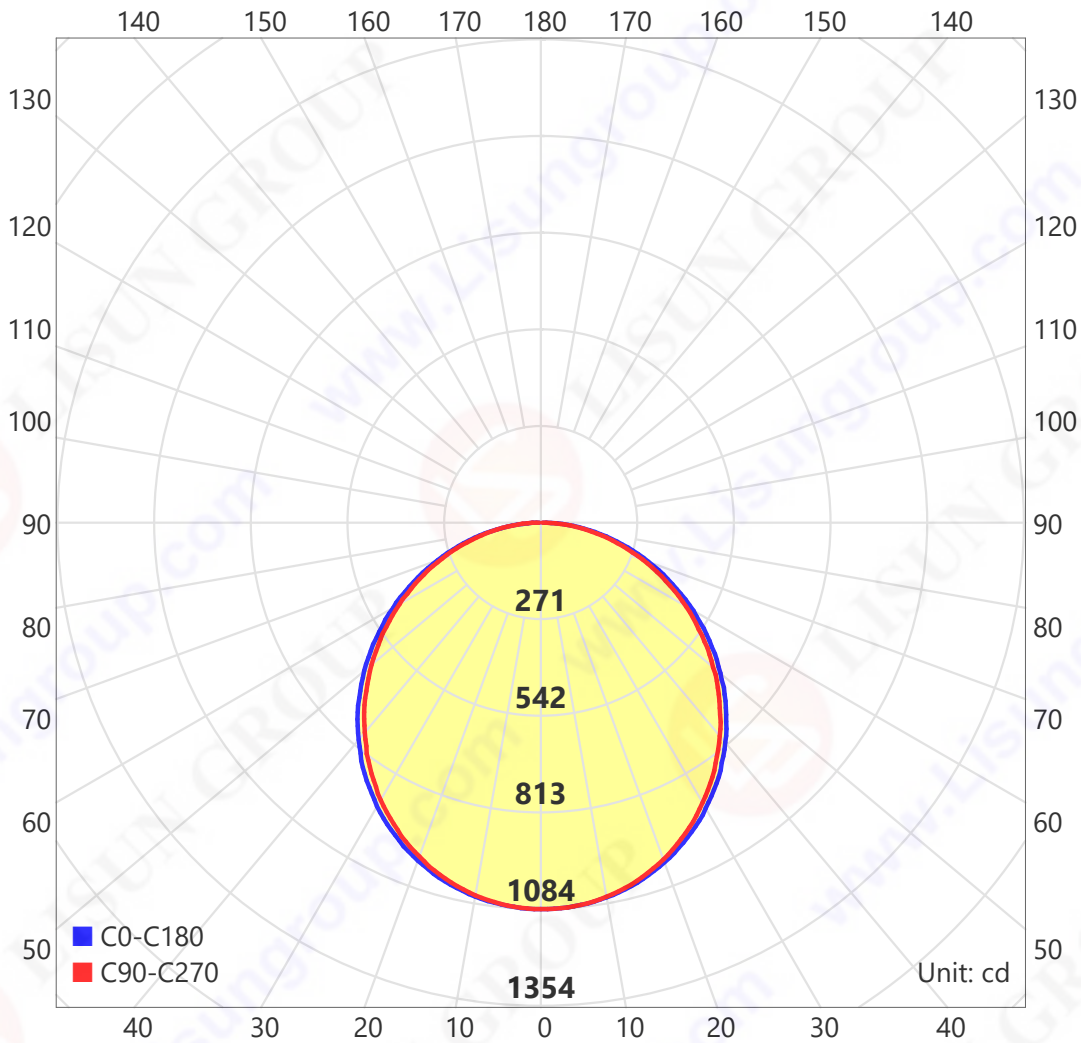
C Plane (°): 0.0-360.0:22.5 γ (°): 0.0-90.0:1.0

Temperature: 25°C

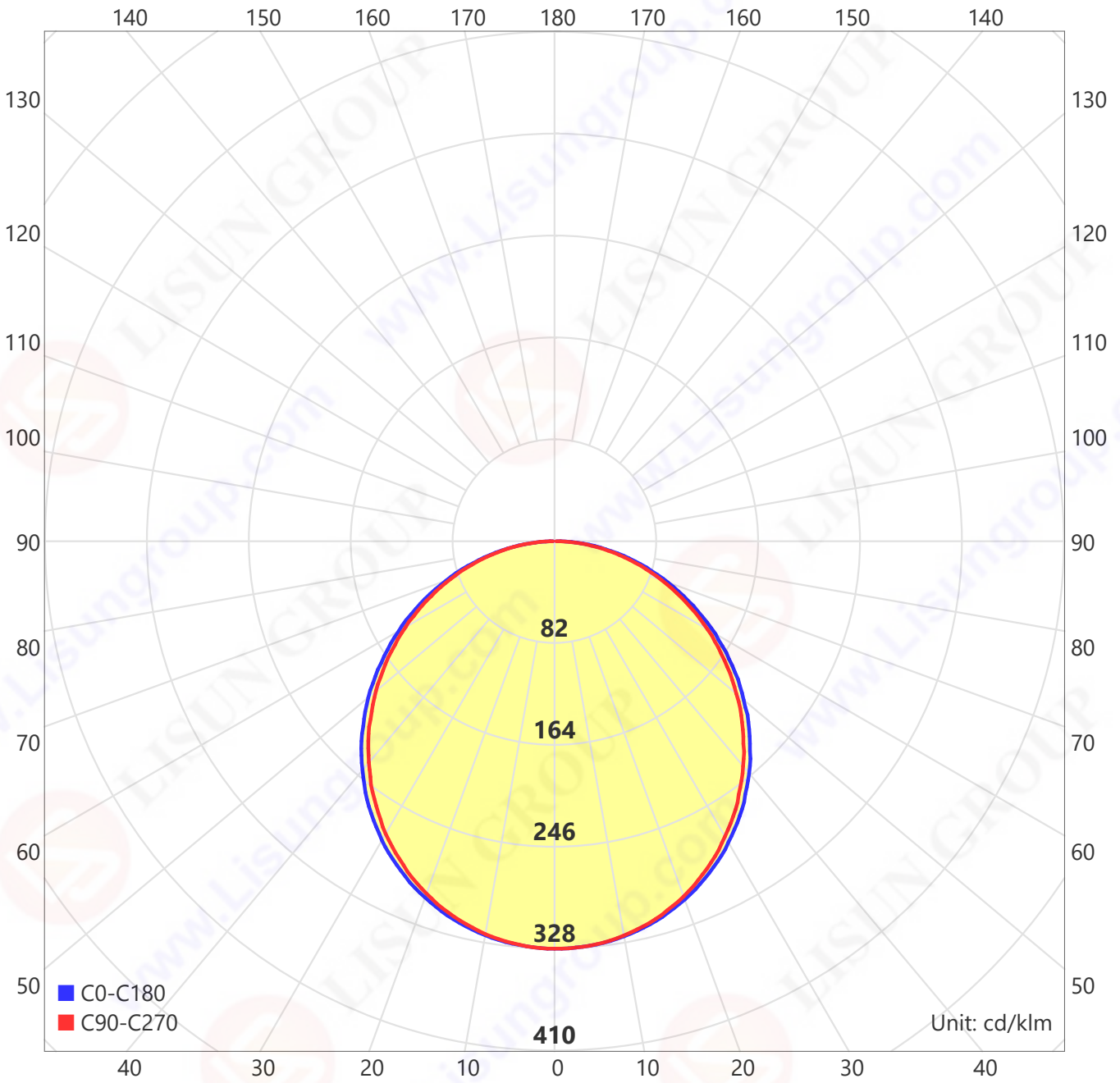
Humidity: 65.0%

Review By:

Light Distribution Curve



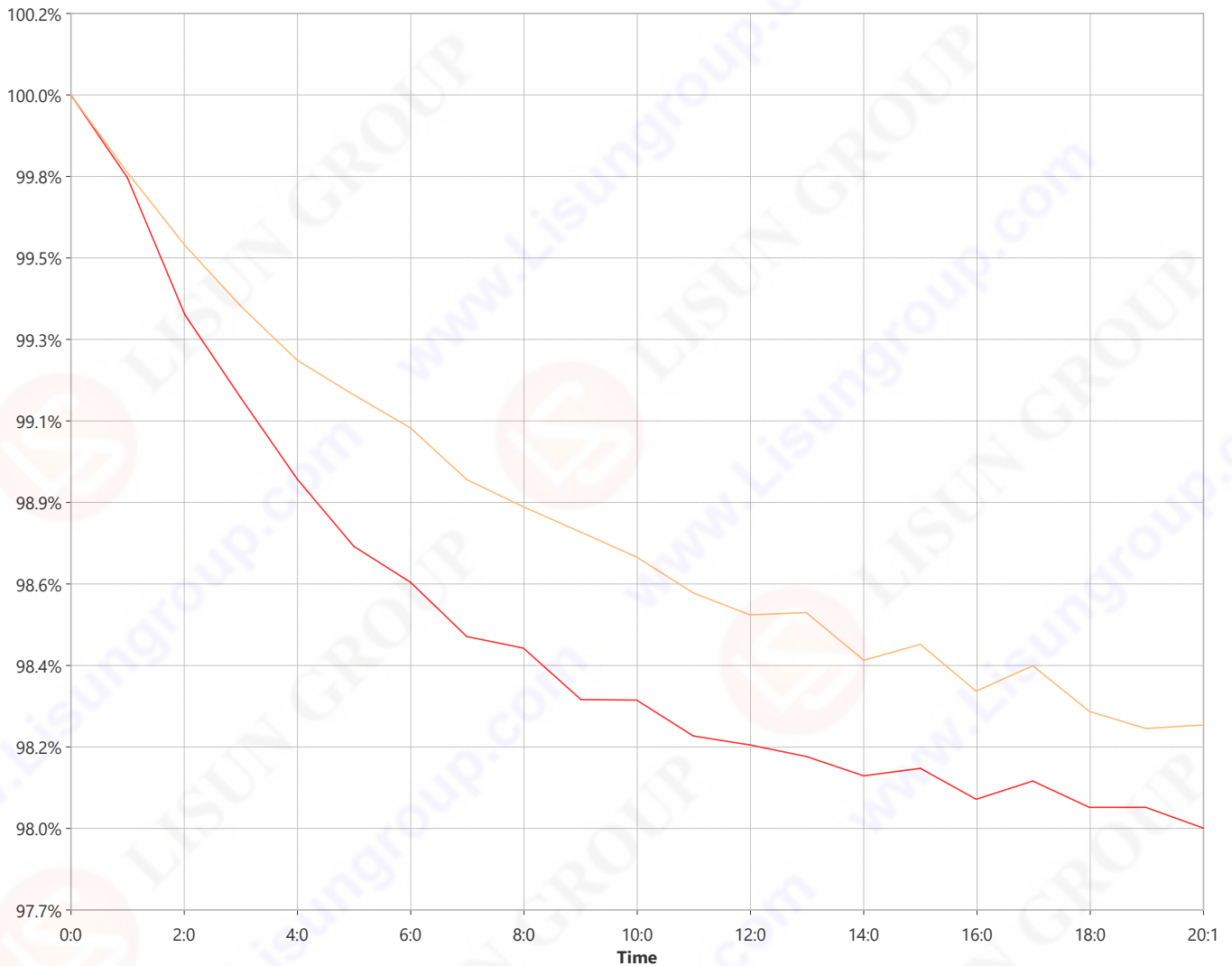
Light Distribution Curve (cd/klm)



011507/CREE

$\eta=94.67\%$

Warmup Log



Stable time: 20:1

Uptime: 0:0

Parameters	Maximum	Minimum	Change
Luminous intensity ,cd	1104.33	1081.91	22.41
Power ,W	47.83	47.00	0.84

Report No. : INDOOR-002

Test Time : 2023-01-03 15:40:15

Page 5 of 30

UGR

Reflectance										
Ceiling (cavity)	0.7	0.7	0.5	0.5	0.3	0.7	0.7	0.5	0.5	0.3
Wall	0.5	0.3	0.5	0.3	0.3	0.5	0.3	0.5	0.3	0.3
Reference plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Room dimensions	Viewed crosswise					Viewed endwise				
X=2H Y=2H	15.8	17.4	16.1	17.7	18.0	15.4	17.1	15.8	17.4	17.7
3H	17.7	19.2	18.1	19.5	19.9	17.4	18.9	17.7	19.2	19.5
4H	18.5	19.9	18.9	20.2	20.6	18.1	19.5	18.5	19.9	20.3
6H	19.1	20.4	19.5	20.8	21.2	18.7	20.1	19.2	20.4	20.8
8H	19.4	20.6	19.8	21.0	21.4	19.0	20.2	19.4	20.6	21.0
12H	19.6	20.8	20.0	21.1	21.6	19.1	20.3	19.6	20.7	21.2
X=4H Y=2H	16.4	17.8	16.8	18.1	18.5	16.2	17.6	16.6	17.9	18.3
3H	18.6	19.8	19.0	20.1	20.5	18.3	19.5	18.7	19.9	20.3
4H	19.5	20.6	19.9	21.0	21.4	19.2	20.3	19.6	20.7	21.1
6H	20.3	21.2	20.7	21.7	22.1	19.9	20.9	20.4	21.3	21.8
8H	20.6	21.5	21.0	21.9	22.4	20.2	21.1	20.7	21.5	22.0
12H	20.8	21.6	21.3	22.1	22.6	20.4	21.2	20.9	21.7	22.2
X=8H Y=4H	19.8	20.7	20.3	21.2	21.6	19.6	20.4	20.0	20.9	21.4
6H	20.7	21.5	21.3	22.0	22.5	20.4	21.2	20.9	21.7	22.2
8H	21.2	21.8	21.7	22.3	22.8	20.8	21.5	21.3	22.0	22.5
12H	21.5	22.1	22.0	22.6	23.1	21.1	21.7	21.6	22.2	22.8
X=12H Y=4H	19.9	20.7	20.4	21.2	21.6	19.6	20.4	20.1	20.9	21.4
6H	20.9	21.5	21.4	22.0	22.5	20.6	21.2	21.1	21.7	22.2
8H	21.3	21.9	21.8	22.4	22.9	21.0	21.6	21.5	22.1	22.6

Calculate in accordance with CIE 190:2010. The table is corrected with 3300lm ($8\log(F/F_0) = 4.1$).

Reflectance										
Ceiling (cavity)	0.7	0.7	0.5	0.5	0.3	0.7	0.7	0.5	0.5	0.3
Wall	0.5	0.3	0.5	0.3	0.3	0.5	0.3	0.5	0.3	0.3
Reference plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Room dimensions	Viewed crosswise					Viewed endwise				
X=2H Y=2H	16.2	17.6	16.5	17.9	18.1	16.0	17.4	16.3	17.6	17.9
3H	17.9	19.2	18.2	19.5	19.8	17.6	18.9	18.0	19.2	19.5
4H	18.6	19.9	19.0	20.2	20.5	18.3	19.5	18.7	19.8	20.1
6H	19.2	20.4	19.6	20.7	21.0	18.9	20.0	19.3	20.3	20.7
8H	19.5	20.6	19.8	20.9	21.2	19.1	20.2	19.5	20.5	20.8
12H	19.6	20.7	20.0	21.0	21.4	19.2	20.3	19.6	20.6	21.0
X=4H Y=2H	16.9	18.1	17.2	18.4	18.7	16.7	17.9	17.1	18.2	18.5
3H	18.8	19.8	19.2	20.2	20.5	18.5	19.6	18.9	19.9	20.3
4H	19.7	20.6	20.1	21.0	21.3	19.4	20.3	19.8	20.7	21.1
6H	20.4	21.2	20.8	21.6	22.0	20.1	20.9	20.5	21.3	21.7
8H	20.7	21.5	21.1	21.9	22.3	20.4	21.1	20.8	21.5	22.0
12H	20.9	21.6	21.4	22.0	22.5	20.6	21.3	21.0	21.7	22.1
X=8H Y=4H	20.0	20.8	20.4	21.2	21.6	19.8	20.5	20.2	20.9	21.3
6H	20.9	21.5	21.4	22.0	22.4	20.6	21.3	21.1	21.7	22.2
8H	21.3	21.8	21.8	22.3	22.8	21.0	21.6	21.5	22.0	22.5
12H	21.6	22.1	22.1	22.6	23.1	21.3	21.8	21.8	22.3	22.8
X=12H Y=4H	20.0	20.7	20.5	21.1	21.6	19.8	20.5	20.3	20.9	21.4
6H	21.0	21.5	21.5	22.0	22.5	20.7	21.3	21.2	21.7	22.2
8H	21.4	21.9	21.9	22.4	22.9	21.1	21.6	21.6	22.1	22.6
Variations with the observer position at spacings										
S=1.0H						+0.2/-0.2				
S=1.5H						+0.4/-0.4				
S=2.0H						+0.5/-0.7				

Calculate in accordance with CIE Pub.117. The table is corrected with 3300lm ($8\log(F/F_0) = 4.1$).

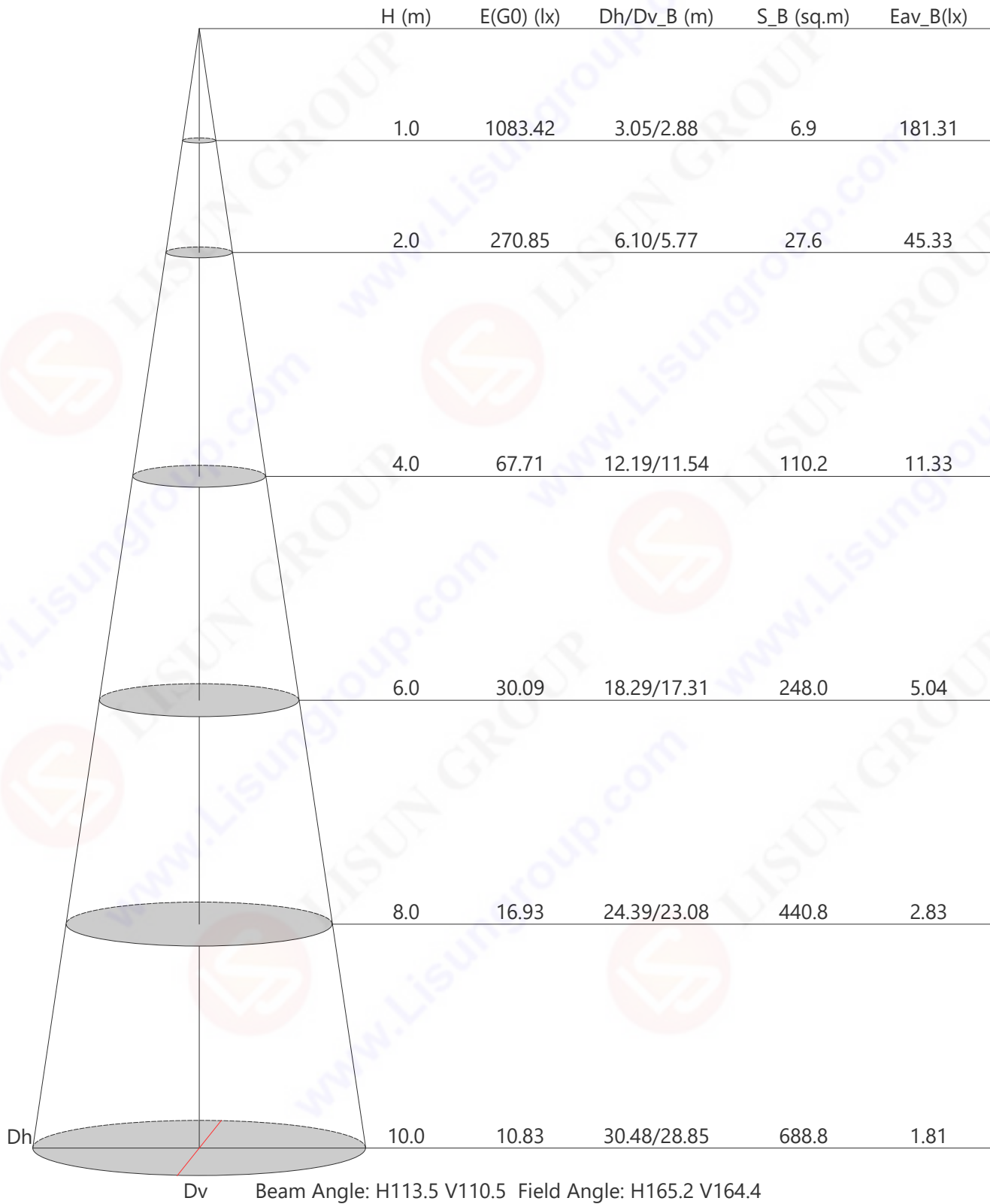
Test Type : Type C	Test Distance : 8.460 m	C Plane (°): 0.0-360.0:22.5	γ (°): 0.0-90.0:1.0
Test Device : LSG-1890BCCD		Temperature : 25°C	Humidity : 65.0%
Test Lab : Lisun Instruments Limited			
Test By : Thomas Fiodorow		Review By :	

Report No. : INDOOR-002

Test Time : 2023-01-03 15:40:15

Page 6 of 30

Lux-Distance



Test Type : Type C Test Distance : 8.460 m

C Plane (°): 0.0-360.0:22.5 γ (°): 0.0-90.0:1.0

Test Device : LSG-1890BCCD

Temperature : 25°C

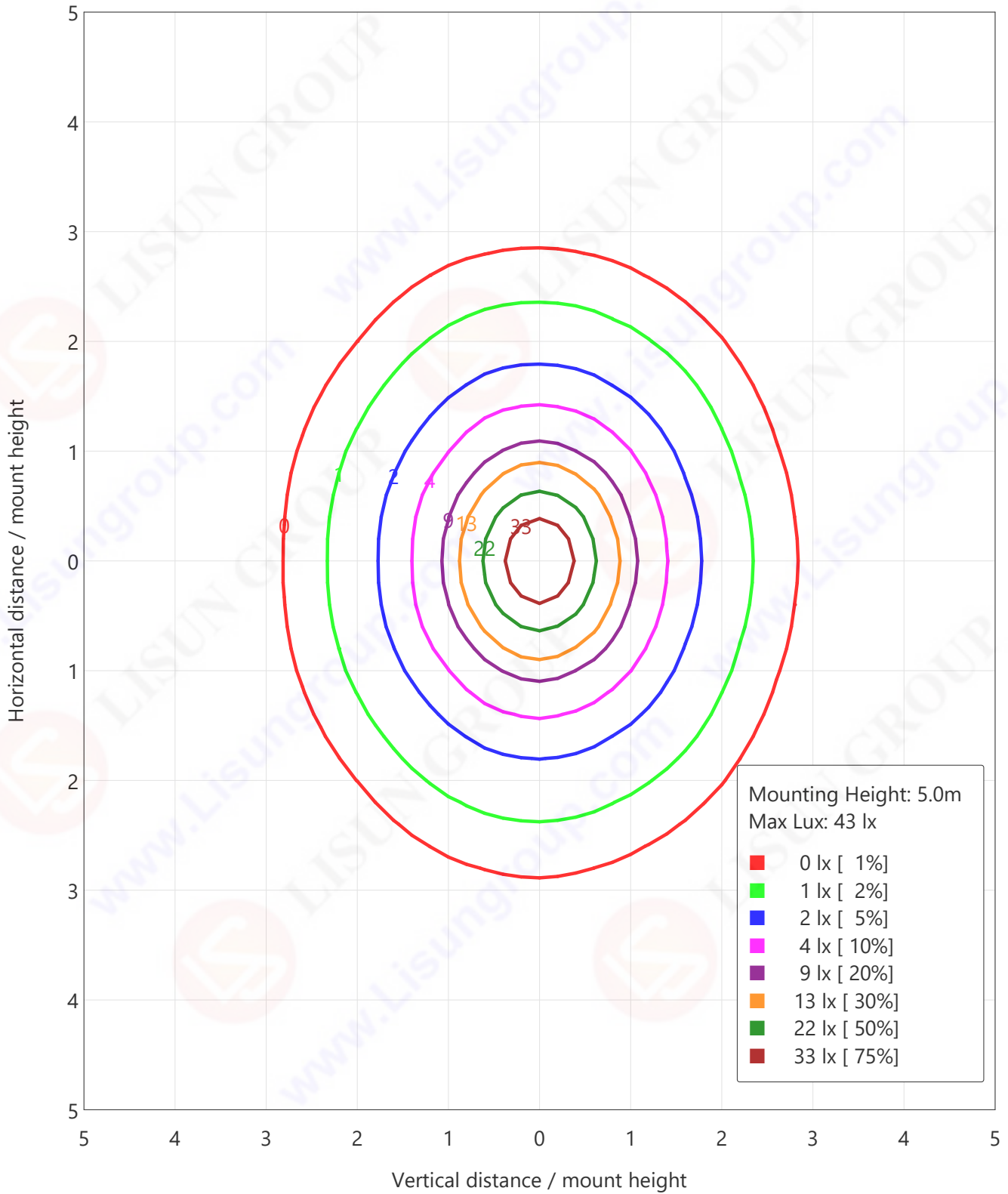
Humidity : 65.0%

Test Lab : Lisun Instruments Limited

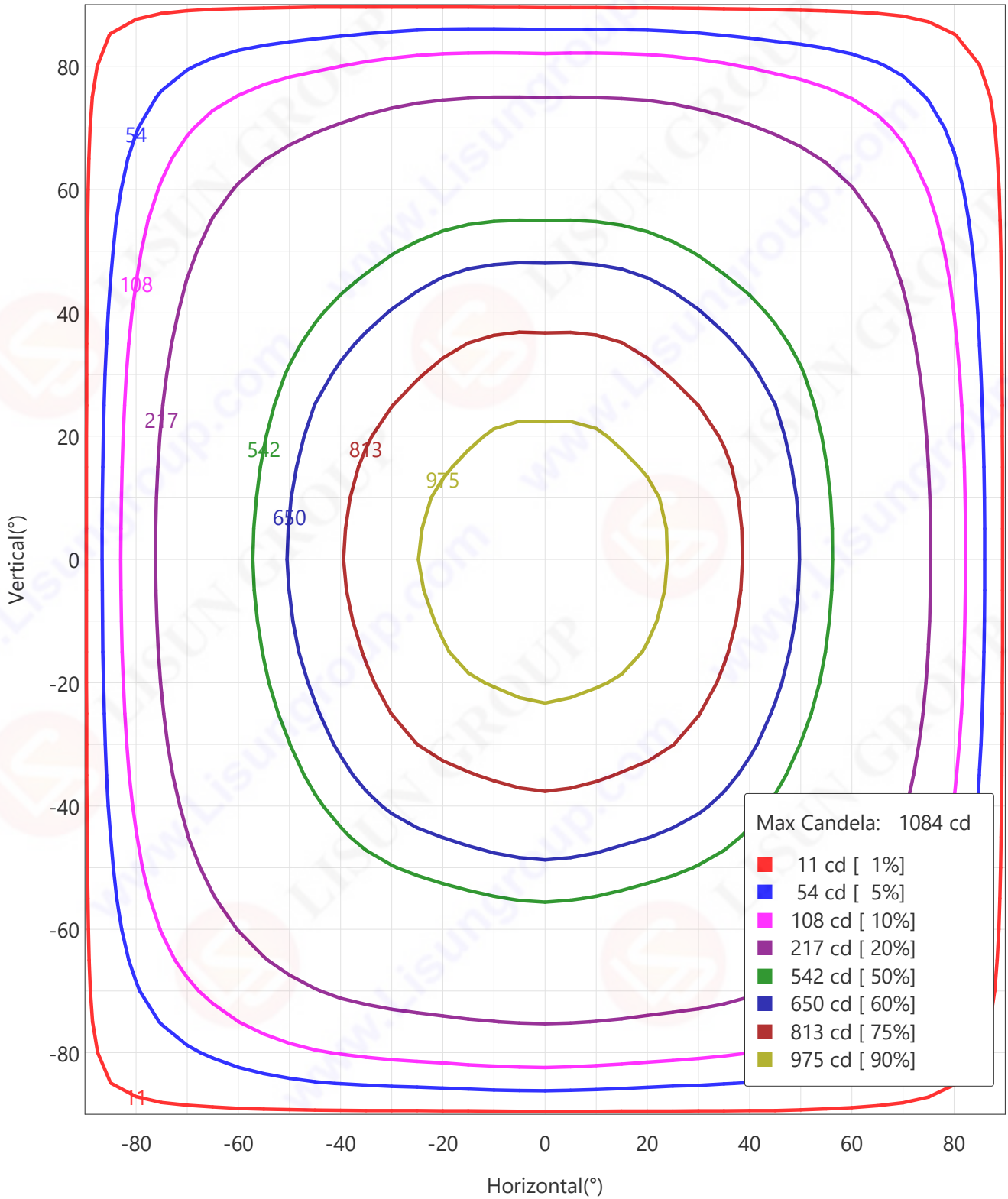
Test By : Thomas Fiodorow

Review By :

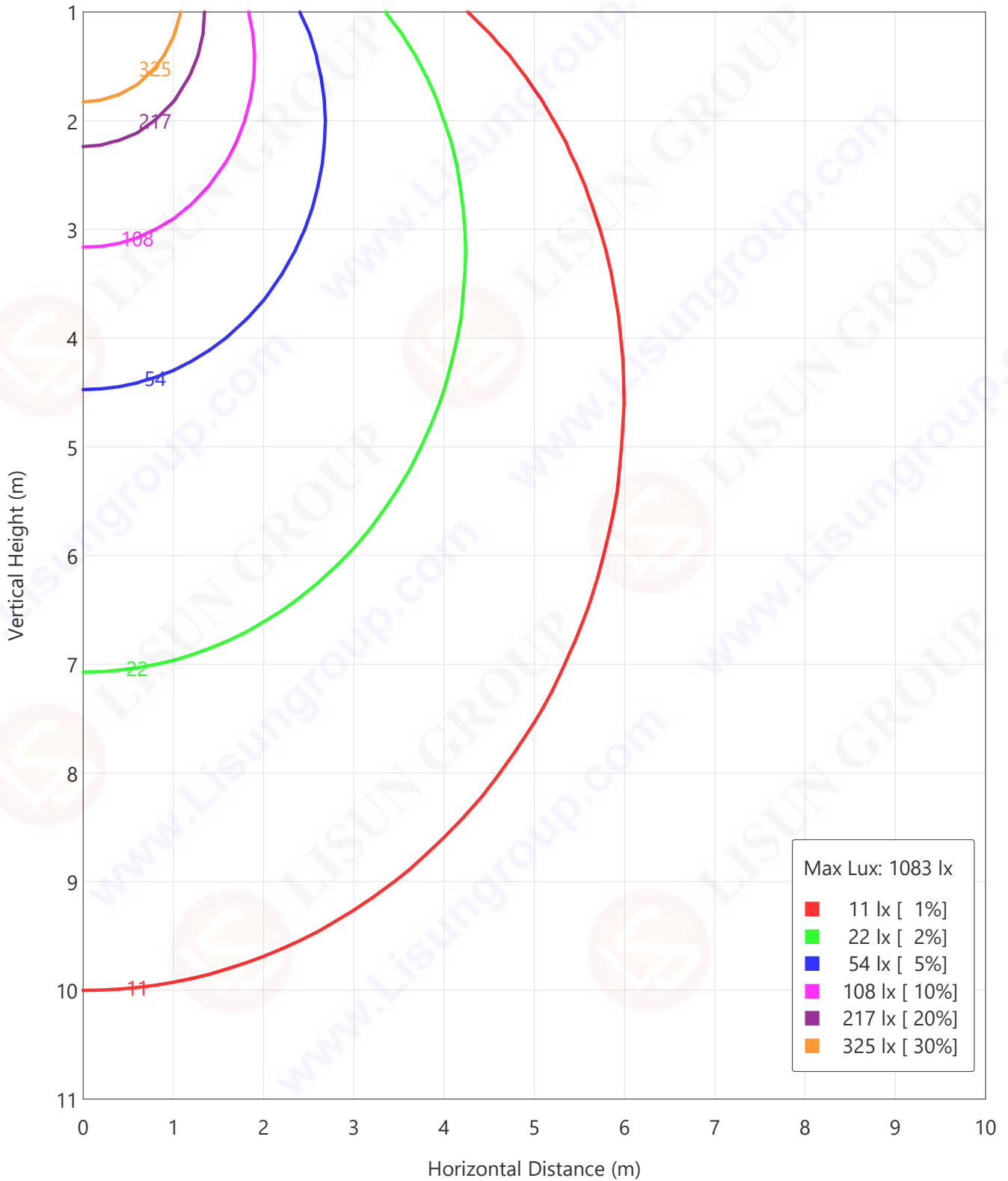
IsoLux



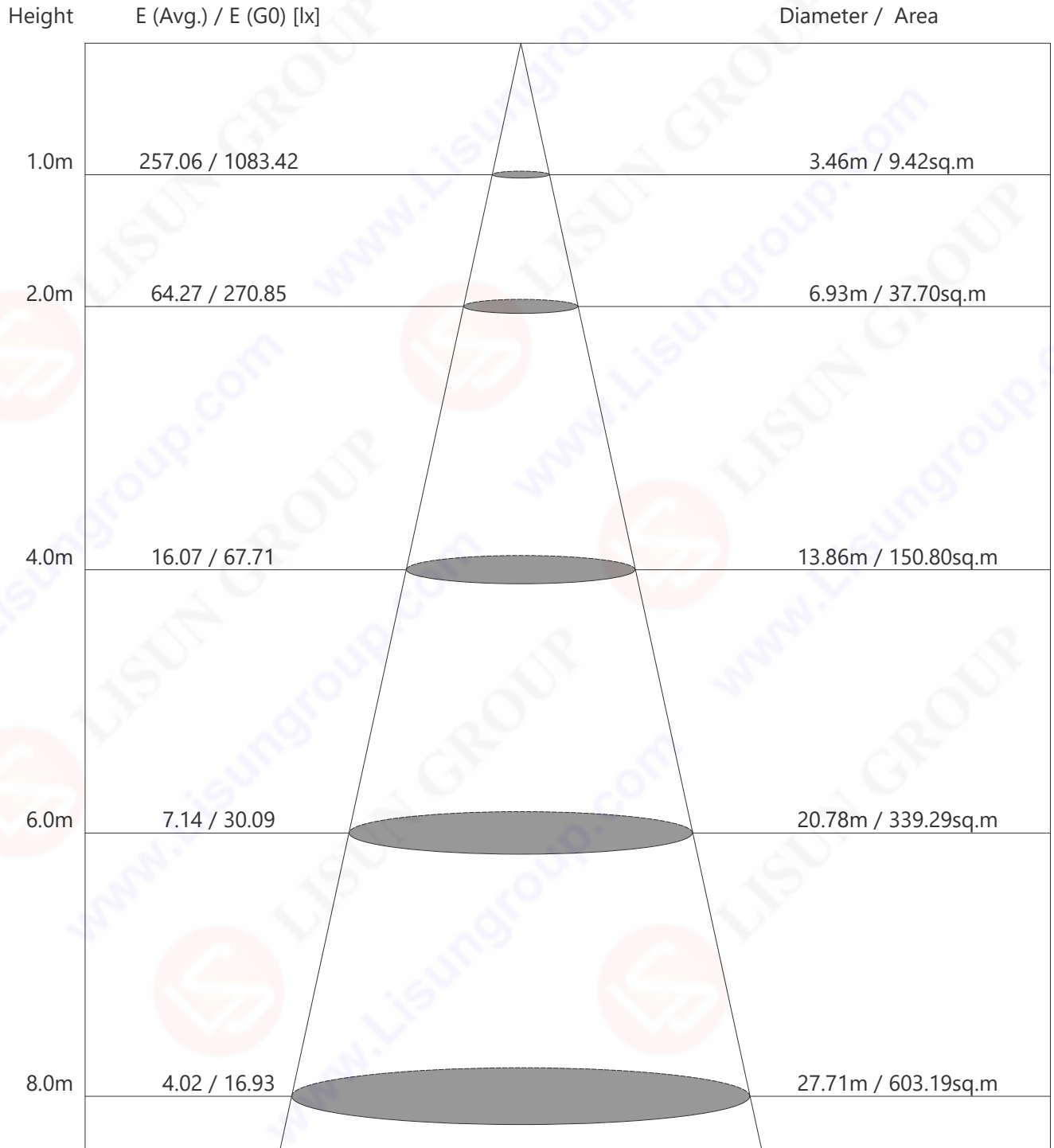
IsoCandela



Vertical IsoLux Plot



Average Illuminance Effective Figure

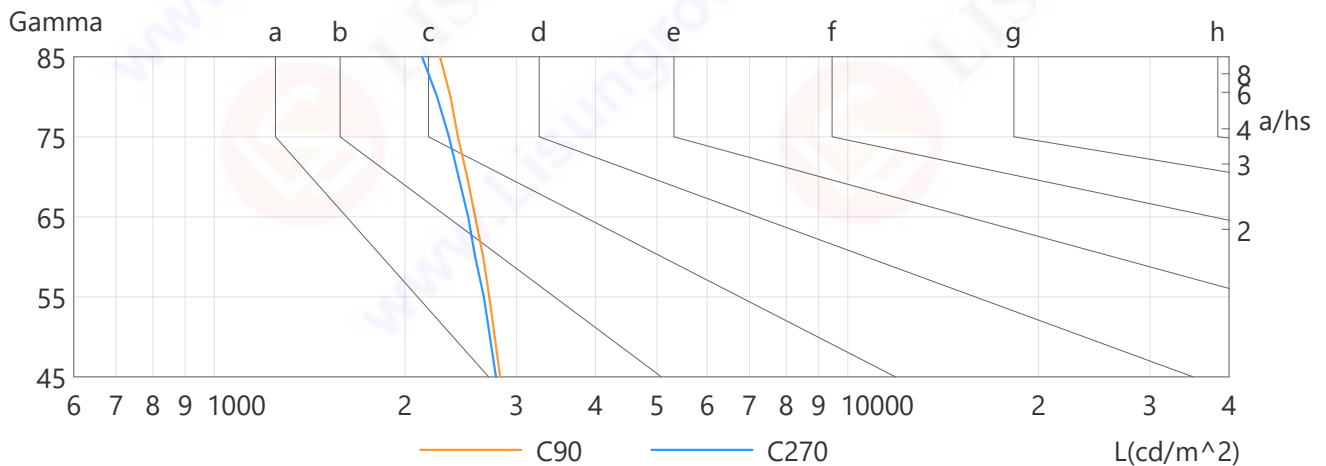
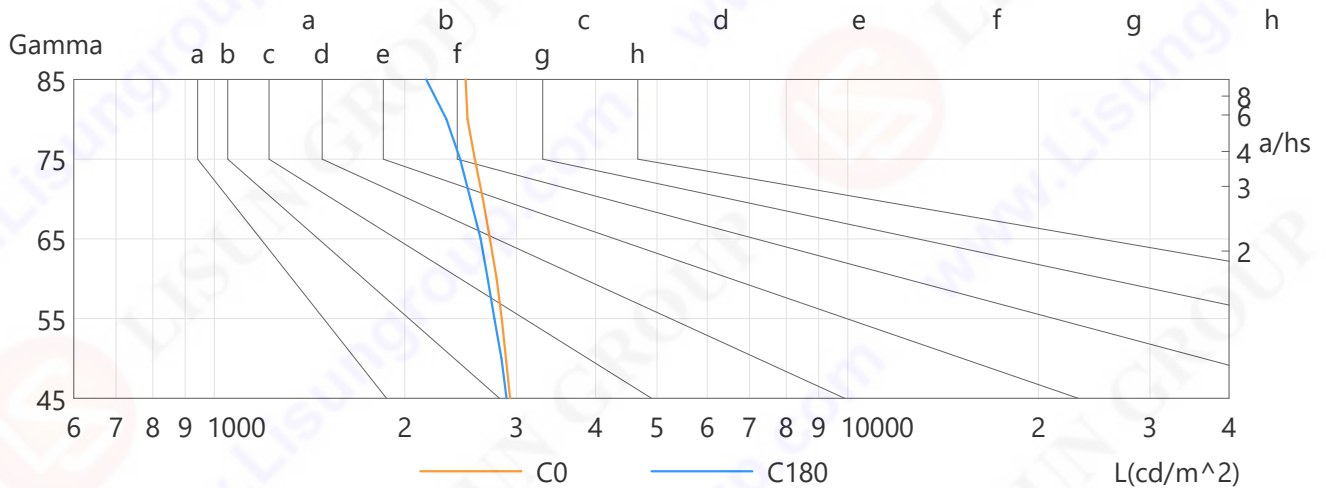


Beam Angle: 120° Flux Out: 2422.76lm

Luminance Limit Curve

L (cd/m ²)	G45	G50	G55	G60	G65	G70	G75	G80	G85
C0	2932	2887	2845	2792	2724	2655	2580	2512	2495
C90	2829	2772	2719	2658	2583	2508	2424	2361	2271
C180	2894	2841	2770	2703	2632	2539	2445	2326	2162
C270	2785	2724	2665	2583	2517	2432	2348	2249	2128

Dazzle	Quality	Illuminance (lx)							
1.15	A	2000	1000	500	<=300				
1.50	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.20	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300



Report No. : INDOOR-002

Test Time : 2023-01-03 15:40:15

Page 12 of 30

TM5 UF Table

Utilisation Factors UF (F)			SHR NOM = 1.25								
Room Reflectance			Room Index(RI)								
C	W	F	0.75	1.00	1.25	1.50	2.00	2.50	3.00	4.00	5.00
0.70	0.50	0.20	0.53	0.63	0.70	0.75	0.82	0.87	0.90	0.94	0.97
	0.30		0.45	0.55	0.63	0.68	0.76	0.81	0.85	0.90	0.94
	0.20		0.40	0.50	0.57	0.63	0.71	0.77	0.81	0.87	0.91
0.50	0.50	0.20	0.51	0.61	0.67	0.72	0.79	0.83	0.86	0.91	0.93
	0.30		0.45	0.54	0.61	0.66	0.74	0.79	0.82	0.87	0.90
	0.20		0.40	0.49	0.56	0.62	0.69	0.75	0.79	0.84	0.88
0.30	0.50	0.20	0.50	0.59	0.65	0.70	0.76	0.80	0.83	0.87	0.90
	0.30		0.44	0.53	0.60	0.65	0.72	0.76	0.80	0.84	0.87
	0.20		0.39	0.49	0.55	0.61	0.68	0.73	0.77	0.82	0.85
0.00	0.00	0.00	0.37	0.46	0.53	0.58	0.65	0.69	0.73	0.78	0.81
Utilisation Factors UF (W)			SHR NOM = 1.25								
Room Reflectance			Room Index(RI)								
C	W	F	0.75	1.00	1.25	1.50	2.00	2.50	3.00	4.00	5.00
0.70	0.50	0.20	0.96	0.79	0.68	0.59	0.48	0.40	0.34	0.26	0.22
	0.30		0.80	0.68	0.59	0.52	0.43	0.36	0.31	0.25	0.21
	0.20		0.69	0.59	0.52	0.47	0.39	0.34	0.29	0.23	0.20
0.50	0.50	0.20	0.93	0.76	0.65	0.57	0.46	0.41	0.32	0.25	0.21
	0.30		0.78	0.66	0.58	0.51	0.42	0.35	0.30	0.24	0.20
	0.20		0.68	0.59	0.52	0.46	0.38	0.33	0.28	0.23	0.19
0.30	0.50	0.20	0.90	0.74	0.63	0.55	0.44	0.36	0.31	0.24	0.20
	0.30		0.77	0.65	0.56	0.49	0.40	0.34	0.29	0.23	0.19
	0.20		0.67	0.58	0.51	0.45	0.37	0.32	0.28	0.22	0.18
0.00	0.00	0.00	0.58	0.49	0.42	0.37	0.30	0.25	0.22	0.17	0.14
Utilisation Factors UF (C)			SHR NOM = 1.25								
Room Reflectance			Room Index(RI)								
C	W	F	0.75	1.00	1.25	1.50	2.00	2.50	3.00	4.00	5.00
0.70	0.50	0.20	0.16	0.17	0.18	0.18	0.19	0.20	0.20	0.20	0.21
	0.30		0.09	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18
	0.20		0.04	0.06	0.07	0.08	0.10	0.12	0.13	0.15	0.16
0.50	0.50	0.20	0.15	0.16	0.17	0.18	0.18	0.19	0.19	0.20	0.20
	0.30		0.09	0.10	0.11	0.12	0.14	0.15	0.16	0.17	0.18
	0.20		0.04	0.06	0.07	0.08	0.10	0.12	0.13	0.14	0.15
0.30	0.50	0.20	0.15	0.16	0.16	0.17	0.18	0.18	0.18	0.19	0.19
	0.30		0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.17
	0.20		0.04	0.06	0.07	0.08	0.10	0.11	0.12	0.14	0.15
0.00	0.00	0.00	NA	NA	NA	NA	NA	NA	NA	NA	NA

Rating: 47W Photometrically tested without ceiling board.
Multiply UF values by service correction factors
Calculate in accordance with CIBSE Technical Memorandum No.5/1980

Test Type : Type C

Test Distance : 8.460 m

C Plane (°): 0.0-360.0:22.5

γ (°): 0.0-90.0:1.0

Test Device : LSG-1890BCCD

Temperature : 25°C

Humidity : 65.0%

Test Lab : Lisun Instruments Limited

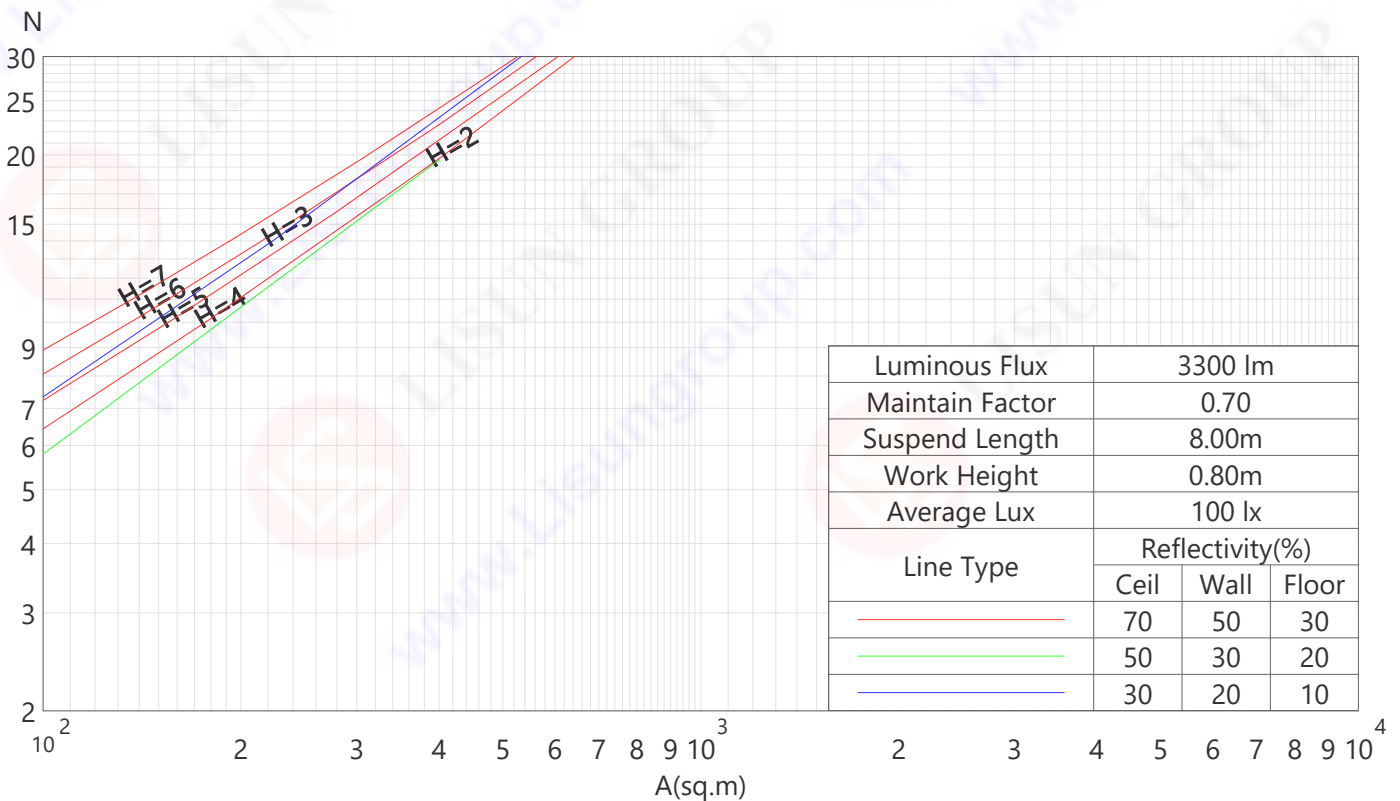
Test By : Thomas Fiodorow

Review By :

Indoor CU, Curves of Luminaires vs Lighting Area

RC	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.5	0.5	0.5	0.3	0.3	0.3	0.1	0.1	0.1	0
RW	0.7	0.5	0.3	0.1	0.7	0.5	0.3	0.1	0.5	0.3	0.1	0.5	0.3	0.1	0.5	0.3	0.1	0
RCR	RF = 0.2																	
0	113	113	113	113	110	110	110	110	105	105	105	101	101	101	97	97	97	95
1	103	98	94	90	100	96	92	88	92	89	86	88	85	83	85	82	81	79
2	93	85	78	73	91	83	77	72	80	75	70	77	72	69	74	70	67	65
3	85	75	67	60	82	73	66	60	70	64	59	68	62	58	65	61	57	55
4	78	66	58	51	75	65	57	51	62	55	50	60	54	49	58	53	49	47
5	71	59	50	44	69	58	50	44	56	49	43	54	48	43	52	47	42	40
6	66	53	44	38	64	52	44	38	50	43	38	49	42	37	47	42	37	35
7	61	48	40	34	59	47	39	34	46	39	33	44	38	33	43	37	33	31
8	57	44	36	30	55	43	35	30	42	35	30	41	34	30	40	34	29	28
9	53	40	32	27	52	40	32	27	39	32	27	38	31	27	37	31	27	25
10	50	37	30	25	49	37	29	24	36	29	24	35	29	24	34	28	24	22

Spacing Criteria: 1.26 (0-180), 1.24 (90-270), 1.37 (Diagonal)



Report No. : INDOOR-002

Test Time : 2023-01-03 15:40:15

Page 14 of 30

Zonal Flux

Gamma °	lmean cd	Zonal Flux lm	Sum Zonal Flux lm	Rel Zonal Flux %	Sum Rel Zonal Flux %
0.0-1.0	1083.3	1.0	1.0	0.03	0.03
1.0-2.0	1082.9	3.1	4.1	0.09	0.13
2.0-3.0	1082.1	5.2	9.3	0.16	0.28
3.0-4.0	1080.9	7.2	16.6	0.22	0.50
4.0-5.0	1079.3	9.3	25.8	0.28	0.78
5.0-6.0	1077.3	11.3	37.2	0.34	1.13
6.0-7.0	1075.0	13.3	50.5	0.40	1.53
7.0-8.0	1072.3	15.3	65.9	0.47	2.00
8.0-9.0	1069.2	17.3	83.2	0.53	2.52
9.0-10.0	1065.6	19.3	102.5	0.58	3.11
10.0-11.0	1061.7	21.2	123.7	0.64	3.75
11.0-12.0	1057.3	23.1	146.8	0.70	4.45
12.0-13.0	1052.6	25.0	171.8	0.76	5.21
13.0-14.0	1047.6	26.8	198.6	0.81	6.02
14.0-15.0	1042.3	28.6	227.2	0.87	6.89
15.0-16.0	1036.4	30.4	257.6	0.92	7.81
16.0-17.0	1030.2	32.1	289.7	0.97	8.78
17.0-18.0	1023.5	33.8	323.4	1.02	9.80
18.0-19.0	1016.6	35.4	358.8	1.07	10.87
19.0-20.0	1009.3	36.9	395.8	1.12	11.99
20.0-21.0	1001.7	38.5	434.2	1.17	13.16
21.0-22.0	993.8	39.9	474.2	1.21	14.37
22.0-23.0	985.4	41.4	515.5	1.25	15.62
23.0-24.0	976.5	42.7	558.2	1.29	16.92
24.0-25.0	967.3	44.0	602.2	1.33	18.25
25.0-26.0	957.9	45.2	647.4	1.37	19.62
26.0-27.0	948.3	46.4	693.8	1.41	21.03
27.0-28.0	938.5	47.5	741.4	1.44	22.47
28.0-29.0	928.2	48.6	789.9	1.47	23.94
29.0-30.0	917.4	49.5	839.5	1.50	25.44
30.0-31.0	906.1	50.4	889.9	1.53	26.97
31.0-32.0	894.5	51.3	941.1	1.55	28.52
32.0-33.0	883.0	52.0	993.2	1.58	30.10
33.0-34.0	871.4	52.7	1045.9	1.60	31.69
34.0-35.0	859.3	53.4	1099.3	1.62	33.31
35.0-36.0	846.8	53.9	1153.2	1.63	34.95
36.0-37.0	833.9	54.4	1207.6	1.65	36.59
37.0-38.0	820.6	54.8	1262.4	1.66	38.25
38.0-39.0	807.2	55.1	1317.5	1.67	39.92
39.0-40.0	793.8	55.4	1372.9	1.68	41.60

Test Type : Type C Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

C Plane (°): 0.0-360.0:22.5 γ (°): 0.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : INDOOR-002

Test Time : 2023-01-03 15:40:15

Page 15 of 30

Zonal Flux

Gamma °	lmean cd	Zonal Flux lm	Sum Zonal Flux lm	Rel Zonal Flux %	Sum Rel Zonal Flux %
40.0-41.0	779.9	55.5	1428.4	1.68	43.28
41.0-42.0	766.1	55.7	1484.1	1.69	44.97
42.0-43.0	751.8	55.7	1539.8	1.69	46.66
43.0-44.0	737.3	55.7	1595.4	1.69	48.35
44.0-45.0	722.6	55.5	1651.0	1.68	50.03
45.0-46.0	707.4	55.3	1706.3	1.68	51.71
46.0-47.0	692.3	55.1	1761.3	1.67	53.37
47.0-48.0	677.3	54.8	1816.1	1.66	55.03
48.0-49.0	661.9	54.4	1870.5	1.65	56.68
49.0-50.0	646.2	53.9	1924.4	1.63	58.31
50.0-51.0	630.3	53.3	1977.7	1.62	59.93
51.0-52.0	614.3	52.7	2030.4	1.60	61.53
52.0-53.0	598.4	52.1	2082.5	1.58	63.11
53.0-54.0	582.2	51.3	2133.8	1.56	64.66
54.0-55.0	565.8	50.5	2184.3	1.53	66.19
55.0-56.0	549.3	49.6	2233.9	1.50	67.70
56.0-57.0	532.7	48.7	2282.7	1.48	69.17
57.0-58.0	516.2	47.7	2330.4	1.45	70.62
58.0-59.0	499.7	46.7	2377.1	1.42	72.03
59.0-60.0	483.0	45.6	2422.8	1.38	73.42
60.0-61.0	466.3	44.5	2467.3	1.35	74.77
61.0-62.0	449.5	43.3	2510.6	1.31	76.08
62.0-63.0	432.7	42.1	2552.7	1.28	77.35
63.0-64.0	415.8	40.8	2593.5	1.24	78.59
64.0-65.0	399.1	39.5	2633.0	1.20	79.79
65.0-66.0	382.4	38.2	2671.1	1.16	80.94
66.0-67.0	365.5	36.8	2707.9	1.11	82.06
67.0-68.0	348.8	35.3	2743.2	1.07	83.13
68.0-69.0	331.9	33.9	2777.1	1.03	84.15
69.0-70.0	315.1	32.4	2809.5	0.98	85.14
70.0-71.0	298.6	30.9	2840.3	0.94	86.07
71.0-72.0	282.1	29.3	2869.7	0.89	86.96
72.0-73.0	265.4	27.8	2897.4	0.84	87.80
73.0-74.0	249.1	26.2	2923.6	0.79	88.59
74.0-75.0	232.7	24.6	2948.2	0.75	89.34
75.0-76.0	216.6	23.0	2971.2	0.70	90.04
76.0-77.0	200.6	21.4	2992.6	0.65	90.68
77.0-78.0	184.6	19.8	3012.4	0.60	91.28
78.0-79.0	168.8	18.1	3030.5	0.55	91.83
79.0-80.0	153.1	16.5	3047.0	0.50	92.33

Test Type : Type C Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

C Plane (°): 0.0-360.0:22.5 γ (°): 0.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : INDOOR-002

Test Time : 2023-01-03 15:40:15

Page 16 of 30

Zonal Flux

Gamma °	I _{mean} cd	Zonal Flux lm	Sum Zonal Flux lm	Rel Zonal Flux %	Sum Rel Zonal Flux %
80.0-81.0	137.5	14.9	3061.9	0.45	92.78
81.0-82.0	122.1	13.2	3075.1	0.40	93.19
82.0-83.0	106.8	11.6	3086.7	0.35	93.54
83.0-84.0	91.8	10.0	3096.7	0.30	93.84
84.0-85.0	77.0	8.4	3105.1	0.25	94.10
85.0-86.0	62.3	6.8	3112.0	0.21	94.30
86.0-87.0	47.8	5.2	3117.2	0.16	94.46
87.0-88.0	33.5	3.7	3120.9	0.11	94.57
88.0-89.0	20.2	2.2	3123.1	0.07	94.64
89.0-90.0	9.6	1.0	3124.1	0.03	94.67

Test Type : Type C Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

C Plane (°): 0.0-360.0:22.5 γ (°): 0.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : INDOOR-002

Test Time : 2023-01-03 15:40:15

Page 17 of 30

Light Distribution Data

Unit: cd

G\C	C0.0	C22.5	C45.0	C67.5	C90.0	C112.5	C135.0	C157.5
G0.0	1083.4	1083.4	1083.4	1083.4	1083.4	1083.4	1083.4	1083.4
G1.0	1083.4	1082.9	1083.1	1082.9	1083.5	1083.1	1083.5	1083.1
G2.0	1083.1	1082.2	1083.0	1082.1	1083.1	1082.3	1083.3	1082.6
G3.0	1082.2	1081.2	1081.9	1081.0	1082.2	1081.4	1082.3	1081.4
G4.0	1081.2	1079.8	1080.7	1079.5	1080.9	1079.8	1081.2	1080.2
G5.0	1079.5	1077.8	1079.0	1077.5	1079.3	1077.5	1079.6	1078.3
G6.0	1077.7	1075.9	1077.1	1075.0	1077.1	1075.2	1077.7	1076.2
G7.0	1075.5	1073.2	1074.7	1072.3	1074.8	1072.5	1075.5	1073.9
G8.0	1073.1	1069.8	1072.1	1069.2	1071.9	1069.4	1073.0	1071.1
G9.0	1069.7	1066.7	1069.0	1065.0	1068.0	1065.9	1069.9	1067.4
G10.0	1066.2	1063.1	1065.6	1061.1	1064.3	1062.0	1066.5	1063.9
G11.0	1062.7	1059.1	1061.5	1056.8	1060.1	1057.8	1061.9	1059.9
G12.0	1058.8	1054.8	1056.7	1051.9	1055.5	1051.9	1057.9	1055.7
G13.0	1054.5	1050.0	1052.0	1046.8	1050.9	1047.1	1053.3	1051.1
G14.0	1050.1	1045.1	1047.1	1041.4	1045.6	1041.6	1048.3	1046.1
G15.0	1044.8	1038.6	1041.8	1034.3	1040.0	1035.8	1043.1	1040.9
G16.0	1039.3	1032.8	1035.9	1028.1	1033.9	1029.5	1037.5	1034.0
G17.0	1032.8	1026.6	1029.9	1021.3	1026.3	1022.8	1030.3	1028.1
G18.0	1026.7	1020.2	1022.3	1014.5	1019.4	1015.9	1023.8	1021.6
G19.0	1020.3	1013.6	1015.6	1007.1	1012.4	1007.4	1017.2	1015.1
G20.0	1013.5	1006.4	1008.3	999.4	1004.8	999.5	1010.1	1008.0
G21.0	1006.5	997.4	1000.7	991.5	996.8	991.5	1002.5	1000.7
G22.0	999.1	989.5	993.0	981.2	988.6	983.1	994.9	992.9
G23.0	989.9	981.3	984.7	972.5	978.5	974.2	986.8	983.3
G24.0	981.8	973.0	974.6	963.5	969.5	965.4	976.6	974.9
G25.0	973.3	964.2	965.7	954.1	960.1	954.0	967.7	966.1
G26.0	964.4	954.9	956.4	944.3	950.4	944.3	958.4	957.0
G27.0	955.5	945.5	946.9	934.3	940.5	934.1	949.0	947.6
G28.0	946.1	933.8	937.1	923.9	930.4	923.7	939.2	937.7
G29.0	936.5	923.8	927.0	911.2	917.7	913.3	929.2	925.9
G30.0	924.4	913.3	916.6	900.2	906.9	902.3	918.6	915.5
G31.0	914.0	902.5	903.5	888.9	895.6	888.6	905.7	904.7
G32.0	903.3	891.5	892.5	877.4	884.1	877.0	894.7	893.7
G33.0	892.4	880.2	881.4	865.7	872.6	865.3	883.5	882.4
G34.0	881.3	866.4	869.8	853.7	860.8	853.3	871.9	871.0
G35.0	869.7	854.5	857.8	838.7	848.4	840.8	859.8	856.7
G36.0	857.7	842.3	845.6	826.2	833.4	828.3	847.5	844.6
G37.0	843.3	829.7	830.6	813.1	820.7	815.3	832.8	831.8
G38.0	830.9	817.0	818.0	800.1	807.8	799.7	820.2	819.3
G39.0	818.2	804.1	805.0	787.0	794.6	786.4	806.9	806.4

Test Type : Type C Test Distance : 8.460 m

C Plane (°): 0.0-360.0:22.5 γ (°): 0.0-90.0:1.0

Test Device : LSG-1890BCCD

Temperature : 25°C

Humidity : 65.0%

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

Review By :

Report No. : INDOOR-002

Test Time : 2023-01-03 15:40:15

Page 18 of 30

Light Distribution Data

Unit: cd

G\C	C0.0	C22.5	C45.0	C67.5	C90.0	C112.5	C135.0	C157.5
G40.0	805.0	790.7	791.6	773.4	780.9	772.7	793.6	792.9
G41.0	791.9	774.6	778.0	756.7	767.2	758.9	780.0	779.5
G42.0	778.5	760.6	764.5	742.6	753.5	744.8	766.4	762.6
G43.0	762.2	746.6	750.8	728.5	736.9	730.5	750.0	748.5
G44.0	748.5	732.5	734.1	714.1	722.8	716.3	736.0	734.4
G45.0	734.0	718.0	719.7	699.7	708.2	698.8	721.5	719.9
G46.0	719.7	703.4	705.1	684.9	693.4	683.9	706.7	705.1
G47.0	705.1	688.5	690.3	670.1	679.0	669.1	692.2	690.3
G48.0	690.6	671.0	675.7	652.4	664.3	654.4	677.4	675.5
G49.0	672.3	655.9	660.6	637.4	649.2	639.4	659.1	657.2
G50.0	657.0	640.7	645.2	622.1	630.8	624.2	643.7	642.0
G51.0	641.5	625.4	626.6	607.0	615.4	605.8	628.2	626.6
G52.0	626.1	609.8	611.5	591.4	600.3	590.2	612.9	610.7
G53.0	611.2	591.2	596.5	576.2	585.2	574.9	597.6	595.2
G54.0	593.1	575.9	578.5	558.0	567.3	559.8	579.5	576.6
G55.0	577.6	560.8	563.0	543.0	552.1	541.7	564.1	561.2
G56.0	559.5	542.5	548.1	525.1	534.3	526.6	546.0	542.8
G57.0	544.5	527.4	530.3	510.2	519.8	508.8	531.2	527.6
G58.0	526.7	509.9	512.7	493.1	502.4	494.5	513.5	509.9
G59.0	509.0	492.4	498.2	475.9	487.9	477.3	495.8	495.2
G60.0	494.2	477.9	480.6	461.6	470.5	460.1	481.0	477.5
G61.0	476.7	460.7	463.5	444.9	453.7	443.2	463.9	460.2
G62.0	459.8	443.7	446.9	428.2	437.3	426.5	447.2	442.9
G63.0	440.4	427.3	430.5	412.1	421.0	410.5	430.6	426.3
G64.0	423.9	408.3	414.2	393.7	402.5	394.6	411.5	409.9
G65.0	407.5	392.3	395.5	378.1	386.5	378.9	395.3	390.9
G66.0	389.0	376.5	380.0	362.7	371.2	360.9	377.1	375.0
G67.0	373.5	358.5	362.2	345.2	353.8	345.8	361.9	356.8
G68.0	356.1	341.4	345.1	328.5	336.9	329.0	344.6	341.9
G69.0	338.6	324.5	327.9	312.0	320.1	312.4	327.3	324.7
G70.0	321.5	307.9	311.3	295.8	303.7	296.1	310.5	307.8
G71.0	305.1	291.8	295.3	280.2	288.0	280.4	294.4	289.2
G72.0	287.1	275.9	277.7	264.8	270.6	262.9	276.7	273.1
G73.0	269.9	258.8	263.0	248.2	254.1	248.2	259.6	255.9
G74.0	254.9	242.2	246.3	232.0	239.8	232.0	245.0	239.0
G75.0	236.4	226.2	230.1	216.4	222.1	216.3	226.7	222.7
G76.0	220.8	210.7	213.0	201.4	207.0	199.3	211.4	207.1
G77.0	204.1	194.1	196.6	185.4	191.0	184.9	194.9	190.3
G78.0	188.0	178.4	181.1	170.1	175.7	169.6	179.2	174.4
G79.0	170.7	161.7	165.8	155.6	160.7	153.3	162.2	159.1

Test Type : Type C Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

C Plane (°): 0.0-360.0:22.5 γ (°): 0.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : INDOOR-002

Test Time : 2023-01-03 15:40:15

Page 19 of 30

Light Distribution Data

Unit: cd

G\C	C0.0	C22.5	C45.0	C67.5	C90.0	C112.5	C135.0	C157.5
G80.0	154.4	147.3	149.9	140.1	145.2	137.9	147.8	143.0
G81.0	139.2	130.7	133.5	125.5	129.1	123.3	131.3	127.8
G82.0	123.5	116.4	118.3	110.3	114.1	108.0	116.0	111.9
G83.0	107.7	100.6	103.0	95.2	99.1	94.2	100.4	97.3
G84.0	92.8	86.1	88.5	81.2	85.0	79.0	85.9	81.5
G85.0	77.0	71.5	73.1	67.2	70.1	65.0	70.5	66.8
G86.0	61.8	56.3	58.6	52.8	55.9	51.5	55.9	52.7
G87.0	46.2	41.8	43.7	39.2	41.4	37.9	40.9	37.5
G88.0	31.4	27.7	29.3	26.1	27.7	24.1	26.9	24.3
G89.0	16.9	14.5	15.5	13.4	14.8	12.8	14.4	12.5
G90.0	6.6	5.3	4.8	4.3	4.9	5.2	5.8	5.1

Test Type : Type C Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

C Plane (°): 0.0-360.0:22.5 γ (°): 0.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : INDOOR-002

Test Time : 2023-01-03 15:40:15

Page 20 of 30

Light Distribution Data

Unit: cd

G\C	C180.0	C202.5	C225.0	C247.5	C270.0	C292.5	C315.0	C337.5
G0.0	1083.4	1083.4	1083.4	1083.4	1083.4	1083.4	1083.4	1083.4
G1.0	1083.1	1083.2	1082.9	1083.1	1083.1	1083.3	1083.0	1083.2
G2.0	1082.6	1083.0	1082.1	1082.8	1082.3	1083.1	1082.3	1083.1
G3.0	1081.4	1082.0	1080.8	1081.8	1081.1	1081.9	1081.0	1082.1
G4.0	1079.7	1081.0	1079.4	1080.5	1079.2	1080.5	1079.2	1080.8
G5.0	1077.8	1079.5	1077.5	1078.8	1076.9	1078.7	1077.3	1079.0
G6.0	1075.8	1077.4	1075.0	1076.3	1074.5	1076.7	1074.8	1077.0
G7.0	1073.4	1075.1	1072.5	1073.9	1071.5	1074.2	1072.0	1074.9
G8.0	1070.6	1072.6	1069.4	1071.0	1068.3	1071.3	1069.0	1071.9
G9.0	1067.5	1069.5	1066.2	1067.7	1064.7	1067.4	1065.7	1069.0
G10.0	1063.9	1066.3	1061.4	1064.1	1060.7	1063.6	1061.8	1065.7
G11.0	1060.1	1062.8	1057.3	1060.1	1056.1	1059.6	1057.8	1061.4
G12.0	1055.1	1058.7	1052.8	1054.7	1050.3	1055.3	1052.1	1057.2
G13.0	1050.6	1053.4	1047.9	1049.8	1045.1	1050.2	1047.4	1053.0
G14.0	1045.7	1048.6	1042.7	1044.5	1039.5	1045.0	1042.1	1047.8
G15.0	1040.3	1043.7	1037.1	1039.0	1033.4	1039.4	1036.2	1042.8
G16.0	1035.0	1038.2	1031.0	1032.9	1026.9	1032.4	1030.2	1037.3
G17.0	1029.0	1032.5	1023.3	1026.7	1020.2	1026.0	1024.0	1031.6
G18.0	1021.6	1026.4	1016.8	1020.2	1013.4	1019.2	1016.0	1024.2
G19.0	1015.0	1019.9	1009.7	1011.7	1004.3	1012.2	1008.8	1017.6
G20.0	1008.2	1011.7	1002.0	1004.0	996.4	1004.8	1001.3	1010.8
G21.0	1000.6	1004.6	994.2	996.3	988.2	996.9	993.6	1003.5
G22.0	993.2	997.3	986.4	988.3	979.7	987.3	985.5	996.2
G23.0	985.3	989.4	976.4	979.9	971.0	978.9	977.1	988.4
G24.0	975.4	981.3	967.5	970.9	961.8	969.8	966.6	978.4
G25.0	966.6	972.8	958.1	961.8	950.3	960.8	957.2	969.8
G26.0	957.7	962.2	948.8	950.5	940.3	951.4	947.8	961.0
G27.0	948.4	953.2	939.1	940.7	930.4	941.8	938.3	951.9
G28.0	938.9	943.6	929.2	930.6	919.8	931.7	928.2	942.4
G29.0	928.9	933.6	918.8	920.2	909.1	919.1	917.7	932.5
G30.0	918.6	923.6	905.9	909.4	898.1	908.4	907.1	922.2
G31.0	906.0	913.1	894.9	898.4	886.6	897.4	894.0	909.6
G32.0	895.1	900.4	883.7	884.9	873.0	886.2	882.8	898.9
G33.0	884.2	889.2	872.3	873.2	861.0	874.6	871.4	887.8
G34.0	872.6	877.7	860.3	861.3	848.8	862.6	859.5	876.4
G35.0	860.6	866.1	847.9	849.2	836.2	850.6	847.2	864.6
G36.0	848.5	854.3	835.5	836.8	823.7	835.7	834.9	852.8
G37.0	836.2	841.8	820.4	824.3	810.9	823.2	822.3	840.6
G38.0	821.3	829.3	807.6	811.2	795.3	810.2	807.1	825.6
G39.0	808.0	816.4	794.3	798.0	781.8	797.0	793.7	812.7

Test Type : Type C

Test Distance : 8.460 m

C Plane (°): 0.0-360.0:22.5

γ (°): 0.0-90.0:1.0

Test Device : LSG-1890BCCD

Temperature : 25°C

Humidity : 65.0%

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

Review By :

Report No. : INDOOR-002

Test Time : 2023-01-03 15:40:15

Page 21 of 30

Light Distribution Data

Unit: cd

G\C	C180.0	C202.5	C225.0	C247.5	C270.0	C292.5	C315.0	C337.5
G40.0	794.6	800.7	780.6	781.9	767.9	783.6	780.0	799.6
G41.0	781.1	787.4	766.9	768.3	754.1	770.3	766.4	786.5
G42.0	767.5	774.1	753.2	754.8	740.3	756.8	752.8	773.2
G43.0	753.7	760.2	739.4	740.8	726.4	740.0	738.9	759.1
G44.0	739.3	746.1	721.9	726.5	711.7	725.8	724.5	745.2
G45.0	724.6	731.8	707.2	712.1	697.1	711.5	709.7	728.1
G46.0	707.1	714.4	692.6	694.8	679.6	696.9	692.4	713.8
G47.0	692.3	699.7	678.0	680.0	664.9	682.2	677.8	699.0
G48.0	677.5	684.5	663.1	665.0	650.3	667.3	663.0	684.1
G49.0	661.9	669.5	647.7	650.1	635.0	652.3	647.9	669.1
G50.0	646.5	654.1	632.5	634.8	619.8	634.1	632.6	653.9
G51.0	631.1	638.7	614.1	619.5	604.8	619.0	614.2	638.7
G52.0	612.4	623.2	598.6	604.3	586.5	603.8	598.9	620.1
G53.0	596.8	604.5	583.3	586.0	571.4	588.4	583.8	604.9
G54.0	581.1	589.1	567.8	570.8	556.1	570.4	568.5	589.5
G55.0	562.4	573.7	549.4	555.8	541.1	555.2	550.5	571.3
G56.0	547.3	555.6	534.5	538.0	523.4	540.6	535.6	556.4
G57.0	529.0	537.4	516.7	520.2	506.0	523.0	518.0	538.4
G58.0	514.2	522.3	502.0	505.6	491.5	505.2	503.4	523.4
G59.0	496.1	504.5	484.3	488.2	474.1	490.8	485.9	505.7
G60.0	478.4	486.8	467.1	471.2	457.2	473.7	468.8	488.2
G61.0	463.9	469.6	450.2	454.3	443.4	457.0	452.1	471.1
G62.0	446.8	452.3	433.6	437.7	424.4	440.3	435.6	454.0
G63.0	427.2	435.5	417.2	421.2	408.3	423.9	419.4	437.2
G64.0	410.4	418.8	400.7	405.1	392.3	407.8	403.2	420.8
G65.0	393.8	402.6	384.7	389.4	376.6	389.4	387.2	404.7
G66.0	378.0	384.0	366.6	371.6	359.0	374.2	369.4	386.4
G67.0	359.8	368.3	351.5	356.4	344.3	356.5	352.0	368.2
G68.0	342.0	350.4	334.2	339.0	327.3	339.2	337.3	353.1
G69.0	324.4	333.0	317.1	322.2	310.7	324.8	320.5	335.9
G70.0	307.4	316.1	300.5	305.9	294.5	306.2	304.0	319.1
G71.0	291.2	299.8	284.7	290.1	279.0	290.5	286.2	300.6
G72.0	275.3	281.3	267.1	272.4	263.9	275.0	270.9	284.7
G73.0	257.7	263.8	252.1	255.3	247.2	257.9	254.1	267.2
G74.0	240.5	248.8	235.3	240.9	230.9	241.5	237.5	250.3
G75.0	224.0	230.4	219.2	223.2	215.1	225.7	221.7	234.2
G76.0	208.3	214.8	203.9	208.0	200.3	208.7	206.7	218.7
G77.0	191.4	197.6	187.5	191.5	184.2	194.0	190.4	201.6
G78.0	175.1	181.3	171.7	175.8	168.7	178.3	175.0	185.5
G79.0	159.5	165.8	156.4	160.8	153.9	161.7	158.3	168.4

Test Type : Type C Test Distance : 8.460 m

C Plane (°): 0.0-360.0:22.5 γ (°): 0.0-90.0:1.0

Test Device : LSG-1890BCCD

Temperature : 25°C

Humidity : 65.0%

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

Review By :

Report No.: INDOOR-002

Test Time: 2023-01-03 15:40:15

Page 22 of 30

Light Distribution Data

Unit: cd

G\C	C180.0	C202.5	C225.0	C247.5	C270.0	C292.5	C315.0	C337.5
G80.0	143.0	149.6	140.3	145.2	138.2	146.1	144.1	152.5
G81.0	127.6	132.8	125.3	129.1	123.8	131.5	127.9	137.5
G82.0	111.8	116.8	110.0	113.7	108.7	116.1	113.0	121.6
G83.0	97.0	102.2	94.4	98.3	93.7	100.6	97.8	105.7
G84.0	81.8	86.0	79.5	84.1	79.5	86.3	83.6	90.9
G85.0	66.7	70.4	64.9	69.1	65.7	71.4	68.9	75.5
G86.0	52.1	55.5	50.9	54.8	51.4	56.1	54.9	59.6
G87.0	37.5	40.6	36.5	39.7	38.0	41.8	40.4	44.7
G88.0	23.1	25.4	22.8	26.1	24.7	28.1	26.7	30.2
G89.0	11.8	12.5	10.8	13.2	12.6	15.3	14.4	16.3
G90.0	4.6	4.3	4.0	4.2	4.9	6.1	7.3	6.9

Test Type: Type C Test Distance: 8.460 m

C Plane (°): 0.0-360.0:22.5 γ (°): 0.0-90.0:1.0

Test Device: LSG-1890BCCD

Temperature: 25°C

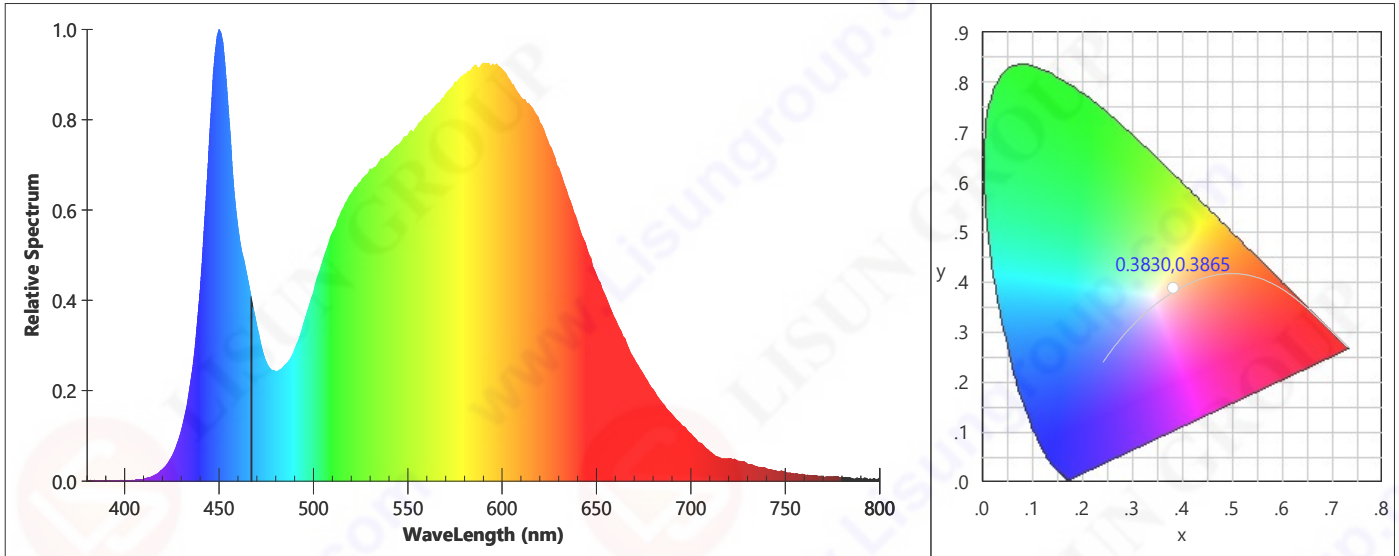
Humidity: 65.0%

Test Lab: Lisun Instruments Limited

Test By: Thomas Fiodorow

Review By:

Color Properties



Colorimetric

CIE(x,y): 0.3830,0.3865

CCT: 4004 K (Duv=0.003780)

Peak Wavelength: 450.2 nm

Luminous Flux: 3124.12 lm

CIE(u,v): 0.2229,0.3375

Dominant Wavelength: 577.2 nm

Half Width: 21.2 nm

Radiant Power: 9.203 W

CIE(u',v'): 0.2229,0.5062

Color Purity: 0.309

Color Ratio: R:0.178, G:0.789, B:0.033

Color Render Index: Ra: 81.1

R1: 79

R2: 87

R3: 93

R4: 80

R5: 79

R6: 82

R7: 86

R8: 63

R9: 1

R10: 69

R11: 87

R12: 56

R13: 80

R14: 96

R15: 72

Color Quality Scale: Qa: 81.8, Qf: 82.2, Qp: 81.0, Qg: 91.2

Q1: 81

Q2: 98

Q3: 79

Q4: 76

Q5: 80

Q6: 82

Q7: 84

Q8: 88

Q9: 97

Q10: 88

Q11: 85

Q12: 84

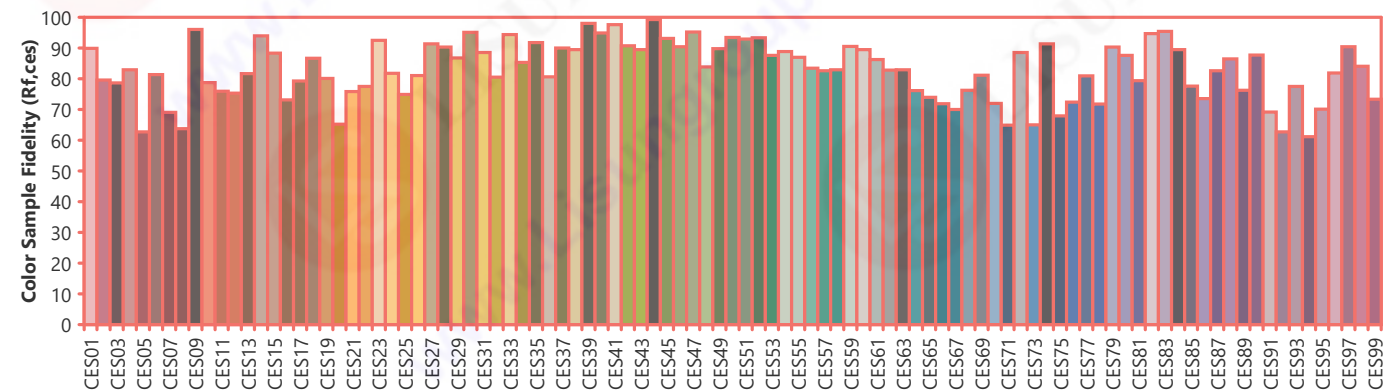
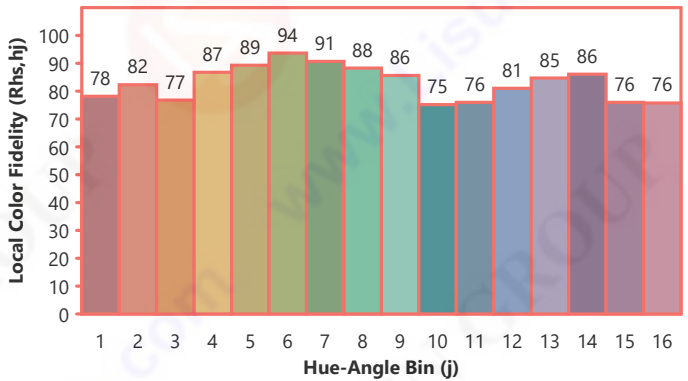
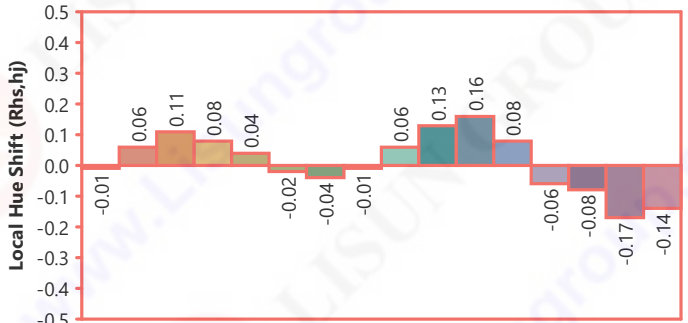
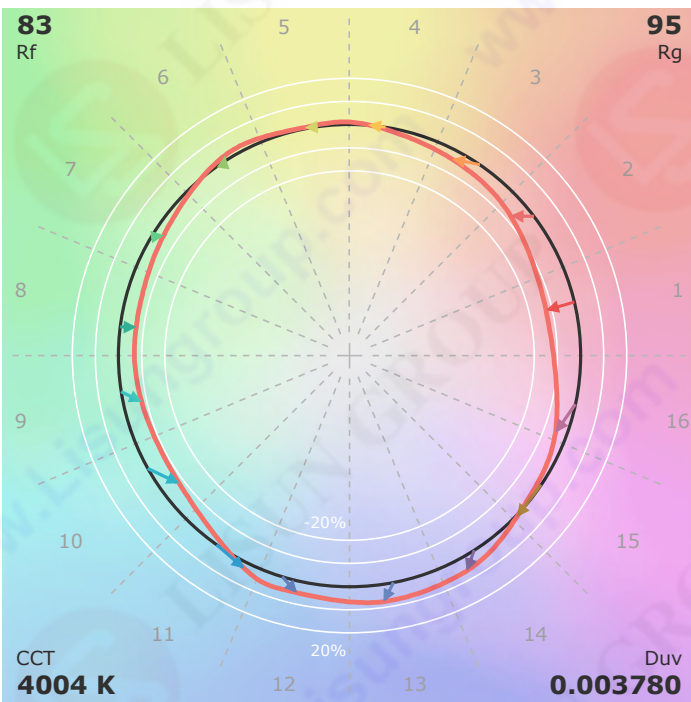
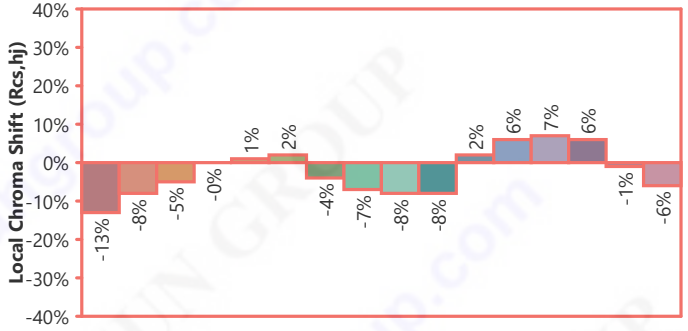
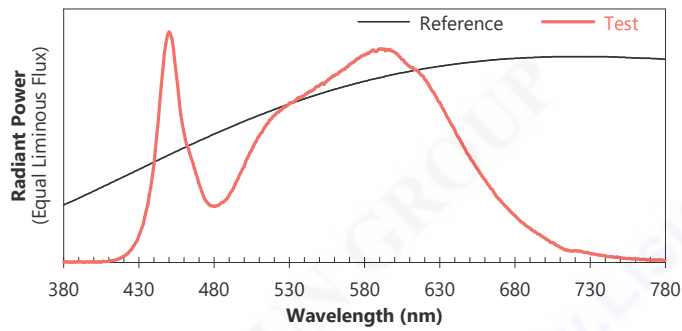
Q13: 83

Q14: 71

Q15: 74

TM-30-18: Rf: 83, Rg: 95

IES TM-30-18 Color Rendition Report



Notes: This is a recommended method for displaying IES TM-30-18 information.

x **0.3830**
y **0.3865**
u' **0.2229**
v' **0.5062**

CIE13.3-1995 (CRI)
Ra **81**
R9 **1**

Color Distribution Data

Evaluation of Spatial non-uniformity of chromaticity

IESNA LM-79: Spatially Averaged Chromaticity (u',v'): 0.2226, 0.5042

Spatially Averaged Chromaticity (CCT): 4050K

Spatial non-uniformity of chromaticity $\Delta u'v'(\Delta u',\Delta v')$: 0.001960 (0.0003,0.0019)

CIE S025: Spatially Averaged Chromaticity (u',v'): 0.2226, 0.5042

Spatially Averaged Chromaticity (CCT): 4050K

Angular Colour Uniformity $\Delta u'v'(\Delta u',\Delta v')$: 0.001958 (0.0003,0.0019)

GB/T 24824: Spatially Averaged Chromaticity (u',v'): 0.2226, 0.5042

Average Color Nonuniformity $\Delta u'v'(\Delta u',\Delta v')$: 0.000020 (-0.0000,0.0000)

Maximum Color Nonuniformity $\Delta u'v'(\Delta u',\Delta v')$: 0.001979 (0.0003,0.0020)

Color Distribution Data Tc(K)

Average Color(Tc):4050

G\C	0.0	15.0	30.0	45.0	60.0	75.0	90.0	105.0
0.0	4032	4033	4032	4031	4033	4033	4034	4033
1.0	4033	4032	4031	4033	4033	4034	4033	4032
2.0	4032	4031	4033	4033	4034	4033	4032	4032
3.0	4031	4033	4033	4034	4033	4032	4032	4034
4.0	4033	4033	4034	4033	4032	4032	4034	4033
5.0	4033	4034	4033	4032	4032	4034	4033	4034
6.0	4034	4033	4032	4032	4034	4033	4034	4034
7.0	4033	4032	4032	4034	4033	4034	4034	4035
8.0	4032	4032	4034	4033	4034	4034	4035	4035
9.0	4032	4034	4033	4034	4034	4035	4035	4034
10.0	4034	4033	4034	4034	4035	4035	4034	4035
11.0	4033	4034	4034	4035	4035	4034	4035	4037
12.0	4034	4034	4035	4035	4034	4035	4037	4035
13.0	4034	4035	4035	4034	4035	4037	4035	4037
14.0	4035	4035	4034	4035	4037	4035	4037	4035
15.0	4035	4034	4035	4037	4035	4037	4035	4033
16.0	4034	4035	4037	4035	4037	4035	4033	4035
17.0	4035	4037	4035	4037	4035	4033	4035	4036
18.0	4037	4035	4037	4035	4033	4035	4036	4035
19.0	4035	4037	4035	4033	4035	4036	4035	4035
20.0	4037	4035	4033	4035	4036	4035	4035	4033
21.0	4035	4033	4035	4036	4035	4035	4033	4036
22.0	4033	4035	4036	4035	4035	4033	4036	4037
23.0	4035	4036	4035	4035	4033	4036	4037	4037
24.0	4036	4035	4035	4033	4036	4037	4037	4037
25.0	4035	4035	4033	4036	4037	4037	4037	4037
26.0	4035	4033	4036	4037	4037	4037	4037	4036
27.0	4033	4036	4037	4037	4037	4037	4036	4037
28.0	4036	4037	4037	4037	4037	4036	4037	4037

Test Type : Type C

Test Distance : 8.460 m

C Plane (°): 0.0-360.0:22.5

 γ (°) : 0.0-90.0:1.0

Test Device : LSG-1890BCCD

Temperature : 25°C

Humidity : 65.0%

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

Review By :

Report No. : INDOOR-002

Test Time : 2023-01-03 15:40:15

Page 26 of 30

Color Distribution Data

Color Distribution Data Tc(K)

Average Color(Tc):4050

G\C	0.0	15.0	30.0	45.0	60.0	75.0	90.0	105.0
29.0	4037	4037	4037	4037	4036	4037	4037	4037
30.0	4037	4037	4037	4036	4037	4037	4037	4038
31.0	4037	4037	4036	4037	4037	4037	4038	4037
32.0	4037	4036	4037	4037	4037	4038	4037	4037
33.0	4036	4037	4037	4037	4038	4037	4037	4039
34.0	4037	4037	4037	4038	4037	4037	4039	4037
35.0	4037	4037	4038	4037	4037	4039	4037	4038
36.0	4037	4038	4037	4037	4039	4037	4038	4036
37.0	4038	4037	4037	4039	4037	4038	4036	4037
38.0	4037	4037	4039	4037	4038	4036	4037	4038
39.0	4037	4039	4037	4038	4036	4037	4038	4039
40.0	4039	4037	4038	4036	4037	4038	4039	4038
41.0	4037	4038	4036	4037	4038	4039	4038	4037
42.0	4038	4036	4037	4038	4039	4038	4037	4036
43.0	4036	4037	4038	4039	4038	4037	4036	4038
44.0	4037	4038	4039	4038	4037	4036	4038	4037
45.0	4038	4039	4038	4037	4036	4038	4037	4038
46.0	4039	4038	4037	4036	4038	4037	4038	4039
47.0	4038	4037	4036	4038	4037	4038	4039	4039
48.0	4037	4036	4038	4037	4038	4039	4039	4039
49.0	4036	4038	4037	4038	4039	4039	4039	4039
50.0	4038	4037	4038	4039	4039	4039	4039	4040
51.0	4037	4038	4039	4039	4039	4039	4040	4041
52.0	4038	4039	4039	4039	4039	4040	4041	4043
53.0	4039	4039	4039	4039	4040	4041	4043	4043
54.0	4039	4039	4039	4040	4041	4043	4043	4043
55.0	4039	4039	4040	4041	4043	4043	4043	4043
56.0	4039	4040	4041	4043	4043	4043	4043	4043
57.0	4040	4041	4043	4043	4043	4043	4043	4043

 Test Type : Type C
 Test Device : LSG-1890BCCD
 Test Lab : Lisun Instruments Limited
 Test By : Thomas Fiodorow

Test Distance : 8.460 m

 C Plane (°): 0.0-360.0:22.5
 Temperature : 25°C

 γ (°): 0.0-90.0:1.0
 Humidity : 65.0%

Review By :

Report No. : INDOOR-002

Test Time : 2023-01-03 15:40:15

Page 27 of 30

Color Distribution Data

Color Distribution Data Tc(K)

Average Color(Tc):4050

G/C	120.0	135.0	150.0	165.0	180.0	195.0	210.0	225.0
0.0	4032	4032	4034	4033	4034	4034	4035	4035
1.0	4032	4034	4033	4034	4034	4035	4035	4034
2.0	4034	4033	4034	4034	4035	4035	4034	4035
3.0	4033	4034	4034	4035	4035	4034	4035	4037
4.0	4034	4034	4035	4035	4034	4035	4037	4035
5.0	4034	4035	4035	4034	4035	4037	4035	4037
6.0	4035	4035	4034	4035	4037	4035	4037	4035
7.0	4035	4034	4035	4037	4035	4037	4035	4033
8.0	4034	4035	4037	4035	4037	4035	4033	4035
9.0	4035	4037	4035	4037	4035	4033	4035	4036
10.0	4037	4035	4037	4035	4033	4035	4036	4035
11.0	4035	4037	4035	4033	4035	4036	4035	4035
12.0	4037	4035	4033	4035	4036	4035	4035	4033
13.0	4035	4033	4035	4036	4035	4035	4033	4036
14.0	4033	4035	4036	4035	4035	4033	4036	4037
15.0	4035	4036	4035	4035	4033	4036	4037	4037
16.0	4036	4035	4035	4033	4036	4037	4037	4037
17.0	4035	4035	4033	4036	4037	4037	4037	4037
18.0	4035	4033	4036	4037	4037	4037	4037	4036
19.0	4033	4036	4037	4037	4037	4037	4036	4037
20.0	4036	4037	4037	4037	4037	4036	4037	4037
21.0	4037	4037	4037	4037	4036	4037	4037	4037
22.0	4037	4037	4037	4036	4037	4037	4037	4038
23.0	4037	4037	4036	4037	4037	4037	4038	4037
24.0	4037	4036	4037	4037	4037	4038	4037	4037
25.0	4036	4037	4037	4037	4038	4037	4037	4039
26.0	4037	4037	4037	4038	4037	4037	4039	4037
27.0	4037	4037	4038	4037	4037	4039	4037	4038
28.0	4037	4038	4037	4037	4039	4037	4038	4036

Test Type : Type C Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

C Plane (°): 0.0-360.0:22.5 γ (°): 0.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : INDOOR-002

Test Time : 2023-01-03 15:40:15

Page 28 of 30

Color Distribution Data

Color Distribution Data Tc(K)

Average Color(Tc):4050

G\C	120.0	135.0	150.0	165.0	180.0	195.0	210.0	225.0
29.0	4038	4037	4037	4039	4037	4038	4036	4037
30.0	4037	4037	4039	4037	4038	4036	4037	4038
31.0	4037	4039	4037	4038	4036	4037	4038	4039
32.0	4039	4037	4038	4036	4037	4038	4039	4038
33.0	4037	4038	4036	4037	4038	4039	4038	4037
34.0	4038	4036	4037	4038	4039	4038	4037	4036
35.0	4036	4037	4038	4039	4038	4037	4036	4038
36.0	4037	4038	4039	4038	4037	4036	4038	4037
37.0	4038	4039	4038	4037	4036	4038	4037	4038
38.0	4039	4038	4037	4036	4038	4037	4038	4039
39.0	4038	4037	4036	4038	4037	4038	4039	4039
40.0	4037	4036	4038	4037	4038	4039	4039	4039
41.0	4036	4038	4037	4038	4039	4039	4039	4039
42.0	4038	4037	4038	4039	4039	4039	4039	4040
43.0	4037	4038	4039	4039	4039	4039	4040	4041
44.0	4038	4039	4039	4039	4039	4040	4041	4043
45.0	4039	4039	4039	4039	4040	4041	4043	4043
46.0	4039	4039	4039	4040	4041	4043	4043	4043
47.0	4039	4039	4040	4041	4043	4043	4043	4043
48.0	4039	4040	4041	4043	4043	4043	4043	4043
49.0	4040	4041	4043	4043	4043	4043	4043	4043
50.0	4041	4043	4043	4043	4043	4043	4043	4041
51.0	4043	4043	4043	4043	4043	4043	4041	4042
52.0	4043	4043	4043	4043	4043	4041	4042	4041
53.0	4043	4043	4043	4043	4041	4042	4041	4042
54.0	4043	4043	4043	4041	4042	4041	4042	4043
55.0	4043	4043	4041	4042	4041	4042	4043	4042
56.0	4043	4041	4042	4041	4042	4043	4042	4042
57.0	4041	4042	4041	4042	4043	4042	4042	4043

Test Type : Type C

Test Distance : 8.460 m

C Plane (°): 0.0-360.0:22.5

γ (°): 0.0-90.0:1.0

Test Device : LSG-1890BCCD

Temperature : 25°C

Humidity : 65.0%

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

Review By :

Report No. : INDOOR-002

Test Time : 2023-01-03 15:40:15

Page 29 of 30

Color Distribution Data

Color Distribution Data Tc(K)

Average Color(Tc):4050

G/C	240.0	255.0	270.0	285.0	300.0	315.0	330.0	345.0
0.0	4034	4035	4037	4035	4037	4035	4033	4035
1.0	4035	4037	4035	4037	4035	4033	4035	4036
2.0	4037	4035	4037	4035	4033	4035	4036	4035
3.0	4035	4037	4035	4033	4035	4036	4035	4035
4.0	4037	4035	4033	4035	4036	4035	4035	4033
5.0	4035	4033	4035	4036	4035	4035	4033	4036
6.0	4033	4035	4036	4035	4035	4033	4036	4037
7.0	4035	4036	4035	4035	4033	4036	4037	4037
8.0	4036	4035	4035	4033	4036	4037	4037	4037
9.0	4035	4035	4033	4036	4037	4037	4037	4037
10.0	4035	4033	4036	4037	4037	4037	4037	4036
11.0	4033	4036	4037	4037	4037	4037	4036	4037
12.0	4036	4037	4037	4037	4037	4036	4037	4037
13.0	4037	4037	4037	4037	4036	4037	4037	4037
14.0	4037	4037	4037	4036	4037	4037	4037	4038
15.0	4037	4037	4036	4037	4037	4037	4038	4037
16.0	4037	4036	4037	4037	4037	4038	4037	4037
17.0	4036	4037	4037	4037	4038	4037	4037	4039
18.0	4037	4037	4037	4038	4037	4037	4039	4037
19.0	4037	4037	4038	4037	4037	4039	4037	4038
20.0	4037	4038	4037	4037	4039	4037	4038	4036
21.0	4038	4037	4037	4039	4037	4038	4036	4037
22.0	4037	4037	4039	4037	4038	4036	4037	4038
23.0	4037	4039	4037	4038	4036	4037	4038	4039
24.0	4039	4037	4038	4036	4037	4038	4039	4038
25.0	4037	4038	4036	4037	4038	4039	4038	4037
26.0	4038	4036	4037	4038	4039	4038	4037	4036
27.0	4036	4037	4038	4039	4038	4037	4036	4038
28.0	4037	4038	4039	4038	4037	4036	4038	4037

Test Type : Type C Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

C Plane (°): 0.0-360.0:22.5 γ (°): 0.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Color Distribution Data

Color Distribution Data Tc(K)

Average Color(Tc):4050

G\C	240.0	255.0	270.0	285.0	300.0	315.0	330.0	345.0
29.0	4038	4039	4038	4037	4036	4038	4037	4038
30.0	4039	4038	4037	4036	4038	4037	4038	4039
31.0	4038	4037	4036	4038	4037	4038	4039	4039
32.0	4037	4036	4038	4037	4038	4039	4039	4039
33.0	4036	4038	4037	4038	4039	4039	4039	4039
34.0	4038	4037	4038	4039	4039	4039	4039	4040
35.0	4037	4038	4039	4039	4039	4039	4040	4041
36.0	4038	4039	4039	4039	4039	4040	4041	4043
37.0	4039	4039	4039	4039	4040	4041	4043	4043
38.0	4039	4039	4039	4040	4041	4043	4043	4043
39.0	4039	4039	4040	4041	4043	4043	4043	4043
40.0	4039	4040	4041	4043	4043	4043	4043	4043
41.0	4040	4041	4043	4043	4043	4043	4043	4043
42.0	4041	4043	4043	4043	4043	4043	4043	4041
43.0	4043	4043	4043	4043	4043	4043	4041	4042
44.0	4043	4043	4043	4043	4043	4041	4042	4041
45.0	4043	4043	4043	4043	4041	4042	4041	4042
46.0	4043	4043	4043	4041	4042	4041	4042	4043
47.0	4043	4043	4041	4042	4041	4042	4043	4042
48.0	4043	4041	4042	4041	4042	4043	4042	4042
49.0	4041	4042	4041	4042	4043	4042	4042	4043
50.0	4042	4041	4042	4043	4042	4042	4043	4041
51.0	4041	4042	4043	4042	4042	4043	4041	4042
52.0	4042	4043	4042	4042	4043	4041	4042	4040
53.0	4043	4042	4042	4043	4041	4042	4040	4040
54.0	4042	4042	4043	4041	4042	4040	4040	4042
55.0	4042	4043	4041	4042	4040	4040	4042	4042
56.0	4043	4041	4042	4040	4040	4042	4042	4044
57.0	4041	4042	4040	4040	4042	4042	4044	4041

Test Type : Type C Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

C Plane (°): 0.0-360.0:22.5 γ (°): 0.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No.: ROADWAY-001

Test Time: 2023-01-03 14:12:36

Page 1 of 33

Lisun Goniophotometer Test Report

Product Info

 Luminaire Category: **Roadway**

 Luminaire: **AK-KH120**

 Lamp Category: **CREE**

 Lamp: **011507**

 Manufacturer: **Philips Lighting B.V.**

 Submitter: **Michael Aslami**

 Number of Lamps: **1**

 Lumens per Lamp: **2100 lm**

 Luminous Length: **20 mm**

 Luminous Width: **15 mm**

 Luminous Height: **5 mm**

Electric Parameters

 Voltage: **230.00 V** Current: **0.1813 A** Power: **21.60 W** Power Factor: **0.518** Frequency: **50.00 Hz**

Photometric Parameters

 IES Classification: **Type II**

 Longitudinal Classification: **Short**

 Total Rated Lamp Lumens: **2100.0 lm**

 Measurement Flux: **1991.9 lm**

 Efficiency: **94.85 %**

 Upward Ratio: **0.00 %**

 Downward Ratio: **94.85 %**

 Central Intensity: **576.11 cd**

 Maximum Intensity: **1097.62 cd**

 Position Of Maximum Intensity: **C0° γ61°**

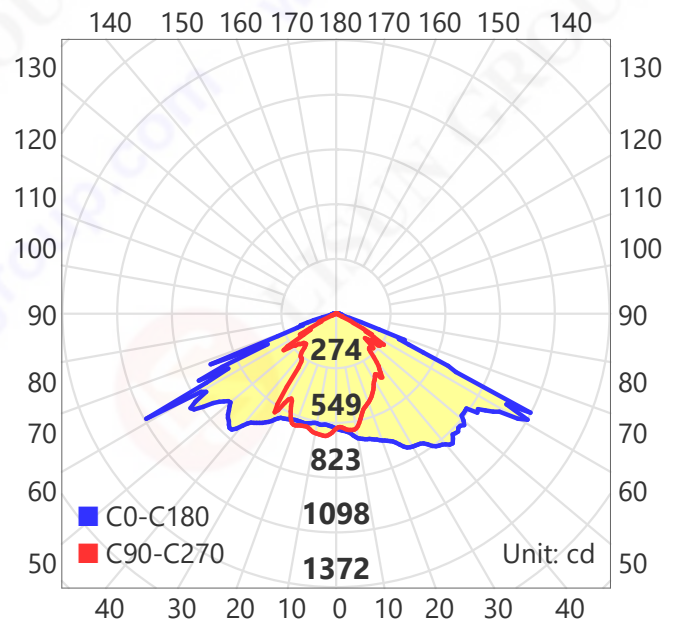
 Luminaire Efficacy Rating (LER): **92**

 Energy Efficiency Class: **F (EU 2019/2015 η_{TM}:92lm/W)**

 Beam Angle (C0-C180): **133.9 °**

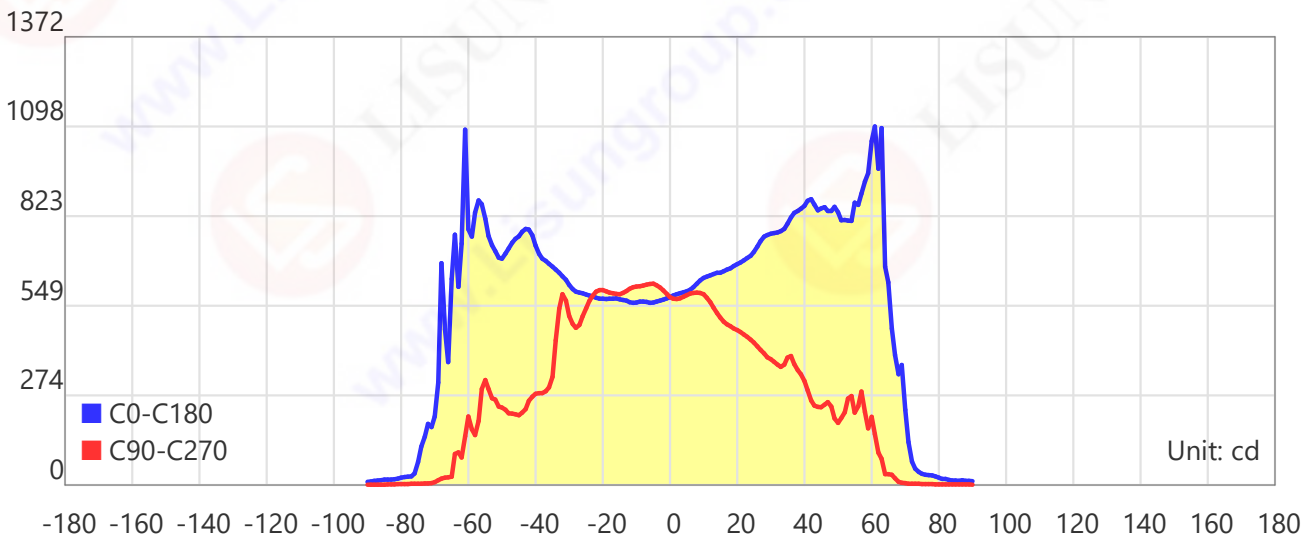
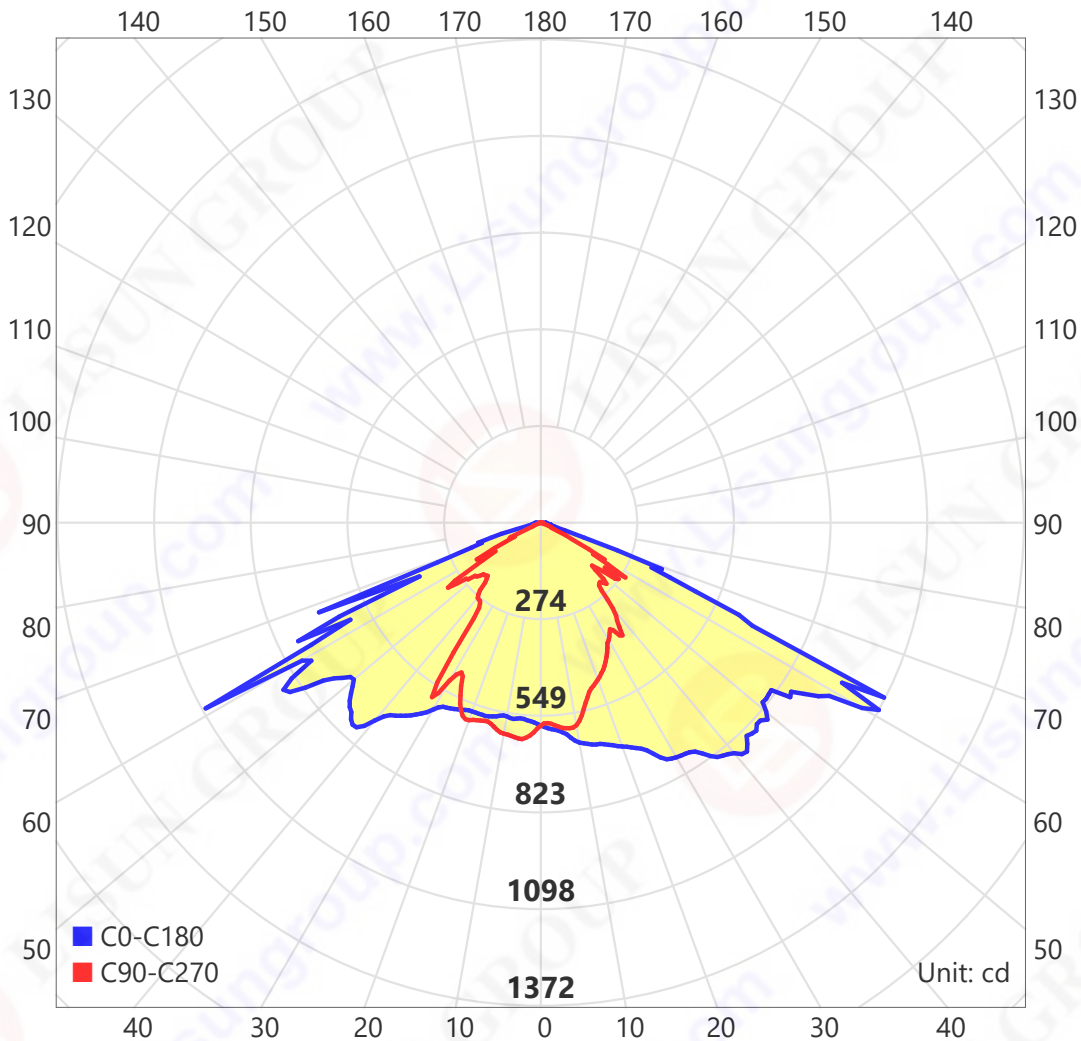
 Beam Angle (C90-C270): **95.9 °**

 Field Angle(C0-C180): **145.5 °**

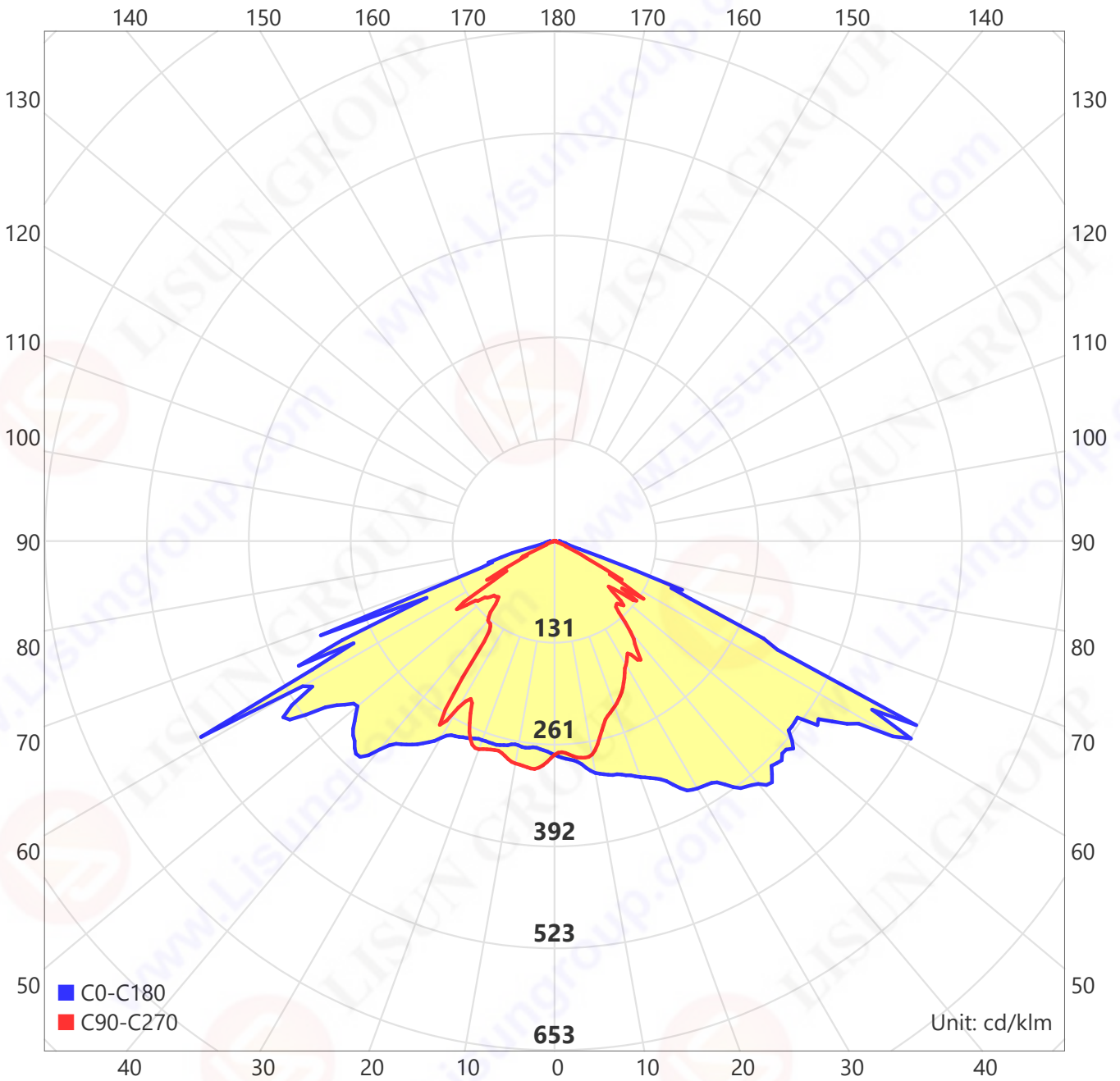
 Field Angle(C90-C270): **127.9 °**

 Test Type: Type C Test Distance: 8.460 m
 Test Device: LSG-1890BCCD
 Test Lab: Lisun Instruments Limited
 Test By: Thomas Fiodorow

 C Plane (°): 0.0-360.0:15.0 γ (°): 0.0-90.0:1.0
 Temperature: 25°C Humidity: 65.0%
 Review By:

Light Distribution Curve



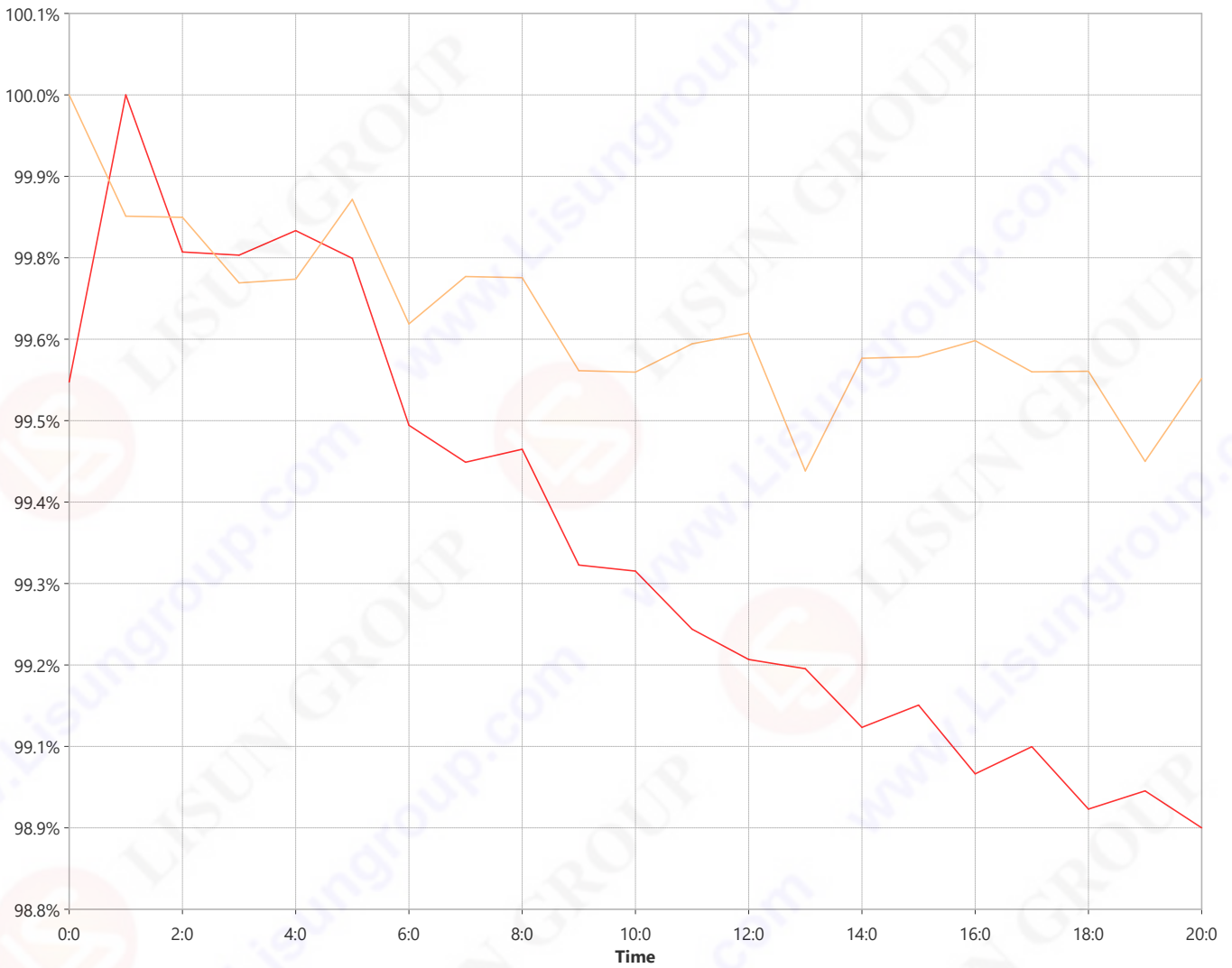
Light Distribution Curve (cd/klm)



011507/CREE

$\eta=94.85\%$

Warmup Log



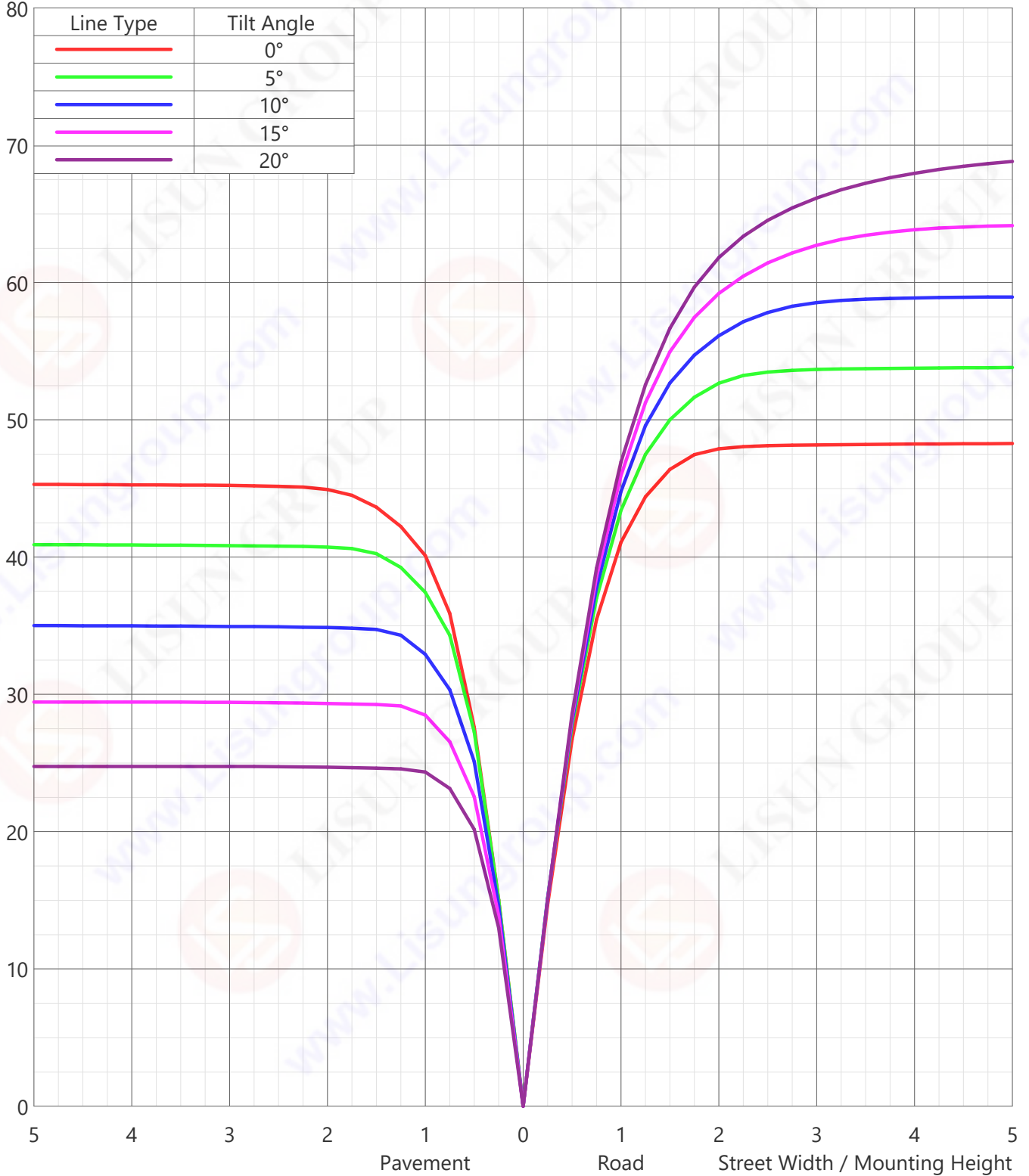
Stable time: 20:0

Uptime: 0:0

Parameters	Maximum	Minimum	Change
Luminous intensity ,cd	582.69	576.51	6.18
Power ,W	21.72	21.60	0.12

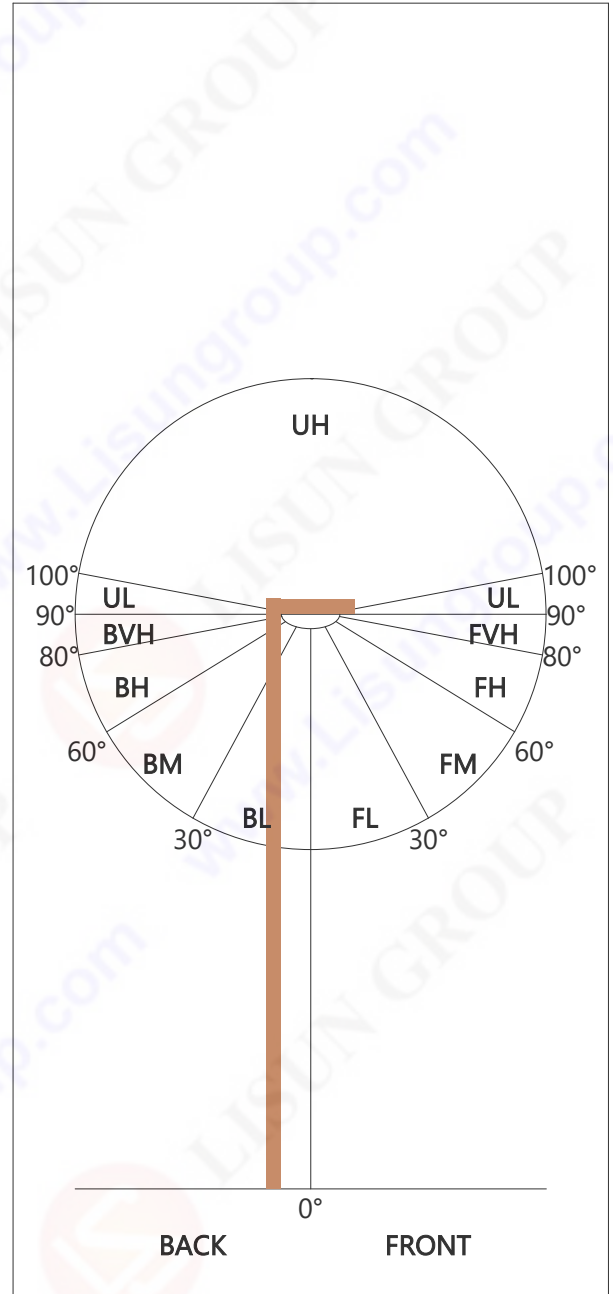
Roadway CU

Efficiency (%)



BUG Ratings

ZONE	LUMENS	% LAMP LUMENS
FORWARD LIGHT	1022	48.7
FL (0°-30°)	233	11.1
FM (30°-60°)	601	28.6
FH (60°-80°)	183	8.7
FVH (80°-90°)	5	0.2
BACK LIGHT	970	46.2
BL (0°-30°)	260	12.4
BM (30°-60°)	593	28.2
BH (60°-80°)	113	5.4
BVH (80°-90°)	4	0.2
UP LIGHT	0	0.0
UL (90°-100°)	0	0.0
UH (100°-180°)	0	0.0
TRAPPED LIGHT	108	5.1



BUG(Backlight,Uplight,Glare) Rating Base On	TM-15-07	TM-15-11
Asymmetrical Luminaire Types (Type I,II,III,IV)	B1 U0 G1	B1 U0 G1
Quadrilateral Symmetrical Luminaire Types (Type V,Area Light)	B1 U0 G0	B1 U0 G0

Test Type : Type C

Test Distance : 8.460 m

C Plane (°): 0.0-360.0:15.0

γ (°): 0.0-90.0:1.0

Test Device : LSG-1890BCCD

Temperature : 25°C

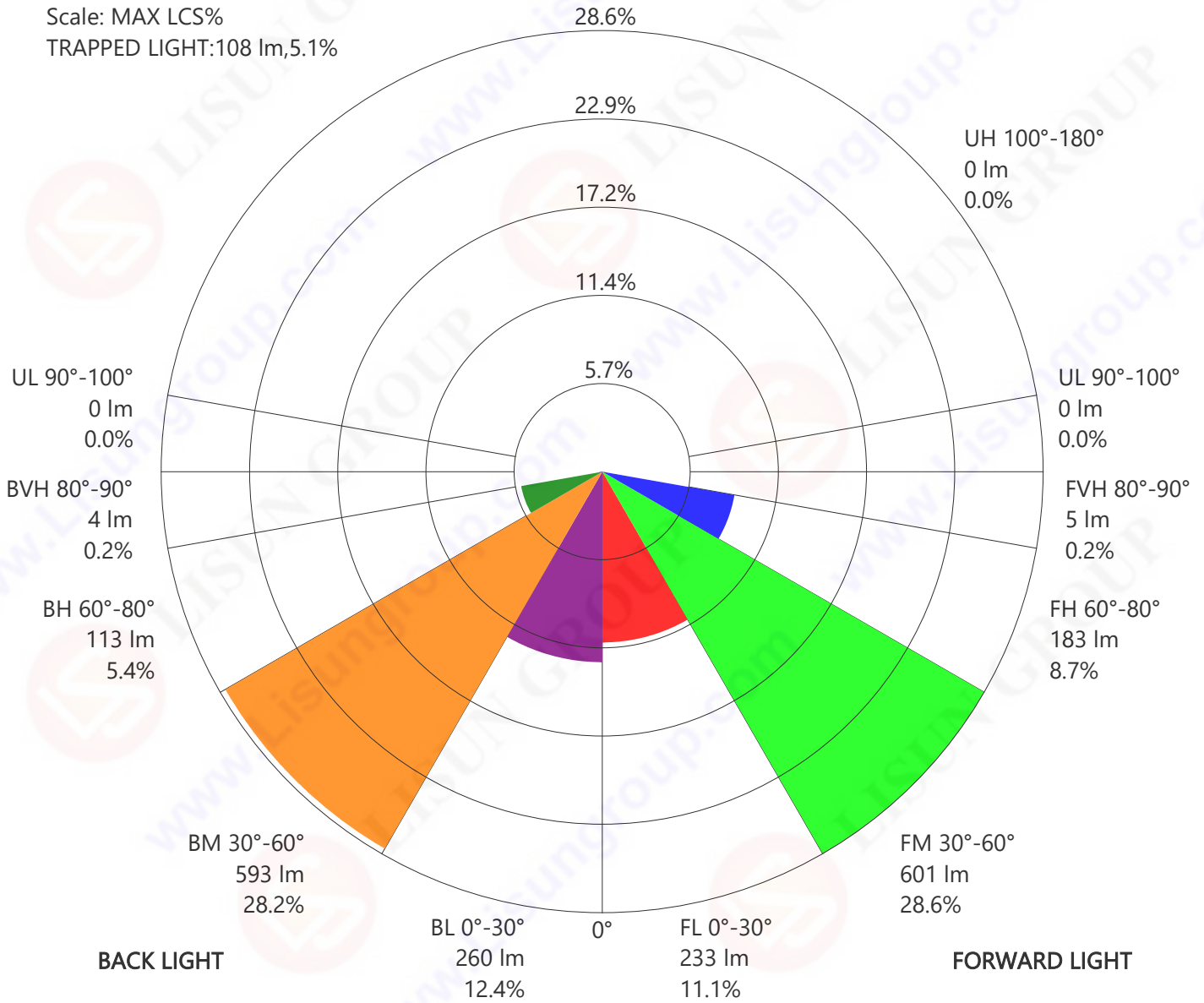
Humidity : 65.0%

Test Lab : Lisun Instruments Limited

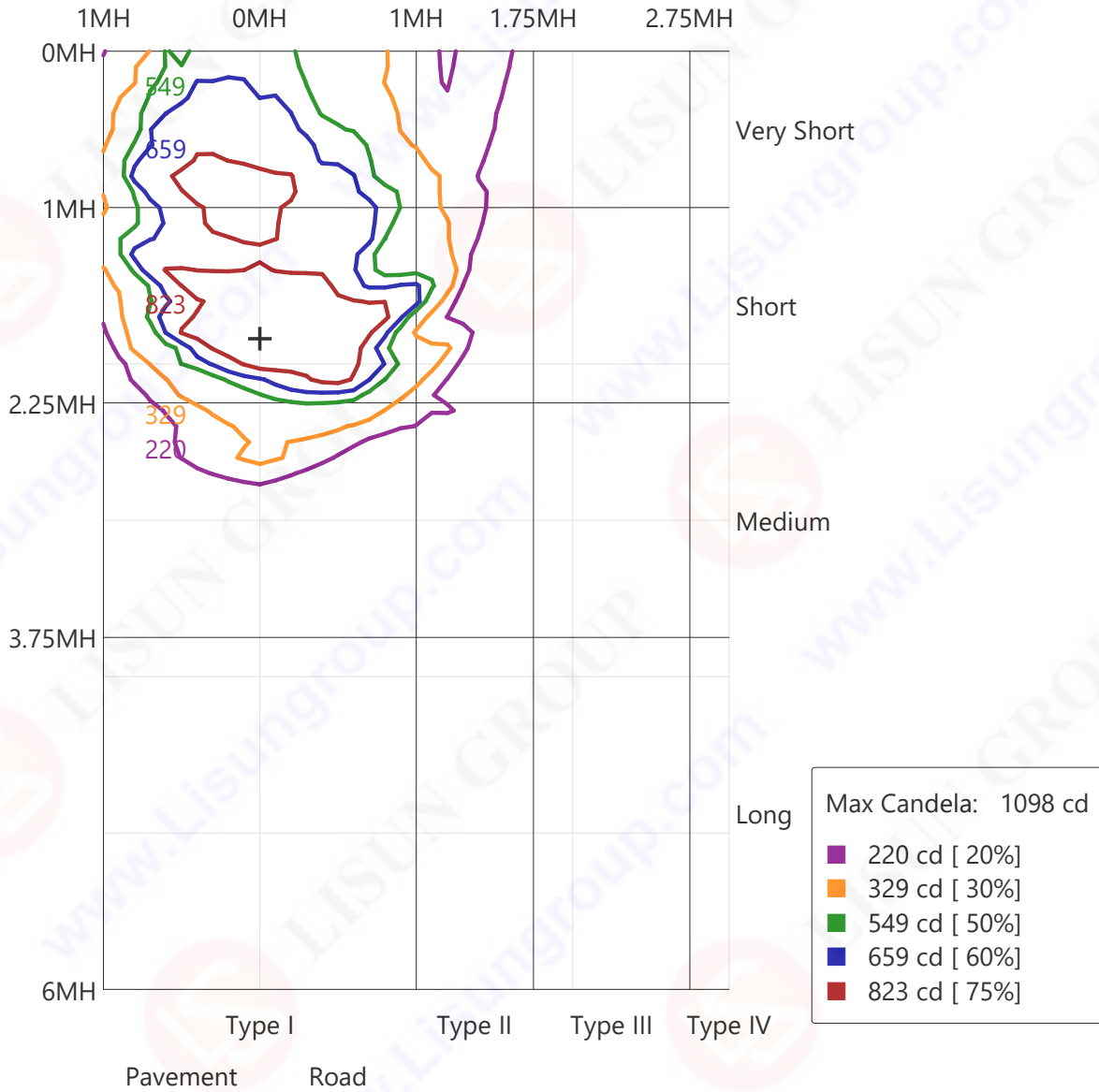
Test By : Thomas Fiodorow

Review By :

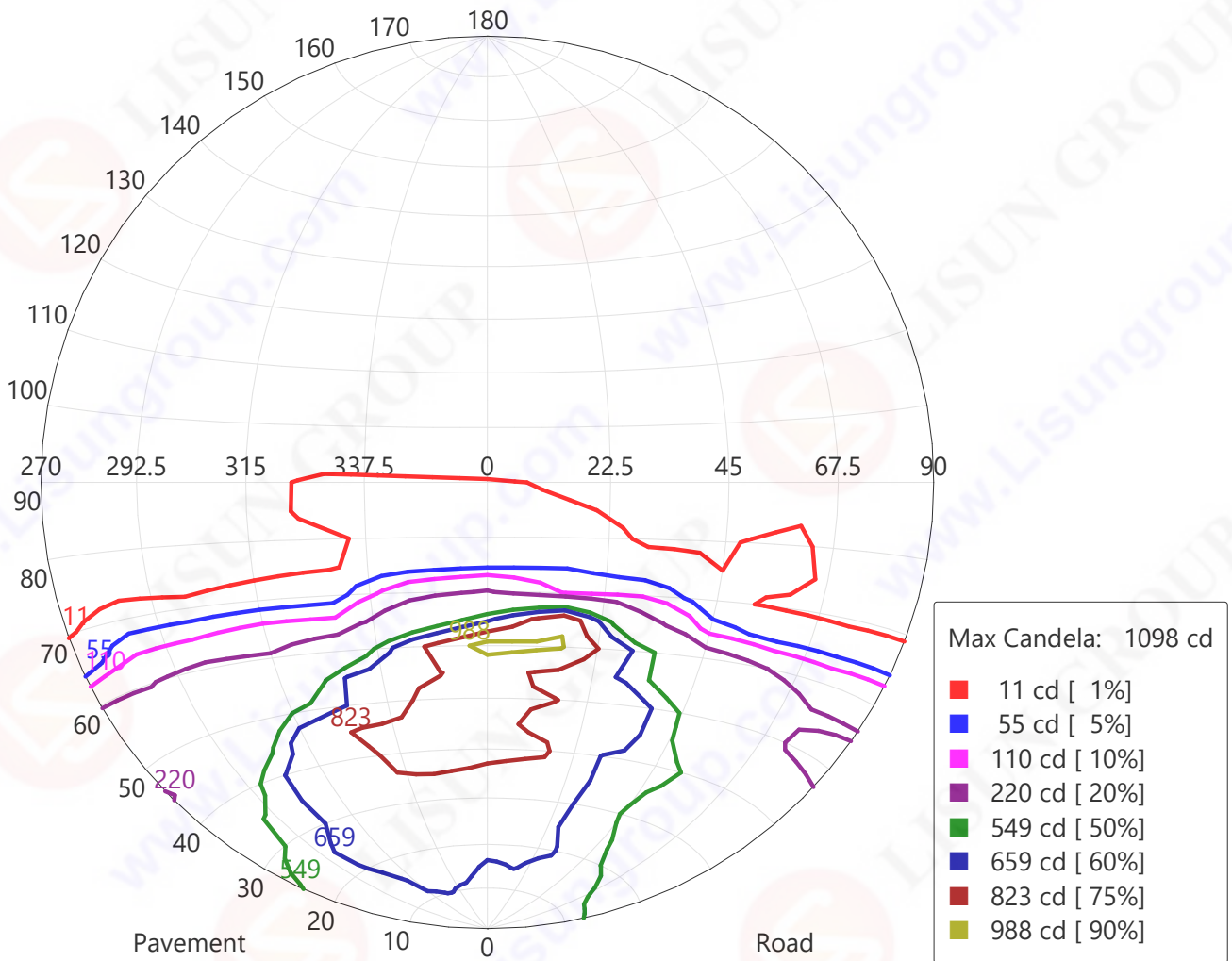
LCS Graph



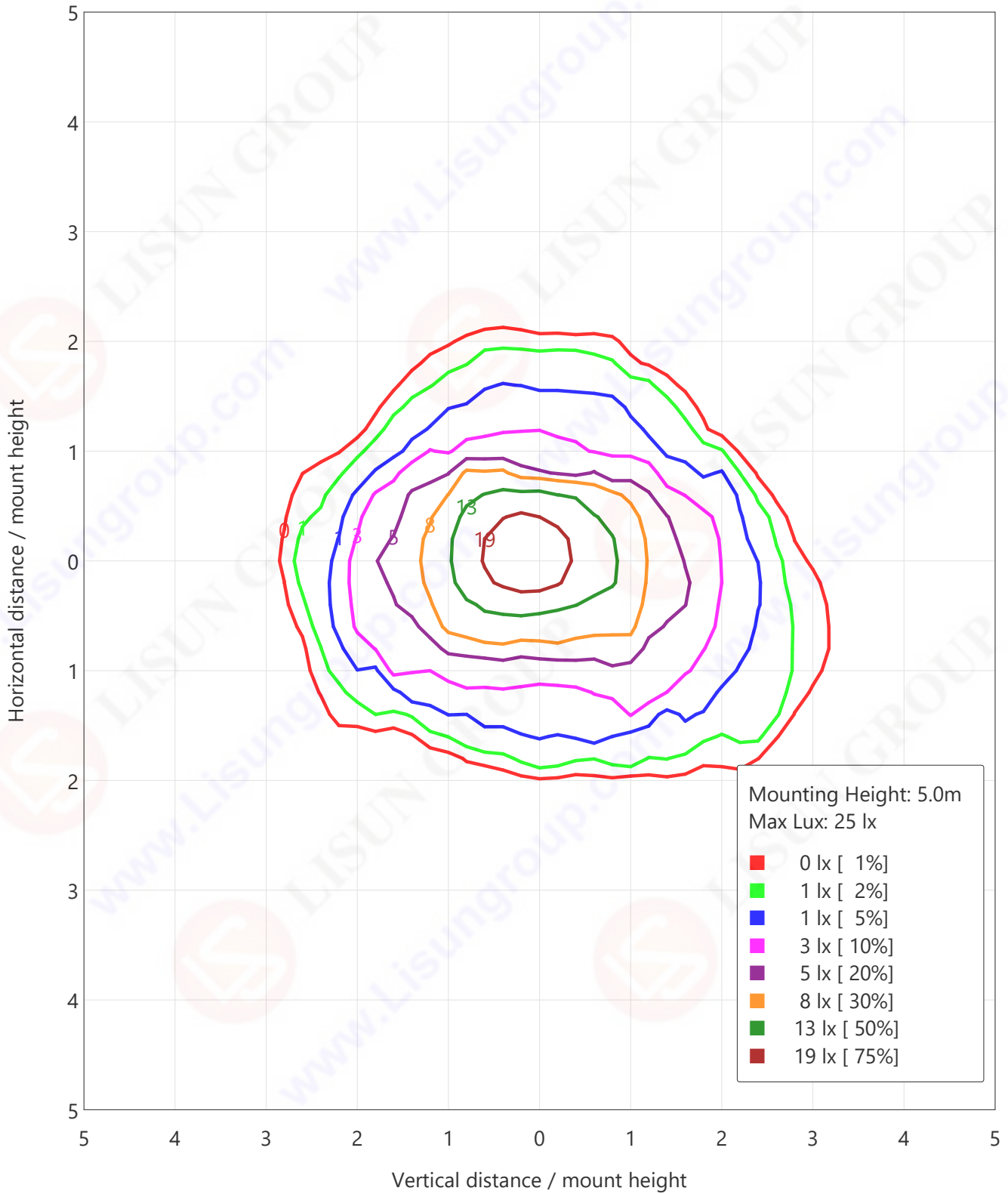
Road Surface IsoCandela Diagram



IsoCandela



IsoLux



Report No. : ROADWAY-001

Test Time : 2023-01-03 14:12:36

Page 11 of 33

Zonal Flux

Gamma °	I _{mean} cd	Zonal Flux lm	Sum Zonal Flux lm	Rel Zonal Flux %	Sum Rel Zonal Flux %
0.0-1.0	576.6	0.6	0.6	0.03	0.03
1.0-2.0	578.3	1.7	2.2	0.08	0.11
2.0-3.0	581.5	2.8	5.0	0.13	0.24
3.0-4.0	585.4	3.9	8.9	0.19	0.42
4.0-5.0	589.3	5.1	14.0	0.24	0.67
5.0-6.0	593.0	6.2	20.2	0.30	0.96
6.0-7.0	596.6	7.4	27.6	0.35	1.32
7.0-8.0	600.5	8.6	36.2	0.41	1.72
8.0-9.0	603.7	9.8	46.0	0.47	2.19
9.0-10.0	605.2	11.0	57.0	0.52	2.71
10.0-11.0	605.2	12.1	69.0	0.58	3.29
11.0-12.0	604.0	13.2	82.3	0.63	3.92
12.0-13.0	601.7	14.3	96.5	0.68	4.60
13.0-14.0	598.8	15.3	111.9	0.73	5.33
14.0-15.0	595.5	16.4	128.2	0.78	6.11
15.0-16.0	592.6	17.4	145.6	0.83	6.93
16.0-17.0	590.3	18.4	164.0	0.88	7.81
17.0-18.0	588.6	19.4	183.4	0.92	8.73
18.0-19.0	587.4	20.4	203.8	0.97	9.71
19.0-20.0	586.7	21.5	225.3	1.02	10.73
20.0-21.0	586.6	22.5	247.8	1.07	11.80
21.0-22.0	586.5	23.6	271.4	1.12	12.92
22.0-23.0	586.4	24.6	296.0	1.17	14.10
23.0-24.0	585.9	25.6	321.6	1.22	15.32
24.0-25.0	584.3	26.6	348.2	1.27	16.58
25.0-26.0	581.2	27.4	375.6	1.31	17.89
26.0-27.0	576.9	28.2	403.9	1.34	19.23
27.0-28.0	572.4	29.0	432.8	1.38	20.61
28.0-29.0	569.5	29.8	462.6	1.42	22.03
29.0-30.0	569.6	30.8	493.4	1.46	23.50
30.0-31.0	572.8	31.9	525.3	1.52	25.01
31.0-32.0	577.4	33.1	558.4	1.58	26.59
32.0-33.0	582.1	34.3	592.7	1.63	28.22
33.0-34.0	583.6	35.3	628.0	1.68	29.90
34.0-35.0	579.6	36.0	664.0	1.71	31.62
35.0-36.0	575.2	36.6	700.6	1.74	33.36
36.0-37.0	572.4	37.3	738.0	1.78	35.14
37.0-38.0	567.1	37.9	775.8	1.80	36.94
38.0-39.0	561.8	38.3	814.2	1.83	38.77
39.0-40.0	560.2	39.1	853.2	1.86	40.63

Test Type : Type C Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

C Plane (°): 0.0-360.0:15.0 γ (°): 0.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Zonal Flux

Gamma °	I _{mean} cd	Zonal Flux lm	Sum Zonal Flux lm	Rel Zonal Flux %	Sum Rel Zonal Flux %
40.0-41.0	560.7	39.9	893.2	1.90	42.53
41.0-42.0	558.2	40.6	933.7	1.93	44.46
42.0-43.0	553.0	41.0	974.7	1.95	46.41
43.0-44.0	546.6	41.3	1016.0	1.96	48.38
44.0-45.0	539.9	41.5	1057.5	1.98	50.35
45.0-46.0	532.7	41.7	1099.1	1.98	52.34
46.0-47.0	523.4	41.6	1140.8	1.98	54.32
47.0-48.0	513.4	41.5	1182.3	1.98	56.30
48.0-49.0	504.9	41.5	1223.7	1.97	58.27
49.0-50.0	496.8	41.4	1265.2	1.97	60.25
50.0-51.0	489.0	41.4	1306.5	1.97	62.22
51.0-52.0	482.2	41.4	1347.9	1.97	64.19
52.0-53.0	478.8	41.7	1389.6	1.98	66.17
53.0-54.0	477.4	42.1	1431.7	2.00	68.17
54.0-55.0	476.8	42.6	1474.2	2.03	70.20
55.0-56.0	475.4	43.0	1517.2	2.05	72.25
56.0-57.0	471.5	43.1	1560.3	2.05	74.30
57.0-58.0	461.9	42.7	1603.0	2.03	76.33
58.0-59.0	447.2	41.8	1644.8	1.99	78.33
59.0-60.0	447.5	42.3	1687.1	2.01	80.34
60.0-61.0	455.9	43.5	1730.6	2.07	82.41
61.0-62.0	425.4	41.0	1771.6	1.95	84.36
62.0-63.0	366.6	35.7	1807.3	1.70	86.06
63.0-64.0	314.1	30.8	1838.1	1.47	87.53
64.0-65.0	280.5	27.8	1865.9	1.32	88.85
65.0-66.0	252.2	25.2	1891.0	1.20	90.05
66.0-67.0	202.8	20.4	1911.4	0.97	91.02
67.0-68.0	155.9	15.8	1927.2	0.75	91.77
68.0-69.0	123.7	12.6	1939.9	0.60	92.37
69.0-70.0	102.1	10.5	1950.3	0.50	92.87
70.0-71.0	82.6	8.5	1958.9	0.41	93.28
71.0-72.0	60.7	6.3	1965.2	0.30	93.58
72.0-73.0	43.8	4.6	1969.8	0.22	93.80
73.0-74.0	32.2	3.4	1973.2	0.16	93.96
74.0-75.0	24.4	2.6	1975.7	0.12	94.08
75.0-76.0	18.5	2.0	1977.7	0.09	94.18
76.0-77.0	14.9	1.6	1979.3	0.08	94.25
77.0-78.0	13.0	1.4	1980.7	0.07	94.32
78.0-79.0	11.8	1.3	1981.9	0.06	94.38
79.0-80.0	10.8	1.2	1983.1	0.06	94.43

Test Type : Type C Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

C Plane (°): 0.0-360.0:15.0 γ (°): 0.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : ROADWAY-001

Test Time : 2023-01-03 14:12:36

Page 13 of 33

Zonal Flux

Gamma °	I _{mean} cd	Zonal Flux lm	Sum Zonal Flux lm	Rel Zonal Flux %	Sum Rel Zonal Flux %
80.0-81.0	9.9	1.1	1984.2	0.05	94.49
81.0-82.0	9.2	1.0	1985.2	0.05	94.53
82.0-83.0	8.8	1.0	1986.1	0.05	94.58
83.0-84.0	8.4	0.9	1987.1	0.04	94.62
84.0-85.0	8.2	0.9	1988.0	0.04	94.66
85.0-86.0	8.0	0.9	1988.8	0.04	94.71
86.0-87.0	7.7	0.8	1989.7	0.04	94.75
87.0-88.0	7.4	0.8	1990.5	0.04	94.78
88.0-89.0	6.7	0.7	1991.2	0.03	94.82
89.0-90.0	6.2	0.7	1991.9	0.03	94.85

Test Type : Type C Test Distance : 8.460 m
Test Device : LSG-1890BCCD
Test Lab : Lisun Instruments Limited
Test By : Thomas Fiodorow

C Plane (°): 0.0-360.0:15.0 γ (°): 0.0-90.0:1.0
Temperature : 25°C Humidity : 65.0%
Review By :

Light Distribution Data

Unit: cd

G\C	C0.0	C15.0	C30.0	C45.0	C60.0	C75.0	C90.0	C105.0
G0.0	576.1	576.1	576.1	576.1	576.1	576.1	576.1	576.1
G1.0	580.2	578.3	576.7	576.4	573.5	575.3	570.6	573.6
G2.0	584.2	579.6	577.2	577.6	574.0	578.2	569.4	574.1
G3.0	587.6	580.3	578.4	579.6	576.7	582.9	572.0	579.5
G4.0	590.1	582.5	579.4	586.5	581.0	587.8	576.9	584.3
G5.0	593.0	586.5	583.7	593.2	586.5	593.9	581.7	588.6
G6.0	598.4	592.7	589.4	600.8	592.3	597.0	586.3	590.8
G7.0	605.9	600.7	596.5	606.9	597.4	598.3	588.3	591.4
G8.0	617.3	610.9	608.4	613.8	600.0	598.4	589.8	590.5
G9.0	626.6	621.0	617.5	618.8	601.0	597.5	588.8	584.8
G10.0	634.4	631.7	624.4	620.8	600.9	594.0	584.5	573.2
G11.0	638.4	638.6	630.8	623.9	601.7	587.2	574.2	559.1
G12.0	642.6	644.3	637.3	627.4	599.5	574.3	560.0	545.1
G13.0	646.5	649.9	642.3	627.1	594.0	559.3	543.1	530.2
G14.0	649.8	653.4	645.5	623.4	586.5	544.6	526.5	516.7
G15.0	650.5	659.8	646.9	617.7	576.4	526.3	512.9	501.2
G16.0	654.7	662.9	650.0	608.8	564.5	514.0	500.1	488.9
G17.0	660.1	663.1	653.2	597.8	553.6	504.6	492.0	480.1
G18.0	664.0	664.3	656.2	586.8	546.2	498.9	486.5	473.1
G19.0	670.9	666.6	659.1	576.2	541.2	493.5	480.1	468.2
G20.0	676.8	669.0	661.8	569.2	536.5	487.4	474.5	462.7
G21.0	682.1	670.8	662.8	564.7	531.8	479.8	468.7	457.8
G22.0	688.4	674.3	660.6	562.2	525.7	474.5	460.7	452.1
G23.0	695.1	681.6	656.7	562.4	517.3	472.9	453.8	446.8
G24.0	702.2	690.2	651.4	564.0	509.2	471.6	445.4	442.9
G25.0	713.7	697.3	645.6	562.2	503.8	470.0	436.3	436.9
G26.0	730.7	703.8	639.5	557.8	501.1	464.5	425.1	427.3
G27.0	747.5	710.8	634.2	551.2	502.0	457.8	414.4	415.1
G28.0	761.0	719.0	631.7	545.1	504.2	448.3	403.1	404.1
G29.0	765.9	728.6	634.5	541.2	503.9	433.1	391.6	396.0
G30.0	769.6	741.9	642.2	541.2	499.0	421.8	385.7	390.5
G31.0	772.2	754.4	651.0	545.9	493.0	413.3	378.2	382.5
G32.0	774.1	765.1	658.1	552.6	487.1	407.0	369.2	374.1
G33.0	777.4	774.9	659.8	558.0	481.7	400.9	361.8	369.5
G34.0	784.1	780.5	658.1	560.6	481.1	399.6	368.6	371.7
G35.0	800.6	784.5	654.0	559.5	482.0	418.2	390.7	375.6
G36.0	819.4	789.1	646.9	555.9	477.1	436.5	395.4	373.9
G37.0	833.3	794.5	640.0	561.6	465.7	414.7	370.7	376.5
G38.0	839.7	801.9	638.4	583.5	455.3	372.6	352.6	382.8
G39.0	846.0	817.7	643.4	610.6	456.6	343.0	340.0	390.2

Test Type : Type C Test Distance : 8.460 m

C Plane (°): 0.0-360.0:15.0 γ (°): 0.0-90.0:1.0

Test Device : LSG-1890BCCD

Temperature : 25°C

Humidity : 65.0%

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

Review By :

Report No. : ROADWAY-001

Test Time : 2023-01-03 14:12:36

Page 15 of 33

Light Distribution Data

Unit: cd

G\C	C0.0	C15.0	C30.0	C45.0	C60.0	C75.0	C90.0	C105.0
G40.0	854.8	835.9	652.9	624.6	476.3	308.8	318.9	386.7
G41.0	870.6	846.6	664.6	617.7	473.8	284.3	290.2	361.5
G42.0	875.3	841.3	685.4	597.4	444.9	276.0	259.3	308.2
G43.0	859.4	824.6	708.4	573.9	399.6	273.0	243.7	271.8
G44.0	841.7	803.8	734.3	562.2	357.7	258.9	239.5	249.9
G45.0	847.0	799.0	752.0	559.0	341.4	253.9	238.3	233.9
G46.0	850.9	803.5	747.1	543.7	327.2	268.8	246.9	232.0
G47.0	839.1	798.7	732.0	514.1	312.1	262.3	254.8	242.5
G48.0	839.4	798.5	744.0	491.5	298.9	233.7	240.3	259.2
G49.0	852.5	820.2	763.5	494.4	302.1	220.2	204.7	277.6
G50.0	835.3	825.7	780.3	538.5	308.3	211.3	190.4	246.0
G51.0	811.3	793.7	769.1	543.8	301.4	226.4	205.4	210.7
G52.0	811.9	760.9	715.6	534.0	233.2	249.8	223.4	210.9
G53.0	810.5	751.0	703.0	538.9	249.2	282.5	265.0	229.4
G54.0	809.0	743.0	710.6	456.9	287.2	243.6	273.2	271.9
G55.0	864.8	793.3	631.6	376.5	275.6	227.5	222.4	308.9
G56.0	858.0	842.6	537.7	356.3	284.5	250.5	241.7	289.2
G57.0	892.7	880.9	491.7	364.2	253.9	232.1	286.7	239.8
G58.0	929.4	868.5	490.6	352.1	219.8	209.0	224.0	178.9
G59.0	955.4	884.4	519.3	363.8	201.3	142.5	173.5	262.8
G60.0	1053.4	1000.1	654.5	305.2	219.4	183.4	209.3	233.4
G61.0	1097.6	967.1	807.2	281.1	148.6	97.7	156.4	148.0
G62.0	968.4	950.5	822.2	224.9	112.3	79.0	99.6	107.8
G63.0	1093.4	1073.3	463.6	154.5	101.2	44.5	80.6	82.3
G64.0	668.5	892.3	263.5	121.3	48.9	32.0	33.9	39.7
G65.0	621.3	968.8	303.0	77.0	37.6	32.1	33.9	40.0
G66.0	479.5	646.3	403.6	55.7	31.1	26.4	32.1	31.0
G67.0	398.5	493.4	253.2	43.7	23.7	13.9	20.9	20.3
G68.0	339.8	312.8	179.3	30.4	15.9	8.4	10.3	10.3
G69.0	368.3	192.6	241.0	17.8	9.5	6.7	7.0	8.2
G70.0	230.4	103.4	104.6	13.6	8.6	5.2	6.1	6.9
G71.0	131.4	89.6	37.1	12.4	8.5	4.9	4.8	6.5
G72.0	72.3	82.0	31.2	11.1	9.1	4.9	4.4	6.5
G73.0	50.0	62.9	24.9	11.3	10.0	5.1	4.1	6.2
G74.0	41.0	56.9	17.0	11.8	11.9	4.9	3.9	6.2
G75.0	35.2	49.1	13.8	11.0	14.0	4.3	3.7	6.2
G76.0	31.6	39.2	12.0	10.6	13.5	3.9	3.6	7.0
G77.0	30.6	27.1	11.8	10.4	12.3	3.8	3.2	7.1
G78.0	29.9	17.8	11.9	10.0	11.8	3.7	2.9	7.2
G79.0	26.9	14.7	10.3	9.6	12.6	3.5	2.9	7.7

Test Type : Type C Test Distance : 8.460 m

C Plane (°): 0.0-360.0:15.0 γ (°): 0.0-90.0:1.0

Test Device : LSG-1890BCCD

Temperature : 25°C

Humidity : 65.0%

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

Review By :

Report No. : ROADWAY-001

Test Time : 2023-01-03 14:12:36

Page 16 of 33

Light Distribution Data

Unit: cd

G\C	C0.0	C15.0	C30.0	C45.0	C60.0	C75.0	C90.0	C105.0
G80.0	22.6	15.0	9.9	10.5	12.8	3.4	2.8	7.7
G81.0	19.3	12.2	9.5	11.0	12.7	3.2	2.7	7.1
G82.0	19.2	9.9	9.5	10.5	11.1	3.1	2.5	6.5
G83.0	16.6	8.9	9.3	9.5	11.1	2.9	2.5	6.0
G84.0	14.0	9.2	9.3	8.6	10.7	2.7	2.4	5.4
G85.0	14.2	12.0	9.0	8.0	9.9	2.8	2.3	5.1
G86.0	13.3	11.0	7.5	8.4	9.2	2.6	2.2	4.8
G87.0	15.3	8.9	7.7	9.3	8.8	2.5	2.1	4.6
G88.0	13.3	9.3	8.5	8.2	7.8	2.3	2.1	4.2
G89.0	13.3	8.6	6.4	6.4	6.6	2.2	2.0	3.8
G90.0	12.6	9.3	5.2	6.9	6.1	2.0	1.8	3.5

Test Type : Type C Test Distance : 8.460 m

C Plane (°): 0.0-360.0:15.0 γ (°): 0.0-90.0:1.0

Test Device : LSG-1890BCCD

Temperature : 25°C

Humidity : 65.0%

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

Review By :

Report No. : ROADWAY-001

Test Time : 2023-01-03 14:12:36

Page 17 of 33

Light Distribution Data

Unit: cd

G\C	C120.0	C135.0	C150.0	C165.0	C180.0	C195.0	C210.0	C225.0
G0.0	576.1	576.1	576.1	576.1	576.1	576.1	576.1	576.1
G1.0	569.6	571.7	570.5	571.0	572.1	574.0	576.3	577.8
G2.0	566.7	568.7	565.7	565.7	567.4	571.3	578.0	580.5
G3.0	566.7	568.2	560.3	561.4	564.8	569.0	580.0	585.7
G4.0	569.1	568.3	557.8	556.8	562.2	569.8	581.4	589.6
G5.0	574.5	573.5	556.1	553.2	559.1	570.8	583.4	591.9
G6.0	579.3	577.9	556.5	551.3	558.3	570.1	585.8	591.9
G7.0	583.9	581.7	557.8	553.3	561.1	572.7	591.0	594.5
G8.0	586.3	583.6	561.2	553.1	562.5	576.8	594.1	598.4
G9.0	584.0	584.3	563.3	551.2	561.6	580.8	595.9	600.9
G10.0	578.2	584.2	565.0	551.1	558.8	583.8	597.2	600.7
G11.0	572.3	581.4	567.9	554.8	558.0	586.2	599.2	601.6
G12.0	564.3	577.7	573.0	559.3	560.3	586.3	601.4	600.5
G13.0	556.3	572.9	574.0	564.5	564.8	586.7	603.3	598.3
G14.0	544.8	564.4	573.8	568.5	567.0	589.7	606.6	593.7
G15.0	531.5	556.1	573.7	572.4	569.2	592.7	608.8	586.9
G16.0	516.6	548.0	572.1	574.8	571.5	596.2	609.1	579.0
G17.0	501.7	538.6	570.1	577.2	570.9	598.2	607.5	572.5
G18.0	491.3	529.3	568.1	577.5	570.7	598.4	604.3	569.9
G19.0	482.3	520.3	563.7	578.6	570.3	598.6	600.2	569.4
G20.0	474.3	513.4	559.1	581.6	570.8	597.6	594.8	572.3
G21.0	469.8	508.9	553.0	581.4	571.1	599.9	588.8	574.7
G22.0	467.2	503.3	548.9	580.9	573.9	603.3	582.1	571.2
G23.0	462.6	497.9	546.3	580.3	577.4	606.9	579.4	566.0
G24.0	458.4	494.2	544.2	579.3	580.8	609.5	576.2	564.3
G25.0	455.6	492.2	541.6	579.2	583.5	608.5	573.4	569.5
G26.0	452.3	490.7	538.9	582.3	587.1	608.1	571.6	581.5
G27.0	448.2	488.8	538.1	586.5	589.9	608.6	570.5	599.3
G28.0	440.6	486.3	537.8	589.7	592.1	611.4	570.3	611.5
G29.0	431.4	486.4	535.6	593.2	600.0	615.0	570.7	613.8
G30.0	423.7	485.6	534.6	603.3	613.3	620.9	571.9	607.3
G31.0	416.4	480.6	535.5	613.2	628.5	629.1	573.6	591.7
G32.0	415.0	476.4	533.2	623.4	639.6	634.7	576.7	570.6
G33.0	413.9	473.1	533.0	633.1	650.0	638.0	585.7	542.8
G34.0	411.2	467.8	536.9	642.0	660.3	639.1	605.9	512.4
G35.0	406.6	462.3	545.7	652.7	669.2	644.6	634.3	486.1
G36.0	404.2	459.0	555.0	668.2	677.7	655.9	658.3	471.6
G37.0	402.6	456.3	562.4	681.9	686.2	673.2	667.3	470.7
G38.0	402.2	455.7	569.0	695.9	693.7	683.2	665.5	476.9
G39.0	400.1	455.3	577.7	708.5	708.4	694.7	658.3	493.7

Test Type : Type C Test Distance : 8.460 m

C Plane (°): 0.0-360.0:15.0 γ (°): 0.0-90.0:1.0

Test Device : LSG-1890BCCD

Temperature : 25°C

Humidity : 65.0%

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

Review By :

Report No. : ROADWAY-001

Test Time : 2023-01-03 14:12:36

Page 18 of 33

Light Distribution Data

Unit: cd

G\C	C120.0	C135.0	C150.0	C165.0	C180.0	C195.0	C210.0	C225.0
G40.0	398.5	457.5	583.8	719.7	733.8	707.8	661.4	529.7
G41.0	403.4	460.9	592.9	730.5	765.3	717.6	669.7	564.2
G42.0	411.7	464.7	604.2	740.6	782.4	730.4	673.0	583.5
G43.0	433.3	469.7	615.3	750.4	784.1	743.4	666.4	628.1
G44.0	458.5	478.8	630.3	758.8	775.7	756.3	648.9	604.0
G45.0	468.2	494.9	660.0	764.6	761.7	760.5	638.9	528.4
G46.0	444.3	512.5	689.2	769.8	754.3	752.1	640.3	440.3
G47.0	389.5	529.2	717.0	774.0	741.9	731.3	652.8	367.4
G48.0	326.6	543.0	737.8	765.5	725.1	703.0	655.5	303.7
G49.0	281.7	577.3	751.9	741.3	708.7	676.4	650.0	270.7
G50.0	251.5	647.0	763.6	698.8	692.9	659.0	647.7	267.6
G51.0	245.5	688.2	760.2	677.5	696.5	662.9	663.8	269.0
G52.0	248.4	684.1	720.8	679.3	716.7	662.2	672.1	271.6
G53.0	291.0	638.7	673.8	701.1	734.5	674.4	621.2	273.7
G54.0	400.4	563.4	632.3	724.1	762.7	708.5	570.7	273.1
G55.0	378.5	540.6	620.4	775.4	816.3	730.7	567.2	261.4
G56.0	254.6	530.5	615.0	809.3	860.3	725.7	395.1	246.5
G57.0	246.9	534.0	673.8	857.6	871.5	666.7	276.9	245.3
G58.0	254.3	548.0	746.5	1026.1	834.4	654.9	270.0	224.6
G59.0	351.5	610.5	790.0	895.4	760.9	661.4	239.3	210.2
G60.0	462.9	641.3	1001.8	714.3	783.4	610.4	236.4	219.1
G61.0	263.5	539.2	1075.6	822.1	1088.7	683.6	252.9	229.7
G62.0	206.0	370.8	726.0	1043.3	739.6	542.6	231.6	204.2
G63.0	229.8	239.5	514.3	991.1	607.5	449.9	201.3	193.9
G64.0	241.1	312.8	600.5	559.9	767.1	627.9	167.3	155.4
G65.0	109.1	375.5	796.1	494.7	631.3	759.1	104.4	94.5
G66.0	54.5	354.6	673.0	925.8	377.3	513.5	93.4	84.1
G67.0	57.5	277.9	354.8	829.2	477.6	253.0	41.9	76.6
G68.0	46.8	144.7	415.0	491.2	679.3	151.0	30.2	54.6
G69.0	30.1	151.6	378.8	376.0	314.5	114.2	27.2	38.6
G70.0	15.3	112.3	516.2	530.7	209.8	88.8	23.7	18.2
G71.0	13.2	63.8	516.9	323.2	177.6	61.4	17.7	15.2
G72.0	12.5	30.8	199.9	383.0	187.9	41.2	11.9	12.2
G73.0	11.5	23.7	122.3	254.7	148.7	30.3	10.2	9.1
G74.0	10.3	20.6	89.0	171.7	117.7	22.3	9.3	7.5
G75.0	9.5	17.0	52.6	114.3	71.1	18.2	8.6	6.8
G76.0	8.8	13.9	45.8	73.6	35.9	17.9	8.1	7.0
G77.0	7.8	11.9	38.6	48.1	27.0	18.3	8.2	6.7
G78.0	8.0	10.0	31.2	40.4	25.8	16.5	8.0	6.5
G79.0	8.9	8.6	25.0	32.9	25.3	14.5	7.6	6.2

Test Type : Type C Test Distance : 8.460 m

C Plane (°): 0.0-360.0:15.0 γ (°): 0.0-90.0:1.0

Test Device : LSG-1890BCCD

Temperature : 25°C

Humidity : 65.0%

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

Review By :

Report No. : ROADWAY-001

Test Time : 2023-01-03 14:12:36

Page 19 of 33

Light Distribution Data

Unit: cd

G\C	C120.0	C135.0	C150.0	C165.0	C180.0	C195.0	C210.0	C225.0
G80.0	8.6	8.1	18.1	26.9	23.0	13.3	7.1	6.2
G81.0	8.0	7.9	13.3	23.2	20.3	13.2	5.9	6.3
G82.0	7.7	7.8	11.8	19.5	18.4	12.8	5.5	6.7
G83.0	6.8	7.7	10.9	16.1	17.6	12.9	5.2	6.8
G84.0	6.4	8.1	9.9	14.6	17.3	13.3	5.2	6.1
G85.0	6.5	7.9	8.6	13.5	17.6	12.9	5.5	5.6
G86.0	7.1	8.0	8.1	12.4	15.5	12.1	5.1	5.1
G87.0	6.7	8.0	7.2	11.6	14.6	10.2	4.7	4.9
G88.0	7.0	7.1	6.6	10.0	13.3	7.8	4.3	4.5
G89.0	6.5	5.6	5.7	8.9	10.8	7.2	4.1	4.1
G90.0	4.9	4.7	5.0	8.8	10.6	7.9	4.0	3.8

Test Type : Type C Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

C Plane (°): 0.0-360.0:15.0 γ (°): 0.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : ROADWAY-001

Test Time : 2023-01-03 14:12:36

Page 20 of 33

Light Distribution Data

Unit: cd

G\C	C240.0	C255.0	C270.0	C285.0	C300.0	C315.0	C330.0	C345.0
G0.0	576.1	576.1	576.1	576.1	576.1	576.1	576.1	576.1
G1.0	580.9	581.3	585.1	582.8	584.9	582.9	582.3	581.0
G2.0	588.8	588.4	595.9	592.8	597.2	592.4	590.5	585.5
G3.0	594.3	597.1	605.3	605.0	609.1	603.9	601.3	591.6
G4.0	597.7	604.7	612.3	616.3	619.5	615.5	608.2	598.7
G5.0	599.7	611.5	616.9	623.4	624.4	622.9	616.6	603.8
G6.0	601.1	612.2	616.2	628.0	627.8	630.4	626.9	611.3
G7.0	602.5	612.6	614.1	628.3	628.9	636.8	637.7	621.4
G8.0	605.6	611.0	611.5	627.9	631.9	644.6	648.7	632.5
G9.0	606.2	610.3	609.5	627.1	635.2	652.2	657.7	642.9
G10.0	602.7	608.4	608.6	626.5	637.7	654.6	659.7	650.7
G11.0	597.5	604.1	606.4	625.7	638.6	655.4	661.5	652.4
G12.0	589.0	596.3	601.1	622.5	636.8	656.4	662.3	656.0
G13.0	578.7	586.6	594.3	617.8	634.4	660.2	662.3	662.4
G14.0	568.5	579.0	588.5	611.4	633.3	662.1	664.8	669.2
G15.0	558.5	573.3	585.0	606.7	633.7	666.2	669.0	676.5
G16.0	553.2	567.3	586.0	605.5	636.7	673.1	673.8	684.9
G17.0	549.1	564.0	587.8	606.5	638.2	679.2	681.6	697.0
G18.0	548.1	559.7	589.7	610.5	641.2	684.9	685.0	703.4
G19.0	548.1	556.8	592.9	615.8	645.9	689.1	689.9	706.8
G20.0	549.8	560.9	597.1	619.5	654.1	689.7	696.1	710.2
G21.0	552.4	566.8	597.7	623.4	664.2	688.5	705.2	712.1
G22.0	561.9	572.7	592.5	623.6	675.9	692.5	714.3	713.7
G23.0	574.1	572.6	580.4	618.3	681.8	698.4	726.7	717.0
G24.0	580.9	564.1	564.0	607.7	680.1	705.2	737.3	727.0
G25.0	578.2	538.2	541.5	599.2	670.0	713.6	745.3	738.9
G26.0	559.3	505.7	516.5	587.6	660.8	717.3	747.7	746.5
G27.0	524.5	470.9	490.3	573.9	653.3	716.6	747.9	747.5
G28.0	478.6	446.3	481.7	562.8	648.5	713.6	754.4	745.2
G29.0	450.3	440.8	493.4	556.4	640.6	711.5	768.5	745.1
G30.0	438.5	451.8	518.0	547.3	635.4	710.0	789.2	753.0
G31.0	441.0	473.4	564.7	539.0	640.1	716.9	798.7	766.3
G32.0	454.4	516.8	584.2	555.4	639.9	729.2	801.6	778.9
G33.0	478.0	610.9	540.0	571.7	632.4	741.5	802.7	792.9
G34.0	528.2	595.2	443.0	557.3	626.6	746.0	806.8	806.9
G35.0	603.1	396.3	331.4	526.3	629.8	744.2	815.4	816.9
G36.0	596.0	304.9	299.0	518.5	630.2	749.0	818.6	821.7
G37.0	489.9	286.5	287.2	525.0	619.2	764.3	830.6	830.4
G38.0	352.6	269.7	281.8	475.7	614.0	774.0	844.2	851.1
G39.0	294.8	266.2	281.4	344.5	623.2	758.4	836.7	882.7

Test Type : Type C Test Distance : 8.460 m

C Plane (°): 0.0-360.0:15.0 γ (°): 0.0-90.0:1.0

Test Device : LSG-1890BCCD

Temperature : 25°C

Humidity : 65.0%

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

Review By :

Report No. : ROADWAY-001

Test Time : 2023-01-03 14:12:36

Page 21 of 33

Light Distribution Data

Unit: cd

G\C	C240.0	C255.0	C270.0	C285.0	C300.0	C315.0	C330.0	C345.0
G40.0	275.2	263.1	279.3	305.2	626.8	732.4	809.2	913.2
G41.0	263.7	261.3	270.5	297.0	611.7	714.6	802.1	921.7
G42.0	254.3	253.4	258.3	292.3	546.0	711.2	834.1	907.5
G43.0	251.0	243.5	232.9	291.4	462.1	714.2	884.0	885.2
G44.0	246.5	231.4	222.2	287.8	412.2	727.2	878.0	862.3
G45.0	241.5	216.1	213.7	270.5	411.0	745.7	842.9	846.3
G46.0	236.8	210.0	216.8	254.2	353.5	736.5	811.7	839.3
G47.0	235.4	210.4	219.4	240.4	322.9	728.3	778.3	846.0
G48.0	227.3	216.9	219.6	233.3	307.6	735.2	748.5	849.4
G49.0	220.0	214.1	230.4	233.2	292.5	683.5	713.7	852.6
G50.0	213.4	210.0	237.9	235.4	286.5	551.7	673.6	842.5
G51.0	214.3	223.9	240.7	236.8	275.8	480.8	654.7	802.9
G52.0	214.9	236.4	262.4	244.4	254.7	445.4	652.0	787.3
G53.0	216.5	245.5	265.7	244.8	247.6	380.6	660.8	789.5
G54.0	231.1	254.0	294.4	246.9	228.8	332.0	649.9	759.4
G55.0	234.1	275.0	321.7	255.6	220.5	289.2	674.9	799.2
G56.0	242.2	319.8	294.4	263.6	228.8	275.6	785.7	851.3
G57.0	263.2	305.2	196.6	297.6	219.8	280.2	730.2	966.4
G58.0	310.7	177.8	153.1	286.6	222.9	265.3	613.8	834.4
G59.0	278.6	153.0	170.7	225.0	236.6	270.9	427.3	783.7
G60.0	178.8	161.3	210.4	215.8	248.8	236.7	350.2	784.0
G61.0	144.4	210.2	149.8	177.9	195.8	214.7	334.8	880.0
G62.0	141.0	169.8	84.3	200.1	162.9	183.5	230.7	849.0
G63.0	195.3	86.7	100.7	147.5	119.2	170.7	240.6	563.5
G64.0	92.1	94.3	95.1	116.8	118.1	126.6	185.1	571.0
G65.0	68.1	135.2	26.3	101.4	110.4	133.7	132.3	349.6
G66.0	73.4	30.3	23.6	81.3	79.1	81.2	95.6	324.2
G67.0	62.0	23.8	23.2	27.1	56.8	49.7	55.6	228.6
G68.0	20.6	23.3	20.6	22.6	35.0	51.9	39.2	188.9
G69.0	18.4	21.1	15.3	21.0	16.6	22.6	31.4	188.5
G70.0	16.5	16.8	9.6	18.5	14.4	18.1	25.7	169.5
G71.0	14.0	8.9	6.2	12.4	12.0	15.6	20.2	109.6
G72.0	9.4	6.4	5.5	6.9	9.7	12.5	13.7	64.4
G73.0	6.8	5.6	5.0	6.1	6.4	8.3	11.9	36.6
G74.0	6.4	5.0	4.7	5.6	5.4	7.2	10.5	24.9
G75.0	6.0	4.6	4.5	5.0	5.1	7.7	9.5	19.8
G76.0	5.3	4.3	4.1	4.8	4.8	7.3	8.9	17.6
G77.0	5.0	4.0	3.9	4.6	4.6	7.1	8.5	16.9
G78.0	4.8	3.9	3.8	4.5	4.6	6.7	9.0	16.9
G79.0	4.5	3.7	3.6	4.3	4.7	8.0	9.2	16.9

Test Type : Type C Test Distance : 8.460 m

C Plane (°): 0.0-360.0:15.0 γ (°): 0.0-90.0:1.0

Test Device : LSG-1890BCCD

Temperature : 25°C

Humidity : 65.0%

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

Review By :

Report No. : ROADWAY-001

Test Time : 2023-01-03 14:12:36

Page 22 of 33

Light Distribution Data

Unit: cd

G\C	C240.0	C255.0	C270.0	C285.0	C300.0	C315.0	C330.0	C345.0
G80.0	4.1	3.7	3.3	3.9	4.7	7.8	9.0	15.9
G81.0	3.9	3.2	2.9	3.5	5.0	7.5	9.5	16.0
G82.0	3.9	3.0	2.7	3.2	5.4	7.0	12.2	16.9
G83.0	3.7	2.7	2.3	2.8	5.5	6.3	16.0	16.2
G84.0	3.5	2.6	2.1	2.7	5.8	6.2	14.7	15.5
G85.0	3.4	2.4	1.9	2.6	5.7	6.0	14.7	17.7
G86.0	3.2	2.2	1.7	2.5	5.4	5.4	18.0	16.6
G87.0	3.3	2.2	1.4	2.6	5.4	5.2	20.4	17.3
G88.0	3.1	2.0	1.3	2.5	5.4	5.0	17.2	16.2
G89.0	2.8	1.9	1.3	2.3	4.7	4.5	15.1	17.0
G90.0	2.6	1.7	1.2	2.2	4.8	4.1	15.8	14.2

Test Type : Type C Test Distance : 8.460 m

C Plane (°): 0.0-360.0:15.0 γ (°): 0.0-90.0:1.0

Test Device : LSG-1890BCCD

Temperature : 25°C

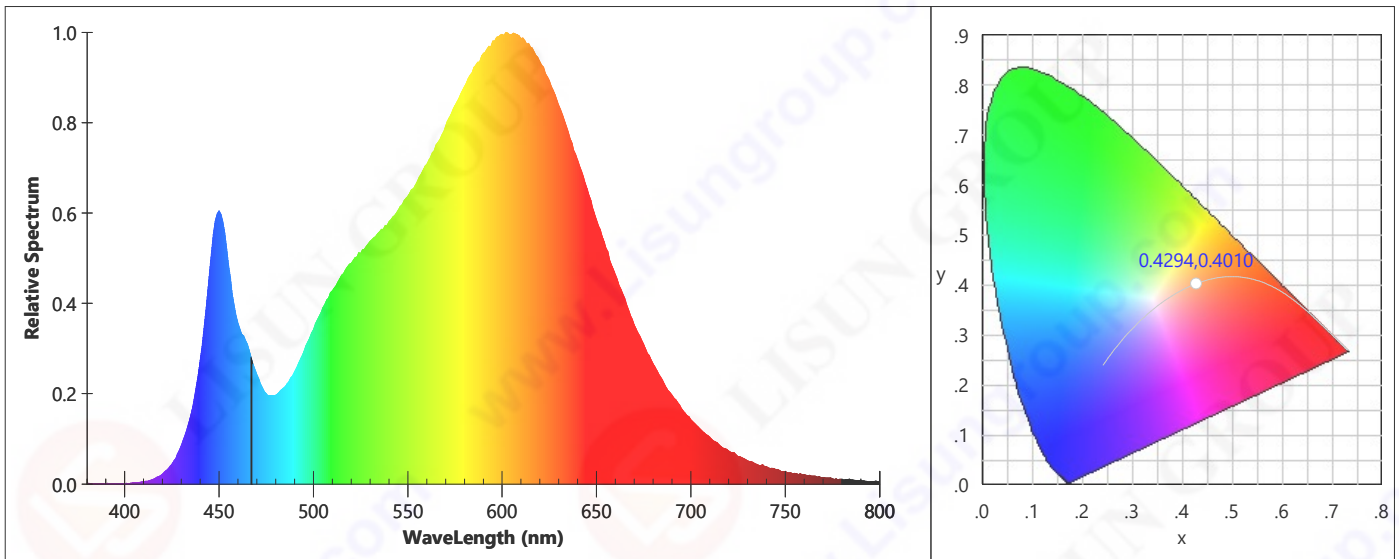
Humidity : 65.0%

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

Review By :

Color Properties



Colorimetric

CIE(x,y): 0.4294,0.4010

CIE(u,v): 0.2470,0.3460

CIE(u',v'): 0.2470,0.5190

CCT: 3106 K (Duv=-0.000151)

Dominant Wavelength: 582.4 nm

Color Purity: 0.492

Peak Wavelength: 602.4 nm

Half Width: 135.2 nm

Color Ratio: R:0.224, G:0.750, B:0.027

Luminous Flux: 1991.89 lm

Radiant Power: 6.034 W

Color Render Index: Ra: 83.5

R1: 82

R2: 91

R3: 97

R4: 82

R5: 82

R6: 89

R7: 84

R8: 61

R9: 11

R10: 79

R11: 91

R12: 71

R13: 84

R14: 99

R15: 75

Color Quality Scale: Qa: 82.9, Qf: 83.1, Qp: 84.2, Qg: 92.2

Q1: 79

Q2: 96

Q3: 83

Q4: 80

Q5: 83

Q6: 84

Q7: 84

Q8: 87

Q9: 96

Q10: 89

Q11: 86

Q12: 84

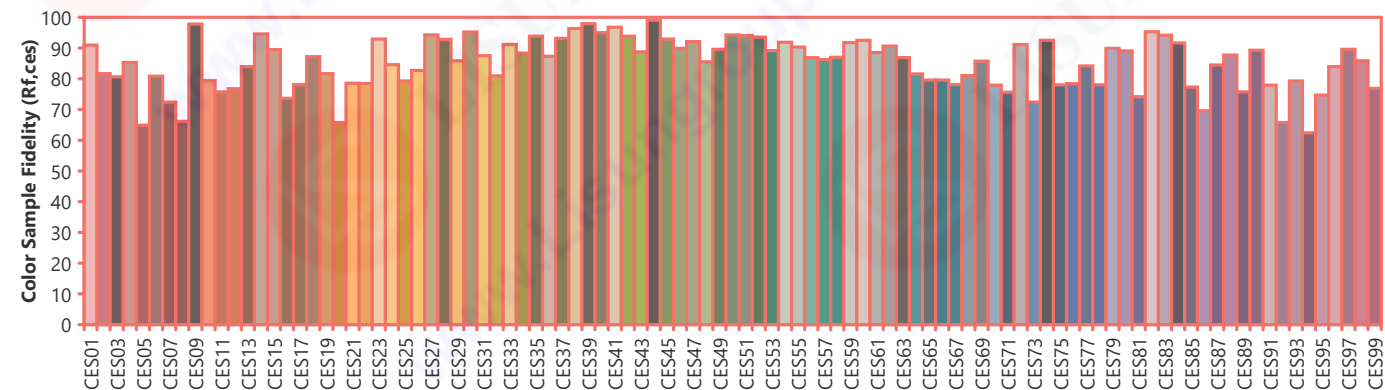
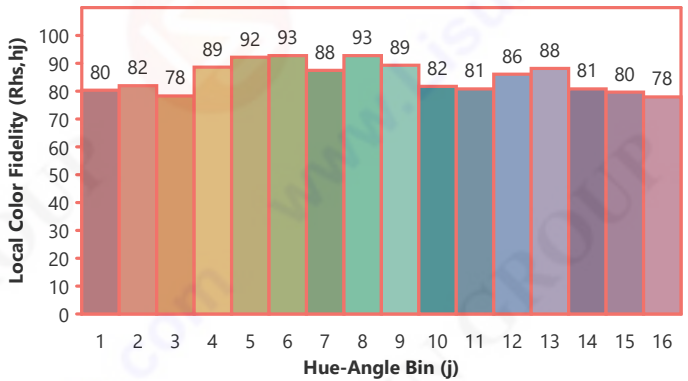
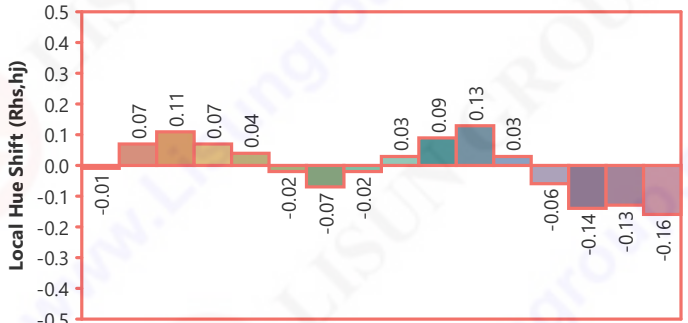
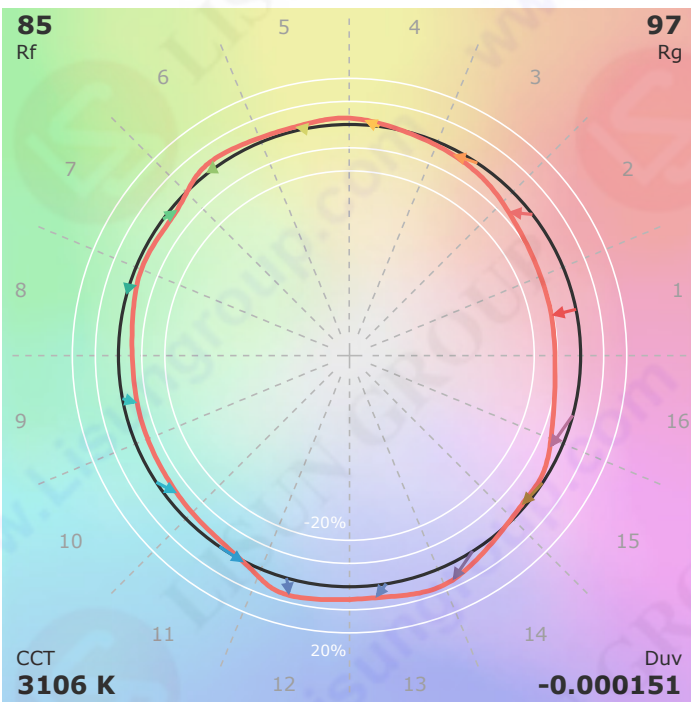
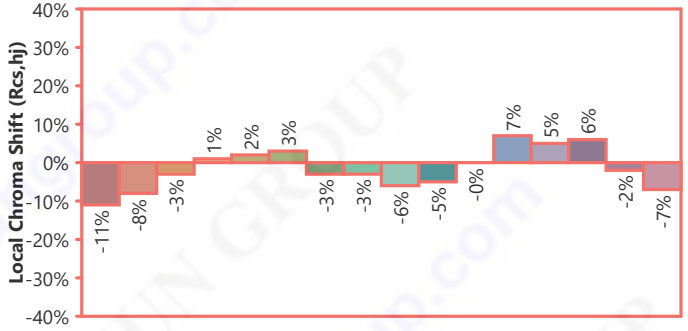
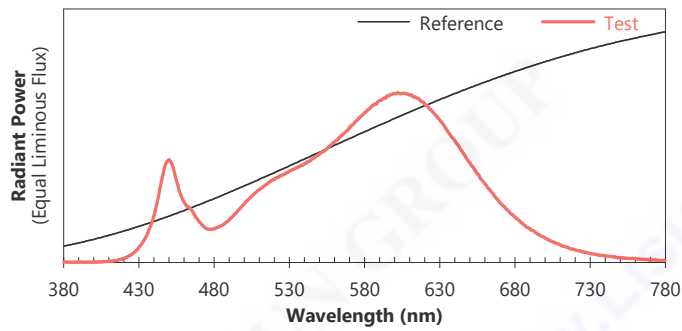
Q13: 83

Q14: 73

Q15: 75

TM-30-18: Rf: 85, Rg: 97

IES TM-30-18 Color Rendition Report



Notes: This is a recommended method for displaying IES TM-30-18 information.

x **0.4294**
 y **0.4010**
 u' **0.2470**
 v' **0.5190**

CIE13.3-1995
 (CRI)
 Ra **83**
 R9 **11**

Test Type: Type C Test Distance: 8.460 m
 Test Device: LSG-1890BCCD
 Test Lab: Lisun Instruments Limited
 Test By: Thomas Fiodorow

C Plane (°): 0.0-360.0:15.0 γ (°): 0.0-90.0:1.0
 Temperature: 25°C Humidity: 65.0%
 Review By:

Color Distribution Data

Evaluation of Spatial non-uniformity of chromaticity

IESNA LM-79: Spatially Averaged Chromaticity (u',v'): 0.2467, 0.5180
 Spatially Averaged Chromaticity (CCT): 3123K
 Spatial non-uniformity of chromaticity $\Delta u'v'(\Delta u',\Delta v')$: 0.001052 (0.0003,0.0010)

CIE S025: Spatially Averaged Chromaticity (u',v'): 0.2467, 0.5179
 Spatially Averaged Chromaticity (CCT): 3123K
 Angular Colour Uniformity $\Delta u'v'(\Delta u',\Delta v')$: 0.001083 (0.0003,0.0010)

GB/T 24824: Spatially Averaged Chromaticity (u',v'): 0.2467, 0.5180
 Average Color Nonuniformity $\Delta u'v'(\Delta u',\Delta v')$:0.000049 (0.0000,0.0000)
 Maximum Color Nonuniformity $\Delta u'v'(\Delta u',\Delta v')$:0.001102 (0.0003,0.0011)

Color Distribution Data Tc(K)

Average Color(Tc):3123

G/C	0.0	15.0	30.0	45.0	60.0	75.0	90.0	105.0
0.0	3116	3116	3115	3115	3116	3115	3115	3116
1.0	3116	3115	3115	3116	3115	3115	3116	3116
2.0	3115	3115	3116	3115	3115	3116	3116	3114
3.0	3115	3116	3115	3115	3116	3116	3114	3116
4.0	3116	3115	3115	3116	3116	3114	3116	3116
5.0	3115	3115	3116	3116	3114	3116	3116	3116
6.0	3115	3116	3116	3114	3116	3116	3116	3115
7.0	3116	3116	3114	3116	3116	3116	3115	3117
8.0	3116	3114	3116	3116	3116	3115	3117	3115
9.0	3114	3116	3116	3116	3115	3117	3115	3116
10.0	3116	3116	3116	3115	3117	3115	3116	3116
11.0	3116	3116	3115	3117	3115	3116	3116	3117
12.0	3116	3115	3117	3115	3116	3116	3117	3116
13.0	3115	3117	3115	3116	3116	3117	3116	3115
14.0	3117	3115	3116	3116	3117	3116	3115	3116
15.0	3115	3116	3116	3117	3116	3115	3116	3117
16.0	3116	3116	3117	3116	3115	3116	3117	3117
17.0	3116	3117	3116	3115	3116	3117	3117	3116
18.0	3117	3116	3115	3116	3117	3117	3116	3116
19.0	3116	3115	3116	3117	3117	3116	3116	3116
20.0	3115	3116	3117	3117	3116	3116	3116	3117
21.0	3116	3117	3117	3116	3116	3116	3117	3117
22.0	3117	3117	3116	3116	3116	3117	3117	3115
23.0	3117	3116	3116	3116	3117	3117	3115	3116

Report No. : ROADWAY-001

Test Time : 2023-01-03 14:12:36

Page 26 of 33

Color Distribution Data

Color Distribution Data Tc(K)

Average Color(Tc):3123

G/C	0.0	15.0	30.0	45.0	60.0	75.0	90.0	105.0
24.0	3116	3116	3116	3117	3117	3115	3116	3115
25.0	3116	3116	3117	3117	3115	3116	3115	3117
26.0	3116	3117	3117	3115	3116	3115	3117	3116
27.0	3117	3117	3115	3116	3115	3117	3116	3117
28.0	3117	3115	3116	3115	3117	3116	3117	3116
29.0	3115	3116	3115	3117	3116	3117	3116	3117
30.0	3116	3115	3117	3116	3117	3116	3117	3116
31.0	3115	3117	3116	3117	3116	3117	3116	3118
32.0	3117	3116	3117	3116	3117	3116	3118	3115
33.0	3116	3117	3116	3117	3116	3118	3115	3116
34.0	3117	3116	3117	3116	3118	3115	3116	3116
35.0	3116	3117	3116	3118	3115	3116	3116	3116
36.0	3117	3116	3118	3115	3116	3116	3116	3117
37.0	3116	3118	3115	3116	3116	3116	3117	3117
38.0	3118	3115	3116	3116	3116	3117	3117	3118
39.0	3115	3116	3116	3116	3117	3117	3118	3117
40.0	3116	3116	3116	3117	3117	3118	3117	3118
41.0	3116	3116	3117	3117	3118	3117	3118	3118
42.0	3116	3117	3117	3118	3117	3118	3118	3116
43.0	3117	3117	3118	3117	3118	3118	3116	3117
44.0	3117	3118	3117	3118	3118	3116	3117	3117
45.0	3118	3117	3118	3118	3116	3117	3117	3116
46.0	3117	3118	3118	3116	3117	3117	3116	3117
47.0	3118	3118	3116	3117	3117	3116	3117	3116

Test Type : Type C Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

C Plane (°): 0.0-360.0:15.0 γ (°): 0.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Color Distribution Data

Color Distribution Data Tc(K)

Average Color(Tc):3123

G/C	0.0	15.0	30.0	45.0	60.0	75.0	90.0	105.0
48.0	3118	3116	3117	3117	3116	3117	3116	3116
49.0	3116	3117	3117	3116	3117	3116	3116	3117
50.0	3117	3117	3116	3117	3116	3116	3117	3117
51.0	3117	3116	3117	3116	3116	3117	3117	3118
52.0	3116	3117	3116	3116	3117	3117	3118	3117
53.0	3117	3116	3116	3117	3117	3118	3117	3117
54.0	3116	3116	3117	3117	3118	3117	3117	3118
55.0	3116	3117	3117	3118	3117	3117	3118	3117
56.0	3117	3117	3118	3117	3117	3118	3117	3117
57.0	3117	3118	3117	3117	3118	3117	3117	3119
58.0	3118	3117	3117	3118	3117	3117	3119	3116
59.0	3117	3117	3118	3117	3117	3119	3116	3117
60.0	3117	3118	3117	3117	3119	3116	3117	3117
61.0	3118	3117	3117	3119	3116	3117	3117	3117
62.0	3117	3117	3119	3116	3117	3117	3117	3117
63.0	3117	3119	3116	3117	3117	3117	3117	3118
64.0	3119	3116	3117	3117	3117	3117	3118	3120
65.0	3116	3117	3117	3117	3117	3118	3120	3120
66.0	3117	3117	3117	3117	3118	3120	3120	3120
67.0	3117	3117	3117	3118	3120	3120	3120	3119
68.0	3117	3117	3118	3120	3120	3120	3119	3121
69.0	3117	3118	3120	3120	3120	3119	3121	3120
70.0	3118	3120	3120	3120	3119	3121	3120	3119

Test Type : Type C Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

C Plane (°): 0.0-360.0:15.0 γ (°): 0.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Color Distribution Data

Color Distribution Data Tc(K)

Average Color(Tc):3123

G/C	120.0	135.0	150.0	165.0	180.0	195.0	210.0	225.0
0.0	3116	3114	3116	3116	3116	3115	3117	3115
1.0	3114	3116	3116	3116	3115	3117	3115	3116
2.0	3116	3116	3116	3115	3117	3115	3116	3116
3.0	3116	3116	3115	3117	3115	3116	3116	3117
4.0	3116	3115	3117	3115	3116	3116	3117	3116
5.0	3115	3117	3115	3116	3116	3117	3116	3115
6.0	3117	3115	3116	3116	3117	3116	3115	3116
7.0	3115	3116	3116	3117	3116	3115	3116	3117
8.0	3116	3116	3117	3116	3115	3116	3117	3117
9.0	3116	3117	3116	3115	3116	3117	3117	3116
10.0	3117	3116	3115	3116	3117	3117	3116	3116
11.0	3116	3115	3116	3117	3117	3116	3116	3116
12.0	3115	3116	3117	3117	3116	3116	3116	3117
13.0	3116	3117	3117	3116	3116	3116	3117	3117
14.0	3117	3117	3116	3116	3116	3117	3117	3115
15.0	3117	3116	3116	3116	3117	3117	3115	3116
16.0	3116	3116	3116	3117	3117	3115	3116	3115
17.0	3116	3116	3117	3117	3115	3116	3115	3117
18.0	3116	3117	3117	3115	3116	3115	3117	3116
19.0	3117	3117	3115	3116	3115	3117	3116	3117
20.0	3117	3115	3116	3115	3117	3116	3117	3116
21.0	3115	3116	3115	3117	3116	3117	3116	3117
22.0	3116	3115	3117	3116	3117	3116	3117	3116
23.0	3115	3117	3116	3117	3116	3117	3116	3118

Test Type : Type C Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

C Plane (°): 0.0-360.0:15.0 γ (°): 0.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : ROADWAY-001

Test Time : 2023-01-03 14:12:36

Page 29 of 33

Color Distribution Data

Color Distribution Data Tc(K)

Average Color(Tc):3123

G/C	120.0	135.0	150.0	165.0	180.0	195.0	210.0	225.0
24.0	3117	3116	3117	3116	3117	3116	3118	3115
25.0	3116	3117	3116	3117	3116	3118	3115	3116
26.0	3117	3116	3117	3116	3118	3115	3116	3116
27.0	3116	3117	3116	3118	3115	3116	3116	3116
28.0	3117	3116	3118	3115	3116	3116	3116	3117
29.0	3116	3118	3115	3116	3116	3116	3117	3117
30.0	3118	3115	3116	3116	3116	3117	3117	3118
31.0	3115	3116	3116	3116	3117	3117	3118	3117
32.0	3116	3116	3116	3117	3117	3118	3117	3118
33.0	3116	3116	3117	3117	3118	3117	3118	3118
34.0	3116	3117	3117	3118	3117	3118	3118	3116
35.0	3117	3117	3118	3117	3118	3118	3116	3117
36.0	3117	3118	3117	3118	3118	3116	3117	3117
37.0	3118	3117	3118	3118	3116	3117	3117	3116
38.0	3117	3118	3118	3116	3117	3117	3116	3117
39.0	3118	3118	3116	3117	3117	3116	3117	3116
40.0	3118	3116	3117	3117	3116	3117	3116	3116
41.0	3116	3117	3117	3116	3117	3116	3116	3117
42.0	3117	3117	3116	3117	3116	3116	3117	3117
43.0	3117	3116	3117	3116	3116	3117	3117	3118
44.0	3116	3117	3116	3116	3117	3117	3118	3117
45.0	3117	3116	3116	3117	3117	3118	3117	3117
46.0	3116	3116	3117	3117	3118	3117	3117	3118
47.0	3116	3117	3117	3118	3117	3117	3118	3117

Test Type : Type C Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

C Plane (°): 0.0-360.0:15.0 γ (°): 0.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : ROADWAY-001

Test Time : 2023-01-03 14:12:36

Page 30 of 33

Color Distribution Data

Color Distribution Data Tc(K)

Average Color(Tc):3123

G/C	120.0	135.0	150.0	165.0	180.0	195.0	210.0	225.0
48.0	3117	3117	3118	3117	3117	3118	3117	3117
49.0	3117	3118	3117	3117	3118	3117	3117	3119
50.0	3118	3117	3117	3118	3117	3117	3119	3116
51.0	3117	3117	3118	3117	3117	3119	3116	3117
52.0	3117	3118	3117	3117	3119	3116	3117	3117
53.0	3118	3117	3117	3119	3116	3117	3117	3117
54.0	3117	3117	3119	3116	3117	3117	3117	3117
55.0	3117	3119	3116	3117	3117	3117	3117	3118
56.0	3119	3116	3117	3117	3117	3117	3118	3120
57.0	3116	3117	3117	3117	3117	3118	3120	3120
58.0	3117	3117	3117	3117	3118	3120	3120	3120
59.0	3117	3117	3117	3118	3120	3120	3120	3119
60.0	3117	3117	3118	3120	3120	3120	3119	3121
61.0	3117	3118	3120	3120	3120	3119	3121	3120
62.0	3118	3120	3120	3120	3119	3121	3120	3119
63.0	3120	3120	3120	3119	3121	3120	3119	3120
64.0	3120	3120	3119	3121	3120	3119	3120	3120
65.0	3120	3119	3121	3120	3119	3120	3120	3119
66.0	3119	3121	3120	3119	3120	3120	3119	3119
67.0	3121	3120	3119	3120	3120	3119	3119	3120
68.0	3120	3119	3120	3120	3119	3119	3120	3119
69.0	3119	3120	3120	3119	3119	3120	3119	3119
70.0	3120	3120	3119	3119	3120	3119	3119	3119

Test Type : Type C Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

C Plane (°): 0.0-360.0:15.0 γ (°): 0.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : ROADWAY-001

Test Time : 2023-01-03 14:12:36

Page 31 of 33

Color Distribution Data

Color Distribution Data Tc(K)

Average Color(Tc):3123

G/C	240.0	255.0	270.0	285.0	300.0	315.0	330.0	345.0
0.0	3116	3116	3117	3116	3115	3116	3117	3117
1.0	3116	3117	3116	3115	3116	3117	3117	3116
2.0	3117	3116	3115	3116	3117	3117	3116	3116
3.0	3116	3115	3116	3117	3117	3116	3116	3116
4.0	3115	3116	3117	3117	3116	3116	3116	3117
5.0	3116	3117	3117	3116	3116	3116	3117	3117
6.0	3117	3117	3116	3116	3116	3117	3117	3115
7.0	3117	3116	3116	3116	3117	3117	3115	3116
8.0	3116	3116	3116	3117	3117	3115	3116	3115
9.0	3116	3116	3117	3117	3115	3116	3115	3117
10.0	3116	3117	3117	3115	3116	3115	3117	3116
11.0	3117	3117	3115	3116	3115	3117	3116	3117
12.0	3117	3115	3116	3115	3117	3116	3117	3116
13.0	3115	3116	3115	3117	3116	3117	3116	3117
14.0	3116	3115	3117	3116	3117	3116	3117	3116
15.0	3115	3117	3116	3117	3116	3117	3116	3118
16.0	3117	3116	3117	3116	3117	3116	3118	3115
17.0	3116	3117	3116	3117	3116	3118	3115	3116
18.0	3117	3116	3117	3116	3118	3115	3116	3116
19.0	3116	3117	3116	3118	3115	3116	3116	3116
20.0	3117	3116	3118	3115	3116	3116	3116	3117
21.0	3116	3118	3115	3116	3116	3116	3117	3117
22.0	3118	3115	3116	3116	3116	3117	3117	3118
23.0	3115	3116	3116	3116	3117	3117	3118	3117

Test Type : Type C Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

C Plane (°): 0.0-360.0:15.0 γ (°): 0.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : ROADWAY-001

Test Time : 2023-01-03 14:12:36

Page 32 of 33

Color Distribution Data

Color Distribution Data Tc(K)

Average Color(Tc):3123

G/C	240.0	255.0	270.0	285.0	300.0	315.0	330.0	345.0
24.0	3116	3116	3116	3117	3117	3118	3117	3118
25.0	3116	3116	3117	3117	3118	3117	3118	3118
26.0	3116	3117	3117	3118	3117	3118	3118	3116
27.0	3117	3117	3118	3117	3118	3118	3116	3117
28.0	3117	3118	3117	3118	3118	3116	3117	3117
29.0	3118	3117	3118	3118	3116	3117	3117	3116
30.0	3117	3118	3118	3116	3117	3117	3116	3117
31.0	3118	3118	3116	3117	3117	3116	3117	3116
32.0	3118	3116	3117	3117	3116	3117	3116	3116
33.0	3116	3117	3117	3116	3117	3116	3116	3117
34.0	3117	3117	3116	3117	3116	3116	3117	3117
35.0	3117	3116	3117	3116	3116	3117	3117	3118
36.0	3116	3117	3116	3116	3117	3117	3118	3117
37.0	3117	3116	3116	3117	3117	3118	3117	3117
38.0	3116	3116	3117	3117	3118	3117	3117	3118
39.0	3116	3117	3117	3118	3117	3117	3118	3117
40.0	3117	3117	3118	3117	3117	3118	3117	3117
41.0	3117	3118	3117	3117	3118	3117	3117	3119
42.0	3118	3117	3117	3118	3117	3117	3119	3116
43.0	3117	3117	3118	3117	3117	3119	3116	3117
44.0	3117	3118	3117	3117	3119	3116	3117	3117
45.0	3118	3117	3117	3119	3116	3117	3117	3117
46.0	3117	3117	3119	3116	3117	3117	3117	3117
47.0	3117	3119	3116	3117	3117	3117	3117	3118

Test Type : Type C Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

C Plane (°): 0.0-360.0:15.0 γ (°): 0.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : ROADWAY-001

Test Time : 2023-01-03 14:12:36

Page 33 of 33

Color Distribution Data

Color Distribution Data Tc(K)

Average Color(Tc):3123

G\C	240.0	255.0	270.0	285.0	300.0	315.0	330.0	345.0
48.0	3119	3116	3117	3117	3117	3117	3118	3120
49.0	3116	3117	3117	3117	3117	3118	3120	3120
50.0	3117	3117	3117	3117	3118	3120	3120	3120
51.0	3117	3117	3117	3118	3120	3120	3120	3119
52.0	3117	3117	3118	3120	3120	3120	3119	3121
53.0	3117	3118	3120	3120	3120	3119	3121	3120
54.0	3118	3120	3120	3120	3119	3121	3120	3119
55.0	3120	3120	3120	3119	3121	3120	3119	3120
56.0	3120	3120	3119	3121	3120	3119	3120	3120
57.0	3120	3119	3121	3120	3119	3120	3120	3119
58.0	3119	3121	3120	3119	3120	3120	3119	3119
59.0	3121	3120	3119	3120	3120	3119	3119	3120
60.0	3120	3119	3120	3120	3119	3119	3120	3119
61.0	3119	3120	3120	3119	3119	3120	3119	3119
62.0	3120	3120	3119	3119	3120	3119	3119	3119
63.0	3120	3119	3119	3120	3119	3119	3119	3118
64.0	3119	3119	3120	3119	3119	3119	3118	3119
65.0	3119	3120	3119	3119	3119	3118	3119	3120
66.0	3120	3119	3119	3119	3118	3119	3120	3118
67.0	3119	3119	3119	3118	3119	3120	3118	3119
68.0	3119	3119	3118	3119	3120	3118	3119	3119
69.0	3119	3118	3119	3120	3118	3119	3119	3119
70.0	3118	3119	3120	3118	3119	3119	3119	3119

Test Type : Type C Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

C Plane (°): 0.0-360.0:15.0 γ (°): 0.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No.: FLOOD-003

Test Time: 2023-01-03 16:45:44

Page 1 of 37

Lisun Goniophotometer Test Report

Product Info

Luminaire Category: Flood

Luminaire: BT-EF295

Lamp Category: CREE

Lamp: 011507

Manufacturer: Philips Lighting B.V.

Submitter: Michael Aslami

Number of Lamps: 1

Lumens per Lamp: 9000 lm

Luminous Length: 230 mm

Luminous Width: 135 mm

Luminous Height: 0 mm

Electric Parameters

Voltage: 230.00 V Current: 0.4948 A Power: 106.44 W Power Factor: 0.936 Frequency: 50.00 Hz

Photometric Parameters

IES NEMA Type: 7H x 7V

Measurement Flux: 8844.4 lm

Field Lumens: 8673.6 lm

Central Intensity: 3248.14 cd

Position Of Maximum Intensity: H-1° V0°

Energy Efficiency Class: G (EU 2019/2015 η_{TM} :82lm/W)

Beam Angle (Vertical): 109.5°

Field Angle (Vertical): 147.4°

Total Rated Lamp Lumens: 9000.0 lm

Efficiency: 98.27 %

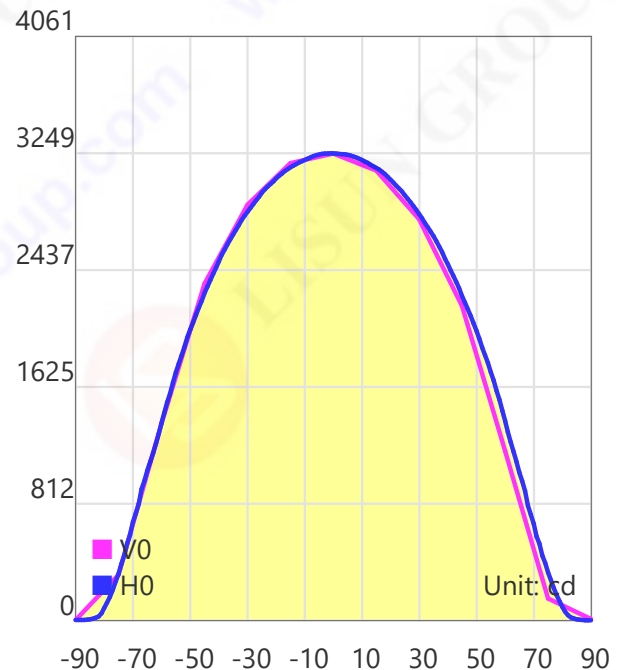
Field Efficiency: 96.37 %

Maximum Intensity: 3249.04 cd

Luminaire Efficacy Rating (LER): 83

Beam Angle (Horizontal): 113.0°

Field Angle (Horizontal): 150.2°



Test Type: Type B Test Distance: 8.460 m

Test Device: LSG-1890BCCD

Test Lab: Lisun Instruments Limited

Test By: Thomas Fiodorow

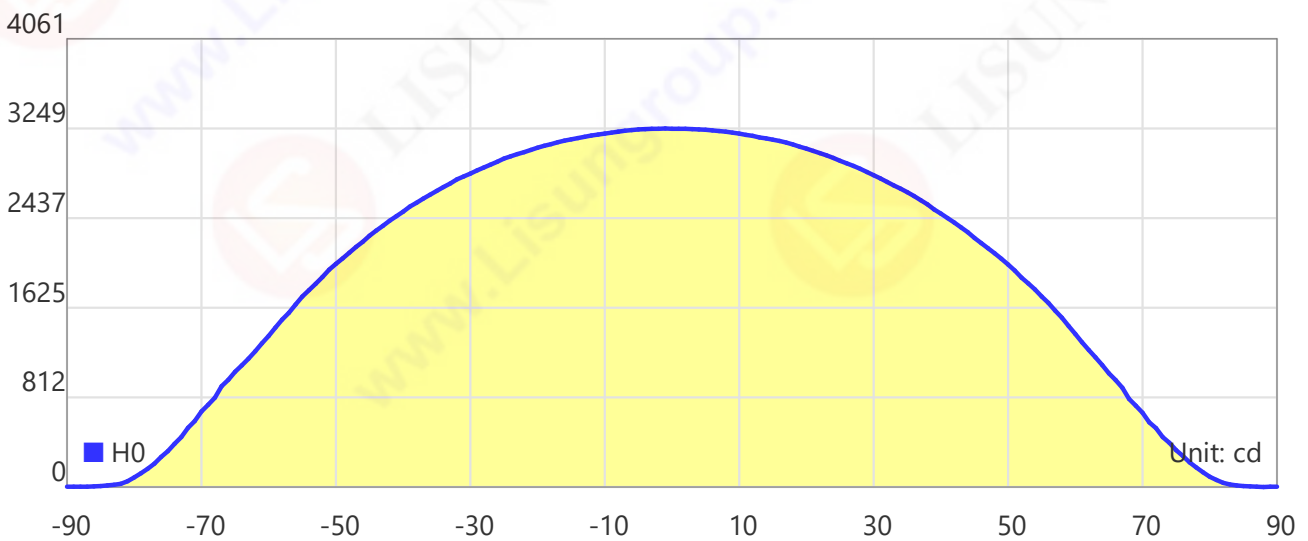
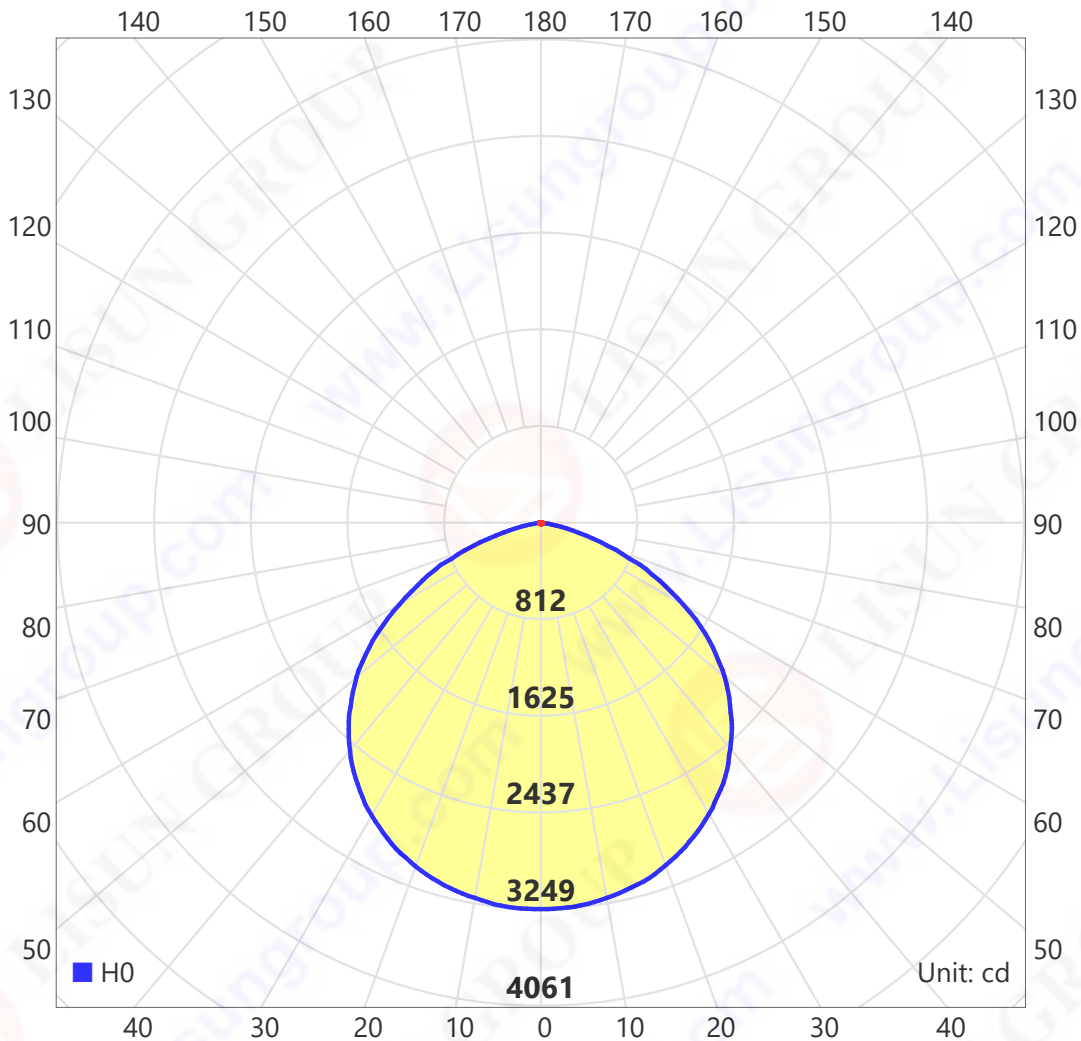
B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature: 25°C

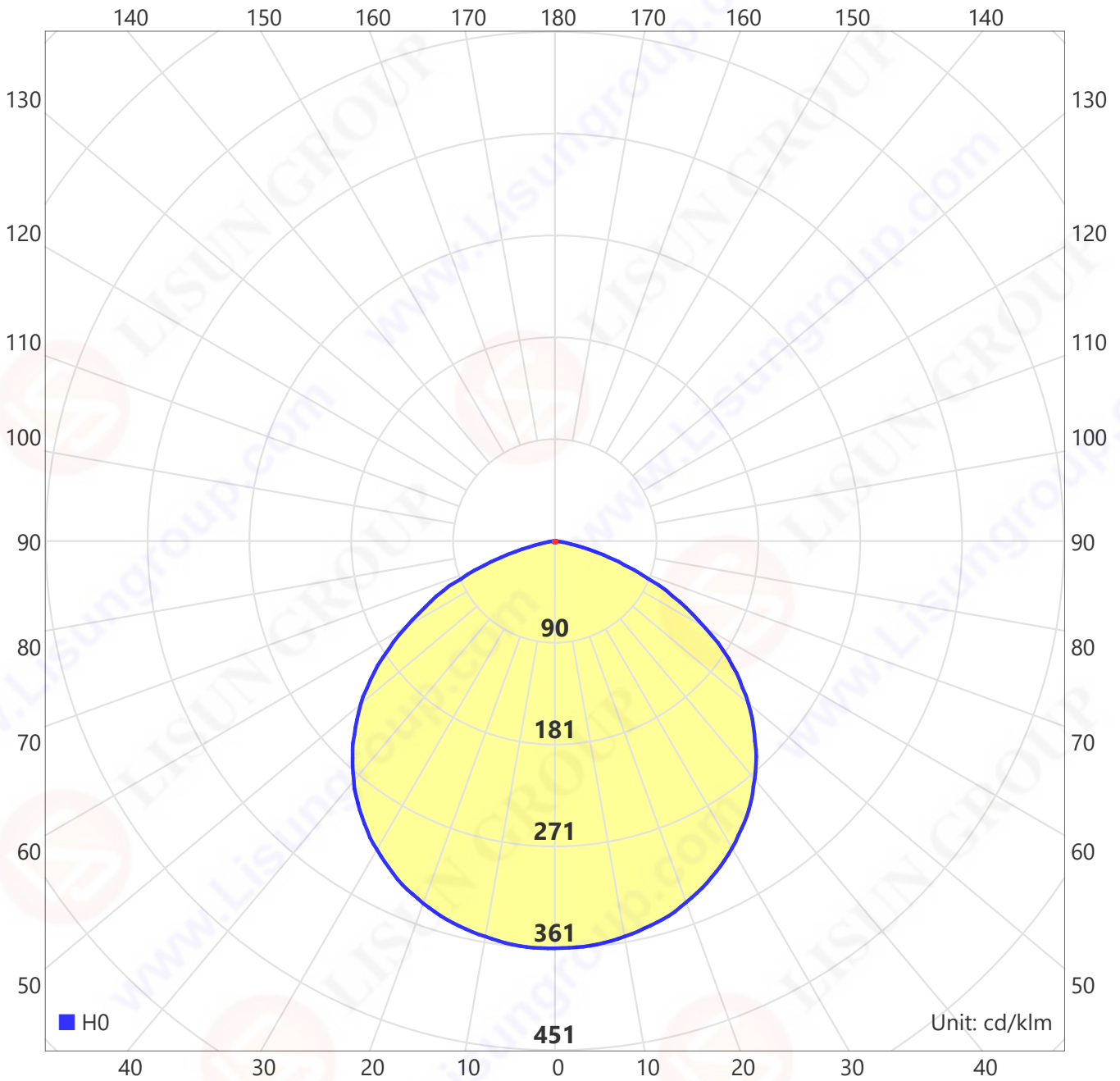
Humidity: 65.0%

Review By:

Light Distribution Curve



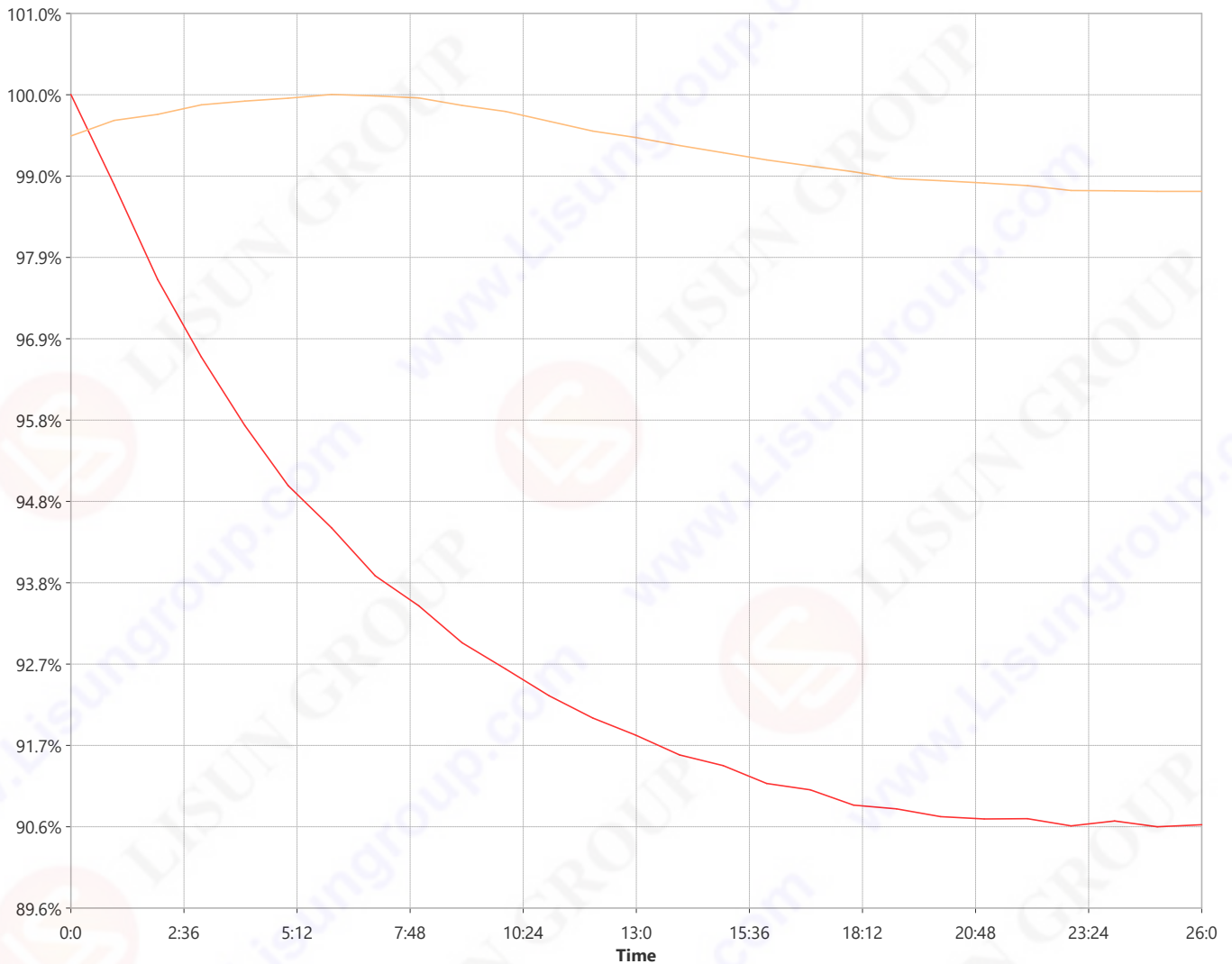
Light Distribution Curve (cd/klm)



011507/CREE

$\eta=98.27\%$

Warmup Log



Stable time: 26:0

Uptime: 0:0

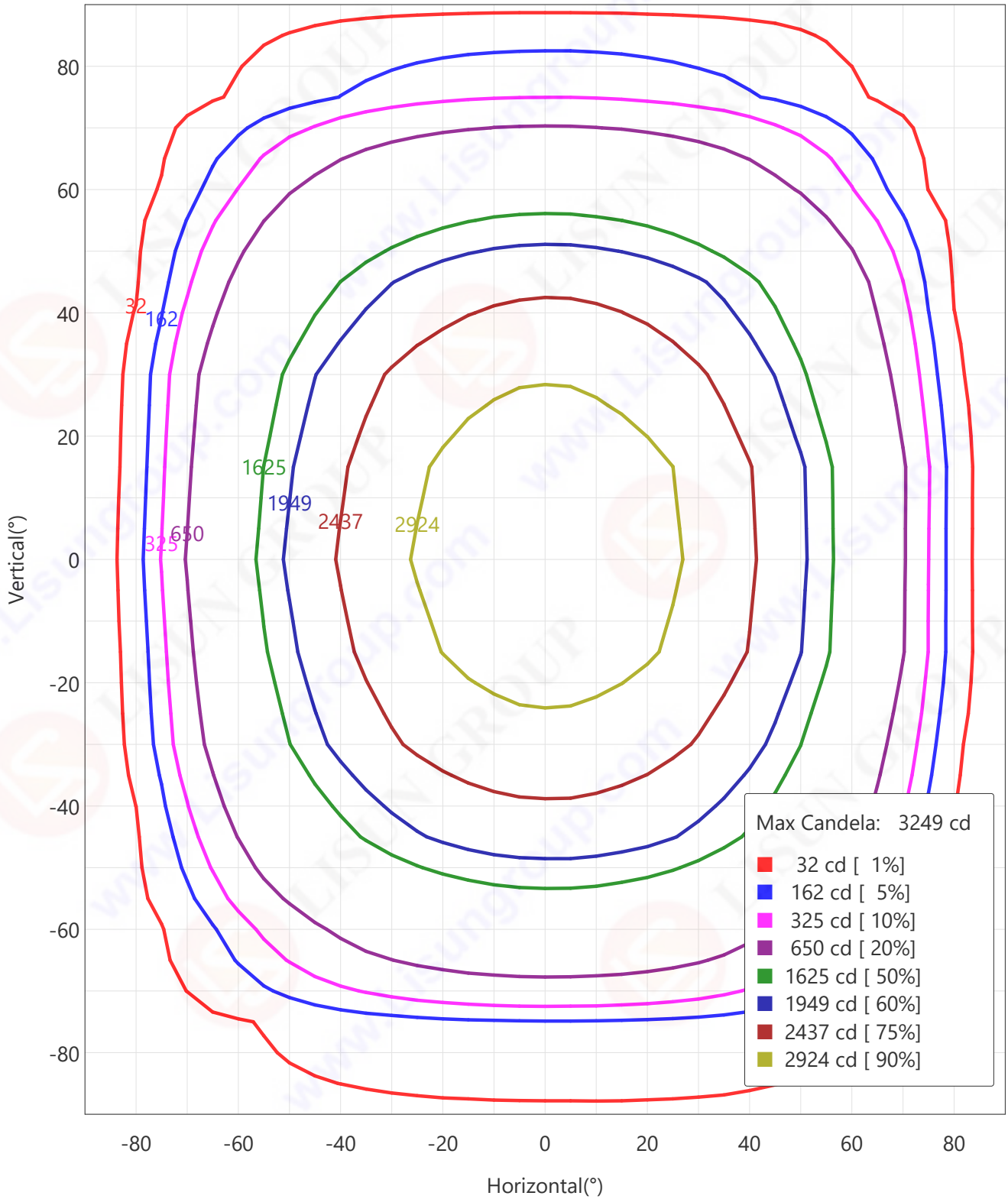
Parameters	Maximum	Minimum	Change
Luminous intensity ,cd	3585.48	3249.97	335.51
Power ,W	107.97	106.64	1.34

Area Flux

		Vertical																				
		90	80	70	60	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60	-70	-80	-90	Horizontal	
∅(E)	∅(T)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	∅(E)	∅(T)
0.0	0.8	13.6	24.6	112.9	121.6	277.1	477.2	672.9	839.0	957.9	1020	1017	950.9	827.1	658.9	464.0	267.6	105.5	11.8	0.0	8674	8845
0.0	0.1	0.1	0.1	0.5	0.2	1.3	2.5	4.0	5.4	6.4	6.9	6.8	6.2	5.1	3.7	2.3	1.1	0.4	0.1	0.0	197.5	53.0
0.0	0.3	0.3	0.3	1.6	0.9	4.9	9.7	15.1	20.0	23.5	25.3	25.1	23.0	19.3	14.5	9.1	4.5	1.4	0.2	0.0	185.6	197.5
0.0	0.6	0.6	0.6	3.7	2.1	10.3	19.2	28.6	36.8	42.7	45.7	45.5	42.1	35.8	27.5	18.1	9.5	3.3	0.5	0.0	370.0	364.6
0.0	1.2	1.2	1.2	6.7	3.9	16.8	29.6	42.4	53.2	61.1	65.1	64.9	60.3	52.0	40.8	28.1	15.5	5.9	1.0	0.0	544.5	541.3
0.1	1.7	1.7	1.7	9.0	5.1	21.5	36.9	51.8	64.4	73.5	78.2	78.0	73.0	63.6	50.8	36.0	21.0	8.6	1.6	0.0	669.8	667.5
0.1	2.3	2.3	2.3	11.2	6.5	25.6	42.7	59.0	72.7	82.5	87.7	87.5	82.1	72.0	58.0	41.7	25.0	10.6	2.1	0.1	762.8	760.9
0.1	2.9	2.9	2.9	13.0	7.7	28.8	47.0	64.2	78.5	88.7	94.0	93.8	88.0	77.3	62.6	45.3	27.5	11.9	2.5	0.1	826.2	824.5
0.1	3.0	3.0	3.0	13.4	8.0	29.8	48.5	66.2	80.9	91.4	96.9	96.8	91.1	80.3	65.3	47.6	29.4	13.0	2.8	0.1	856.6	855.1
0.1	3.0	3.0	3.0	13.5	8.1	30.0	48.8	66.6	81.4	92.0	97.4	97.3	91.6	80.7	65.7	48.0	29.6	13.2	2.9	0.1	861.8	860.3
0.1	2.9	2.9	2.9	13.2	7.9	29.4	47.8	65.3	79.9	90.3	95.5	95.3	89.6	78.7	63.8	46.3	28.2	12.4	2.6	0.1	841.5	839.9
0.1	2.4	2.4	2.4	11.6	6.6	26.3	43.9	60.7	74.9	85.0	90.2	90.1	84.6	74.2	60.0	43.3	26.1	11.2	2.3	0.1	787.0	785.2
0.0	1.8	1.8	1.8	9.6	5.4	22.6	38.6	54.2	67.4	76.9	81.8	81.6	76.5	66.8	53.5	38.1	22.4	9.3	1.8	0.0	702.9	700.7
0.0	1.3	1.3	1.3	7.4	4.1	18.2	31.8	45.4	57.0	65.4	69.7	69.4	64.7	55.9	44.1	30.7	17.2	6.7	1.1	0.0	586.2	583.3
0.0	0.7	0.7	0.7	4.4	2.2	11.8	21.5	31.9	41.0	47.6	51.1	51.0	47.3	40.5	31.4	21.1	11.3	4.1	0.6	0.0	417.4	412.9
0.0	0.3	0.3	0.3	2.0	1.0	6.1	11.8	18.2	24.0	28.4	30.7	30.7	28.3	23.9	18.2	11.7	6.0	2.0	0.3	0.0	242.5	233.4
0.0	0.1	0.1	0.1	0.5	0.2	1.8	3.9	6.4	8.7	10.5	11.5	11.4	10.4	8.6	6.2	3.7	1.7	0.5	0.1	0.0	86.1	43.5
0.0	0.0	0.0	0.0	0.2	0.1	0.5	1.1	1.8	2.4	3.0	3.3	3.3	3.0	2.4	1.7	1.0	0.5	0.1	0.0	0.0	24.3	0.0

Unit: lm

IsoCandela

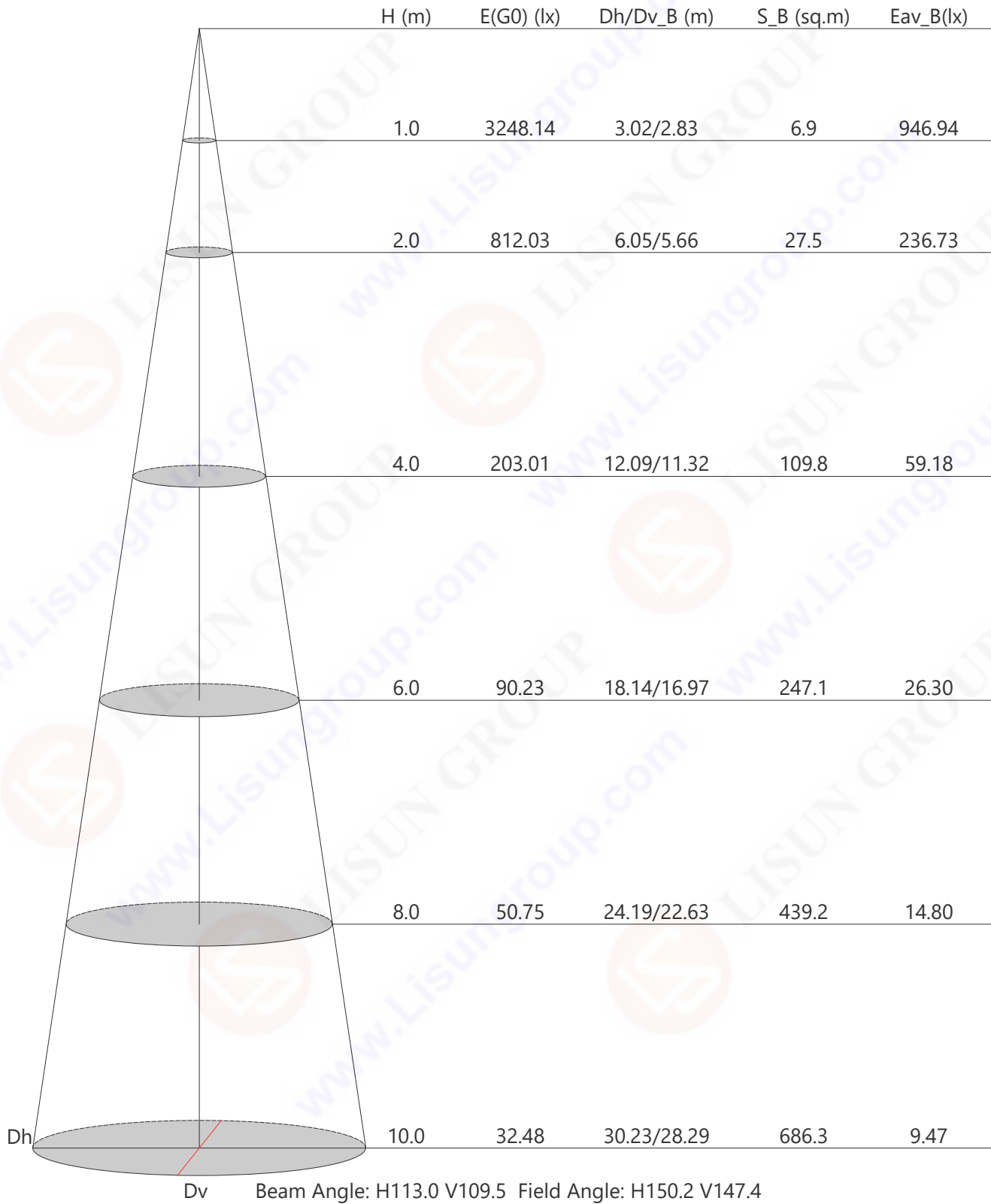


Report No. : FLOOD-003

Test Time : 2023-01-03 16:45:44

Page 7 of 37

Lux-Distance



Test Type : Type B Test Distance : 8.460 m

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Test Device : LSG-1890BCCD

Temperature : 25°C

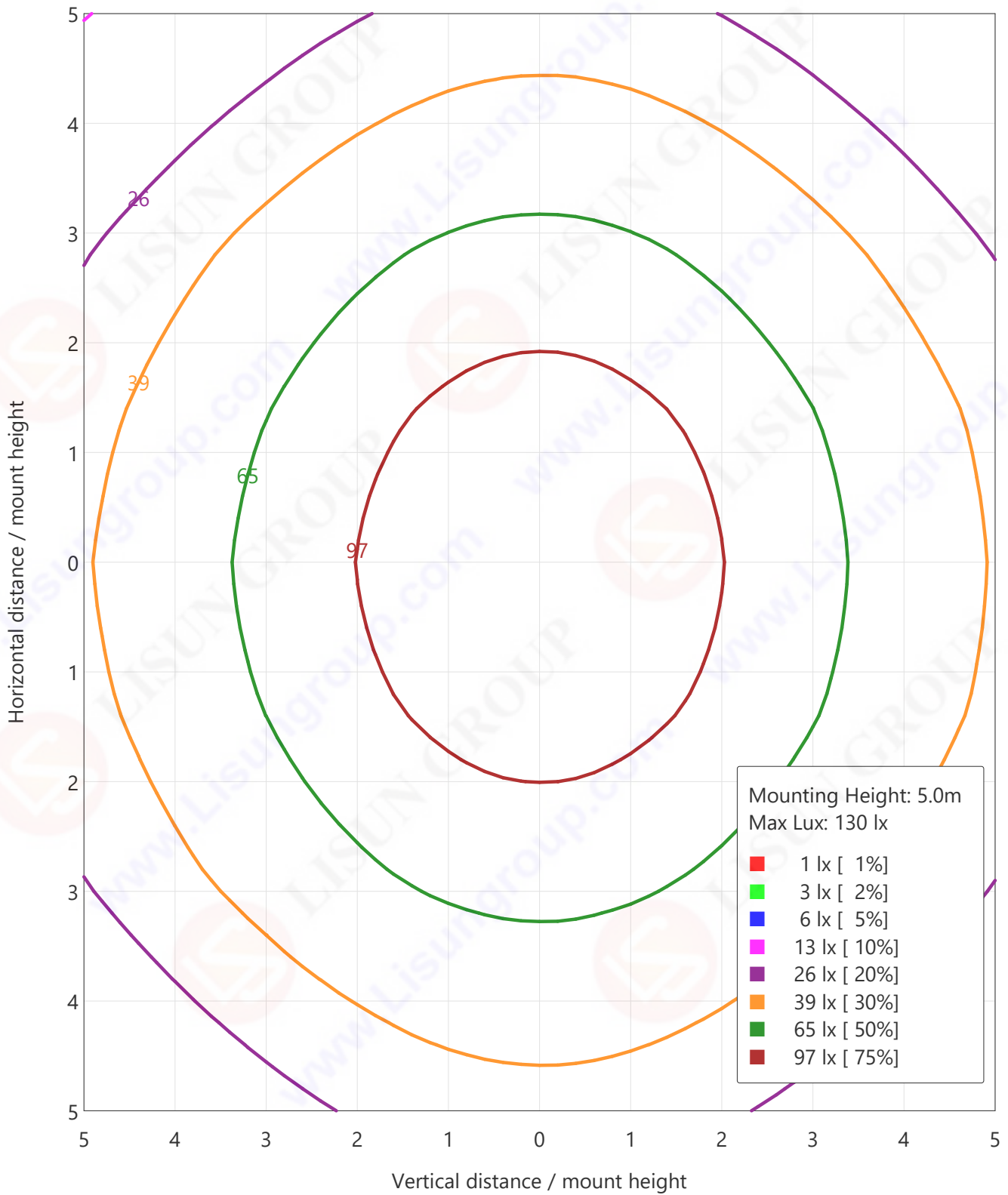
Humidity : 65.0%

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

Review By :

IsoLux



Report No. : FLOOD-003

Test Time : 2023-01-03 16:45:44

Page 9 of 37

Light Distribution Data

Unit: cd

V\H	H-90.0	H-89.0	H-88.0	H-87.0	H-86.0	H-85.0	H-84.0	H-83.0
V-90.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
V-75.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
V-60.0	4.5	3.6	3.6	3.6	3.6	3.6	4.5	5.4
V-45.0	4.5	4.5	3.6	3.6	4.5	6.3	9.0	11.7
V-30.0	4.5	4.5	3.6	4.5	5.4	8.1	11.7	15.3
V-15.0	4.5	4.5	4.5	5.4	8.1	11.7	15.3	21.6
V0.0	4.5	4.5	4.5	5.4	7.2	10.8	15.3	20.7
V15.0	5.4	5.4	5.4	6.3	8.1	11.7	16.2	21.6
V30.0	7.2	7.2	7.2	7.2	8.1	10.8	14.4	18.0
V45.0	9.0	9.0	9.0	9.0	9.0	10.8	12.6	15.3
V60.0	9.9	9.9	9.9	9.9	9.9	9.9	10.8	11.7
V75.0	9.9	9.9	9.9	9.9	9.9	9.9	10.8	10.8
V90.0	9.9	9.9	9.9	9.9	9.9	9.9	10.8	10.8

Test Type : Type B Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : FLOOD-003

Test Time : 2023-01-03 16:45:44

Page 10 of 37

Light Distribution Data

Unit: cd

V\H	H-82.0	H-81.0	H-80.0	H-79.0	H-78.0	H-77.0	H-76.0	H-75.0
V-90.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
V-75.0	3.6	3.6	4.5	5.4	6.3	7.2	8.1	9.0
V-60.0	7.2	9.0	11.7	13.5	16.2	19.8	24.3	31.5
V-45.0	15.3	18.9	25.2	38.7	57.6	81.0	107.1	135.0
V-30.0	20.7	28.8	49.5	74.7	105.3	140.4	183.6	224.0
V-15.0	34.2	59.4	89.1	127.8	172.8	224.0	278.9	337.4
V0.0	29.7	53.1	87.3	125.1	165.6	214.1	273.5	326.6
V15.0	32.4	56.7	89.1	122.4	165.6	211.4	268.1	320.3
V30.0	22.5	30.6	45.0	69.3	99.0	135.0	168.3	211.4
V45.0	18.9	23.4	28.8	35.1	52.2	71.1	95.4	118.8
V60.0	12.6	14.4	16.2	18.9	21.6	24.3	27.0	30.6
V75.0	10.8	11.7	11.7	12.6	13.5	13.5	14.4	15.3
V90.0	10.8	11.7	11.7	12.6	12.6	12.6	12.6	12.6

Test Type : Type B Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : FLOOD-003

Test Time : 2023-01-03 16:45:44

Page 11 of 37

Light Distribution Data

Unit: cd

V\H	H-74.0	H-73.0	H-72.0	H-71.0	H-70.0	H-69.0	H-68.0	H-67.0
V-90.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
V-75.0	9.9	10.8	12.6	13.5	15.3	16.2	18.0	20.7
V-60.0	41.4	54.0	66.6	83.7	99.9	117.9	137.7	160.2
V-45.0	167.4	200.6	239.3	282.5	327.5	369.8	417.5	476.0
V-30.0	275.3	323.0	372.5	431.9	505.7	554.3	619.0	680.2
V-15.0	392.3	457.1	539.9	600.1	687.4	745.9	809.8	911.5
V0.0	394.1	454.4	537.2	598.3	686.5	746.8	811.6	915.1
V15.0	385.1	447.2	527.3	585.7	667.6	730.6	790.0	883.6
V30.0	255.5	304.1	355.4	413.9	465.2	535.4	583.0	653.2
V45.0	148.5	180.9	215.0	251.0	288.8	334.7	370.7	422.0
V60.0	35.1	44.1	54.0	65.7	78.3	92.7	108.0	126.0
V75.0	15.3	16.2	17.1	18.0	18.9	19.8	20.7	21.6
V90.0	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6

Test Type : Type B Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : FLOOD-003

Test Time : 2023-01-03 16:45:44

Page 12 of 37

Light Distribution Data

Unit: cd

V\H	H-66.0	H-65.0	H-64.0	H-63.0	H-62.0	H-61.0	H-60.0	H-59.0
V-90.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
V-75.0	22.5	25.2	28.8	33.3	36.9	41.4	46.8	52.2
V-60.0	184.5	203.3	225.8	257.3	278.0	311.3	334.7	366.2
V-45.0	513.8	559.7	622.6	663.1	705.4	771.1	826.9	871.0
V-30.0	736.0	803.5	881.8	934.9	991.5	1045.5	1098.6	1157.1
V-15.0	969.9	1038.3	1095.9	1156.2	1224.6	1290.3	1360.4	1431.5
V0.0	974.4	1044.6	1104.9	1164.3	1232.7	1302.9	1372.1	1445.9
V15.0	951.0	1016.7	1076.1	1133.7	1210.2	1275.0	1331.6	1400.0
V30.0	712.6	760.3	838.6	907.0	961.8	1014.9	1068.0	1122.0
V45.0	461.6	515.6	551.6	610.9	653.2	693.7	740.5	808.0
V60.0	142.2	162.9	181.8	198.8	224.0	241.1	269.0	288.8
V75.0	22.5	24.3	25.2	27.0	28.8	30.6	31.5	33.3
V90.0	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6

Test Type : Type B Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : FLOOD-003

Test Time : 2023-01-03 16:45:44

Page 13 of 37

Light Distribution Data

Unit: cd

V\H	H-58.0	H-57.0	H-56.0	H-55.0	H-54.0	H-53.0	H-52.0	H-51.0
V-90.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
V-75.0	58.5	63.9	70.2	75.6	82.8	89.1	95.4	101.7
V-60.0	392.3	416.6	441.8	481.4	503.0	526.4	557.0	597.4
V-45.0	917.8	961.8	1000.5	1050.9	1094.1	1140.9	1194.0	1240.8
V-30.0	1220.1	1275.9	1344.2	1399.1	1462.1	1515.2	1571.0	1635.8
V-15.0	1503.5	1577.3	1639.4	1706.8	1762.6	1820.2	1888.6	1943.5
V0.0	1518.8	1579.1	1653.8	1726.6	1785.1	1843.6	1904.8	1971.4
V15.0	1471.1	1543.1	1605.2	1675.4	1730.2	1786.9	1855.3	1909.3
V30.0	1172.4	1234.5	1296.6	1348.7	1401.8	1466.6	1522.4	1577.3
V45.0	852.1	889.0	933.1	969.9	1013.1	1052.7	1102.2	1143.6
V60.0	320.3	338.3	372.5	395.9	413.9	443.6	469.7	494.0
V75.0	36.0	38.7	41.4	45.0	46.8	50.4	53.1	55.8
V90.0	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6

Test Type : Type B Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : FLOOD-003

Test Time : 2023-01-03 16:45:44

Page 14 of 37

Light Distribution Data

Unit: cd

V\H	H-50.0	H-49.0	H-48.0	H-47.0	H-46.0	H-45.0	H-44.0	H-43.0
V-90.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
V-75.0	109.8	115.2	122.4	129.6	135.0	145.8	150.3	158.4
V-60.0	622.6	646.0	670.3	696.4	718.9	742.3	766.6	793.6
V-45.0	1286.7	1329.8	1373.9	1417.1	1468.4	1509.8	1547.6	1584.5
V-30.0	1689.8	1742.8	1794.1	1842.7	1887.7	1939.9	1982.2	2024.5
V-15.0	1996.6	2048.8	2100.0	2148.6	2202.6	2245.8	2288.1	2332.2
V0.0	2023.6	2073.9	2125.2	2176.5	2224.2	2280.0	2324.1	2369.1
V15.0	1959.7	2010.1	2061.4	2118.9	2163.9	2206.2	2247.6	2290.8
V30.0	1629.5	1679.0	1738.3	1786.0	1829.2	1871.5	1913.8	1957.0
V45.0	1185.9	1229.1	1271.4	1311.9	1363.1	1403.6	1441.4	1478.3
V60.0	514.7	542.6	574.9	596.5	617.2	642.4	662.2	682.0
V75.0	59.4	62.1	64.8	69.3	72.0	75.6	78.3	81.9
V90.0	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6

Test Type : Type B Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : FLOOD-003

Test Time : 2023-01-03 16:45:44

Page 15 of 37

Light Distribution Data

Unit: cd

V\H	H-42.0	H-41.0	H-40.0	H-39.0	H-38.0	H-37.0	H-36.0	H-35.0
V-90.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
V-75.0	165.6	171.0	175.5	184.5	191.6	197.0	201.5	209.6
V-60.0	820.6	846.7	877.3	900.7	923.2	947.4	970.8	993.3
V-45.0	1621.4	1657.4	1691.6	1731.1	1762.6	1794.1	1825.6	1855.3
V-30.0	2066.8	2107.2	2147.7	2187.3	2226.0	2271.9	2306.1	2337.6
V-15.0	2375.4	2416.8	2456.3	2502.2	2539.1	2576.0	2612.0	2645.3
V0.0	2414.1	2456.3	2496.8	2542.7	2578.7	2615.6	2650.7	2685.8
V15.0	2333.1	2374.5	2420.4	2456.3	2493.2	2529.2	2564.3	2597.6
V30.0	1998.4	2044.3	2080.2	2115.3	2151.3	2186.4	2218.8	2254.8
V45.0	1515.2	1548.5	1579.1	1614.2	1643.9	1674.5	1704.1	1730.2
V60.0	702.7	724.3	745.9	770.2	792.7	816.1	836.8	858.4
V75.0	84.6	89.1	90.9	96.3	99.0	100.8	105.3	108.0
V90.0	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6

Test Type : Type B Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : FLOOD-003

Test Time : 2023-01-03 16:45:44

Page 16 of 37

Light Distribution Data

Unit: cd

V\H	H-34.0	H-33.0	H-32.0	H-31.0	H-30.0	H-29.0	H-28.0	H-27.0
V-90.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
V-75.0	216.8	221.3	226.7	230.3	233.9	238.4	243.8	249.2
V-60.0	1019.4	1040.1	1059.0	1076.1	1093.2	1111.2	1128.3	1149.9
V-45.0	1888.6	1915.6	1941.7	1966.9	1991.2	2015.5	2038.0	2064.1
V-30.0	2367.3	2397.9	2427.6	2462.6	2490.5	2516.6	2542.7	2567.9
V-15.0	2675.9	2711.9	2739.8	2767.7	2794.7	2821.6	2848.6	2879.2
V0.0	2719.1	2751.5	2788.4	2816.3	2842.3	2869.3	2896.3	2922.4
V15.0	2634.5	2663.3	2690.3	2718.2	2744.3	2770.4	2801.9	2827.0
V30.0	2284.5	2315.1	2344.8	2374.5	2401.5	2426.7	2454.5	2477.0
V45.0	1755.4	1786.9	1812.1	1836.4	1858.9	1878.7	1900.3	1925.5
V60.0	878.2	898.0	916.0	935.8	951.9	966.3	980.7	996.0
V75.0	110.7	114.3	117.0	118.8	121.5	124.2	126.9	129.6
V90.0	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6

Test Type : Type B Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : FLOOD-003

Test Time : 2023-01-03 16:45:44

Page 17 of 37

Light Distribution Data

Unit: cd

V\H	H-26.0	H-25.0	H-24.0	H-23.0	H-22.0	H-21.0	H-20.0	H-19.0
V-90.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
V-75.0	254.6	259.1	263.6	268.1	273.5	277.1	280.7	285.2
V-60.0	1166.1	1181.4	1196.7	1210.2	1222.8	1237.2	1248.9	1260.6
V-45.0	2084.7	2104.5	2123.4	2142.3	2160.3	2181.0	2197.2	2211.6
V-30.0	2591.3	2620.1	2643.5	2666.9	2686.7	2704.7	2720.9	2738.9
V-15.0	2903.5	2925.1	2945.8	2965.6	2984.5	3007.0	3023.2	3040.3
V0.0	2948.5	2976.4	2998.0	3018.7	3036.7	3054.7	3075.4	3092.5
V15.0	2850.4	2871.1	2891.8	2911.6	2934.1	2952.1	2970.1	2986.3
V30.0	2498.6	2521.1	2542.7	2565.2	2585.0	2605.7	2622.8	2637.2
V45.0	1947.1	1966.0	1984.0	2000.2	2016.4	2036.2	2052.4	2067.7
V60.0	1008.6	1023.9	1035.6	1047.3	1059.0	1068.9	1079.7	1090.5
V75.0	130.5	132.3	135.0	136.8	138.6	140.4	142.2	144.9
V90.0	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6

Test Type : Type B Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : FLOOD-003

Test Time : 2023-01-03 16:45:44

Page 18 of 37

Light Distribution Data

Unit: cd

V\H	H-18.0	H-17.0	H-16.0	H-15.0	H-14.0	H-13.0	H-12.0	H-11.0
V-90.0	3.6	3.6	3.6	4.5	4.5	4.5	4.5	4.5
V-75.0	287.9	292.4	296.0	298.7	301.4	304.1	306.8	309.5
V-60.0	1272.3	1283.1	1293.0	1304.7	1313.7	1320.8	1327.1	1333.4
V-45.0	2226.0	2239.5	2251.2	2263.8	2276.4	2286.3	2295.3	2303.4
V-30.0	2753.3	2768.6	2783.0	2796.5	2810.0	2821.6	2833.3	2842.3
V-15.0	3055.6	3070.0	3082.6	3094.3	3106.9	3116.8	3125.8	3135.7
V0.0	3108.7	3124.9	3139.3	3152.8	3163.6	3175.3	3186.1	3195.1
V15.0	3002.5	3016.0	3029.5	3043.0	3053.8	3063.7	3072.7	3082.6
V30.0	2653.4	2667.8	2684.9	2699.3	2711.0	2722.7	2731.7	2739.8
V45.0	2080.2	2091.9	2102.7	2111.7	2125.2	2136.0	2145.9	2155.8
V60.0	1100.4	1109.4	1117.5	1124.7	1131.9	1140.0	1145.4	1150.8
V75.0	145.8	146.7	147.6	149.4	150.3	151.2	152.1	152.1
V90.0	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6

Test Type : Type B Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : FLOOD-003

Test Time : 2023-01-03 16:45:44

Page 19 of 37

Light Distribution Data

Unit: cd

V\H	H-10.0	H-9.0	H-8.0	H-7.0	H-6.0	H-5.0	H-4.0	H-3.0
V-90.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
V-75.0	312.2	314.0	314.9	316.7	317.6	319.4	321.2	321.2
V-60.0	1338.8	1346.0	1353.2	1357.7	1361.3	1364.9	1368.5	1372.1
V-45.0	2310.6	2317.8	2325.0	2330.4	2335.8	2339.4	2343.0	2345.7
V-30.0	2850.4	2858.5	2865.7	2872.9	2881.0	2886.4	2890.9	2892.7
V-15.0	3143.8	3151.9	3160.0	3167.2	3171.7	3176.2	3178.9	3179.8
V0.0	3203.1	3212.1	3220.2	3230.1	3236.4	3241.8	3245.4	3247.2
V15.0	3091.6	3101.5	3108.7	3115.0	3119.5	3124.0	3126.7	3128.5
V30.0	2747.9	2756.9	2764.1	2771.3	2777.6	2783.0	2787.5	2790.2
V45.0	2162.1	2167.5	2173.8	2179.2	2183.7	2188.2	2191.8	2192.7
V60.0	1156.2	1161.6	1166.1	1169.7	1172.4	1175.1	1176.9	1177.8
V75.0	153.0	153.9	154.8	154.8	154.8	154.8	155.7	155.7
V90.0	12.6	12.6	12.6	11.7	11.7	11.7	11.7	11.7

Test Type : Type B Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : FLOOD-003

Test Time : 2023-01-03 16:45:44

Page 20 of 37

Light Distribution Data

Unit: cd

V\H	H-2.0	H-1.0	H0.0	H1.0	H2.0	H3.0	H4.0	H5.0
V-90.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
V-75.0	321.2	320.3	320.3	320.3	320.3	320.3	318.5	316.7
V-60.0	1373.0	1371.2	1370.3	1368.5	1367.6	1366.7	1365.8	1362.2
V-45.0	2345.7	2345.7	2343.9	2342.1	2339.4	2336.7	2333.1	2327.7
V-30.0	2893.6	2892.7	2892.7	2890.9	2890.0	2888.2	2886.4	2882.8
V-15.0	3181.6	3182.5	3181.6	3180.7	3179.8	3177.1	3173.5	3168.1
V0.0	3248.1	3249.0	3248.1	3247.2	3246.3	3244.5	3242.7	3240.0
V15.0	3130.3	3130.3	3130.3	3129.4	3127.6	3124.9	3120.4	3115.0
V30.0	2791.1	2792.0	2791.1	2791.1	2790.2	2788.4	2784.8	2781.2
V45.0	2191.8	2190.9	2189.1	2188.2	2188.2	2186.4	2183.7	2177.4
V60.0	1177.8	1177.8	1178.7	1177.8	1177.8	1176.0	1173.3	1169.7
V75.0	155.7	154.8	154.8	154.8	154.8	153.9	153.9	153.0
V90.0	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7

Test Type : Type B Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : FLOOD-003

Test Time : 2023-01-03 16:45:44

Page 21 of 37

Light Distribution Data

Unit: cd

V\H	H6.0	H7.0	H8.0	H9.0	H10.0	H11.0	H12.0	H13.0
V-90.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
V-75.0	314.9	313.1	312.2	311.3	308.6	305.9	302.3	299.6
V-60.0	1359.5	1355.9	1352.3	1347.8	1340.6	1331.6	1321.7	1313.7
V-45.0	2322.3	2316.0	2308.8	2301.6	2293.5	2284.5	2274.6	2262.9
V-30.0	2878.3	2871.1	2863.9	2855.8	2846.8	2837.8	2827.9	2818.1
V-15.0	3161.8	3154.6	3146.5	3137.5	3128.5	3116.8	3105.1	3093.4
V0.0	3233.7	3228.3	3220.2	3212.1	3203.1	3193.3	3183.4	3169.9
V15.0	3108.7	3101.5	3094.3	3086.2	3075.4	3065.5	3054.7	3043.0
V30.0	2774.9	2768.6	2760.5	2753.3	2743.4	2734.4	2725.4	2715.5
V45.0	2171.1	2164.8	2157.6	2150.4	2143.2	2135.1	2122.5	2109.9
V60.0	1165.2	1160.7	1155.3	1149.9	1144.5	1138.2	1132.8	1123.8
V75.0	152.1	152.1	150.3	150.3	148.5	147.6	146.7	144.9
V90.0	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7

Test Type : Type B Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : FLOOD-003

Test Time : 2023-01-03 16:45:44

Page 22 of 37

Light Distribution Data

Unit: cd

V\H	H14.0	H15.0	H16.0	H17.0	H18.0	H19.0	H20.0	H21.0
V-90.0	4.5	4.5	4.5	4.5	3.6	3.6	3.6	3.6
V-75.0	297.8	296.0	292.4	288.8	285.2	280.7	278.0	274.4
V-60.0	1306.5	1298.4	1289.4	1279.5	1267.8	1257.9	1246.2	1231.8
V-45.0	2250.3	2236.8	2221.5	2203.5	2188.2	2172.0	2156.7	2138.7
V-30.0	2805.5	2792.0	2777.6	2761.4	2744.3	2727.2	2706.5	2687.6
V-15.0	3081.7	3068.2	3053.8	3038.5	3017.8	3000.7	2981.8	2962.0
V0.0	3160.0	3148.3	3136.6	3122.2	3106.0	3085.3	3066.4	3046.6
V15.0	3030.4	3017.8	3002.5	2983.6	2967.4	2949.4	2931.4	2912.5
V30.0	2704.7	2692.1	2677.7	2658.8	2642.6	2626.4	2610.2	2592.2
V45.0	2096.4	2083.8	2071.2	2058.7	2042.5	2027.2	2010.1	1992.1
V60.0	1115.7	1107.6	1098.6	1088.7	1077.9	1064.4	1053.6	1042.8
V75.0	144.0	142.2	141.3	139.5	137.7	135.9	134.1	131.4
V90.0	11.7	10.8	10.8	10.8	10.8	10.8	10.8	10.8

Test Type : Type B Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : FLOOD-003

Test Time : 2023-01-03 16:45:44

Page 23 of 37

Light Distribution Data

Unit: cd

V\H	H22.0	H23.0	H24.0	H25.0	H26.0	H27.0	H28.0	H29.0
V-90.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
V-75.0	270.8	265.4	260.0	255.5	250.1	243.8	238.4	232.1
V-60.0	1217.4	1203.0	1186.8	1172.4	1158.9	1143.6	1128.3	1111.2
V-45.0	2120.7	2100.9	2082.0	2058.7	2037.1	2014.6	1990.3	1964.2
V-30.0	2669.6	2650.7	2630.0	2608.4	2585.0	2554.4	2530.1	2505.8
V-15.0	2943.1	2921.5	2899.0	2871.1	2846.8	2821.6	2794.7	2767.7
V0.0	3025.9	3006.1	2984.5	2958.4	2935.0	2909.8	2883.7	2855.8
V15.0	2891.8	2871.1	2844.1	2820.7	2796.5	2771.3	2745.2	2718.2
V30.0	2572.4	2549.0	2527.4	2505.8	2482.4	2459.0	2434.8	2411.4
V45.0	1973.2	1955.2	1938.1	1913.8	1892.2	1867.9	1843.6	1821.1
V60.0	1031.1	1018.5	1005.0	992.4	974.4	959.1	943.8	929.5
V75.0	128.7	126.9	124.2	122.4	120.6	118.8	115.2	111.6
V90.0	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9

Test Type : Type B Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : FLOOD-003

Test Time : 2023-01-03 16:45:44

Page 24 of 37

Light Distribution Data

Unit: cd

V\H	H30.0	H31.0	H32.0	H33.0	H34.0	H35.0	H36.0	H37.0
V-90.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
V-75.0	227.6	223.1	217.7	210.5	201.5	196.1	190.7	184.5
V-60.0	1093.2	1070.7	1051.8	1032.9	1014.9	996.0	977.1	956.4
V-45.0	1938.1	1910.2	1878.7	1852.6	1825.6	1795.9	1764.4	1734.7
V-30.0	2479.7	2452.7	2423.1	2386.2	2353.8	2321.4	2288.1	2253.9
V-15.0	2739.8	2710.1	2673.2	2641.7	2609.3	2576.0	2540.0	2503.1
V0.0	2827.9	2799.2	2765.0	2735.3	2705.6	2673.2	2639.0	2601.2
V15.0	2690.3	2655.2	2624.6	2593.1	2560.7	2526.5	2492.3	2455.4
V30.0	2380.8	2353.8	2325.0	2294.4	2262.9	2231.4	2199.0	2158.5
V45.0	1798.6	1775.2	1743.7	1714.9	1687.1	1659.2	1631.3	1600.7
V60.0	915.1	898.9	881.8	862.0	843.1	823.3	803.5	783.7
V75.0	108.9	107.1	103.5	100.8	99.0	95.4	91.8	90.0
V90.0	9.9	9.0	9.0	9.0	9.0	9.0	9.0	9.0

Test Type : Type B Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : FLOOD-003

Test Time : 2023-01-03 16:45:44

Page 25 of 37

Light Distribution Data

Unit: cd

V\H	H38.0	H39.0	H40.0	H41.0	H42.0	H43.0	H44.0	H45.0
V-90.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
V-75.0	175.5	170.1	164.7	156.6	148.5	144.0	137.7	129.6
V-60.0	928.6	904.3	880.0	853.0	827.8	803.5	771.1	745.0
V-45.0	1696.0	1662.8	1627.7	1590.8	1554.8	1519.7	1484.6	1447.7
V-30.0	2220.6	2177.4	2139.6	2100.9	2061.4	2021.8	1981.3	1939.9
V-15.0	2464.4	2418.6	2379.0	2338.5	2297.1	2253.0	2208.0	2163.0
V0.0	2563.4	2516.6	2478.8	2438.4	2397.0	2354.7	2310.6	2257.5
V15.0	2409.6	2370.9	2332.2	2291.7	2250.3	2206.2	2163.0	2118.0
V30.0	2124.3	2089.2	2052.4	2014.6	1977.7	1931.8	1892.2	1850.8
V45.0	1568.3	1536.8	1499.9	1468.4	1433.3	1397.3	1361.3	1324.4
V60.0	762.1	734.2	712.6	688.3	665.8	645.1	624.4	597.4
V75.0	86.4	82.8	81.0	78.3	74.7	72.9	68.4	65.7
V90.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0

Test Type : Type B Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : FLOOD-003

Test Time : 2023-01-03 16:45:44

Page 26 of 37

Light Distribution Data

Unit: cd

V\H	H46.0	H47.0	H48.0	H49.0	H50.0	H51.0	H52.0	H53.0
V-90.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
V-75.0	124.2	118.8	111.6	105.3	98.1	93.6	86.4	81.9
V-60.0	718.9	692.8	668.5	646.0	622.6	590.2	549.8	524.6
V-45.0	1408.1	1357.7	1312.8	1265.1	1218.3	1174.2	1127.4	1072.5
V-30.0	1885.9	1840.0	1795.0	1750.0	1702.3	1652.0	1601.6	1540.4
V-15.0	2118.0	2061.4	2011.0	1960.6	1908.4	1856.2	1804.9	1738.3
V0.0	2212.5	2166.6	2118.9	2068.6	2016.4	1962.4	1899.4	1845.4
V15.0	2064.1	2017.3	1966.9	1916.5	1865.2	1815.7	1752.7	1696.9
V30.0	1806.7	1762.6	1717.6	1664.6	1617.8	1569.2	1517.9	1467.5
V45.0	1284.0	1232.7	1190.4	1148.1	1104.0	1059.9	1019.4	968.1
V60.0	577.6	557.0	537.2	503.9	476.9	458.0	435.5	407.6
V75.0	62.1	59.4	56.7	53.1	51.3	47.7	45.0	42.3
V90.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0

Test Type : Type B Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : FLOOD-003

Test Time : 2023-01-03 16:45:44

Page 27 of 37

Light Distribution Data

Unit: cd

V\H	H54.0	H55.0	H56.0	H57.0	H58.0	H59.0	H60.0	H61.0
V-90.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
V-75.0	73.8	69.3	63.0	57.6	51.3	47.7	43.2	38.7
V-60.0	498.5	476.0	441.8	410.3	386.9	363.5	330.2	308.6
V-45.0	1028.4	983.4	930.4	892.6	848.5	801.7	737.8	687.4
V-30.0	1486.4	1418.9	1361.3	1295.7	1239.0	1175.1	1114.8	1051.8
V-15.0	1682.6	1626.8	1555.7	1491.8	1416.2	1347.8	1286.7	1216.5
V0.0	1791.4	1727.5	1670.0	1598.9	1535.9	1460.3	1387.4	1313.7
V15.0	1641.2	1585.4	1512.5	1448.6	1378.4	1308.3	1237.2	1182.3
V30.0	1402.7	1346.9	1281.3	1227.3	1165.2	1106.7	1056.3	996.0
V45.0	928.6	889.9	844.9	809.8	748.6	700.0	659.5	621.7
V60.0	380.6	359.9	343.7	306.8	291.5	274.4	243.8	226.7
V75.0	39.6	36.9	35.1	32.4	29.7	27.9	26.1	24.3
V90.0	9.0	8.1	8.1	8.1	8.1	8.1	8.1	8.1

Test Type : Type B Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : FLOOD-003

Test Time : 2023-01-03 16:45:44

Page 28 of 37

Light Distribution Data

Unit: cd

V\H	H62.0	H63.0	H64.0	H65.0	H66.0	H67.0	H68.0	H69.0
V-90.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
V-75.0	34.2	30.6	27.0	24.3	21.6	19.8	18.0	16.2
V-60.0	282.5	256.4	235.7	208.7	189.8	166.5	144.0	123.3
V-45.0	648.7	603.7	533.6	499.4	459.8	403.1	369.8	321.2
V-30.0	992.4	937.6	885.4	810.7	736.9	682.0	623.5	556.1
V-15.0	1149.9	1079.7	1020.3	951.0	889.9	787.3	735.1	676.6
V0.0	1243.5	1175.1	1107.6	1032.0	971.7	901.6	799.0	736.9
V15.0	1113.9	1049.1	981.6	924.1	846.7	765.7	704.5	643.3
V30.0	943.8	891.7	810.7	745.0	699.1	640.6	564.1	518.3
V45.0	563.3	519.2	485.9	429.2	394.1	357.2	315.8	287.0
V60.0	205.1	187.2	167.4	148.5	132.3	115.2	98.1	86.4
V75.0	23.4	21.6	20.7	18.9	18.0	17.1	15.3	14.4
V90.0	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1

Test Type : Type B Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : FLOOD-003

Test Time : 2023-01-03 16:45:44

Page 29 of 37

Light Distribution Data

Unit: cd

V\H	H70.0	H71.0	H72.0	H73.0	H74.0	H75.0	H76.0	H77.0
V-90.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
V-75.0	14.4	13.5	11.7	10.8	9.9	8.1	7.2	6.3
V-60.0	104.4	88.2	73.8	60.3	47.7	36.9	27.9	23.4
V-45.0	289.7	244.7	208.7	172.8	141.3	113.4	90.9	66.6
V-30.0	508.4	431.9	392.3	329.3	287.9	240.2	197.0	151.2
V-15.0	587.5	528.2	453.5	402.2	340.1	286.1	237.5	189.8
V0.0	674.8	586.6	534.5	453.5	402.2	333.8	281.6	225.8
V15.0	563.3	512.9	438.2	388.7	323.9	268.1	221.3	174.6
V30.0	453.5	406.7	346.4	309.5	258.2	214.1	171.9	135.9
V45.0	245.6	206.9	174.6	146.7	119.7	94.5	72.0	55.8
V60.0	72.0	62.1	52.2	42.3	34.2	28.8	24.3	20.7
V75.0	13.5	12.6	11.7	10.8	10.8	9.9	9.0	8.1
V90.0	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1

Test Type : Type B Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : FLOOD-003

Test Time : 2023-01-03 16:45:44

Page 30 of 37

Light Distribution Data

Unit: cd

V\H	H78.0	H79.0	H80.0	H81.0	H82.0	H83.0	H84.0	H85.0
V-90.0	3.6	4.5	3.6	4.5	4.5	4.5	4.5	4.5
V-75.0	5.4	5.4	4.5	3.6	3.6	3.6	3.6	3.6
V-60.0	18.9	16.2	12.6	10.8	9.0	7.2	5.4	4.5
V-45.0	48.6	33.3	24.3	18.0	14.4	10.8	8.1	6.3
V-30.0	116.1	82.8	57.6	37.8	25.2	17.1	12.6	9.0
V-15.0	144.0	104.4	71.1	46.8	28.8	18.9	13.5	9.9
V0.0	177.3	134.1	94.5	63.9	39.6	23.4	16.2	10.8
V15.0	139.5	98.1	67.5	43.2	27.0	18.9	13.5	9.9
V30.0	100.8	74.7	51.3	33.3	23.4	18.0	13.5	9.9
V45.0	39.6	28.8	23.4	18.9	15.3	11.7	9.0	7.2
V60.0	18.0	16.2	13.5	11.7	9.9	9.0	8.1	7.2
V75.0	8.1	8.1	7.2	7.2	7.2	8.1	8.1	8.1
V90.0	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1

Test Type : Type B Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : FLOOD-003

Test Time : 2023-01-03 16:45:44

Page 31 of 37

Light Distribution Data

Unit: cd

V\H	H86.0	H87.0	H88.0	H89.0	H90.0		
V-90.0	4.5	4.5	4.5	4.5	4.5		
V-75.0	3.6	3.6	3.6	3.6	3.6		
V-60.0	3.6	3.6	3.6	4.5	4.5		
V-45.0	4.5	3.6	3.6	3.6	3.6		
V-30.0	6.3	4.5	3.6	3.6	3.6		
V-15.0	6.3	4.5	3.6	3.6	3.6		
V0.0	7.2	4.5	2.7	3.6	3.6		
V15.0	6.3	4.5	3.6	3.6	3.6		
V30.0	7.2	5.4	5.4	5.4	5.4		
V45.0	6.3	6.3	6.3	6.3	6.3		
V60.0	7.2	7.2	7.2	7.2	7.2		
V75.0	8.1	8.1	8.1	7.2	7.2		
V90.0	8.1	8.1	8.1	7.2	7.2		

Test Type : Type B Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

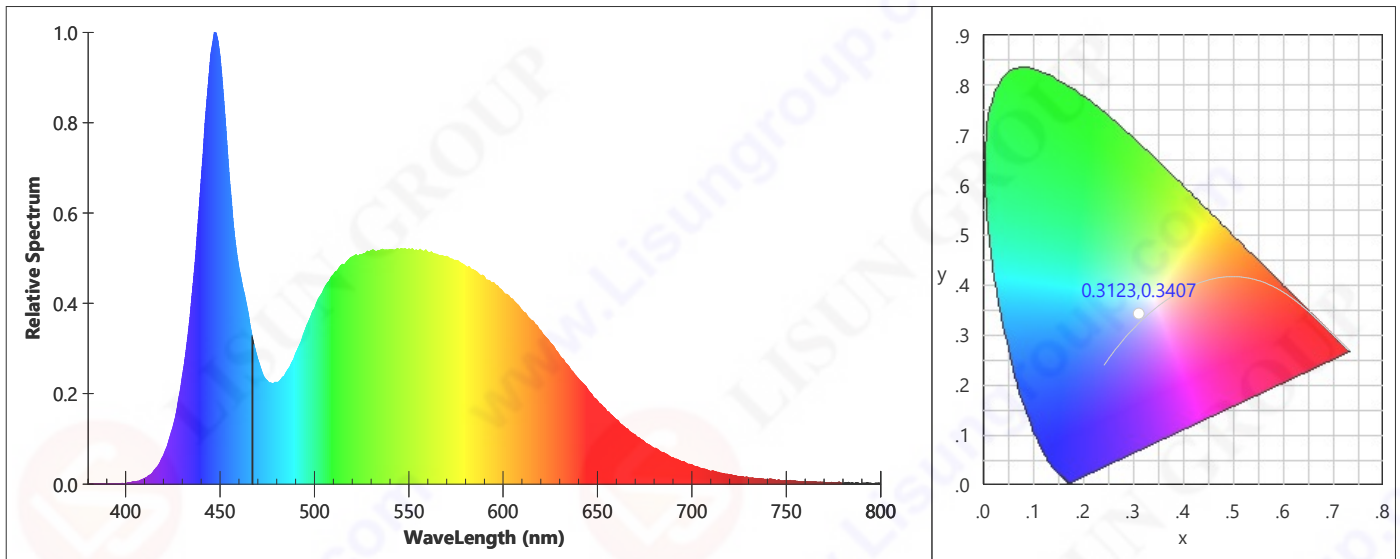
B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Color Properties



Colorimetric

CIE(x,y): 0.3123,0.3407

CIE(u,v): 0.1932,0.3162

CIE(u',v'): 0.1932,0.4744

CCT: 6448 K (Duv=0.009287)

Dominant Wavelength: 496.2 nm

Color Purity: 0.067

Peak Wavelength: 447.5 nm

Half Width: 22.4 nm

Color Ratio: R:0.126, G:0.822, B:0.051

Luminous Flux: 8844.39 lm

Radiant Power: 27.819 W

Color Render Index: Ra: 79.8

R1: 76

R2: 83

R3: 89

R4: 80

R5: 78

R6: 78

R7: 87

R8: 67

R9: -9

R10: 61

R11: 83

R12: 59

R13: 78

R14: 94

R15: 70

Color Quality Scale: Qa: 81.2, Qf: 81.3, Qp: 81.3, Qg: 90.6

Q1: 84

Q2: 97

Q3: 79

Q4: 76

Q5: 81

Q6: 83

Q7: 84

Q8: 90

Q9: 96

Q10: 85

Q11: 83

Q12: 82

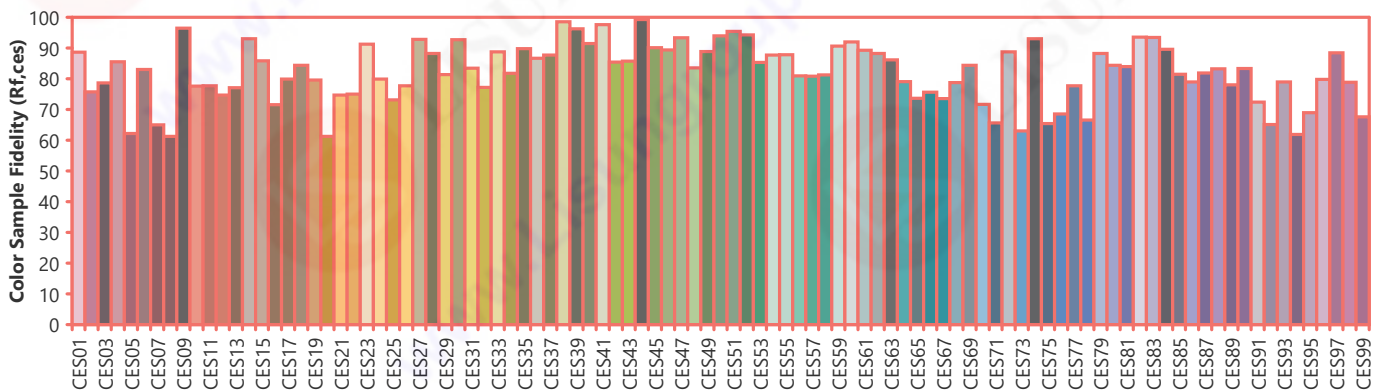
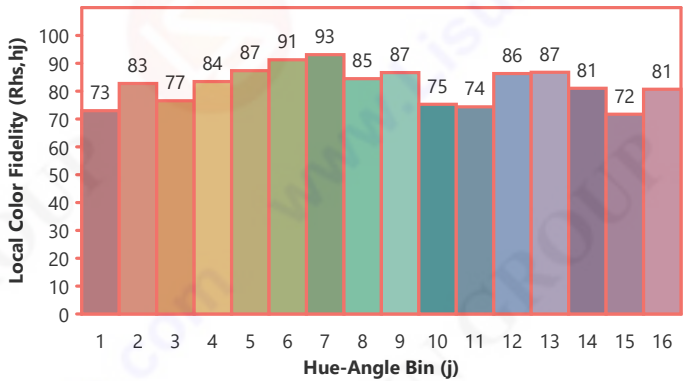
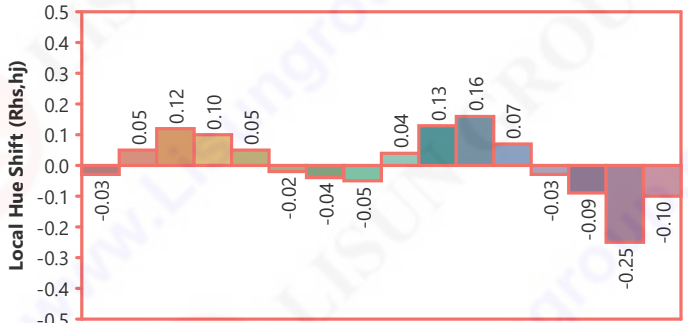
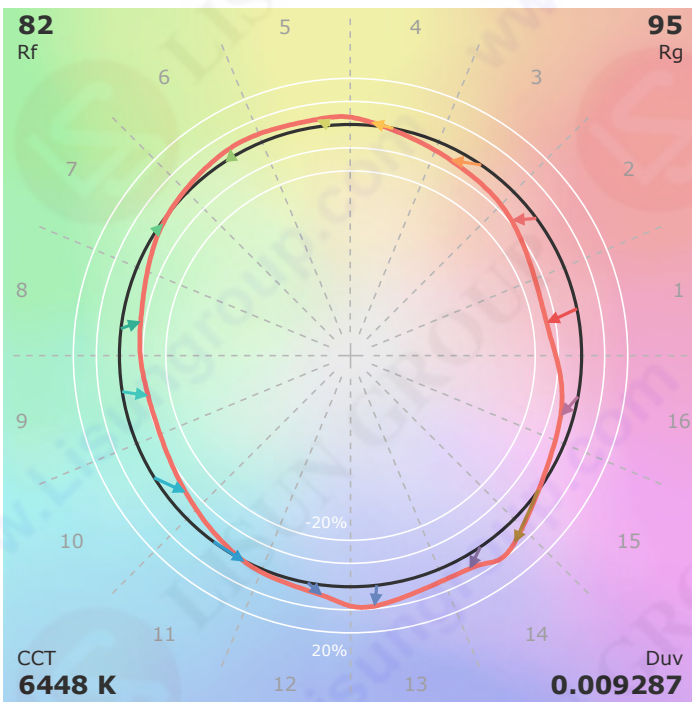
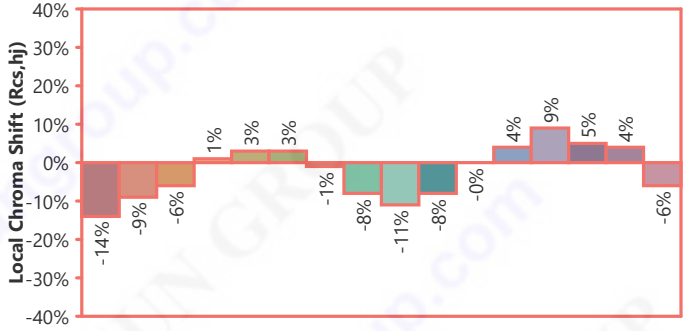
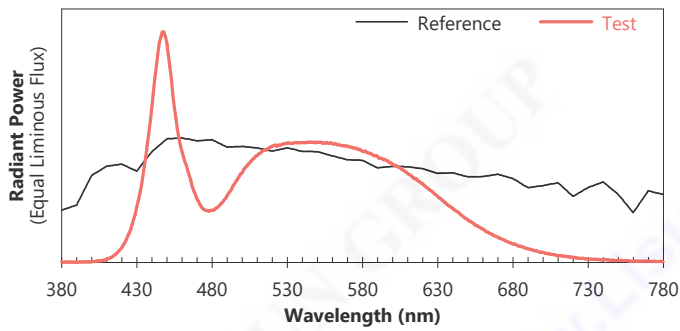
Q13: 82

Q14: 67

Q15: 73

TM-30-18: Rf: 82, Rg: 95

IES TM-30-18 Color Rendition Report



Notes: This is a recommended method for displaying IES TM-30-18 information.

x **0.3123**
 y **0.3407**
 u' **0.1932**
 v' **0.4744**

CIE13.3-1995
 (CRI)
 Ra 80
 R9 -9

Test Type : Type B Test Distance : 8.460 m
 Test Device : LSG-1890BCCD
 Test Lab : Lisun Instruments Limited
 Test By : Thomas Fiodorow

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0
 Temperature : 25°C Humidity : 65.0%
 Review By :

Report No. : FLOOD-003

Test Time : 2023-01-03 16:45:44

Page 34 of 37

Color Distribution Data

Color Distribution Data Tc(K)

Average Color(Tc):22620

V\H	-45.0	-30.0	-15.0	0.0	15.0	30.0	45.0
-53.0	6460	6462	6484	6490	6476	6478	6480
-52.0	6462	6484	6490	6476	6478	6480	6486
-51.0	6484	6490	6476	6478	6480	6486	6494
-50.0	6490	6476	6478	6480	6486	6494	6494
-49.0	6476	6478	6480	6486	6494	6494	6498
-48.0	6478	6480	6486	6494	6494	6498	6504
-47.0	6480	6486	6494	6494	6498	6504	6506
-46.0	6486	6494	6494	6498	6504	6506	6510
-45.0	6494	6494	6498	6504	6506	6510	6514
-44.0	6494	6498	6504	6506	6510	6514	6520
-43.0	6498	6504	6506	6510	6514	6520	6522
-42.0	6504	6506	6510	6514	6520	6522	6526
-41.0	6506	6510	6514	6520	6522	6526	6526
-40.0	6510	6514	6520	6522	6526	6526	6532
-39.0	6514	6520	6522	6526	6526	6532	6532
-38.0	6520	6522	6526	6526	6532	6532	6534
-37.0	6522	6526	6526	6532	6532	6534	6538
-36.0	6526	6526	6532	6532	6534	6538	6542
-35.0	6526	6532	6532	6534	6538	6542	6548
-34.0	6532	6532	6534	6538	6542	6548	6550
-33.0	6532	6534	6538	6542	6548	6550	6554
-32.0	6534	6538	6542	6548	6550	6554	6556
-31.0	6538	6542	6548	6550	6554	6556	6560
-30.0	6542	6548	6550	6554	6556	6560	6560
-29.0	6548	6550	6554	6556	6560	6560	6564
-28.0	6550	6554	6556	6560	6560	6564	6570
-27.0	6554	6556	6560	6560	6564	6570	6570

Test Type : Type B Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : FLOOD-003

Test Time : 2023-01-03 16:45:44

Page 35 of 37

Color Distribution Data

Color Distribution Data Tc(K)

Average Color(Tc):22620

V\H	-45.0	-30.0	-15.0	0.0	15.0	30.0	45.0
-26.0	6556	6560	6560	6564	6570	6570	6576
-25.0	6560	6560	6564	6570	6570	6576	6582
-24.0	6560	6564	6570	6570	6576	6582	6582
-23.0	6564	6570	6570	6576	6582	6582	6586
-22.0	6570	6570	6576	6582	6582	6586	6590
-21.0	6570	6576	6582	6582	6586	6590	6596
-20.0	6576	6582	6582	6586	6590	6596	6596
-19.0	6582	6582	6586	6590	6596	6596	6602
-18.0	6582	6586	6590	6596	6596	6602	6604
-17.0	6586	6590	6596	6596	6602	6604	6602
-16.0	6590	6596	6596	6602	6604	6602	6608
-15.0	6596	6596	6602	6604	6602	6608	6610
-14.0	6596	6602	6604	6602	6608	6610	6610
-13.0	6602	6604	6602	6608	6610	6610	6612
-12.0	6604	6602	6608	6610	6610	6612	6614
-11.0	6602	6608	6610	6610	6612	6614	6618
-10.0	6608	6610	6610	6612	6614	6618	6622
-9.0	6610	6610	6612	6614	6618	6622	6628
-8.0	6610	6612	6614	6618	6622	6628	6622
-7.0	6612	6614	6618	6622	6628	6622	6630
-6.0	6614	6618	6622	6628	6622	6630	6634
-5.0	6618	6622	6628	6622	6630	6634	6638
-4.0	6622	6628	6622	6630	6634	6638	6636
-3.0	6628	6622	6630	6634	6638	6636	6636
-2.0	6622	6630	6634	6638	6636	6636	6640
-1.0	6630	6634	6638	6636	6636	6640	6644
0.0	6634	6638	6636	6636	6640	6644	6650

Test Type : Type B Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Color Distribution Data

Color Distribution Data Tc(K)

Average Color(Tc):22620

V\H	-45.0	-30.0	-15.0	0.0	15.0	30.0	45.0
1.0	6638	6636	6636	6640	6644	6650	6650
2.0	6636	6636	6640	6644	6650	6650	6652
3.0	6636	6640	6644	6650	6650	6652	6654
4.0	6640	6644	6650	6650	6652	6654	6658
5.0	6644	6650	6650	6652	6654	6658	6656
6.0	6650	6650	6652	6654	6658	6656	6658
7.0	6650	6652	6654	6658	6656	6658	6664
8.0	6652	6654	6658	6656	6658	6664	6664
9.0	6654	6658	6656	6658	6664	6664	6670
10.0	6658	6656	6658	6664	6664	6670	6670
11.0	6656	6658	6664	6664	6670	6670	6670
12.0	6658	6664	6664	6670	6670	6670	6676
13.0	6664	6664	6670	6670	6670	6676	6680
14.0	6664	6670	6670	6670	6676	6680	6680
15.0	6670	6670	6670	6676	6680	6680	6686
16.0	6670	6670	6676	6680	6680	6686	6682
17.0	6670	6676	6680	6680	6686	6682	6684
18.0	6676	6680	6680	6686	6682	6684	6686
19.0	6680	6680	6686	6682	6684	6686	6694
20.0	6680	6686	6682	6684	6686	6694	6684
21.0	6686	6682	6684	6686	6694	6684	6694
22.0	6682	6684	6686	6694	6684	6694	6694
23.0	6684	6686	6694	6684	6694	6694	6696
24.0	6686	6694	6684	6694	6694	6696	6694
25.0	6694	6684	6694	6694	6696	6694	6696
26.0	6684	6694	6694	6696	6694	6696	6694
27.0	6694	6694	6696	6694	6696	6694	6700

Test Type : Type B Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :

Report No. : FLOOD-003

Test Time : 2023-01-03 16:45:44

Page 37 of 37

Color Distribution Data

Color Distribution Data Tc(K)

Average Color(Tc):22620

V\H	-45.0	-30.0	-15.0	0.0	15.0	30.0	45.0
28.0	6694	6696	6694	6696	6694	6700	6702
29.0	6696	6694	6696	6694	6700	6702	6700
30.0	6694	6696	6694	6700	6702	6700	6704
31.0	6696	6694	6700	6702	6700	6704	6702
32.0	6694	6700	6702	6700	6704	6702	6706
33.0	6700	6702	6700	6704	6702	6706	6710
34.0	6702	6700	6704	6702	6706	6710	6706
35.0	6700	6704	6702	6706	6710	6706	6714
36.0	6704	6702	6706	6710	6706	6714	6716
37.0	6702	6706	6710	6706	6714	6716	6710
38.0	6706	6710	6706	6714	6716	6710	6720
39.0	6710	6706	6714	6716	6710	6720	6720
40.0	6706	6714	6716	6710	6720	6720	6718
41.0	6714	6716	6710	6720	6720	6718	6728
42.0	6716	6710	6720	6720	6718	6728	6718
43.0	6710	6720	6720	6718	6728	6718	6726
44.0	6720	6720	6718	6728	6718	6726	6726
45.0	6720	6718	6728	6718	6726	6726	6728
46.0	6718	6728	6718	6726	6726	6728	6726
47.0	6728	6718	6726	6726	6728	6726	6726
48.0	6718	6726	6726	6728	6726	6726	6778
49.0	6726	6726	6728	6726	6726	6778	6760
50.0	6726	6728	6726	6726	6778	6760	6778
51.0	6728	6726	6726	6778	6760	6778	6752
52.0	6726	6726	6778	6760	6778	6752	6744
53.0	6726	6778	6760	6778	6752	6744	6772

Test Type : Type B Test Distance : 8.460 m

Test Device : LSG-1890BCCD

Test Lab : Lisun Instruments Limited

Test By : Thomas Fiodorow

B Plane (°): -90.0-90.0:15.0 β (°): -90.0-90.0:1.0

Temperature : 25°C

Humidity : 65.0%

Review By :