



Moving Detector Goniophotometer (LSG-6000) Brochure

Global Office of Lisun Electronics Inc.

<http://www.Lisungroup.com>

Lisun Group (Hong Kong) Limited

Add: Room 803, Chevalier House, 45-51 Chatham Road South, Tsim Sha Tsui, KL, HK

Tel: 00852-68852050 Fax: 00852-30785638

Email: SalesHK@Lisungroup.com

Lisun Electronics (Shanghai) Co., Ltd

Add: 113-114, No. 1 Building, Nanxiang Zhidi Industry Park, No. 1101, Huyi Road, Jiading District, Shanghai, 201802, China

Tel: +86(21)5108 3341 Fax: +86(21)5108 3342

Email: SalesSH@Lisungroup.com

Lisun Electronics Inc. (USA)

Add: 445 S. Figueroa Street, Los Angeles, CA 90071, U.S.A.

Email: Sales@Lisungroup.com

Lisun China Factory

Add: NO. 37, Xiangyuan Road, Hangzhou City, Zhejiang Province, China

Tel: +86-189-1799-6096

Email: Engineering@Lisungroup.com

Leader in Lighting & Electrical Test Instruments

Rev. 4/25/2021

1. System Configuration

A. LSG-6000 Goniophotometric System:

- Goniometric Rotating Console: [Japanese Mitsubishi Motor and German Angle encoder System](#) to keep the test accuracy. Both Far Field and Near Field Test.
- [High Reflective Moving Mirror](#): Special design and produced to keep high reflective value.
- Goniometric Rotating Control Instrument in 19inch cabinet: It connects to the PC and was controlled by the software.
- It has Goniometric Rotating Control Android App which can control it to rotating angle in the dark room easily
- Far Field and Near Field applied with [Germany produced Class L Constant Temperature Photo Detector](#)
- 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

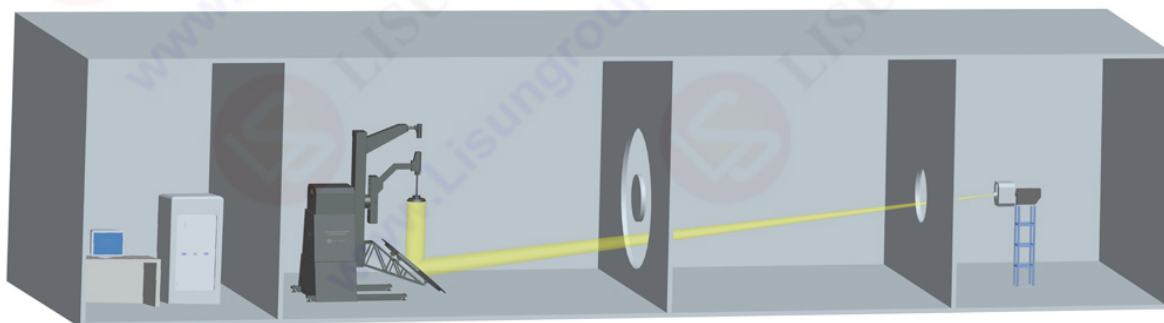
B. SLS-150W DC Standard Light Intensity Lamp

C. **LS2050C Digital Power Meter:** With LCD screen display, it is used to test AC/DC voltage, current, power, PF, DF and Harmonic

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-500V ARC 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.**



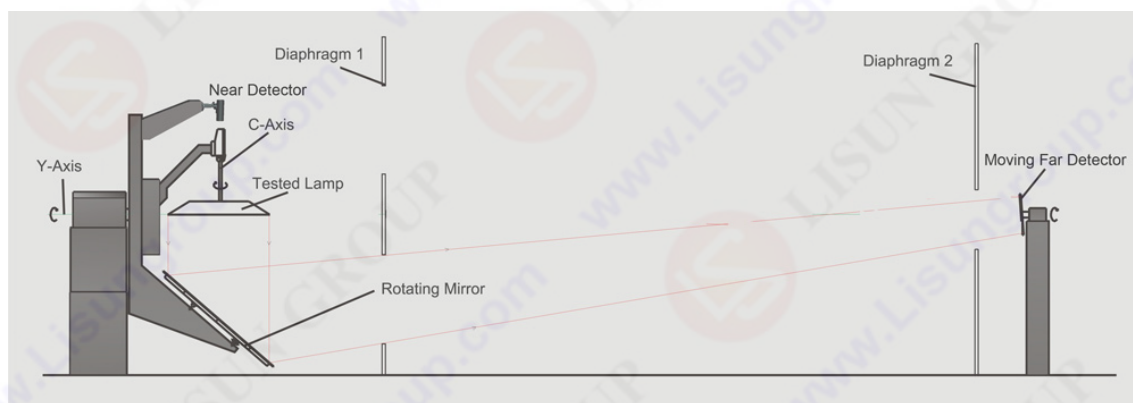
Full View for LSG-6000 Moving Detector Goniophotometer

Note: PC and Printer prepared by the customer (request at least one USB port)

2. Measurement Principle

LSG-6000 Moving Detector Goniophotometer is full meet LM-79-19 request. The tested lamp will keep burning position and be fixed, near field detector move together with the big mirror in a line, and the far field detector will move with the big mirror synchronously. The detector will always sense the light directly from the luminaries.

The rotation priority is determined by the software. If mirror axle is took precedence of rotation, the goniophotometer will continuously measure the luminous intensity at each γ angle on a vertical plane determined by the C angle, the measuring trace is equivalent to the longitude. Similarly, while the luminaries axle is priority, the system will continuously measure the luminous intensity at each C angle on a conical surface determined by the γ angle, the trace can be looked upon the woof. See the following figure.



Measurement Principle

3. System Functions



The LSG-6000 full meet LM-79-19, CIE and GB standards for Goniophotometric of luminaires, this system is used to measure spatial luminous intensity distribution of luminaires for floodlight, street lighting and interior lighting, and other photometric parameters such as spatial iso-intensity curve, intensity distribution curve of each section (shown in rectangular coordinate system or polar coordinate system), iso-illuminance distribution curve, luminance limitation curve, luminaires efficiency, glare grade, effective beam angles, upward luminous flux ratio, downward luminous flux ratio, total luminous flux, effective luminous flux, utilization factor and electric parameters (wattage, power factor, voltage and current) of luminaires etc.



LSG-6000 Can test all of the above luminaires

4. Specifications

- The tested luminaire rotates around the mirror with an angle of $(\gamma)\pm 180^\circ$ (or $0-360^\circ$) and the tested luminaire rotates around itself with an angle of $(C)\pm 180^\circ$ (or $0-360^\circ$)
- The accuracy of angle: 0.05° Resolution of angle: 0.001°
- Luminosity Testing Range: Illuminance $0.001\text{lx}\sim 99,999\text{lx}$; Light Intensity $1.0\text{cd}\sim 10^7\text{cd}$ (detector)
- Accuracy of photometry: Germany produced constant temperature photo detector DIN5032-6/CIE pub1. No. 69 Class L
- Testing Accuracy: 2% (Under Standard lamp); Stray Light: less than 0.1%
- English version software can run in Win7, Win8 or Win10

5. Laboratory Requirements

1) Room Requirements according to CIE

LISUN MODEL	Center Height (A)	Total Height (B)	Total Depth (C)	Total Width (D)	The max size for the Testing Lamp(Unit: mm)		The max diameter of the mast rotating (G)	The Mirror Size (H*I)	Max Testing Weight
					C-Gamma Test with one Pillar (Diameter E* Depth F)	B-Beta Test with two Pillars (L*W)			
LSG-6000B	2300	4500	2900	1850	∅1600×800	600*600	∅4400	1550×1950	50kg
LSG-6000	2050	4030	2720	1750	∅1400×600	600*600	∅3960	1400×1850	40kg
LSG-6000S	1500	2950	2450	1350	∅1000×500	600*600	∅2900	1000×1360	30kg

Table 1 The Dimensions of the Goniophotometer Master

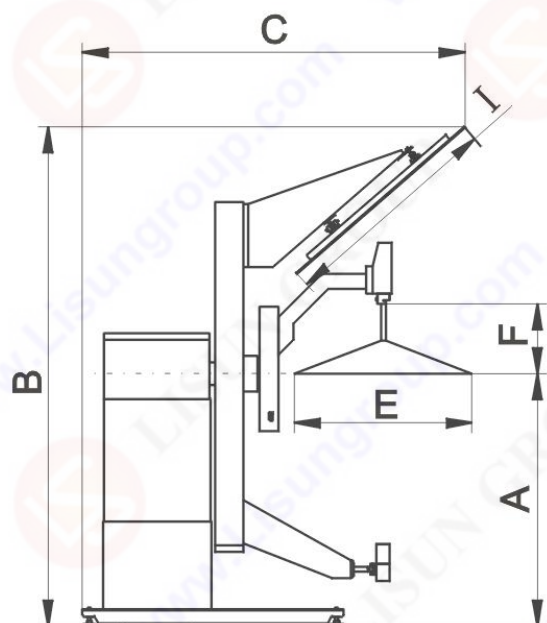


Figure 1 The Side View

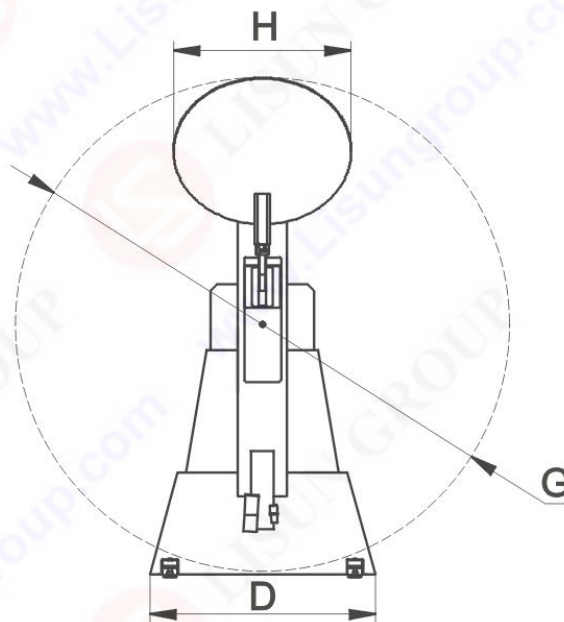


Figure 2 The Vertical View

- The dark room wall, ceiling and floor should be all coated with dull black paint or be covered by black cloth and black carpet.
- Air-conditioner: be set in the dark room to control the temperature around lamps to the standard value upon the CIE requirements.

Note: LISUN GROUP engineer dept will submit the Lab Design support documents according to the customer's real lab size after the formal purchase order was confirmed

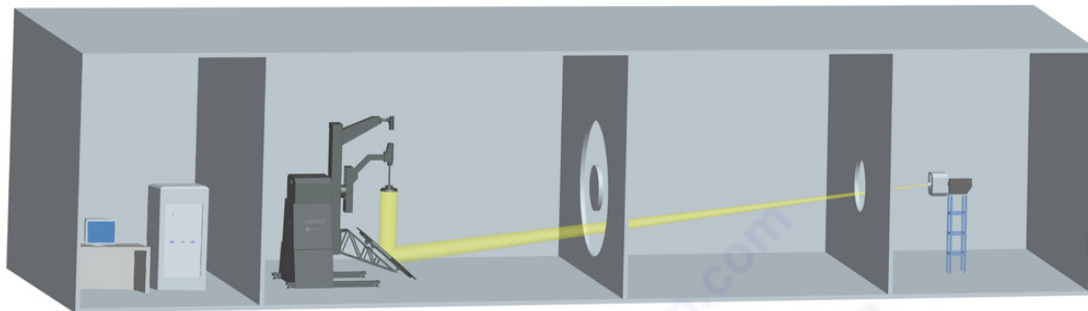
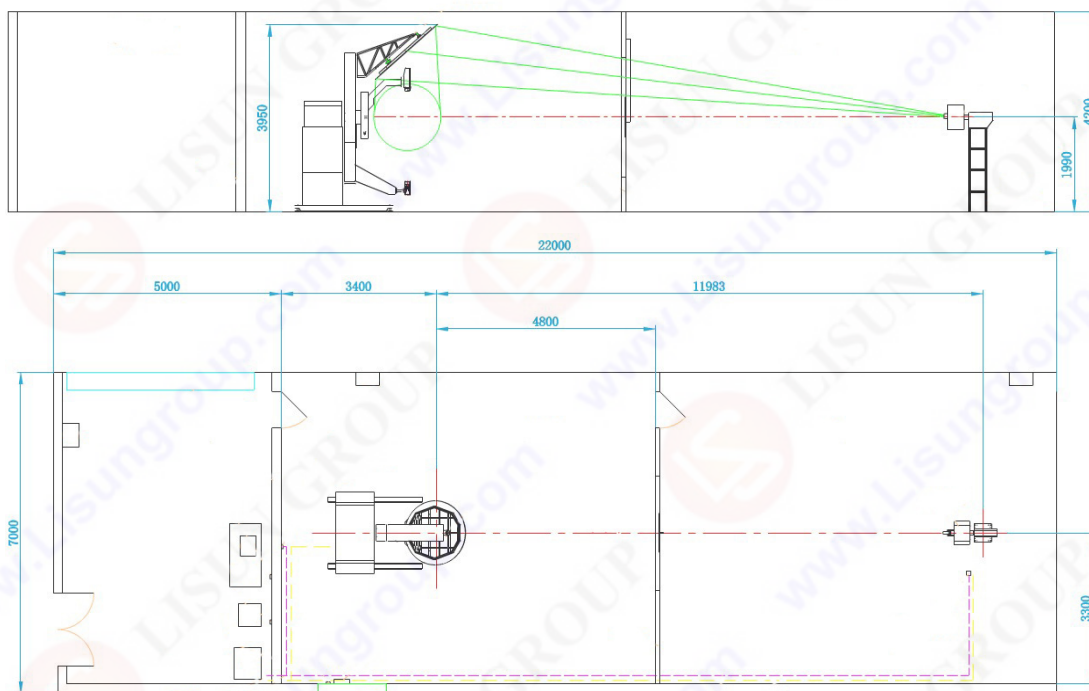


Fig: LSG-6000 lab dark room view



2) Requirements of Eliminating the stray Light

Luminaires must be where the photo detector can only receive the light reflected by the two moving mirror in the LSG-6000 system. The light given off directly by the luminaires and reflected by the wall and floor is warded off by the light fence. Internal surface of the dark room and dark path together with the surface of the light fence should be painted unpolished black or be covered by black cloth and black carpet.

3) Temperature of the Environment

Temperature around the lamp or luminaires must be $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ during the test. Exceptions can be given according to relative lamps as following.

- a. Tungsten Incandescent Lamp: $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$
- b. Double-caps Fluorescent Lamp: $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$
- c. High Pressure Mercury Lamp: $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$
- d. Metal Halogen Lamp: $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$
- e. High Pressure Sodium Lamp: $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$
- f. Low Pressure Sodium Lamp: $25^{\circ}\text{C} \pm 2$

4) Airflow

Airflow may be induced by natural aeration, air conditioner or movement of the luminaries in the goniophotometer, but the speed of the airflow couldn't exceed 0.2m/s.

5) Vibration and shock

When the lamp is in lighting, the vibration couldn't exceed 10m/s²(4~3000Hz), or the moving scope of the lamp couldn't exceed 30mm (at most 4Hz)

6) Smoke, Dust and Moisture

The test environment must free from smoke, dust or moisture. At the same time, even not during the measurement, smoke, dust or moisture will also influence the reflectance of the reflecting mirror and induce more stray light. So, the test room must be kept clean, no smoke and dry. The humidity should be less than 60% RH.

6. Service

1) Installation and Training

LISUN GROUP engineers will take responsibility for installation and Training of the system at the customer's

2) Period of Guarantee: 24 months

The service is for free except technician's travel payment if the service provided by LISUN GROUP implement at the customer's.

3) Upgrading the applications software for free

7. Design Standard of Device

The construction, technical parameter, test & operate steps as well as data processing software of LSG-6000 Moving Detector 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. Typical overseas market customers:

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

9. Application Software

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 luminaire 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, luminaire 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 the software of LSG-6000:

Report No.: 5

Test Time : 2021-04-02 15:13:16

Page 1 of 22

Lisun Goniophotometer Test Report

Product Info

 Luminaire Category : **Indoor LED**

 Lamp : **cree**

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

 Submitter : **Michael Aslami**

 Nuber of Lamps : **1**

 Lumens per Lamp : **2100 lm**

 Luminous Length : **100 mm**

 Luminous Width : **100 mm**

 Luminous Height : **0 mm**

Electric Parameters

 Voltage : **229.80 V** Current : **0.1320 A** Power : **28.56 W** Power Factor : **0.938** Frequency : **50.06 Hz**

Photometric Parameters

 CIE Class : **Direct**

 Measurement Flux : **1942.7 lm**

 Upward Ratio : **6.67 %**

 Maximum Intensity : **663.61 cd**

 Central Intensity : **663.51 cd**

 Luminaire Efficacy Rating (LER) : **68**

 Beam Angle (C0-C180,C90-C270) : **117.9 °, 115.4 °**

 Field Angle (C0-C180,C90-C270) : **155.6 °, 153.1 °**

 Total Rated Lamp Lumens : **2100.0 lm**

 Efficiency : **92.51 %**

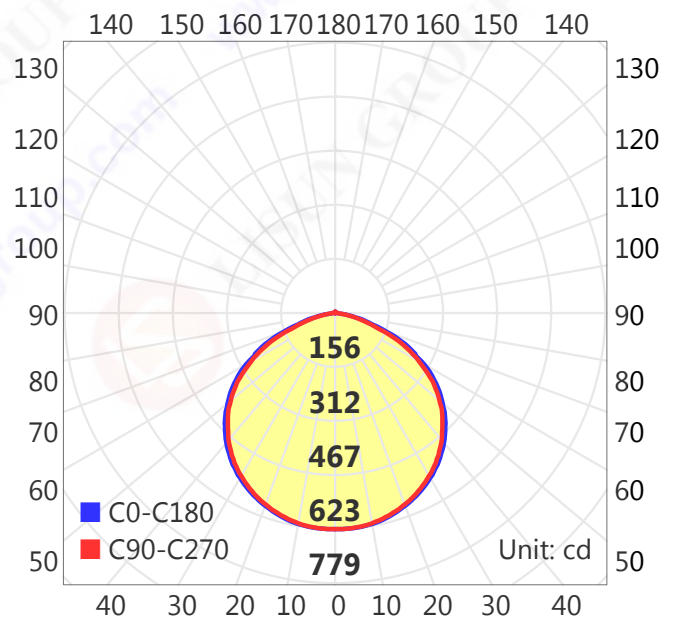
 Downward Ratio : **85.84 %**

 Position Of Maximum Intensity : **C60° γ1°**

 S/MH(C0-C180,C90-C270) : **1.32, 1.30**

 Energy Efficiency Class : **A (EU 874/2012 EEI:0.247)**

 Beam Angle (C45-C225,C135-C315) : **117.2 °, 117.2 °**

 Field Angle (C45-C225,C135-C315) : **155.0 °, 155.0 °**


Test Type : Type C Test Distance : 8.160 m

Test Device : Lisun LSG-6000 (E312012J)

Test Lab : LISUN Lab

Test By : David

C Plane (°): 0.0-180.0:1.0 γ (°): 0.0-180.0:1.0

Temperature : 25.0°C Humidity : 65.0%

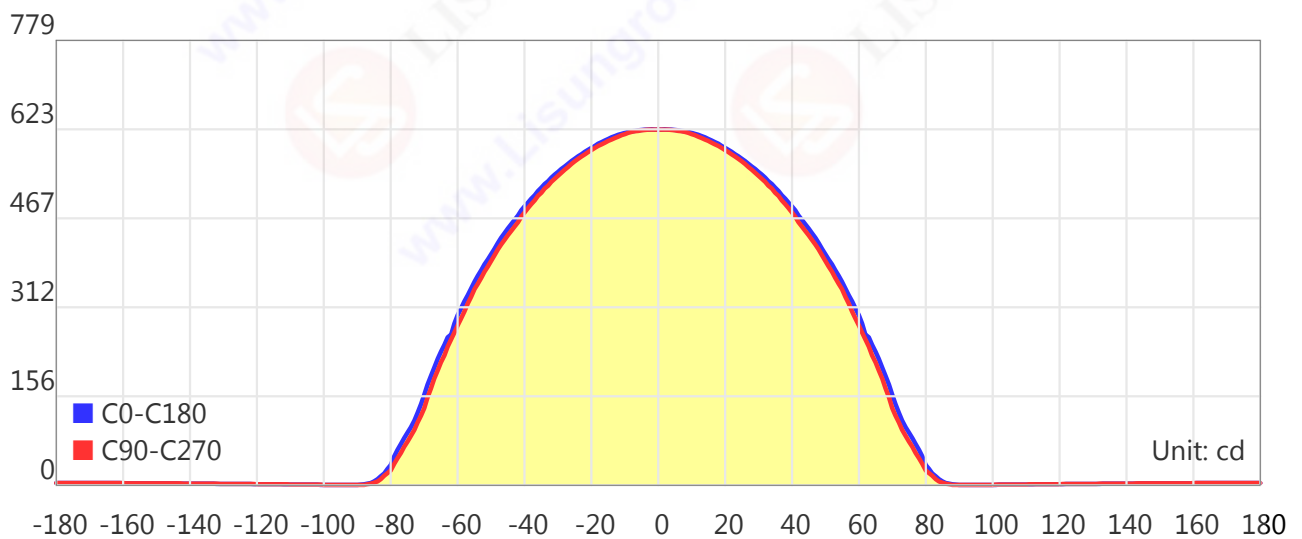
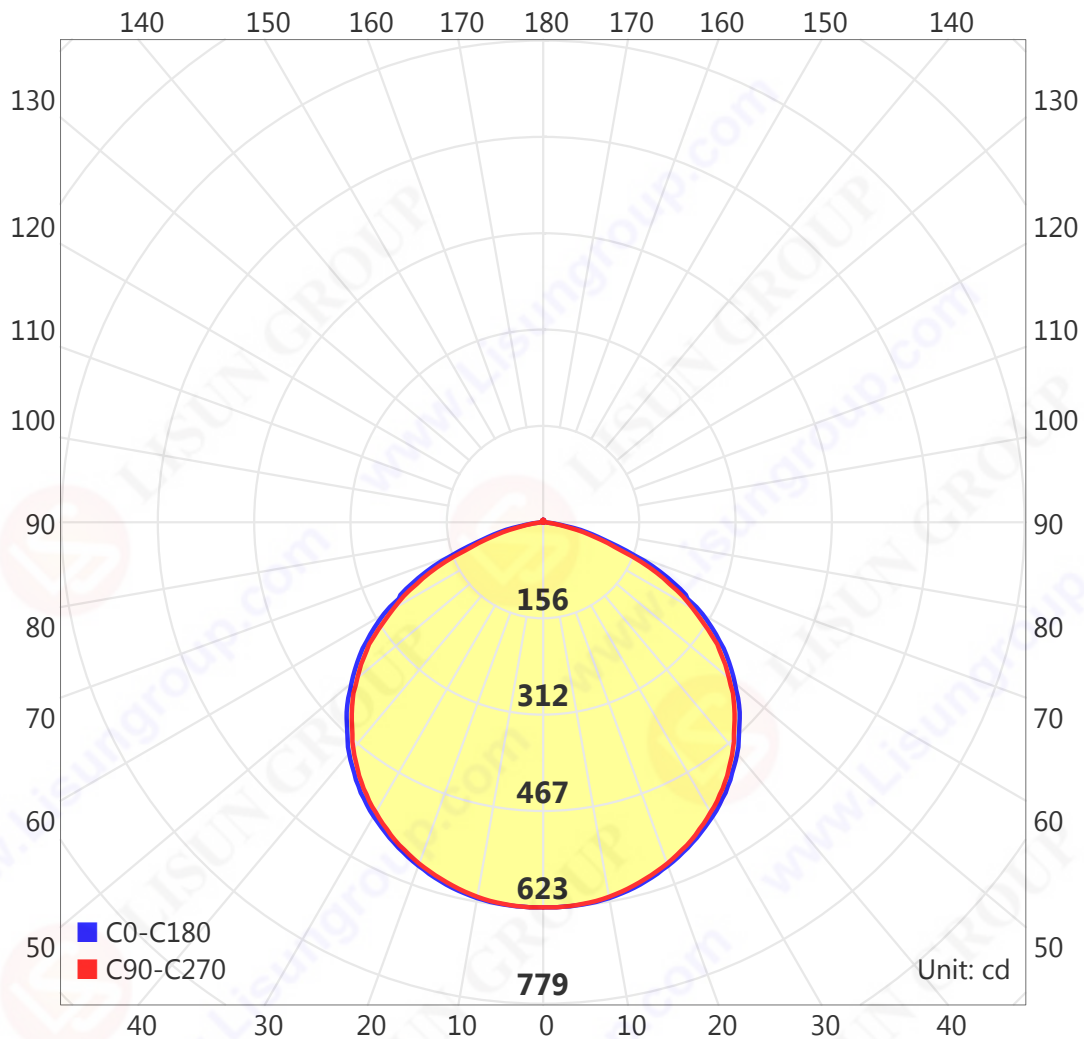
Review By :

Report No.: 5

Test Time : 2021-04-02 15:13:16

Page 2 of 22

Light Distribution Curve


 Test Type : Type C
 Test Device : Lisun LSG-6000 (E312012J)
 Test Lab : LISUN Lab
 Test By : David

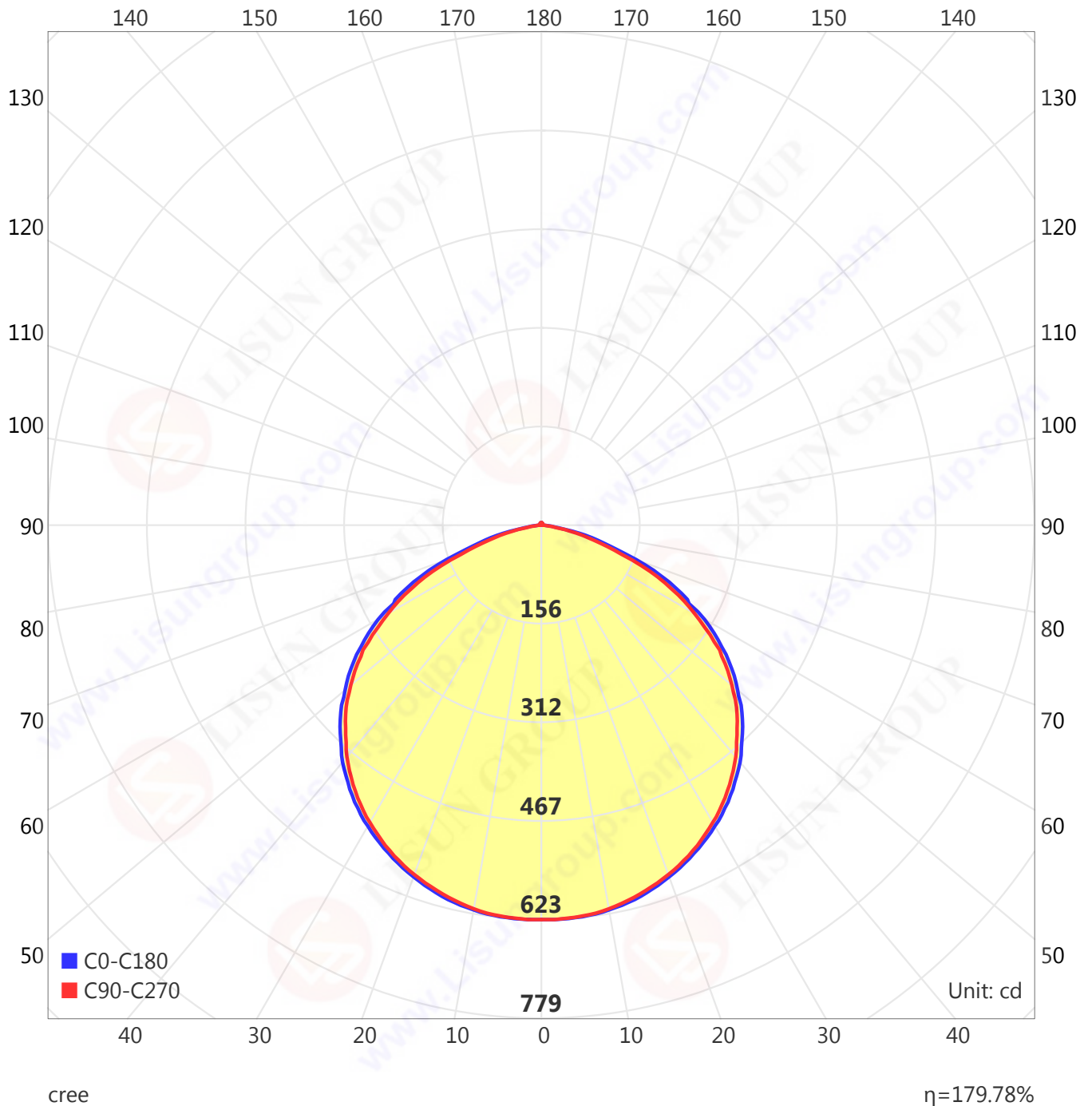
Test Distance : 8.160 m

 C Plane (°): 0.0-180.0:1.0
 Temperature : 25.0°C

 γ (°): 0.0-180.0:1.0
 Humidity : 65.0%

Review By :

Light Distribution Curve (cd/klm)

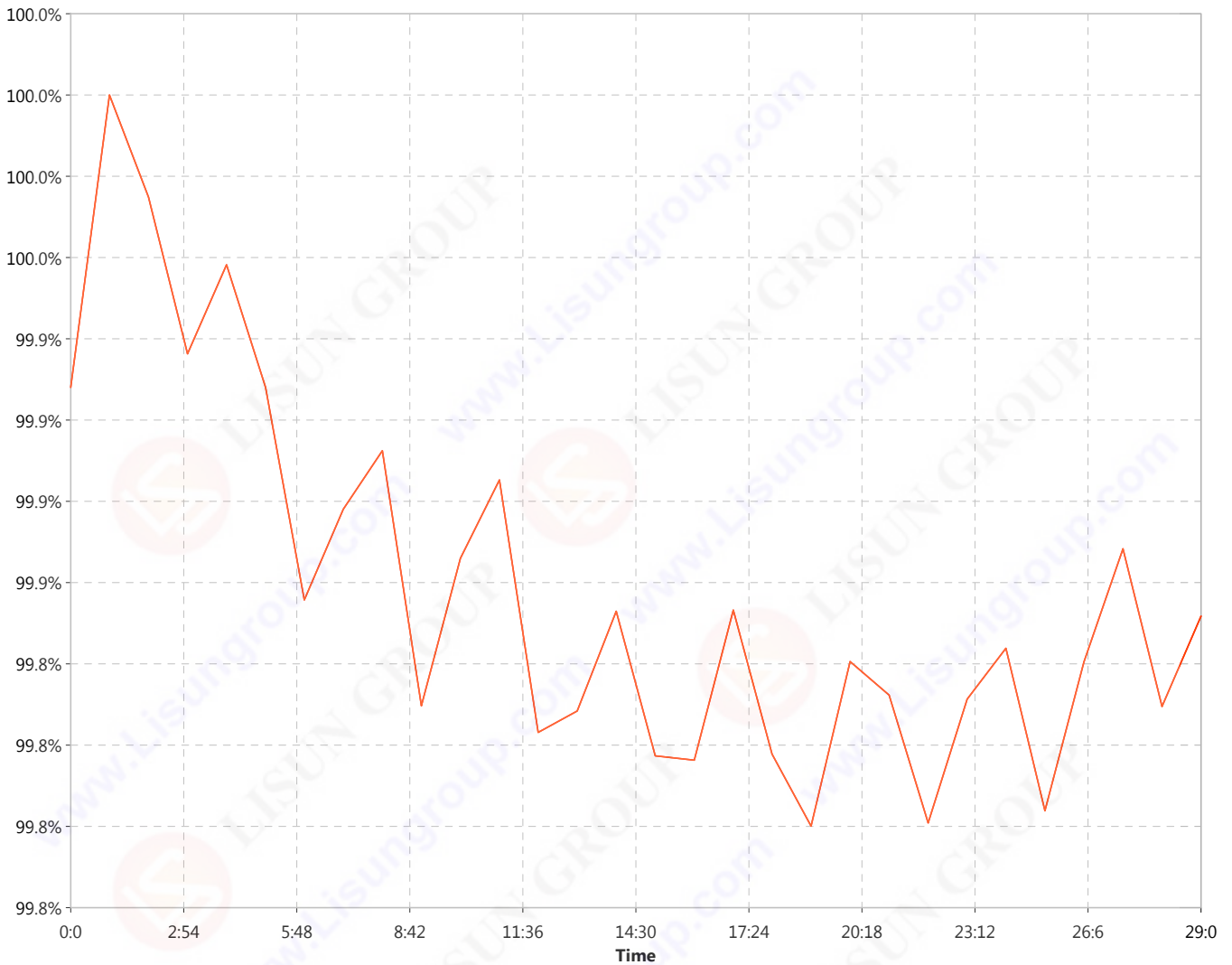


Report No.: 5

Test Time : 2021-04-02 15:13:16

Page 4 of 22

Warmup Log



Stable time: 29:0

Uptime: 0:0

Parameters	Maximum	Minimum	Change
Luminous intensity ,cd	623.73	622.34	1.38
Power ,W	0.00	0.00	0.00
Illumination ,lx	9.367	9.347	0.021

 Test Type : Type C
 Test Device : Lisun LSG-6000 (E312012J)
 Test Lab : LISUN Lab
 Test By : David

Test Distance : 8.160 m

C Plane (°): 0.0-180.0:1.0

Temperature : 25.0°C

γ (°): 0.0-180.0:1.0

Humidity : 65.0%

Review By :

Report No. : 5

Test Time : 2021-04-02 15:13:16

Page 5 of 22

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	26.6	28.2	27.0	28.5	28.9	26.5	28.1	26.9	28.5	28.8
3H	28.1	29.5	28.5	29.9	30.3	27.8	29.3	28.2	29.6	30.0
4H	28.5	29.8	28.9	30.2	30.6	28.2	29.5	28.6	29.9	30.3
6H	28.6	29.9	29.1	30.3	30.7	28.3	29.5	28.7	29.9	30.3
8H	28.7	29.8	29.1	30.2	30.7	28.3	29.5	28.7	29.9	30.3
12H	28.6	29.8	29.1	30.2	30.6	28.2	29.4	28.7	29.8	30.2
X=4H Y=2H	27.2	28.5	27.6	28.9	29.3	27.1	28.4	27.5	28.8	29.2
3H	28.7	29.9	29.2	30.3	30.7	28.6	29.7	29.0	30.1	30.5
4H	29.2	30.2	29.6	30.6	31.1	29.0	30.0	29.4	30.4	30.9
6H	29.4	30.3	29.9	30.7	31.2	29.1	30.0	29.6	30.5	30.9
8H	29.4	30.2	29.9	30.7	31.2	29.1	30.0	29.6	30.4	30.9
12H	29.4	30.1	29.9	30.6	31.1	29.1	29.9	29.6	30.3	30.8
X=8H Y=4H	29.3	30.1	29.8	30.6	31.1	29.1	29.9	29.6	30.4	30.9
6H	29.5	30.2	30.1	30.7	31.2	29.3	30.0	29.8	30.5	31.0
8H	29.6	30.2	30.1	30.7	31.2	29.3	29.9	29.8	30.4	30.9
12H	29.6	30.1	30.1	30.6	31.2	29.3	29.8	29.8	30.3	30.9
X=12H Y=4H	29.3	30.0	29.8	30.5	31.0	29.1	29.8	29.6	30.3	30.8
6H	29.5	30.1	30.1	30.6	31.2	29.3	29.9	29.8	30.4	30.9
8H	29.6	30.1	30.1	30.6	31.2	29.3	29.9	29.9	30.4	30.9

 Calculate in accordance with CIE 190:2010. The table is corrected with 1000lm ($8\log(F/F_0) = 0.0$).

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	27.0	28.4	27.3	28.6	28.9	26.9	28.3	27.2	28.5	28.8
3H	28.3	29.5	28.6	29.8	30.1	28.1	29.3	28.4	29.6	29.9
4H	28.6	29.8	29.0	30.1	30.4	28.4	29.5	28.7	29.8	30.1
6H	28.8	29.9	29.2	30.2	30.5	28.4	29.5	28.8	29.8	30.2
8H	28.8	29.8	29.2	30.1	30.5	28.4	29.5	28.8	29.8	30.1
12H	28.8	29.7	29.1	30.1	30.4	28.4	29.4	28.8	29.7	30.1
X=4H Y=2H	27.6	28.8	28.0	29.1	29.4	27.5	28.7	27.9	29.0	29.3
3H	29.0	30.0	29.4	30.3	30.7	28.8	29.8	29.2	30.1	30.5
4H	29.4	30.3	29.8	30.6	31.0	29.2	30.1	29.6	30.4	30.8
6H	29.6	30.4	30.0	30.8	31.2	29.3	30.1	29.8	30.5	30.9
8H	29.6	30.3	30.1	30.7	31.2	29.3	30.0	29.8	30.5	30.9
12H	29.6	30.2	30.1	30.7	31.1	29.3	29.9	29.8	30.4	30.8
X=8H Y=4H	29.5	30.2	30.0	30.6	31.1	29.3	30.0	29.8	30.4	30.9
6H	29.8	30.3	30.2	30.8	31.2	29.5	30.1	30.0	30.5	31.0
8H	29.8	30.3	30.3	30.7	31.2	29.5	30.0	30.0	30.5	31.0
12H	29.8	30.2	30.3	30.7	31.2	29.5	30.0	30.0	30.4	31.0
X=12H Y=4H	29.5	30.1	30.0	30.6	31.0	29.3	29.9	29.8	30.4	30.8
6H	29.7	30.2	30.2	30.7	31.2	29.5	30.0	30.0	30.5	31.0
8H	29.8	30.2	30.3	30.7	31.2	29.5	30.0	30.0	30.5	31.0
Variations with the observer position at spacings										
S=1.0H						+0.1/-0.2				
S=1.5H						+0.3/-0.6				
S=2.0H						+0.7/-1.0				

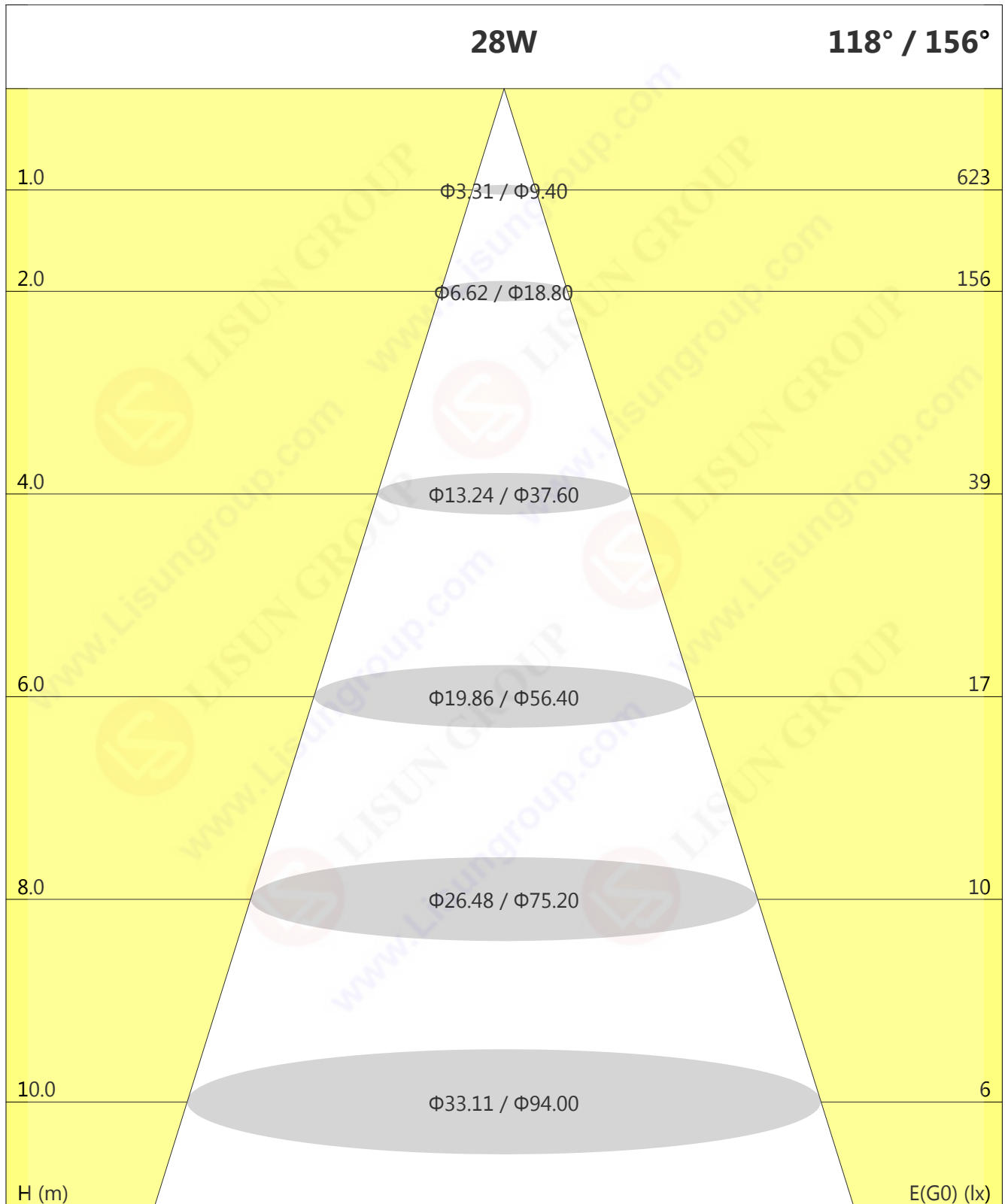
 Calculate in accordance with CIE Pub.117. The table is corrected with 1000lm ($8\log(F/F_0) = 0.0$).

Test Type : Type C	Test Distance : 8.160 m	C Plane (°): 0.0-180.0:1.0	γ (°): 0.0-180.0:1.0
Test Device : Lisun LSG-6000 (E312012J)		Temperature : 25.0°C	Humidity : 65.0%
Test Lab : LISUN Lab			
Test By : David		Review By :	

Report No.: 5

Test Time : 2021-04-02 15:13:16

Page 6 of 22

Lux-Distance


Test Type : Type C

Test Distance : 8.160 m

C Plane (°): 0.0-180.0:1.0

γ (°): 0.0-180.0:1.0

Test Device : Lisun LSG-6000 (E312012J)

Temperature : 25.0°C

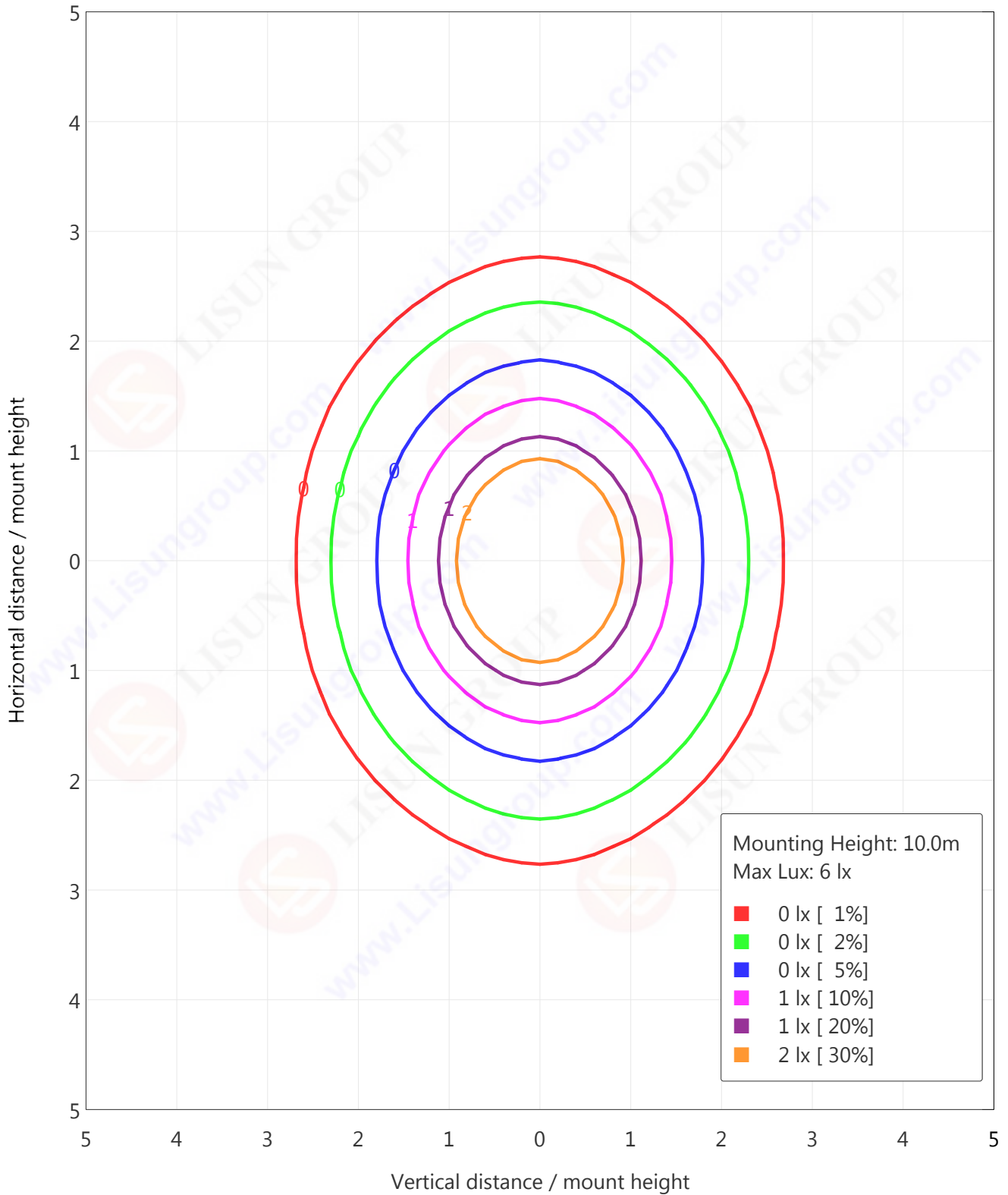
Humidity : 65.0%

Test Lab : LISUN Lab

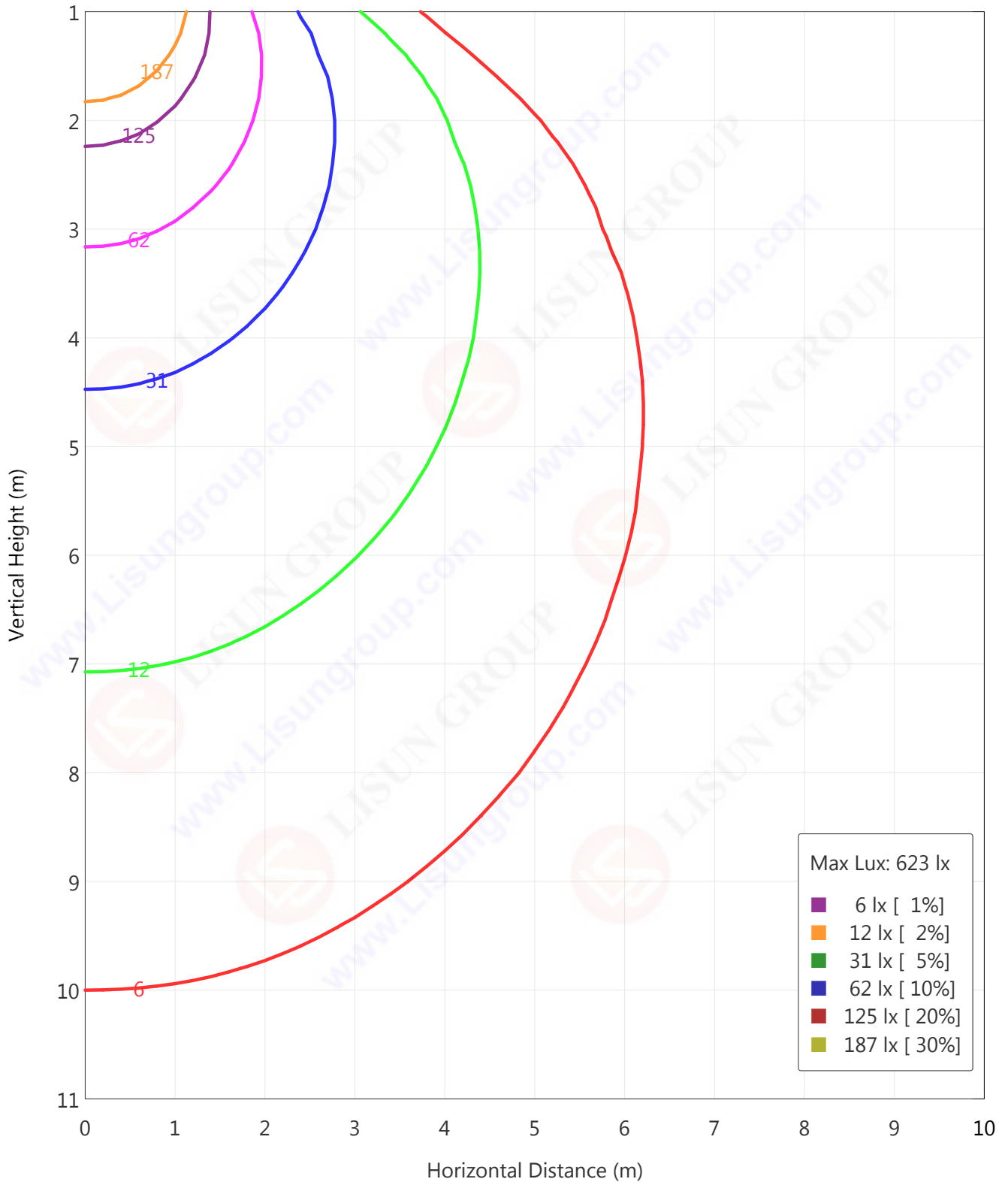
Test By : David

Review By :

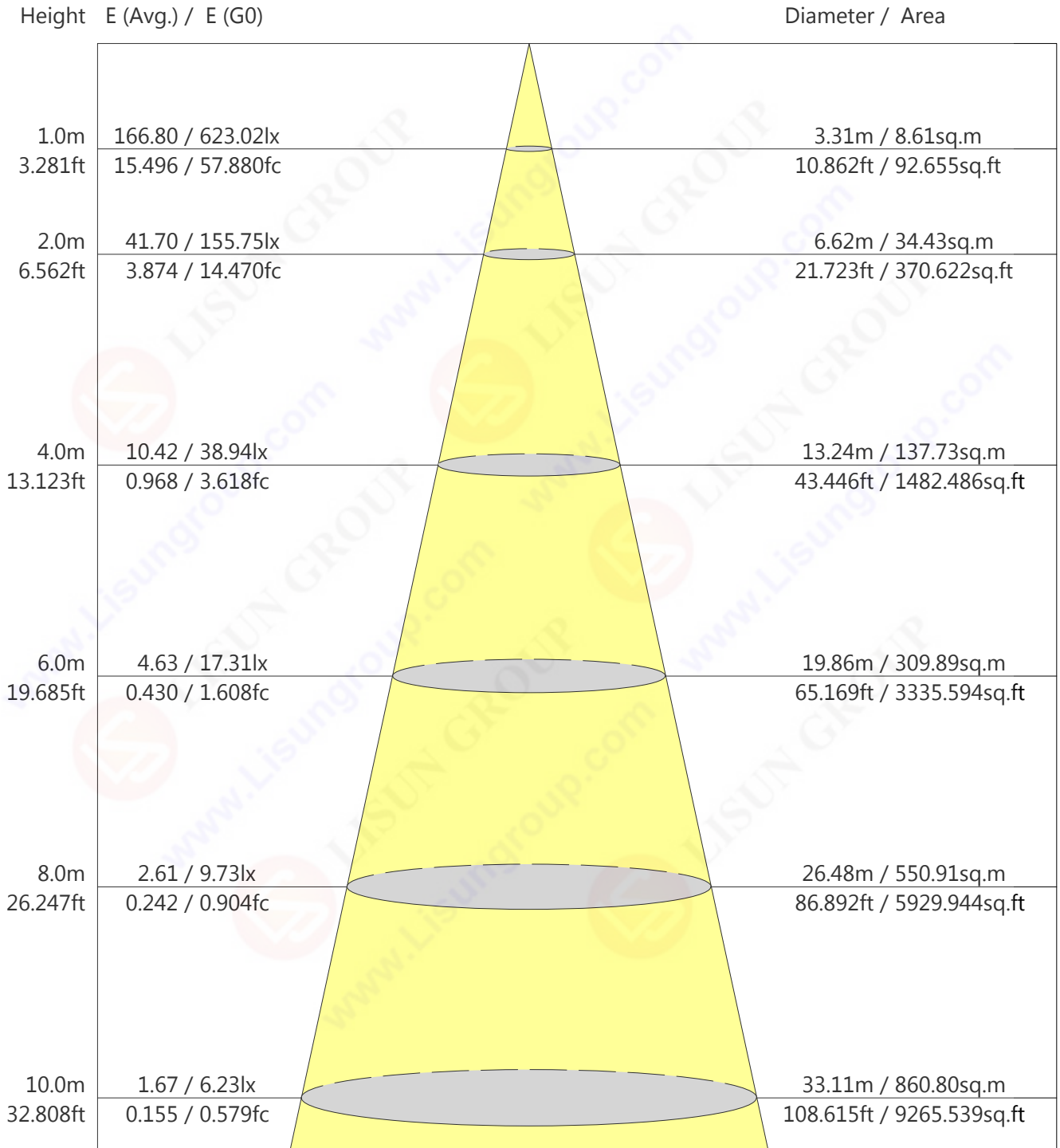
IsoLux



Vertical IsoLux Plot



Average Illuminance Effective Figure

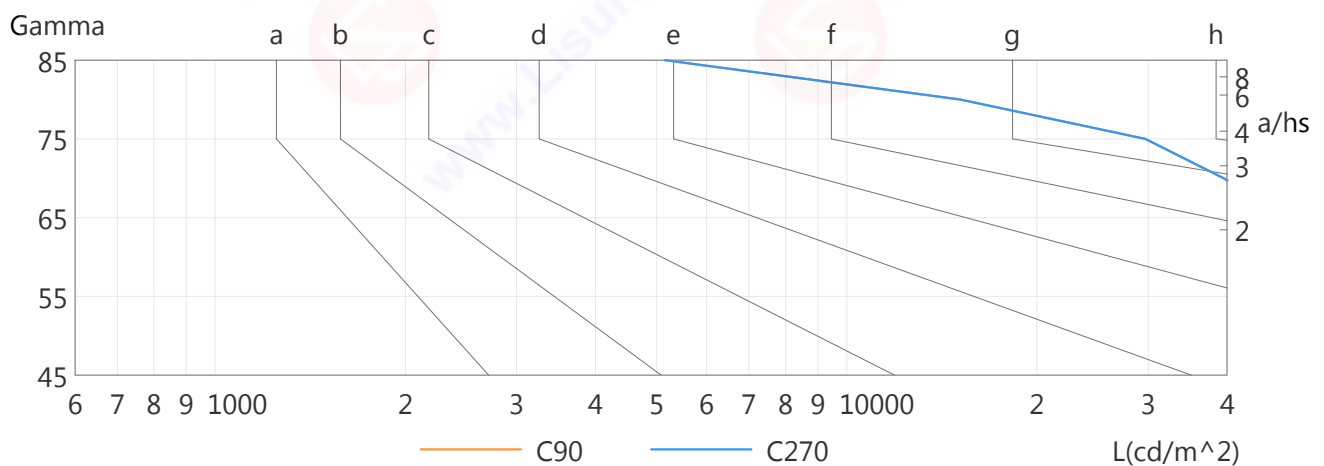
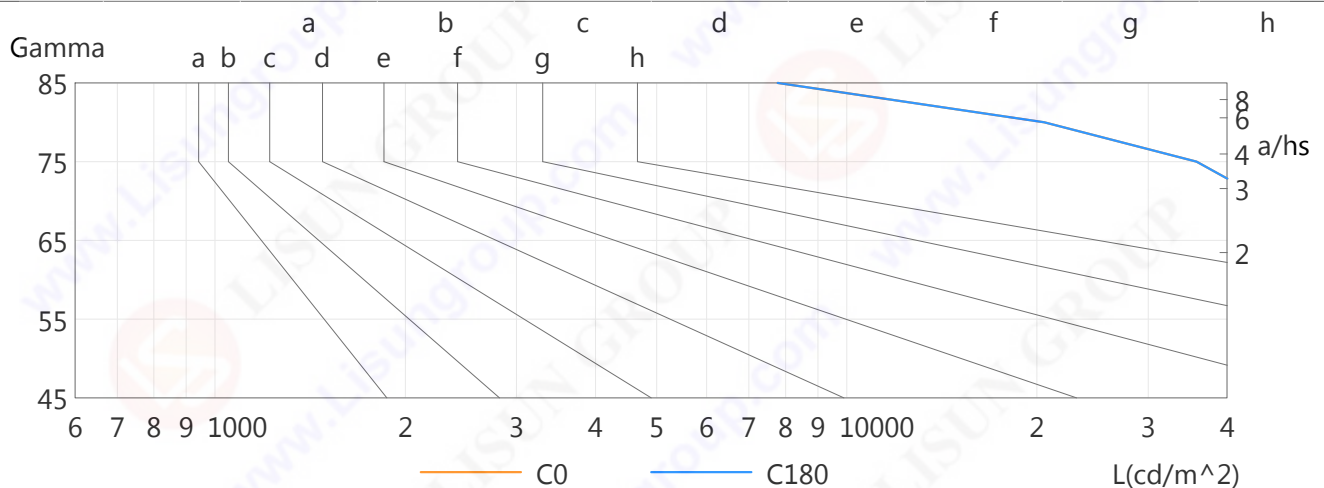


Beam Angle: 117.7° Flux Out: 1435.78lm

Lumen Limit Curve

L (cd/m ²)	G45	G50	G55	G60	G65	G70	G75	G80	G85
C0	63623	63026	62147	59578	55372	46527	35787	20533	7773
C90	61923	61177	59983	55985	50925	39505	29687	15134	5155
C270	63623	63026	62147	59578	55372	46527	35787	20533	7773
C90	61923	61177	59983	55985	50925	39505	29687	15134	5155

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	



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	1.03	1.22	1.36	1.46	1.59	1.68	1.75	1.83	1.88
	0.30		0.88	1.08	1.23	1.33	1.49	1.59	1.66	1.76	1.82
	0.20		0.78	0.98	1.13	1.24	1.40	1.51	1.59	1.69	1.76
0.50	0.50	0.20	1.00	1.18	1.31	1.41	1.53	1.62	1.68	1.75	1.80
	0.30		0.87	1.06	1.20	1.30	1.44	1.54	1.61	1.69	1.75
	0.20		0.78	0.97	1.11	1.22	1.37	1.47	1.54	1.64	1.71
0.30	0.50	0.20	0.97	1.15	1.27	1.36	1.48	1.56	1.61	1.68	1.73
	0.30		0.85	1.04	1.17	1.27	1.40	1.49	1.55	1.64	1.69
	0.20		0.77	0.96	1.10	1.20	1.34	1.43	1.50	1.59	1.65
0.00	0.00	0.00	0.73	0.91	1.04	1.14	1.28	1.37	1.43	1.51	1.56

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	1.78	1.46	1.23	1.06	0.84	0.69	0.59	0.45	0.36
	0.30		1.49	1.25	1.07	0.94	0.76	0.63	0.54	0.42	0.35
	0.20		1.28	1.09	0.95	0.84	0.69	0.58	0.51	0.40	0.33
0.50	0.50	0.20	1.72	1.40	1.18	1.02	0.80	0.72	0.56	0.42	0.34
	0.30		1.45	1.21	1.04	0.91	0.73	0.61	0.52	0.40	0.33
	0.20		1.26	1.07	0.93	0.82	0.67	0.56	0.49	0.38	0.32
0.30	0.50	0.20	1.67	1.34	1.13	0.97	0.76	0.62	0.53	0.40	0.33
	0.30		1.42	1.18	1.01	0.88	0.70	0.58	0.50	0.38	0.31
	0.20		1.25	1.05	0.91	0.81	0.65	0.55	0.47	0.37	0.30
0.00	0.00	0.00	1.06	0.88	0.74	0.65	0.51	0.42	0.36	0.28	0.23

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	0.31	0.33	0.34	0.35	0.37	0.38	0.39	0.40	0.40
	0.30		0.18	0.21	0.24	0.26	0.29	0.31	0.32	0.35	0.36
	0.20		0.10	0.13	0.15	0.18	0.22	0.25	0.27	0.30	0.32
0.50	0.50	0.20	0.30	0.32	0.33	0.34	0.36	0.36	0.37	0.38	0.39
	0.30		0.18	0.21	0.23	0.25	0.28	0.30	0.31	0.33	0.35
	0.20		0.10	0.13	0.15	0.18	0.21	0.24	0.26	0.29	0.31
0.30	0.50	0.20	0.29	0.31	0.32	0.33	0.34	0.35	0.36	0.36	0.37
	0.30		0.18	0.20	0.23	0.24	0.27	0.29	0.30	0.32	0.33
	0.20		0.10	0.12	0.15	0.17	0.21	0.23	0.25	0.28	0.30
0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Rating: 28W Photometrically tested without ceiling board.

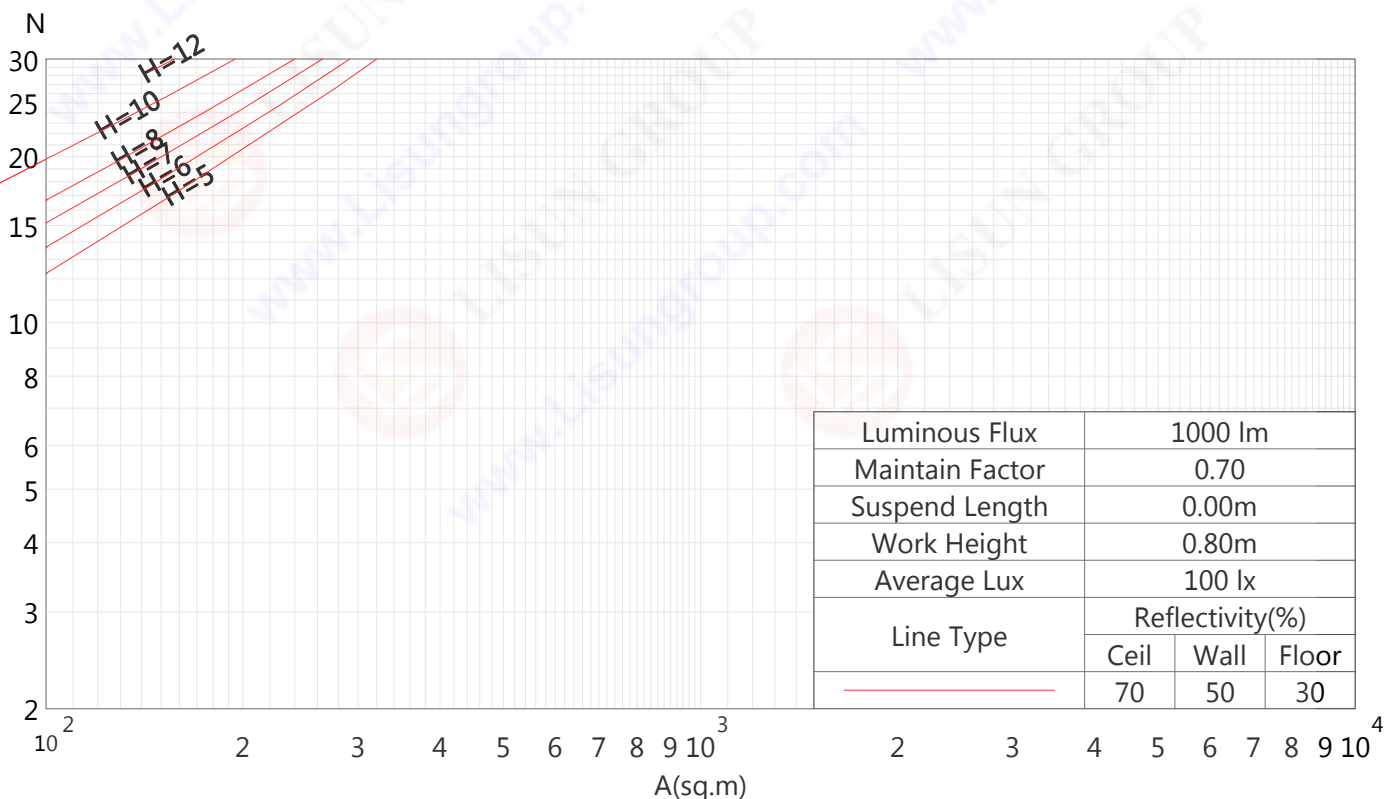
Multiply UF values by service correction factors

Calculate in accordance with CIBSE Technical Memorandum No.5/1980

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	214	214	214	214	209	209	209	209	199	199	199	190	190	190	182	182	182	178
1	197	189	181	175	192	184	178	172	176	171	166	169	165	161	163	159	156	152
2	179	165	153	143	174	161	151	141	155	146	138	149	141	135	143	137	131	128
3	163	145	131	119	159	142	129	118	136	125	116	131	122	114	127	119	112	108
4	150	128	113	101	145	126	111	100	121	109	99	117	106	97	113	104	96	92
5	137	115	99	87	134	112	97	86	109	95	85	105	93	84	101	91	83	79
6	127	103	87	76	123	101	86	75	98	84	74	95	83	74	92	81	73	69
7	117	93	78	67	114	92	77	66	89	75	66	86	74	65	84	73	65	61
8	109	85	70	59	106	84	69	59	81	68	59	79	67	58	77	66	58	54
9	102	78	63	53	99	77	63	53	75	62	53	73	61	52	71	60	52	49
10	96	72	58	48	93	71	57	48	69	56	48	67	56	47	65	55	47	44

Spacing Criteria: 1.31 (0-180), 1.29 (90-270), 1.42 (Diagonal)



Test Type : Type C Test Distance : 8.160 m
 Test Device : Lisun LSG-6000 (E312012J)
 Test Lab : LISUN Lab
 Test By : David

C Plane (°): 0.0-180.0:1.0 γ (°): 0.0-180.0:1.0
 Temperature : 25.0°C Humidity : 65.0%

Review By :

Report No. : 5

Test Time : 2021-04-02 15:13:16

Page 13 of 22

Zonal Flux

Gamma °	I _{mean} cd	Zonal Flux lm	Sum Zonal Flux lm	Rel Zonal Flux %	Sum Rel Zonal Flux %
0.0-1.0	623.1	0.6	0.6	0.06	0.06
1.0-2.0	623.2	1.8	2.4	0.18	0.24
2.0-3.0	623.0	3.0	5.4	0.30	0.54
3.0-4.0	622.6	4.2	9.5	0.42	0.95
4.0-5.0	622.1	5.4	14.9	0.54	1.49
5.0-6.0	621.4	6.5	21.4	0.65	2.14
6.0-7.0	620.6	7.7	29.1	0.77	2.91
7.0-8.0	619.6	8.9	38.0	0.89	3.80
8.0-9.0	618.3	10.0	48.0	1.00	4.80
9.0-10.0	616.7	11.2	59.2	1.12	5.92
10.0-11.0	614.9	12.3	71.5	1.23	7.15
11.0-12.0	612.9	13.4	84.9	1.34	8.49
12.0-13.0	610.6	14.5	99.4	1.45	9.94
13.0-14.0	608.3	15.6	114.9	1.56	11.49
14.0-15.0	605.7	16.6	131.6	1.66	13.16
15.0-16.0	603.0	17.7	149.2	1.77	14.92
16.0-17.0	600.0	18.7	167.9	1.87	16.79
17.0-18.0	597.1	19.7	187.6	1.97	18.76
18.0-19.0	593.9	20.7	208.3	2.07	20.83
19.0-20.0	590.6	21.6	229.9	2.16	22.99
20.0-21.0	587.2	22.6	252.4	2.26	25.24
21.0-22.0	583.6	23.5	275.9	2.35	27.59
22.0-23.0	579.6	24.3	300.2	2.43	30.02
23.0-24.0	575.7	25.2	325.4	2.52	32.54
24.0-25.0	571.6	26.0	351.4	2.60	35.14
25.0-26.0	567.2	26.8	378.2	2.68	37.82
26.0-27.0	562.8	27.5	405.7	2.75	40.57
27.0-28.0	558.0	28.3	434.0	2.83	43.40
28.0-29.0	553.0	28.9	462.9	2.89	46.29
29.0-30.0	548.0	29.6	492.5	2.96	49.25
30.0-31.0	542.9	30.2	522.7	3.02	52.27
31.0-32.0	537.5	30.8	553.5	3.08	55.35
32.0-33.0	531.6	31.3	584.8	3.13	58.48
33.0-34.0	525.9	31.8	616.6	3.18	61.66
34.0-35.0	519.9	32.3	648.9	3.23	64.89
35.0-36.0	513.7	32.7	681.7	3.27	68.17
36.0-37.0	507.3	33.1	714.7	3.31	71.47
37.0-38.0	500.6	33.4	748.2	3.34	74.82
38.0-39.0	493.8	33.7	781.9	3.37	78.19
39.0-40.0	486.7	33.9	815.8	3.39	81.58

 Test Type : Type C Test Distance : 8.160 m
 Test Device : Lisun LSG-6000 (E312012J)
 Test Lab : LISUN Lab
 Test By : David

 C Plane (°): 0.0-180.0:1.0 γ (°): 0.0-180.0:1.0
 Temperature : 25.0°C Humidity : 65.0%

Review By :

Report No. : 5

Test Time : 2021-04-02 15:13:16

Page 14 of 22

Zonal Flux

Gamma °	Imean cd	Zonal Flux lm	Sum Zonal Flux lm	Rel Zonal Flux %	Sum Rel Zonal Flux %
40.0-41.0	479.4	34.1	850.0	3.41	85.00
41.0-42.0	471.8	34.3	884.3	3.43	88.43
42.0-43.0	463.8	34.4	918.6	3.44	91.86
43.0-44.0	455.8	34.4	953.0	3.44	95.30
44.0-45.0	447.7	34.4	987.4	3.44	98.74
45.0-46.0	439.5	34.4	1021.8	3.44	102.18
46.0-47.0	431.2	34.3	1056.1	3.43	105.61
47.0-48.0	422.6	34.2	1090.3	3.42	109.03
48.0-49.0	413.4	34.0	1124.2	3.40	112.42
49.0-50.0	403.8	33.7	1157.9	3.37	115.79
50.0-51.0	394.1	33.3	1191.3	3.33	119.13
51.0-52.0	384.1	33.0	1224.2	3.30	122.42
52.0-53.0	373.8	32.5	1256.7	3.25	125.67
53.0-54.0	363.3	32.0	1288.8	3.20	128.88
54.0-55.0	352.9	31.5	1320.3	3.15	132.03
55.0-56.0	343.3	31.0	1351.3	3.10	135.13
56.0-57.0	331.7	30.3	1381.6	3.03	138.16
57.0-58.0	318.2	29.4	1411.1	2.94	141.11
58.0-59.0	305.5	28.6	1439.6	2.86	143.96
59.0-60.0	291.3	27.5	1467.1	2.75	146.71
60.0-61.0	278.7	26.6	1493.8	2.66	149.38
61.0-62.0	267.8	25.8	1519.6	2.58	151.96
62.0-63.0	255.7	24.9	1544.4	2.49	154.44
63.0-64.0	243.0	23.8	1568.3	2.38	156.83
64.0-65.0	228.9	22.7	1590.9	2.27	159.09
65.0-66.0	214.6	21.4	1612.3	2.14	161.23
66.0-67.0	199.7	20.1	1632.4	2.01	163.24
67.0-68.0	184.2	18.7	1651.1	1.87	165.11
68.0-69.0	168.6	17.2	1668.3	1.72	166.83
69.0-70.0	153.0	15.7	1684.0	1.57	168.40
70.0-71.0	137.6	14.2	1698.2	1.42	169.82
71.0-72.0	123.3	12.8	1711.1	1.28	171.11
72.0-73.0	110.6	11.6	1722.6	1.16	172.26
73.0-74.0	99.3	10.4	1733.1	1.04	173.31
74.0-75.0	88.6	9.4	1742.4	0.94	174.24
75.0-76.0	78.3	8.3	1750.7	0.83	175.07
76.0-77.0	67.8	7.2	1758.0	0.72	175.80
77.0-78.0	57.2	6.1	1764.1	0.61	176.41
78.0-79.0	47.0	5.1	1769.1	0.51	176.91
79.0-80.0	36.8	4.0	1773.1	0.40	177.31

 Test Type : Type C Test Distance : 8.160 m
 Test Device : Lisun LSG-6000 (E312012J)
 Test Lab : LISUN Lab
 Test By : David

 C Plane (°): 0.0-180.0:1.0 γ (°): 0.0-180.0:1.0
 Temperature : 25.0°C Humidity : 65.0%

Review By :

Report No. : 5

Test Time : 2021-04-02 15:13:16

Page 15 of 22

Zonal Flux

Gamma °	Imean cd	Zonal Flux lm	Sum Zonal Flux lm	Rel Zonal Flux %	Sum Rel Zonal Flux %
80.0-81.0	28.3	3.1	1776.2	0.31	177.62
81.0-82.0	22.4	2.4	1778.6	0.24	177.86
82.0-83.0	16.7	1.8	1780.4	0.18	178.04
83.0-84.0	11.3	1.2	1781.6	0.12	178.16
84.0-85.0	7.2	0.8	1782.4	0.08	178.24
85.0-86.0	4.5	0.5	1782.9	0.05	178.29
86.0-87.0	2.8	0.3	1783.2	0.03	178.32
87.0-88.0	1.8	0.2	1783.4	0.02	178.34
88.0-89.0	1.1	0.1	1783.6	0.01	178.36
89.0-90.0	0.8	0.1	1783.6	0.01	178.36
90.0-91.0	0.7	0.1	1783.7	0.01	178.37
91.0-92.0	0.7	0.1	1783.8	0.01	178.38
92.0-93.0	0.7	0.1	1783.9	0.01	178.39
93.0-94.0	0.8	0.1	1784.0	0.01	178.40
94.0-95.0	0.8	0.1	1784.0	0.01	178.40
95.0-96.0	0.9	0.1	1784.1	0.01	178.41
96.0-97.0	0.9	0.1	1784.2	0.01	178.42
97.0-98.0	1.0	0.1	1784.3	0.01	178.43
98.0-99.0	1.0	0.1	1784.4	0.01	178.44
99.0-100.0	1.0	0.1	1784.6	0.01	178.46
100.0-101.0	1.1	0.1	1784.7	0.01	178.47
101.0-102.0	1.1	0.1	1784.8	0.01	178.48
102.0-103.0	1.2	0.1	1784.9	0.01	178.49
103.0-104.0	1.3	0.1	1785.1	0.01	178.51
104.0-105.0	1.3	0.1	1785.2	0.01	178.52
105.0-106.0	1.4	0.1	1785.4	0.01	178.54
106.0-107.0	1.4	0.1	1785.5	0.01	178.55
107.0-108.0	1.5	0.2	1785.7	0.02	178.57
108.0-109.0	1.5	0.2	1785.8	0.02	178.58
109.0-110.0	1.6	0.2	1786.0	0.02	178.60
110.0-111.0	1.6	0.2	1786.1	0.02	178.61
111.0-112.0	1.7	0.2	1786.3	0.02	178.63
112.0-113.0	1.8	0.2	1786.5	0.02	178.65
113.0-114.0	1.8	0.2	1786.7	0.02	178.67
114.0-115.0	1.9	0.2	1786.9	0.02	178.69
115.0-116.0	1.9	0.2	1787.1	0.02	178.71
116.0-117.0	2.0	0.2	1787.3	0.02	178.73
117.0-118.0	2.0	0.2	1787.4	0.02	178.74
118.0-119.0	2.1	0.2	1787.7	0.02	178.76
119.0-120.0	2.1	0.2	1787.9	0.02	178.79

 Test Type : Type C Test Distance : 8.160 m
 Test Device : Lisun LSG-6000 (E312012J)
 Test Lab : LISUN Lab
 Test By : David

 C Plane (°): 0.0-180.0:1.0 γ (°): 0.0-180.0:1.0
 Temperature : 25.0°C Humidity : 65.0%

Review By :

Report No.: 5

Test Time : 2021-04-02 15:13:16

Page 16 of 22

Zonal Flux

Gamma °	I _{mean} cd	Zonal Flux lm	Sum Zonal Flux lm	Rel Zonal Flux %	Sum Rel Zonal Flux %
120.0-121.0	2.2	0.2	1788.1	0.02	178.81
121.0-122.0	2.3	0.2	1788.3	0.02	178.83
122.0-123.0	2.3	0.2	1788.5	0.02	178.85
123.0-124.0	2.4	0.2	1788.7	0.02	178.87
124.0-125.0	2.4	0.2	1788.9	0.02	178.89
125.0-126.0	2.5	0.2	1789.1	0.02	178.91
126.0-127.0	2.5	0.2	1789.4	0.02	178.94
127.0-128.0	2.6	0.2	1789.6	0.02	178.96
128.0-129.0	2.6	0.2	1789.8	0.02	178.98
129.0-130.0	2.7	0.2	1790.1	0.02	179.01
130.0-131.0	2.8	0.2	1790.3	0.02	179.03
131.0-132.0	2.8	0.2	1790.5	0.02	179.05
132.0-133.0	2.9	0.2	1790.7	0.02	179.07
133.0-134.0	2.9	0.2	1791.0	0.02	179.10
134.0-135.0	3.0	0.2	1791.2	0.02	179.12
135.0-136.0	3.0	0.2	1791.4	0.02	179.14
136.0-137.0	3.1	0.2	1791.7	0.02	179.17
137.0-138.0	3.1	0.2	1791.9	0.02	179.19
138.0-139.0	3.2	0.2	1792.1	0.02	179.21
139.0-140.0	3.2	0.2	1792.4	0.02	179.24
140.0-141.0	3.3	0.2	1792.6	0.02	179.26
141.0-142.0	3.3	0.2	1792.8	0.02	179.28
142.0-143.0	3.3	0.2	1793.0	0.02	179.30
143.0-144.0	3.4	0.2	1793.3	0.02	179.33
144.0-145.0	3.4	0.2	1793.5	0.02	179.35
145.0-146.0	3.5	0.2	1793.7	0.02	179.37
146.0-147.0	3.5	0.2	1793.9	0.02	179.39
147.0-148.0	3.6	0.2	1794.1	0.02	179.41
148.0-149.0	3.6	0.2	1794.3	0.02	179.43
149.0-150.0	3.6	0.2	1794.5	0.02	179.45
150.0-151.0	3.7	0.2	1794.7	0.02	179.47
151.0-152.0	3.7	0.2	1794.9	0.02	179.49
152.0-153.0	3.7	0.2	1795.1	0.02	179.51
153.0-154.0	3.8	0.2	1795.3	0.02	179.53
154.0-155.0	3.8	0.2	1795.5	0.02	179.55
155.0-156.0	3.8	0.2	1795.6	0.02	179.56
156.0-157.0	3.9	0.2	1795.8	0.02	179.58
157.0-158.0	3.9	0.2	1796.0	0.02	179.60
158.0-159.0	3.9	0.2	1796.1	0.02	179.61
159.0-160.0	3.9	0.2	1796.3	0.02	179.63

 Test Type : Type C Test Distance : 8.160 m
 Test Device : Lisun LSG-6000 (E312012J)
 Test Lab : LISUN Lab
 Test By : David

 C Plane (°): 0.0-180.0:1.0 γ (°): 0.0-180.0:1.0
 Temperature : 25.0°C Humidity : 65.0%
 Review By :

Report No.: 5

Test Time : 2021-04-02 15:13:16

Page 17 of 22

Zonal Flux

Gamma °	I _{mean} cd	Zonal Flux lm	Sum Zonal Flux lm	Rel Zonal Flux %	Sum Rel Zonal Flux %
160.0-161.0	4.0	0.1	1796.4	0.01	179.64
161.0-162.0	4.0	0.1	1796.6	0.01	179.66
162.0-163.0	4.0	0.1	1796.7	0.01	179.67
163.0-164.0	4.0	0.1	1796.8	0.01	179.68
164.0-165.0	4.1	0.1	1796.9	0.01	179.69
165.0-166.0	4.1	0.1	1797.1	0.01	179.71
166.0-167.0	4.1	0.1	1797.2	0.01	179.72
167.0-168.0	4.1	0.1	1797.3	0.01	179.73
168.0-169.0	4.1	0.1	1797.3	0.01	179.73
169.0-170.0	4.1	0.1	1797.4	0.01	179.74
170.0-171.0	4.2	0.1	1797.5	0.01	179.75
171.0-172.0	4.2	0.1	1797.6	0.01	179.76
172.0-173.0	4.2	0.1	1797.6	0.01	179.76
173.0-174.0	4.2	0.1	1797.7	0.01	179.77
174.0-175.0	4.2	0.0	1797.7	0.00	179.77
175.0-176.0	4.2	0.0	1797.8	0.00	179.78
176.0-177.0	4.2	0.0	1797.8	0.00	179.78
177.0-178.0	4.2	0.0	1797.8	0.00	179.78
178.0-179.0	4.2	0.0	1797.8	0.00	179.78
179.0-180.0	4.2	0.0	1797.8	0.00	179.78

 Test Type : Type C Test Distance : 8.160 m
 Test Device : Lisun LSG-6000 (E312012J)
 Test Lab : LISUN Lab
 Test By : David

 C Plane (°): 0.0-180.0:1.0 γ (°): 0.0-180.0:1.0
 Temperature : 25.0°C Humidity : 65.0%
 Review By :

Report No.: 5

Test Time : 2021-04-02 15:13:16

Page 18 of 22

Light Distribution Data

Unit: cd

G\C	C0.0	C30.0	C60.0	C90.0				
G0.0	623.0	623.0	623.0	623.0				
G1.0	623.1	623.2	623.1	623.2				
G2.0	623.2	623.2	623.1	623.2				
G3.0	623.0	622.9	622.8	622.7				
G4.0	622.8	622.4	622.3	622.3				
G5.0	622.3	621.7	621.8	621.6				
G6.0	621.8	620.9	621.0	620.8				
G7.0	620.8	620.1	620.2	619.9				
G8.0	620.0	618.9	618.8	618.7				
G9.0	618.7	617.4	617.3	617.1				
G10.0	617.2	615.8	615.6	615.2				
G11.0	615.5	614.0	613.5	613.1				
G12.0	613.7	611.7	611.4	610.8				
G13.0	611.6	609.4	609.1	608.5				
G14.0	609.5	606.7	606.6	605.8				
G15.0	606.8	604.3	603.9	603.2				
G16.0	604.0	601.2	601.3	600.2				
G17.0	601.0	598.1	598.4	597.1				
G18.0	598.1	595.2	595.6	594.3				
G19.0	594.4	591.8	592.3	590.8				
G20.0	591.1	588.4	589.1	587.3				
G21.0	587.8	584.9	585.8	583.7				
G22.0	584.1	581.0	582.1	579.9				
G23.0	580.0	576.9	578.0	575.7				
G24.0	576.3	573.2	574.4	571.8				
G25.0	571.8	568.4	569.9	567.2				
G26.0	567.9	564.2	565.8	562.8				
G27.0	563.0	559.7	561.5	557.5				
G28.0	558.6	554.0	556.8	552.6				
G29.0	553.9	548.8	551.9	547.5				
G30.0	548.8	544.3	546.8	542.0				
G31.0	544.5	538.7	541.5	537.3				
G32.0	538.8	532.8	535.8	531.4				
G33.0	532.8	526.3	530.8	525.1				
G34.0	527.7	520.9	524.6	519.6				
G35.0	521.2	514.0	519.3	512.6				
G36.0	515.5	508.1	512.5	506.8				
G37.0	508.3	502.0	506.4	499.1				
G38.0	501.9	494.4	500.1	492.6				
G39.0	495.3	487.7	493.4	485.3				

 Test Type : Type C
 Test Device : Lisun LSG-6000 (E312012J)
 Test Lab : LISUN Lab
 Test By : David

Test Distance : 8.160 m

 C Plane (°): 0.0-180.0:1.0
 Temperature : 25.0°C

 γ (°): 0.0-180.0:1.0
 Humidity : 65.0%

Review By :

Report No.: 5

Test Time : 2021-04-02 15:13:16

Page 19 of 22

Light Distribution Data

Unit: cd

G\C	C0.0	C30.0	C60.0	C90.0				
G40.0	488.5	480.5	485.0	477.9				
G41.0	481.6	473.4	478.1	470.5				
G42.0	472.7	465.9	470.7	461.2				
G43.0	465.0	456.6	463.4	453.4				
G44.0	457.4	448.8	455.6	445.7				
G45.0	449.9	440.7	446.0	437.9				
G46.0	441.9	432.6	438.0	429.9				
G47.0	433.4	424.0	429.4	421.7				
G48.0	424.7	415.3	420.4	413.2				
G49.0	413.9	406.4	411.4	402.5				
G50.0	405.1	395.3	402.1	393.2				
G51.0	396.2	385.7	392.4	383.6				
G52.0	386.7	375.8	380.5	373.9				
G53.0	376.7	365.6	370.1	363.5				
G54.0	366.6	354.9	359.6	352.7				
G55.0	356.5	344.3	348.6	344.0				
G56.0	344.2	342.2	337.4	330.0				
G57.0	333.3	321.9	325.8	318.5				
G58.0	321.8	308.1	314.3	304.3				
G59.0	310.0	296.3	300.3	292.2				
G60.0	297.9	284.1	277.1	279.9				
G61.0	283.5	271.9	274.7	267.8				
G62.0	264.4	259.2	265.1	255.6				
G63.0	259.2	246.5	252.4	243.1				
G64.0	246.6	231.6	239.2	227.9				
G65.0	234.0	219.1	221.6	215.2				
G66.0	221.4	205.7	204.9	201.7				
G67.0	205.9	191.7	187.6	187.1				
G68.0	191.8	176.5	171.9	170.3				
G69.0	176.0	160.4	157.3	153.7				
G70.0	159.1	143.7	144.8	135.1				
G71.0	142.8	126.9	130.7	122.4				
G72.0	127.0	113.1	117.7	110.3				
G73.0	113.7	102.3	106.2	97.3				
G74.0	101.8	92.0	95.3	86.8				
G75.0	92.6	80.3	84.7	76.8				
G76.0	82.7	70.1	74.6	67.7				
G77.0	72.3	57.1	65.1	56.8				
G78.0	62.2	46.8	54.5	47.4				
G79.0	51.0	38.5	43.1	38.0				

 Test Type : Type C
 Test Device : Lisun LSG-6000 (E312012J)
 Test Lab : LISUN Lab
 Test By : David

Test Distance : 8.160 m

 C Plane (°): 0.0-180.0:1.0
 Temperature : 25.0°C

 γ (°): 0.0-180.0:1.0
 Humidity : 65.0%

Review By :

Report No.: 5

Test Time : 2021-04-02 15:13:16

Page 20 of 22

Light Distribution Data

Unit: cd

G\C	C0.0	C30.0	C60.0	C90.0				
G80.0	35.7	30.7	32.9	26.3				
G81.0	29.0	23.1	26.9	21.5				
G82.0	21.0	18.5	21.5	16.9				
G83.0	15.9	13.4	14.7	10.8				
G84.0	10.9	8.1	9.5	7.0				
G85.0	6.8	4.8	6.4	4.5				
G86.0	4.3	2.9	3.6	2.8				
G87.0	2.9	1.9	2.4	1.8				
G88.0	1.9	1.1	1.5	1.1				
G89.0	1.2	0.7	0.8	0.7				
G90.0	0.9	0.7	0.7	0.7				
G91.0	0.7	0.7	0.7	0.7				
G92.0	0.7	0.7	0.7	0.8				
G93.0	0.7	0.8	0.7	0.8				
G94.0	0.8	0.8	0.8	0.8				
G95.0	0.8	0.8	0.8	0.9				
G96.0	0.9	0.9	0.9	0.9				
G97.0	0.9	0.9	0.9	1.0				
G98.0	0.9	1.0	1.0	1.0				
G99.0	1.0	1.0	1.0	1.1				
G100.0	1.0	1.1	1.1	1.1				
G101.0	1.1	1.1	1.1	1.2				
G102.0	1.1	1.2	1.2	1.2				
G103.0	1.2	1.3	1.2	1.3				
G104.0	1.2	1.3	1.3	1.3				
G105.0	1.3	1.4	1.3	1.4				
G106.0	1.4	1.4	1.4	1.4				
G107.0	1.4	1.5	1.4	1.5				
G108.0	1.5	1.5	1.5	1.5				
G109.0	1.5	1.6	1.5	1.6				
G110.0	1.6	1.6	1.6	1.6				
G111.0	1.6	1.7	1.7	1.7				
G112.0	1.7	1.7	1.7	1.8				
G113.0	1.7	1.8	1.8	1.8				
G114.0	1.8	1.9	1.8	1.9				
G115.0	1.8	1.9	1.9	1.9				
G116.0	1.9	2.0	2.0	2.0				
G117.0	2.0	2.0	2.0	2.0				
G118.0	2.0	2.1	2.1	2.1				
G119.0	2.1	2.1	2.1	2.1				

 Test Type : Type C Test Distance : 8.160 m
 Test Device : Lisun LSG-6000 (E312012J)
 Test Lab : LISUN Lab
 Test By : David

 C Plane (°): 0.0-180.0:1.0 γ (°): 0.0-180.0:1.0
 Temperature : 25.0°C Humidity : 65.0%

Review By :

Report No. : 5

Test Time : 2021-04-02 15:13:16

Page 21 of 22

Light Distribution Data

Unit: cd

G\C	C0.0	C30.0	C60.0	C90.0				
G120.0	2.1	2.2	2.2	2.2				
G121.0	2.2	2.2	2.2	2.2				
G122.0	2.2	2.3	2.3	2.3				
G123.0	2.3	2.4	2.3	2.4				
G124.0	2.4	2.4	2.4	2.4				
G125.0	2.4	2.5	2.4	2.5				
G126.0	2.5	2.5	2.5	2.5				
G127.0	2.5	2.6	2.6	2.6				
G128.0	2.6	2.6	2.6	2.6				
G129.0	2.6	2.7	2.7	2.7				
G130.0	2.7	2.8	2.7	2.7				
G131.0	2.7	2.8	2.8	2.8				
G132.0	2.8	2.8	2.8	2.9				
G133.0	2.9	2.9	2.9	2.9				
G134.0	2.9	3.0	2.9	2.9				
G135.0	2.9	3.0	3.0	3.0				
G136.0	3.0	3.1	3.0	3.1				
G137.0	3.0	3.1	3.1	3.1				
G138.0	3.1	3.2	3.1	3.2				
G139.0	3.2	3.2	3.2	3.2				
G140.0	3.2	3.3	3.2	3.2				
G141.0	3.2	3.3	3.3	3.3				
G142.0	3.3	3.4	3.3	3.3				
G143.0	3.3	3.4	3.4	3.4				
G144.0	3.4	3.4	3.4	3.4				
G145.0	3.4	3.5	3.4	3.5				
G146.0	3.5	3.5	3.5	3.5				
G147.0	3.5	3.6	3.5	3.5				
G148.0	3.5	3.6	3.6	3.6				
G149.0	3.6	3.6	3.6	3.6				
G150.0	3.6	3.7	3.6	3.6				
G151.0	3.6	3.7	3.7	3.7				
G152.0	3.7	3.7	3.7	3.7				
G153.0	3.7	3.8	3.7	3.7				
G154.0	3.7	3.8	3.8	3.8				
G155.0	3.8	3.8	3.8	3.8				
G156.0	3.8	3.8	3.8	3.8				
G157.0	3.8	3.9	3.9	3.9				
G158.0	3.9	3.9	3.9	3.9				
G159.0	3.9	3.9	3.9	3.9				

 Test Type : Type C Test Distance : 8.160 m
 Test Device : Lisun LSG-6000 (E312012J)
 Test Lab : LISUN Lab
 Test By : David

 C Plane (°): 0.0-180.0:1.0 γ (°): 0.0-180.0:1.0
 Temperature : 25.0°C Humidity : 65.0%
 Review By :

Report No.: 5

Test Time : 2021-04-02 15:13:16

Page 22 of 22

Light Distribution Data

Unit: cd

G\C	C0.0	C30.0	C60.0	C90.0				
G160.0	3.9	4.0	4.0	3.9				
G161.0	3.9	4.0	4.0	4.0				
G162.0	4.0	4.0	4.0	4.0				
G163.0	4.0	4.0	4.0	4.0				
G164.0	4.0	4.0	4.0	4.0				
G165.0	4.0	4.1	4.1	4.1				
G166.0	4.1	4.1	4.1	4.1				
G167.0	4.1	4.1	4.1	4.1				
G168.0	4.1	4.1	4.1	4.1				
G169.0	4.1	4.1	4.1	4.1				
G170.0	4.1	4.1	4.2	4.1				
G171.0	4.1	4.2	4.2	4.1				
G172.0	4.2	4.2	4.2	4.2				
G173.0	4.2	4.2	4.2	4.2				
G174.0	4.2	4.2	4.2	4.2				
G175.0	4.2	4.2	4.2	4.2				
G176.0	4.2	4.2	4.2	4.2				
G177.0	4.2	4.2	4.2	4.2				
G178.0	4.2	4.2	4.2	4.2				
G179.0	4.2	4.2	4.3	4.2				
G180.0	4.2	4.2	4.3	4.2				

 Test Type : Type C
 Test Device : Lisun LSG-6000 (E312012J)
 Test Lab : LISUN Lab
 Test By : David

Test Distance : 8.160 m

 C Plane (°): 0.0-180.0:1.0
 Temperature : 25.0°C

 γ (°): 0.0-180.0:1.0
 Humidity : 65.0%

Review By :