



Compact Goniospectroradiometer (LSG-1200ACCD)

Brochure

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Leader in Lighting & Electrical Test Instruments

Rev. 7/6/2021



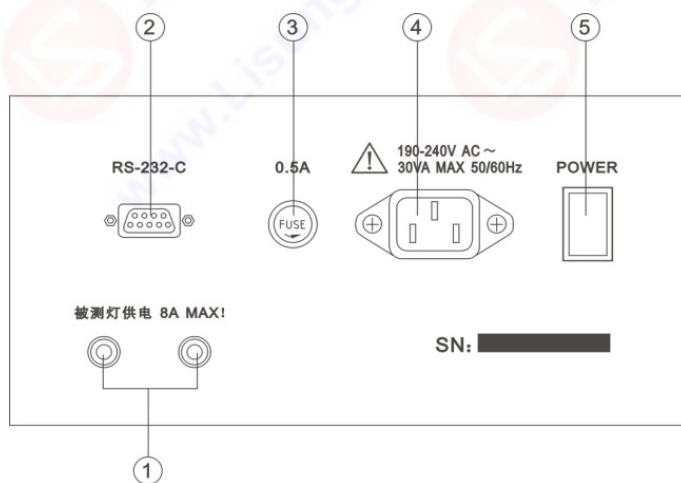
The compact Goniophotometer of LSG-1200ACCD, various dark rooms are selectable according to the size of tested lamps. It is used to measure the luminous intensity distribution curve, intensity data, spread angle and other parameters for Chip LED, LED Module, LED Spotlight and all other light **which beam angle is no more than 180 degree.**

Option Function: The LSG-1200ACCD can work with a Digital Power Meter [[LS2010 Digital Power Meter Harmonic Analyzer Model](#) or [LS2012 DC & AC Power Meter](#)] and AC Power Source ([LSP-500VAR Pure Sine Wave AC Power Source](#))

Measures:

Electronic parameters, spatial intensity distribution curve, spatial iso-intensity curve, iso-illuminance distribution curve, luminance limitation curve, luminaire efficiency, glare grade, effective beam angle, upward luminous flux ratio, downward luminous flux ratio, total luminous flux, effective luminous flux, utilization factor.

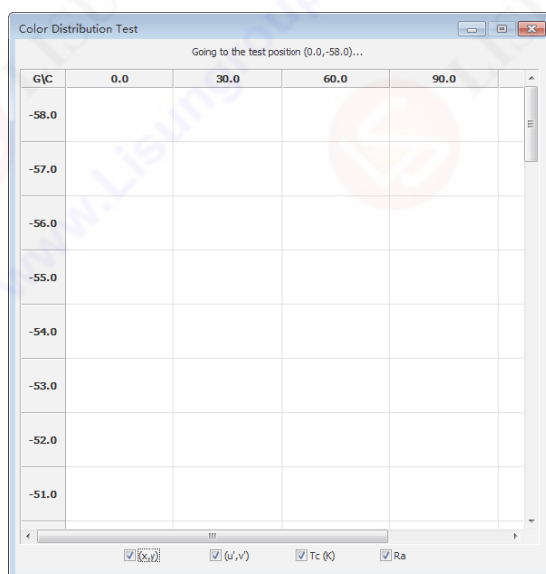
- **Host Rear Panel Diagram**



Picture 1

Technical Specification:

- LSG-1200ACCD has included a dark case
- Test range of luminosity: 0.1~30,000lx
- Test accuracy of luminosity: Class A
- Test range of angle:
 - LSG-1200ACCD: Horizontal angle: $-0^{\circ} \sim 360^{\circ}$ (Automatic)
 - Vertical angle: $-90^{\circ} \sim +90^{\circ}$ (Automatic)
- Test accuracy of angle: $\pm 0.2^{\circ}$
- Angle interval: Horizontal angle: $1^{\circ}/5^{\circ}/10^{\circ}/15^{\circ}/22.5^{\circ}/30^{\circ}/45^{\circ}/90^{\circ}$
Vertical angle: $0.5^{\circ}/2^{\circ}/1.5^{\circ}$
- Measure the maximum size of lamps: diameter=180mm
- The distance between the tested lamp and detector is 316mm or 1000mm
- Measure beam angle automatically: staple half intensity angle as well as 1/4 intensity angle, 3/4 intensity angle and 1/10 intensity angle which meets the special requirements.
- Draw spatial luminous intensity distributional curve automatically (polar coordinates and right-angle coordinates)
- Measured data match with international standard form (IES) and can be applied for lighting design by other lighting design software such as Dialux
- Meets the requirements of IEC, CIE and LM-79 standards
- 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: 380nm~800nm; Accuracy: ± 0.5 nm
- The Hardware and Software can do the PAR, PPF and PPFD 3D distribution test, which can export IES/LDT files.
- English version software can run in Win7, Win8 or Win10.



Typical overseas market customers:

Please get the reference customers' information from Lisun Oversea Sales Dept.

The Next Page is the Test Report by software

Report No.:

Test Time: 2019-05-27 15:48

Luminaire Property

Luminaire Category:

Luminaire Manufacturer: LISUN

Lumens per Lamp: 35

Width (mm): 50

Voltage: 220 V

Power: 3 W

Number of Lamps: 5

Length (mm): 50

Height (mm): 30

Current: 0.028 A

Power Factor: 0.478

Photometric Results

CIE Class: Direct

Measurement Flux: 126.7 lm

Downward Ratio: 72.42%

Field Angle(C0/C180,C90/C270,C45/C225,C135/315): 50.4, 51.0, 50.8, 50.6

Beam Angle(C0/C180,C90/C270,C45/C225,C135/315): 27.7, 27.7, 27.7, 27.7

Luminaire Efficacy Rating (LER): 42.30

Max. Intensity: 440.35 cd

S/MH(C0/C180): 0.47

Total Rated Lamp Lumens: 175.0 lm

Efficiency: 72.42%

Upward Ratio: 0.00%

Central Intensity: 435.54 cd

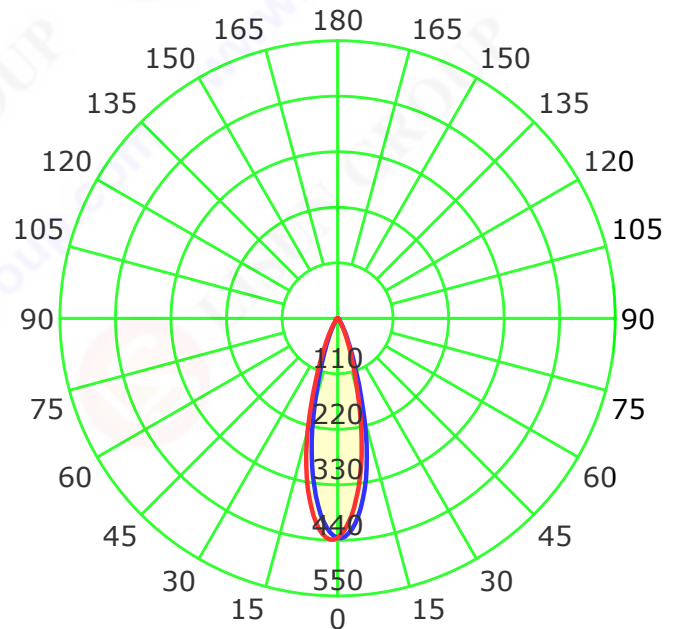
Pos of Max. Intensity: H292.5 V2

S/MH(C90/C270): 0.47

Picture Of Luminaire



Luminous Intensity Distribution Curve



Average Diffuse Angle(50%): 27.7°

— C0-C180 — C90-C270

C Plane (°):0.0-360.0: 22.5

Test Lab: LISUN

Test Type: TYPE C

Temperature: 25

Operator: Jacky

Gamma Plane (°):0.0-90.0:1.0

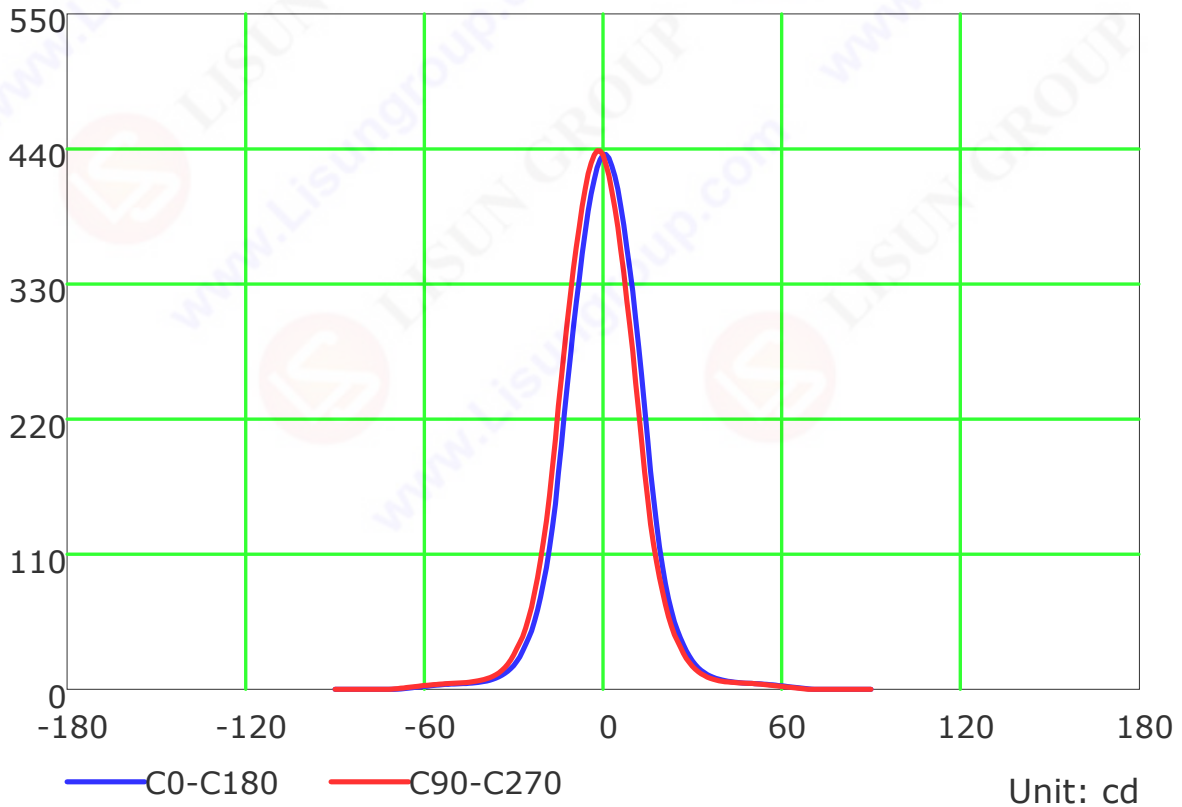
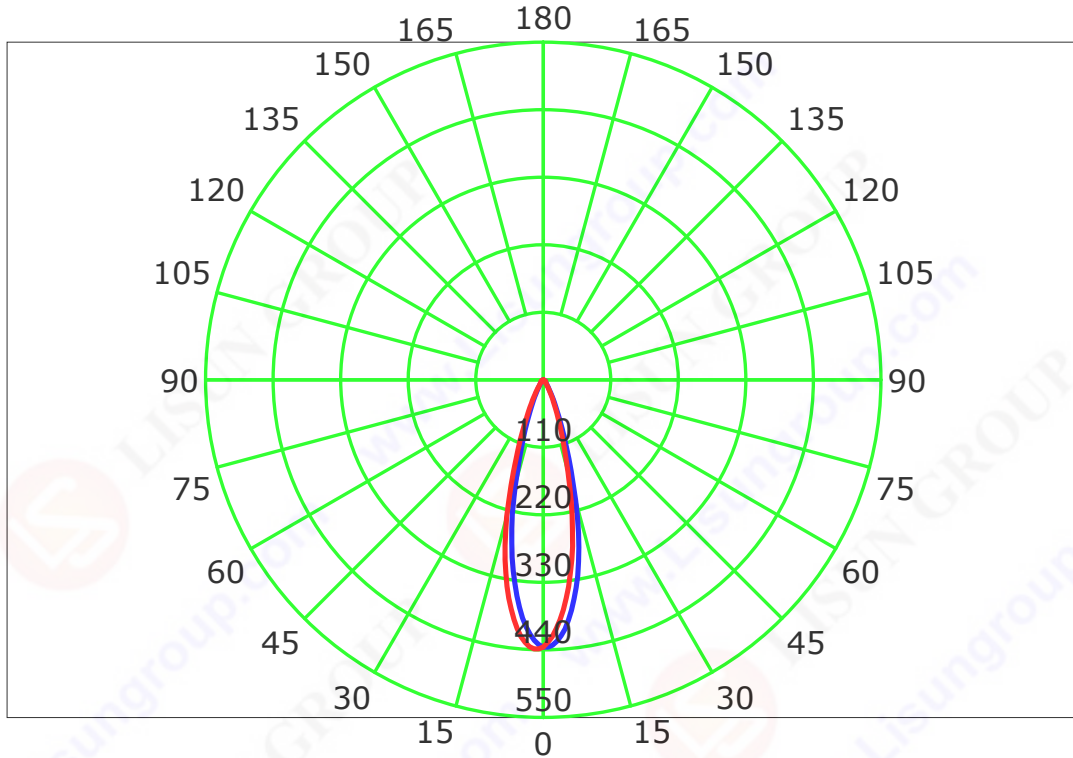
Test Device: LSG-1200A

Distance: 1.000 m

Humidity: 65

Inspector:

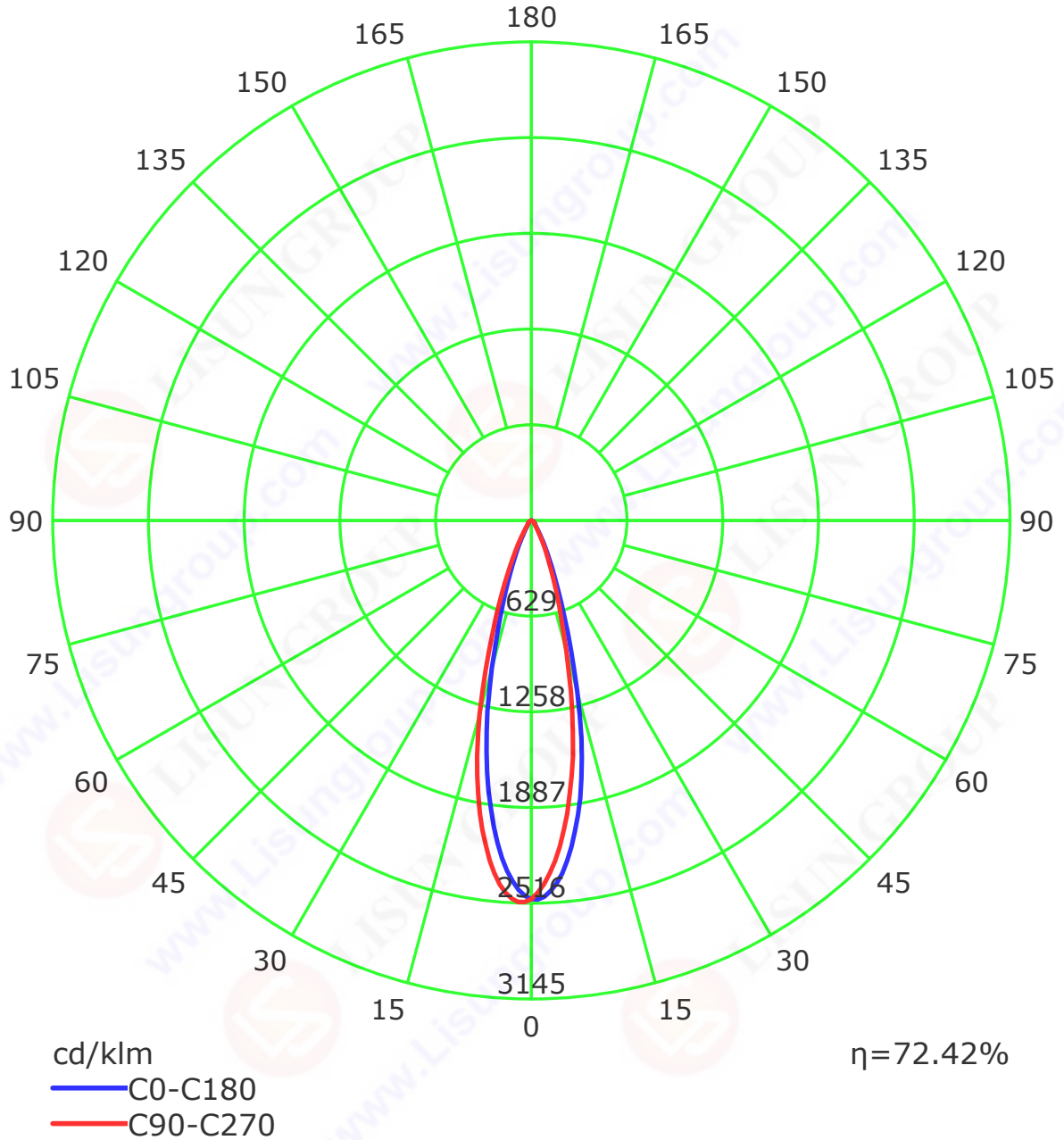
Luminous Intensity Distribution Curve



C Plane (°):0.0-360.0: 22.5
 Test Lab: LISUN
 Test Type: TYPE C
 Temperature: 25
 Operator: Jacky

Gamma Plane (°):0.0-90.0:1.0
 Test Device: LSG-1200A
 Distance: 1.000 m
 Humidity: 65
 Inspector:

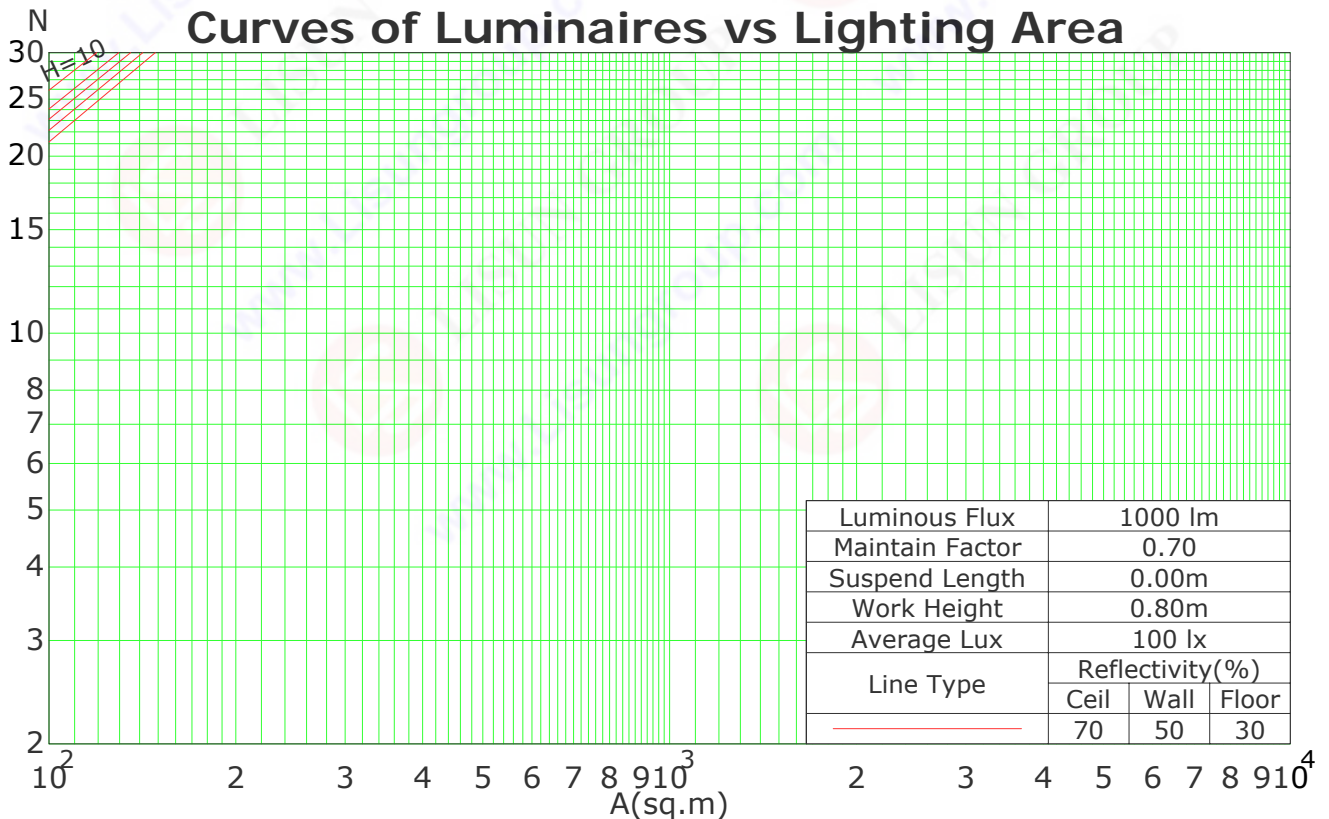
Luminous Intensity Distribution Curve(cd/klm)



Coefficients Of Utilization - Zonal Cavity Method

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	86	86	86	86	84	84	84	84	80	80	80	77	77	77	74	74	74	72
1	83	81	80	78	81	80	78	77	77	76	75	74	73	72	72	71	70	69
2	80	77	74	72	78	75	73	71	73	71	70	71	70	68	69	68	67	66
3	76	73	70	67	75	72	69	67	70	67	66	68	66	65	67	65	64	63
4	74	69	66	63	72	68	65	63	67	64	62	65	63	61	64	62	61	60
5	71	66	62	60	70	65	62	60	64	61	59	63	61	59	62	60	58	57
6	68	63	60	57	67	63	59	57	62	59	57	61	58	56	60	58	56	55
7	66	61	57	55	65	60	57	55	59	56	54	59	56	54	58	56	54	53
8	64	58	55	52	63	58	55	52	57	54	52	57	54	52	56	54	52	51
9	62	56	53	51	61	56	53	50	55	52	50	55	52	50	54	52	50	49
10	60	54	51	49	59	54	51	49	54	51	49	53	50	49	53	50	48	48

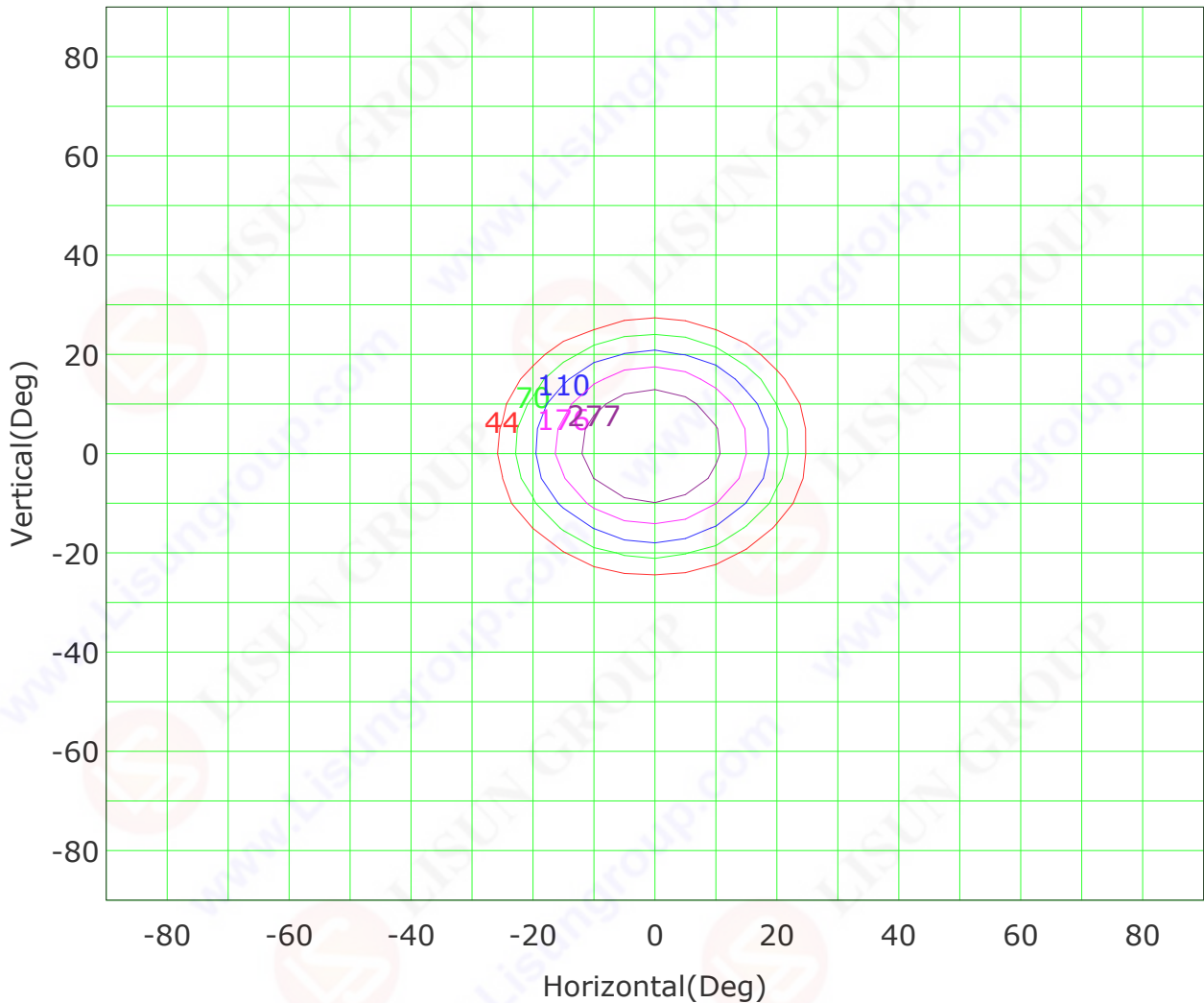
Spacing Criteria (0-180): 0.47
 Spacing Criteria (90-270): 0.47
 Spacing Criteria (Diagonal): 0.46



C Plane (°):0.0-360.0: 22.5
 Test Lab: LISUN
 Test Type: TYPE C
 Temperature: 25
 Operator: Jacky

Gamma Plane (°):0.0-90.0:1.0
 Test Device: LSG-1200A
 Distance: 1.000 m
 Humidity: 65
 Inspector:

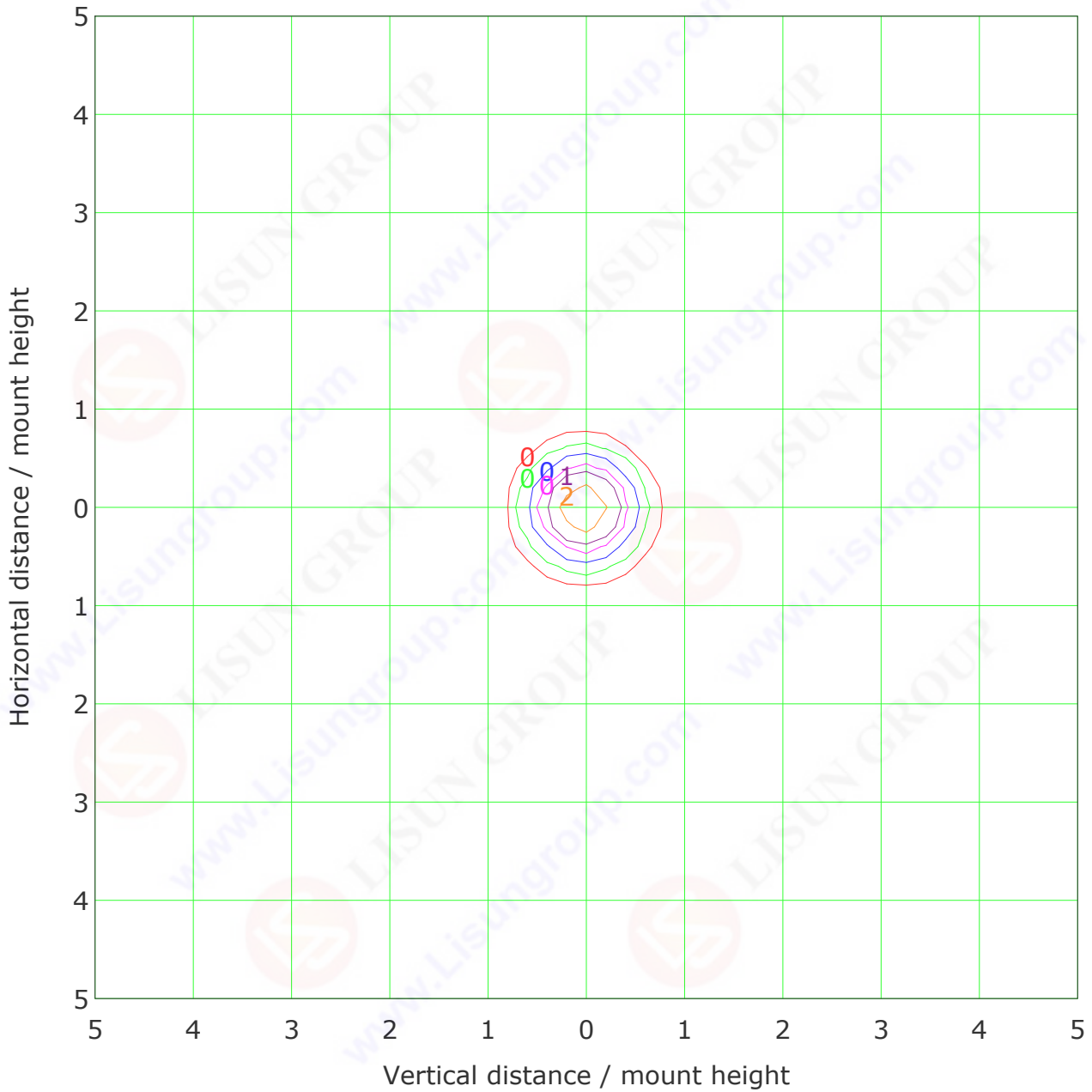
Isocandela (rectangle)



Imax (100%): 440 cd

— (10%):	44 cd	— (16%):	70 cd
— (25%):	110 cd	— (40%):	176 cd
— (63%):	277 cd	— (100%):	440 cd

IsoLux Plot



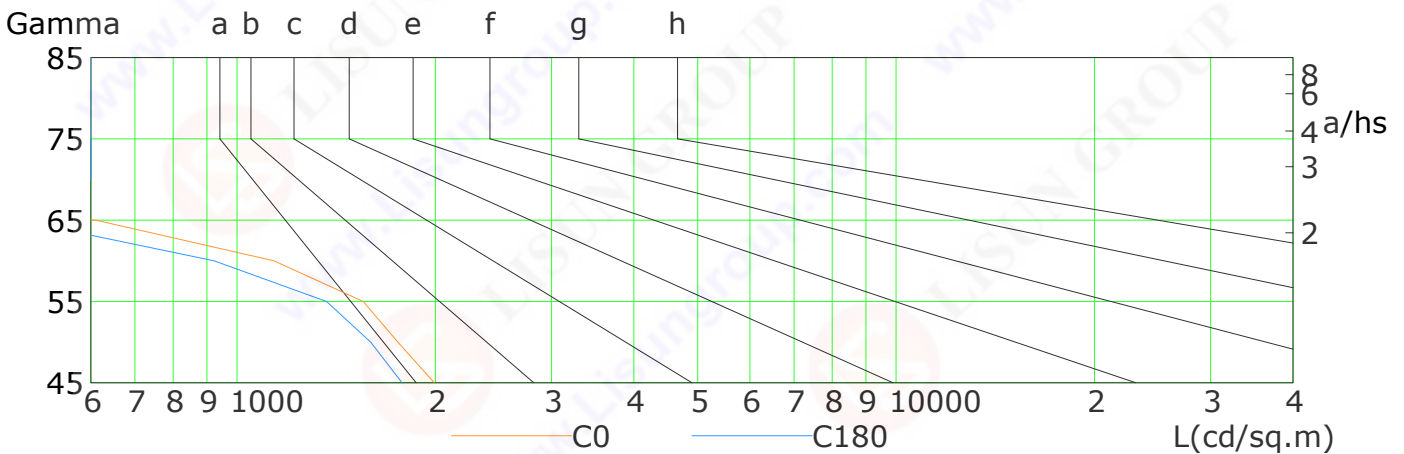
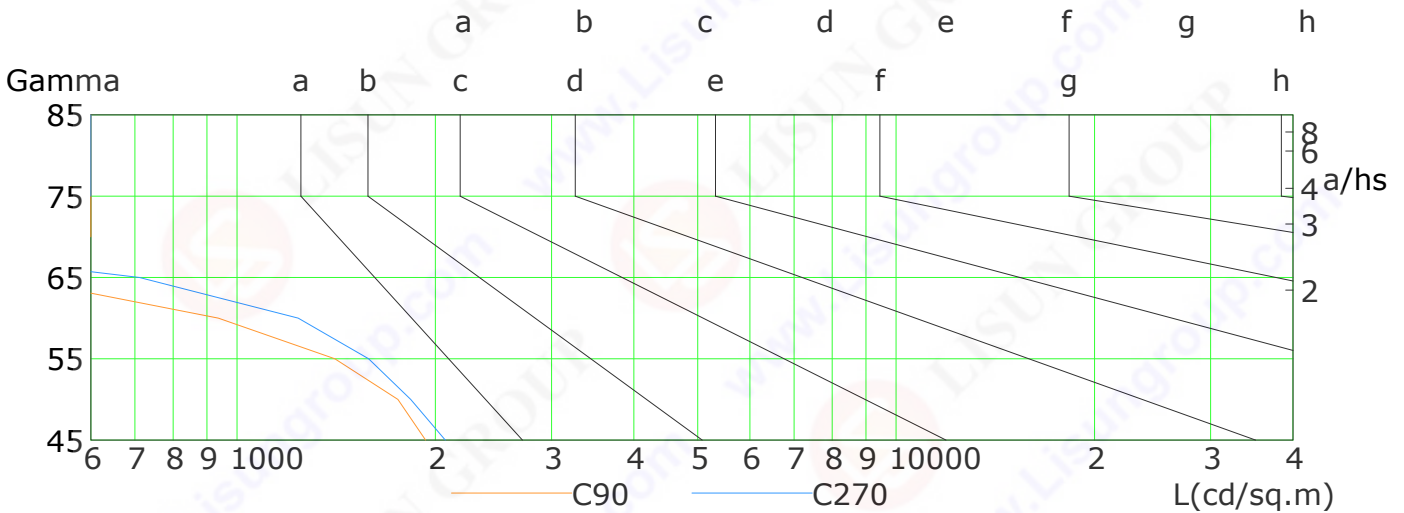
Mounting Height: 10.0m		Max Lux(100%): 4.4 lx	
<ul style="list-style-type: none"> — (1%): 0.0 lx — (5%): 0.2 lx — (20%): 0.9 lx — (100%): 4.4 lx 	<ul style="list-style-type: none"> — (2%): 0.1 lx — (10%): 0.4 lx — (50%): 2.2 lx 		

C Plane (°):0.0-360.0: 22.5
 Test Lab: LISUN
 Test Type: TYPE C
 Temperature: 25
 Operator: Jacky

Gamma Plane (°):0.0-90.0:1.0
 Test Device: LSG-1200A
 Distance: 1.000 m
 Humidity: 65
 Inspector:

Lum Limit Curve

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

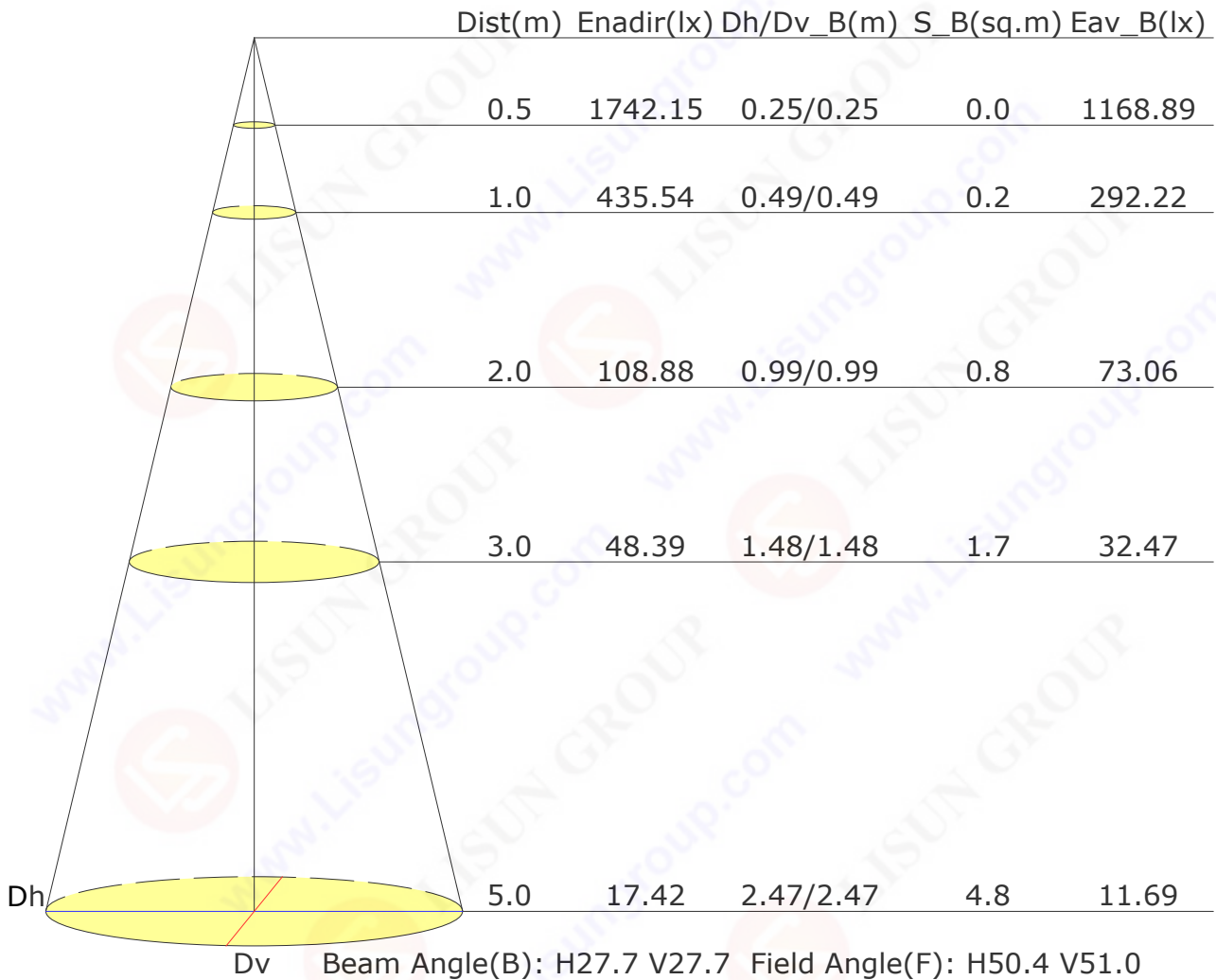


L(cd/sq.m)	G45	G50	G55	G60	G65	G70	G75	G80	G85
C0	1991	1754	1554	1138	611	83	0	0	0
C90	1932	1755	1407	937	455	0	0	0	0
C180	1780	1595	1367	923	466	0	0	0	0
C270	2070	1834	1583	1239	711	221	0	0	0

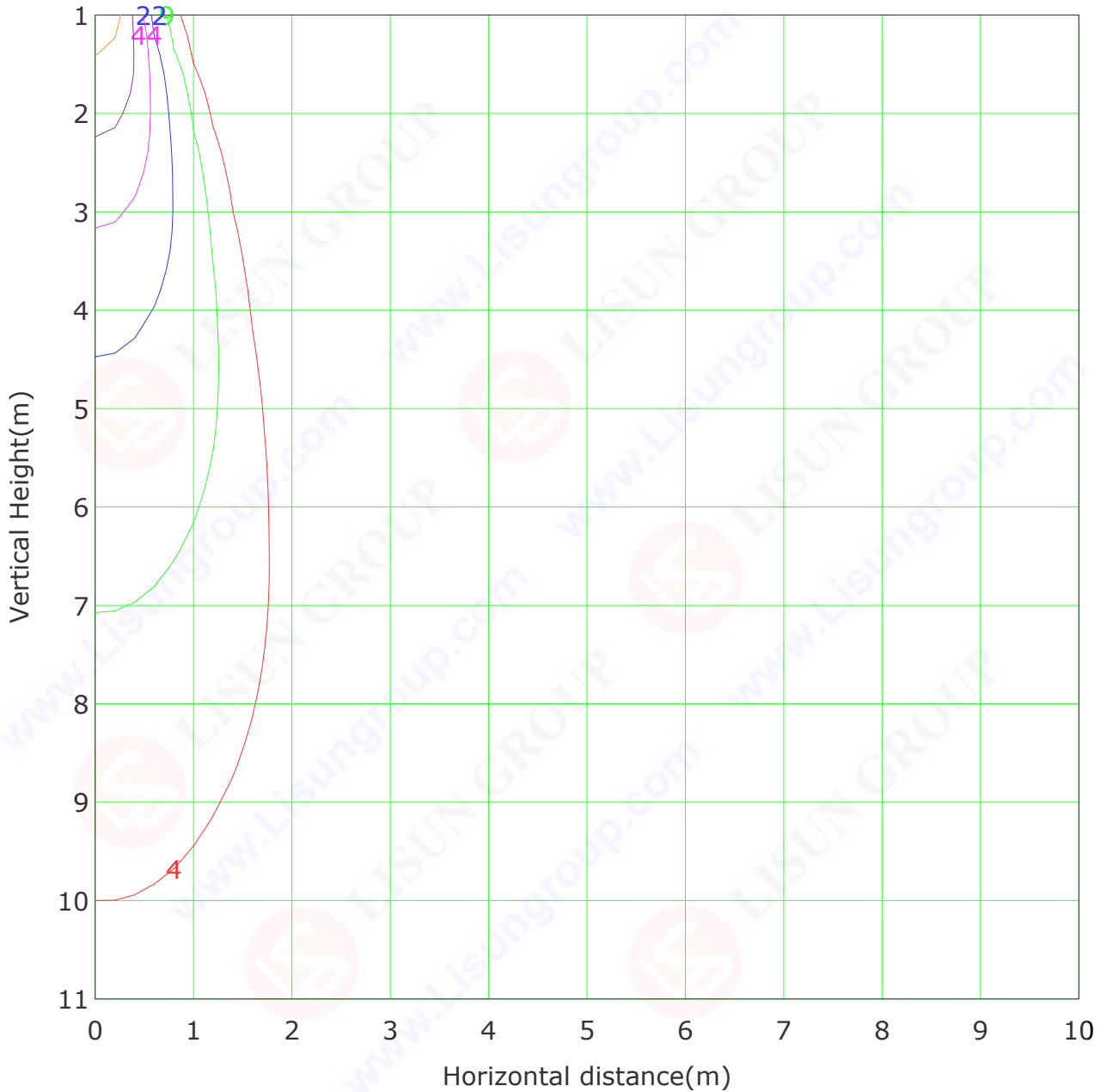
C Plane (°):0.0-360.0: 22.5
 Test Lab: LISUN
 Test Type: TYPE C
 Temperature: 25
 Operator: Jacky

Gamma Plane (°):0.0-90.0:1.0
 Test Device: LSG-1200A
 Distance: 1.000 m
 Humidity: 65
 Inspector:

Illuminance at a Distance



Vertical IsoLux Plot

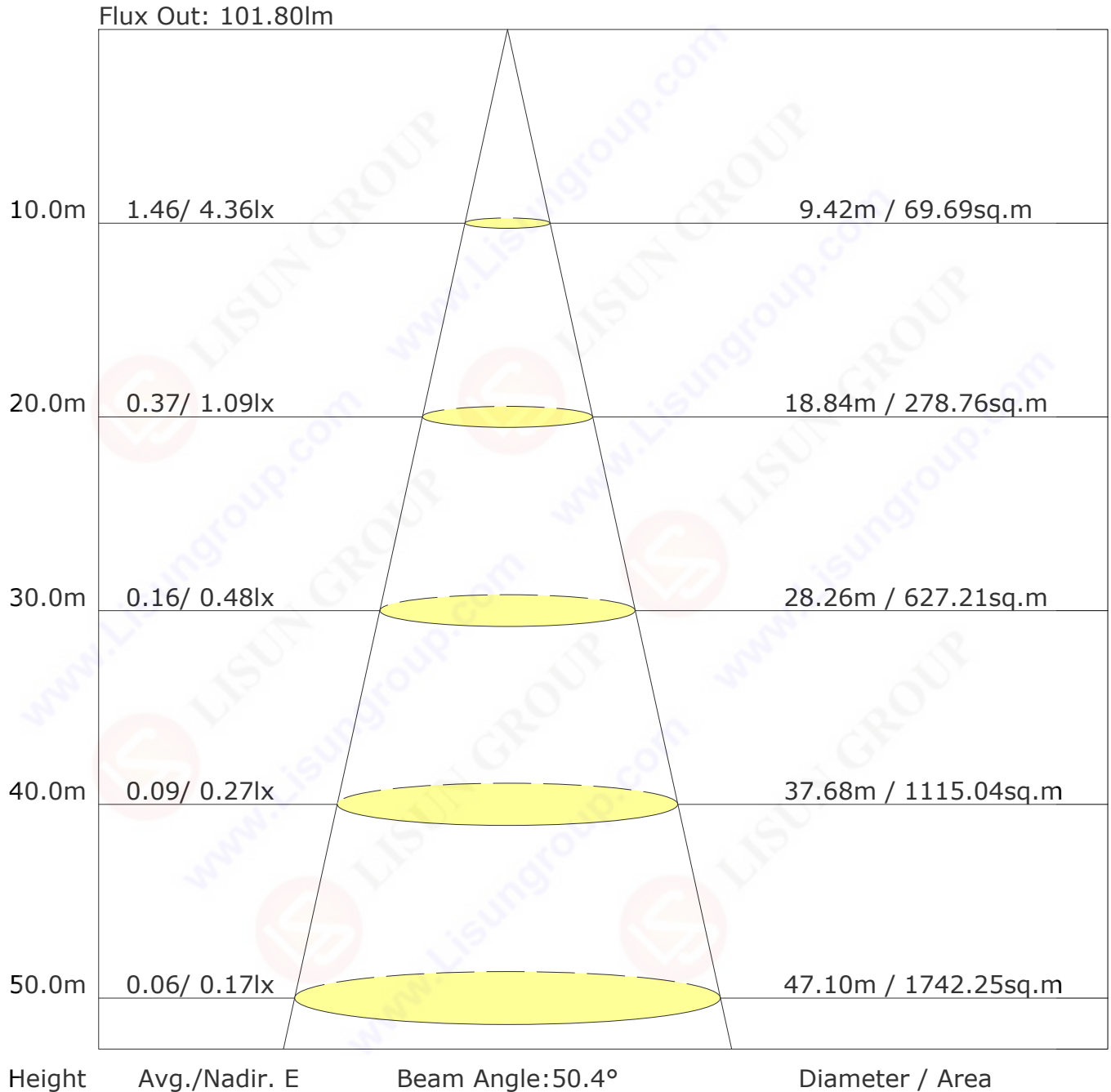


Lowest(m): 1.0m	Highest(m): 11.0m	Max Lux: 435.5 lx
— (1%): 4.4 lx	— (2%): 8.7 lx	
— (5%): 21.8 lx	— (10%): 43.6 lx	
— (20%): 87.1 lx	— (50%): 217.8 lx	
— (100%): 435.5 lx		

C Plane (°):0.0-360.0: 22.5
 Test Lab: LISUN
 Test Type: TYPE C
 Temperature: 25
 Operator: Jacky

Gamma Plane (°):0.0-90.0:1.0
 Test Device: LSG-1200A
 Distance: 1.000 m
 Humidity: 65
 Inspector:

The Average Illuminance Effective Figure



UGR Table

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	8.4	9.1	8.6	9.3	9.5	8.3	9.0	8.6	9.2	9.4
3H	8.4	9.1	8.7	9.3	9.5	8.4	9.0	8.6	9.2	9.5
4H	8.3	8.9	8.6	9.2	9.5	8.3	8.9	8.6	9.1	9.4
6H	8.3	8.8	8.6	9.1	9.4	8.2	8.8	8.5	9.0	9.3
8H	8.2	8.8	8.6	9.1	9.4	8.2	8.7	8.5	9.0	9.3
12H	8.2	8.7	8.5	9.0	9.3	8.1	8.6	8.5	8.9	9.3
X=4H Y=2H	8.5	9.1	8.8	9.4	9.6	8.5	9.1	8.8	9.3	9.6
3H	8.5	9.0	8.9	9.3	9.7	8.5	9.0	8.8	9.3	9.6
4H	8.4	8.9	8.8	9.2	9.6	8.4	8.9	8.8	9.2	9.5
6H	8.4	8.8	8.8	9.1	9.5	8.3	8.7	8.7	9.1	9.5
8H	8.3	8.7	8.7	9.1	9.5	8.3	8.6	8.7	9.0	9.4
12H	8.3	8.6	8.7	9.0	9.4	8.2	8.5	8.6	9.0	9.4
X=8H Y=4H	8.3	8.7	8.7	9.1	9.5	8.3	8.6	8.7	9.0	9.4
6H	8.2	8.5	8.7	8.9	9.4	8.2	8.5	8.6	8.9	9.3
8H	8.2	8.4	8.6	8.9	9.4	8.1	8.4	8.6	8.8	9.3
12H	8.1	8.3	8.6	8.8	9.3	8.1	8.3	8.6	8.8	9.3
X=12H Y=4H	8.3	8.6	8.7	9.0	9.4	8.2	8.5	8.7	9.0	9.4
6H	8.2	8.4	8.6	8.9	9.4	8.1	8.4	8.6	8.8	9.3
8H	8.1	8.3	8.6	8.8	9.3	8.1	8.3	8.6	8.8	9.3
Variations with the observer position at spacings:										
S=1.0H	+1.7/-1.1					+2.3/-1.3				
S=1.5H	+3.3/-3.1					+4.1/-3.2				
S=2.0H	+4.9/-10.1					+5.7/-8.9				

Calculate in accordance with CIE Pub.117. The table is revised with 175lm ($8\log(F/F_0) = -6.1$).

Utilisation Factor Table(Floor cavity)

Utilisation Factors UF(F)			SHR NOM = 0.50									
Room Reflectance			Room Index(RI)									
Ceiling	Wall	Floor	0.75	1.00	1.25	1.50	2.00	2.50	3.00	4.00	5.00	
0.70	0.50	0.20	0.65	0.69	0.72	0.74	0.77	0.79	0.80	0.81	0.82	
	0.30		0.62	0.66	0.69	0.71	0.74	0.76	0.78	0.80	0.81	
	0.20		0.60	0.64	0.67	0.69	0.73	0.75	0.76	0.78	0.80	
0.50	0.50	0.20	0.64	0.68	0.71	0.72	0.75	0.76	0.77	0.78	0.79	
	0.30		0.61	0.65	0.68	0.70	0.73	0.74	0.76	0.77	0.78	
	0.20		0.59	0.63	0.66	0.68	0.71	0.73	0.74	0.76	0.77	
0.30	0.50	0.20	0.63	0.67	0.69	0.71	0.73	0.74	0.75	0.76	0.77	
	0.30		0.61	0.65	0.67	0.69	0.71	0.73	0.74	0.75	0.76	
	0.20		0.59	0.63	0.66	0.67	0.70	0.71	0.73	0.74	0.75	
0.00	0.00	0.00	0.58	0.61	0.64	0.66	0.68	0.69	0.70	0.71	0.72	
Rating:3W Photometrically tested without ceiling board. Multiply UF values by service correction factors Calculate in accordance with CIBSE Technical Memorandum NO.5 1980												

Utilisation Factor Table(Wall)

Utilisation Factors UF(W)			SHR NOM = 0.50									
Room Reflectance			Room Index(RI)									
Ceiling	Wall	Floor	0.75	1.00	1.25	1.50	2.00	2.50	3.00	4.00	5.00	
0.70	0.50	0.20	0.39	0.32	0.27	0.23	0.18	0.15	0.13	0.10	0.08	
	0.30		0.33	0.27	0.23	0.20	0.16	0.14	0.12	0.09	0.08	
	0.20		0.28	0.24	0.21	0.18	0.15	0.13	0.11	0.09	0.07	
0.50	0.50	0.20	0.38	0.30	0.25	0.22	0.17	0.17	0.12	0.09	0.07	
	0.30		0.32	0.26	0.22	0.19	0.15	0.13	0.11	0.08	0.07	
	0.20		0.28	0.23	0.20	0.17	0.14	0.12	0.10	0.08	0.07	
0.30	0.50	0.20	0.36	0.28	0.23	0.20	0.15	0.13	0.11	0.08	0.07	
	0.30		0.31	0.25	0.21	0.18	0.14	0.12	0.10	0.08	0.06	
	0.20		0.27	0.22	0.19	0.17	0.13	0.11	0.10	0.07	0.06	
0.00	0.00	0.00	0.17	0.13	0.11	0.09	0.07	0.05	0.05	0.03	0.03	
Rating:3W Photometrically tested without ceiling board. Multiply UF values by service correction factors Calculate in accordance with CIBSE Technical Memorandum NO.5 1980												

Utilisation Factor Table(Ceiling cavity)

Utilisation Factors UF(C)			SHR NOM = 0.50								
Room Reflectance			Room Index(RI)								
Ceiling	Wall	Floor	0.75	1.00	1.25	1.50	2.00	2.50	3.00	4.00	5.00
0.70	0.50	0.20	0.09	0.10	0.11	0.12	0.13	0.14	0.14	0.15	0.15
	0.30		0.06	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.14
	0.20		0.05	0.06	0.07	0.08	0.10	0.11	0.12	0.13	0.13
0.50	0.50	0.20	0.09	0.10	0.11	0.12	0.13	0.13	0.14	0.14	0.15
	0.30		0.06	0.08	0.09	0.10	0.11	0.12	0.12	0.13	0.14
	0.20		0.04	0.06	0.07	0.08	0.10	0.11	0.11	0.12	0.13
0.30	0.50	0.20	0.09	0.10	0.11	0.11	0.12	0.13	0.13	0.14	0.14
	0.30		0.06	0.08	0.09	0.09	0.11	0.11	0.12	0.13	0.13
	0.20		0.04	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13
0.00	0.00	0.00	NA	NA	NA	NA	NA	NA	NA	NA	NA
Rating:3W Photometrically tested without ceiling board. Multiply UF values by service correction factors Calculate in accordance with CIBSE Technical Memorandum NO.5 1980											

Zonal Lumen

Gamma [°]	I _{mean} [cd]	Zonal Flux [lm]	Sum Zonal Flux [lm]	Rel Zonal Flux [%]	Sum Rel Zonal Flux [%]
0.0-1.0	434.7	0.4	0.4	0.24	0.24
1.0-2.0	431.4	1.2	1.7	0.71	0.95
2.0-3.0	425.0	2.0	3.7	1.16	2.11
3.0-4.0	415.9	2.8	6.5	1.59	3.70
4.0-5.0	404.8	3.5	10.0	1.99	5.69
5.0-6.0	390.9	4.1	14.1	2.35	8.04
6.0-7.0	375.0	4.7	18.7	2.66	10.70
7.0-8.0	357.6	5.1	23.8	2.93	13.62
8.0-9.0	338.7	5.5	29.3	3.14	16.76
9.0-10.0	319.0	5.8	35.1	3.30	20.06
10.0-11.0	297.3	5.9	41.0	3.40	23.45
11.0-12.0	274.7	6.0	47.0	3.43	26.88
12.0-13.0	251.8	6.0	53.0	3.41	30.30
13.0-14.0	227.4	5.8	58.8	3.33	33.63
14.0-15.0	203.3	5.6	64.4	3.19	36.82
15.0-16.0	179.9	5.3	69.7	3.01	39.83
16.0-17.0	157.5	4.9	74.6	2.80	42.63
17.0-18.0	137.7	4.5	79.1	2.59	45.23
18.0-19.0	119.6	4.2	83.3	2.38	47.60
19.0-20.0	103.6	3.8	87.1	2.17	49.77
20.0-21.0	90.0	3.5	90.6	1.98	51.74
21.0-22.0	77.8	3.1	93.7	1.79	53.53
22.0-23.0	67.2	2.8	96.5	1.61	55.14
23.0-24.0	58.1	2.5	99.0	1.45	56.59
24.0-25.0	50.3	2.3	101.3	1.31	57.90
25.0-26.0	43.9	2.1	103.4	1.18	59.08
26.0-27.0	38.0	1.9	105.3	1.06	60.15
27.0-28.0	32.8	1.7	106.9	0.95	61.10
28.0-29.0	28.4	1.5	108.4	0.85	61.95
29.0-30.0	24.3	1.3	109.7	0.75	62.70
30.0-31.0	21.0	1.2	110.9	0.67	63.36
31.0-32.0	18.2	1.0	111.9	0.60	63.96
32.0-33.0	15.8	0.9	112.9	0.53	64.49
33.0-34.0	13.9	0.8	113.7	0.48	64.97
34.0-35.0	12.3	0.8	114.5	0.44	65.41
35.0-36.0	10.9	0.7	115.2	0.40	65.80

C Plane (°):0.0-360.0: 22.5
 Test Lab: LISUN
 Test Type: TYPE C
 Temperature: 25
 Operator: Jacky

Gamma Plane (°):0.0-90.0:1.0
 Test Device: LSG-1200A
 Distance: 1.000 m
 Humidity: 65
 Inspector:

Zonal Lumen (Continue 1)

Gamma [°]	I _{mean} [cd]	Zonal Flux [lm]	Sum Zonal Flux [lm]	Rel Zonal Flux [%]	Sum Rel Zonal Flux [%]
36.0-37.0	9.8	0.6	115.8	0.37	66.17
37.0-38.0	8.9	0.6	116.4	0.34	66.51
38.0-39.0	8.1	0.6	116.9	0.32	66.82
39.0-40.0	7.5	0.5	117.5	0.30	67.12
40.0-41.0	7.0	0.5	118.0	0.28	67.40
41.0-42.0	6.6	0.5	118.4	0.27	67.67
42.0-43.0	6.2	0.5	118.9	0.26	67.94
43.0-44.0	5.9	0.4	119.3	0.25	68.19
44.0-45.0	5.7	0.4	119.8	0.25	68.44
45.0-46.0	5.5	0.4	120.2	0.24	68.68
46.0-47.0	5.3	0.4	120.6	0.24	68.92
47.0-48.0	5.1	0.4	121.0	0.24	69.16
48.0-49.0	5.0	0.4	121.4	0.24	69.40
49.0-50.0	4.9	0.4	121.9	0.23	69.63
50.0-51.0	4.8	0.4	122.3	0.23	69.87
51.0-52.0	4.6	0.4	122.7	0.23	70.09
52.0-53.0	4.5	0.4	123.1	0.22	70.32
53.0-54.0	4.3	0.4	123.4	0.22	70.53
54.0-55.0	4.1	0.4	123.8	0.21	70.74
55.0-56.0	3.9	0.4	124.1	0.20	70.94
56.0-57.0	3.6	0.3	124.5	0.19	71.13
57.0-58.0	3.4	0.3	124.8	0.18	71.31
58.0-59.0	3.1	0.3	125.1	0.17	71.48
59.0-60.0	2.9	0.3	125.4	0.15	71.63
60.0-61.0	2.6	0.2	125.6	0.14	71.77
61.0-62.0	2.3	0.2	125.8	0.13	71.90
62.0-63.0	2.1	0.2	126.0	0.11	72.02
63.0-64.0	1.8	0.2	126.2	0.10	72.11
64.0-65.0	1.5	0.1	126.3	0.08	72.20
65.0-66.0	1.2	0.1	126.5	0.07	72.27
66.0-67.0	1.0	0.1	126.6	0.06	72.33
67.0-68.0	0.7	0.1	126.6	0.04	72.37
68.0-69.0	0.5	0.1	126.7	0.03	72.40
69.0-70.0	0.3	0.0	126.7	0.02	72.41
70.0-71.0	0.1	0.0	126.7	0.01	72.42
71.0-72.0	0.0	0.0	126.7	0.00	72.42

C Plane (°):0.0-360.0: 22.5
 Test Lab: LISUN
 Test Type: TYPE C
 Temperature: 25
 Operator: Jacky

Gamma Plane (°):0.0-90.0:1.0
 Test Device: LSG-1200A
 Distance: 1.000 m
 Humidity: 65
 Inspector:

Zonal Lumen (Continue 2)

Gamma [°]	I _{mean} [cd]	Zonal Flux [lm]	Sum Zonal Flux [lm]	Rel Zonal Flux [%]	Sum Rel Zonal Flux [%]
72.0-73.0	0.0	0.0	126.7	0.00	72.42
73.0-74.0	0.0	0.0	126.7	0.00	72.42
74.0-75.0	0.0	0.0	126.7	0.00	72.42
75.0-76.0	0.0	0.0	126.7	0.00	72.42
76.0-77.0	0.0	0.0	126.7	0.00	72.42
77.0-78.0	0.0	0.0	126.7	0.00	72.42
78.0-79.0	0.0	0.0	126.7	0.00	72.42
79.0-80.0	0.0	0.0	126.7	0.00	72.42
80.0-81.0	0.0	0.0	126.7	0.00	72.42
81.0-82.0	0.0	0.0	126.7	0.00	72.42
82.0-83.0	0.0	0.0	126.7	0.00	72.42
83.0-84.0	0.0	0.0	126.7	0.00	72.42
84.0-85.0	0.0	0.0	126.7	0.00	72.42
85.0-86.0	0.0	0.0	126.7	0.00	72.42
86.0-87.0	0.0	0.0	126.7	0.00	72.42
87.0-88.0	0.0	0.0	126.7	0.00	72.42
88.0-89.0	0.0	0.0	126.7	0.00	72.42
89.0-90.0	0.0	0.0	126.7	0.00	72.42

Candlepower Table

Unit: cd

G\C	C0.0	C22.5	C45.0	C67.5	C90.0	C112.5	C135.0	C157.5	C180.0	C202.5
G0.0	435.5	435.5	435.5	435.5	435.5	435.5	435.5	435.5	435.5	435.5
G1.0	435.9	433.5	431.1	429.7	427.9	428.3	428.6	430.3	431.8	434.1
G2.0	433.0	428.3	424.0	421.2	418.7	419.0	419.7	422.9	425.1	429.4
G3.0	426.6	419.5	413.4	409.0	406.1	406.2	407.0	411.2	415.2	421.6
G4.0	418.4	409.9	402.2	396.1	392.5	391.5	393.5	398.5	403.9	411.5
G5.0	407.6	397.9	388.9	381.6	376.5	375.9	377.6	384.0	389.7	399.4
G6.0	393.6	382.7	371.5	363.0	357.8	356.1	359.2	366.4	372.9	383.0
G7.0	378.3	366.1	354.3	345.5	339.6	337.9	341.0	347.9	354.9	366.9
G8.0	360.6	347.3	334.4	323.9	317.5	316.4	319.9	327.4	334.7	349.2
G9.0	342.9	328.8	315.0	303.8	297.1	295.7	298.6	307.6	315.1	327.8
G10.0	324.3	307.8	293.5	282.6	275.5	273.0	277.3	285.8	293.9	308.0
G11.0	301.9	284.5	269.3	258.0	249.7	248.3	252.6	261.8	270.7	285.5
G12.0	279.2	262.1	246.2	233.5	226.3	225.1	229.8	239.3	247.9	263.2
G13.0	256.1	236.1	222.4	207.4	202.6	199.3	205.5	213.7	225.3	241.3
G14.0	229.9	210.7	195.2	183.8	177.1	176.7	180.1	189.4	198.8	215.6
G15.0	203.8	187.0	172.6	161.7	155.6	154.7	158.3	167.4	175.9	192.7
G16.0	177.8	162.6	150.0	139.9	134.6	134.1	137.4	145.5	151.0	170.2
G17.0	155.7	142.1	131.4	122.0	117.9	117.5	119.9	127.4	132.1	146.0
G18.0	135.6	122.6	114.1	107.4	104.3	102.9	105.1	110.7	115.6	126.4
G19.0	115.8	105.2	98.2	93.2	90.9	88.6	90.7	95.2	99.5	109.2
G20.0	100.0	91.4	85.5	81.7	79.6	77.6	78.8	82.6	87.0	95.2
G21.0	86.0	78.7	74.5	70.1	69.1	67.1	67.7	70.6	75.4	83.2
G22.0	73.8	68.5	64.0	61.2	59.3	58.5	58.3	61.0	64.7	71.5
G23.0	64.3	59.3	55.2	53.3	51.7	51.2	51.2	53.3	56.1	62.0
G24.0	54.9	51.0	47.7	45.9	44.6	44.2	44.6	45.9	47.7	54.3
G25.0	48.0	44.7	42.2	40.8	39.5	39.2	39.1	40.3	41.8	46.9
G26.0	42.0	38.9	37.2	36.1	34.7	34.5	34.6	35.5	36.6	40.9
G27.0	36.5	33.8	31.9	30.9	29.5	29.0	29.4	30.5	31.2	35.2
G28.0	31.5	29.3	27.6	26.4	25.3	24.9	25.0	26.2	26.5	30.3
G29.0	27.2	24.9	24.0	22.5	22.0	21.2	21.6	22.0	22.8	25.8
G30.0	23.2	21.7	20.5	19.6	18.9	18.5	18.5	19.1	19.4	22.0
G31.0	20.2	19.0	18.0	17.1	16.6	16.3	16.0	16.6	17.0	19.1
G32.0	17.6	16.5	15.7	14.9	14.4	14.1	13.8	14.3	14.8	16.8
G33.0	15.5	14.5	13.9	13.2	12.8	12.4	12.3	12.7	13.1	14.6
G34.0	13.7	12.9	12.4	11.8	11.4	11.1	10.8	11.2	11.6	12.9
G35.0	12.1	11.6	11.0	10.4	10.0	9.8	9.4	9.9	10.2	11.4
G36.0	10.8	10.4	9.9	9.4	9.1	8.9	8.5	8.8	9.1	10.2

C Plane (°):0.0-360.0: 22.5

Test Lab: LISUN

Test Type: TYPE C

Temperature: 25

Operator: Jacky

Gamma Plane (°):0.0-90.0:1.0

Test Device: LSG-1200A

Distance: 1.000 m

Humidity: 65

Inspector:

Candlepower Table (Continue 1)

Unit: cd

G\C	C0.0	C22.5	C45.0	C67.5	C90.0	C112.5	C135.0	C157.5	C180.0	C202.5
G37.0	9.9	9.4	9.0	8.5	8.3	8.1	7.7	7.9	8.3	9.2
G38.0	8.9	8.7	8.3	7.9	7.6	7.5	7.0	7.4	7.5	8.3
G39.0	8.3	8.0	7.7	7.3	7.0	6.9	6.5	6.7	6.9	7.6
G40.0	7.6	7.4	7.2	6.8	6.6	6.5	6.1	6.2	6.4	7.0
G41.0	7.1	7.0	6.8	6.5	6.2	6.3	5.7	5.9	6.0	6.6
G42.0	6.6	6.6	6.5	6.1	6.0	6.0	5.4	5.7	5.7	6.1
G43.0	6.3	6.3	6.2	5.9	5.8	5.7	5.2	5.4	5.4	5.7
G44.0	5.9	6.1	6.0	5.6	5.6	5.5	5.0	5.2	5.2	5.5
G45.0	5.6	5.8	5.8	5.5	5.5	5.3	4.8	5.0	5.0	5.3
G46.0	5.4	5.7	5.6	5.3	5.3	5.1	4.7	4.9	4.8	5.1
G47.0	5.2	5.5	5.5	5.3	5.1	4.9	4.6	4.8	4.8	5.0
G48.0	5.1	5.4	5.4	5.2	5.0	4.9	4.6	4.7	4.7	4.9
G49.0	5.0	5.3	5.2	5.1	5.0	4.8	4.5	4.6	4.5	4.8
G50.0	4.8	5.1	5.2	4.9	4.8	4.8	4.4	4.5	4.4	4.7
G51.0	4.7	4.9	4.9	4.7	4.6	4.6	4.2	4.4	4.3	4.6
G52.0	4.6	4.8	4.7	4.6	4.4	4.4	4.0	4.2	4.2	4.4
G53.0	4.5	4.6	4.5	4.4	4.2	4.2	3.8	4.0	4.1	4.2
G54.0	4.3	4.4	4.3	4.1	3.9	4.0	3.5	3.8	3.8	4.0
G55.0	4.1	4.2	4.1	3.8	3.7	3.7	3.4	3.6	3.6	3.8
G56.0	3.9	3.9	3.8	3.6	3.5	3.5	3.1	3.2	3.4	3.7
G57.0	3.7	3.6	3.5	3.3	3.2	3.2	2.9	3.1	3.2	3.4
G58.0	3.4	3.3	3.3	3.1	3.0	2.9	2.7	2.8	2.9	3.1
G59.0	3.1	3.1	2.9	2.8	2.7	2.7	2.3	2.5	2.6	2.8
G60.0	2.9	2.8	2.6	2.5	2.4	2.4	2.1	2.3	2.4	2.6
G61.0	2.6	2.6	2.4	2.2	2.2	2.2	1.8	2.1	2.1	2.3
G62.0	2.3	2.3	2.1	2.0	1.9	1.9	1.6	1.8	1.9	2.0
G63.0	2.0	2.0	1.8	1.6	1.6	1.7	1.4	1.5	1.7	1.8
G64.0	1.7	1.7	1.5	1.4	1.3	1.4	1.1	1.3	1.4	1.5
G65.0	1.5	1.4	1.3	1.2	1.1	1.1	0.8	1.0	1.1	1.3
G66.0	1.2	1.1	1.0	0.9	0.8	0.8	0.6	0.8	0.9	1.0
G67.0	0.9	0.8	0.8	0.7	0.6	0.7	0.3	0.5	0.6	0.8
G68.0	0.8	0.6	0.5	0.5	0.4	0.4	0.1	0.3	0.4	0.5
G69.0	0.5	0.4	0.3	0.2	0.1	0.1	0.0	0.1	0.1	0.4
G70.0	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
G71.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G72.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G73.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

C Plane (°):0.0-360.0: 22.5
 Test Lab: LISUN
 Test Type: TYPE C
 Temperature: 25
 Operator: Jacky

Gamma Plane (°):0.0-90.0:1.0
 Test Device: LSG-1200A
 Distance: 1.000 m
 Humidity: 65
 Inspector:

Candlepower Table (Continue 2)

Unit: cd

G\C	C0.0	C22.5	C45.0	C67.5	C90.0	C112.5	C135.0	C157.5	C180.0	C202.5
G74.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G75.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G76.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G77.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G78.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G79.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G81.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G82.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G83.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G84.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G85.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G86.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G87.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G88.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G89.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G90.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

C Plane (°):0.0-360.0: 22.5
Test Lab: LISUN
Test Type: TYPE C
Temperature: 25
Operator: Jacky

Gamma Plane (°):0.0-90.0:1.0
Test Device: LSG-1200A
Distance: 1.000 m
Humidity: 65
Inspector:

Candlepower Table (Continue 3)

Unit: cd

G\C	C225.0	C247.5	C270.0	C292.5	C315.0	C337.5	C360.0			
G0.0	435.5	435.5	435.5	435.5	435.5	435.5	435.5			
G1.0	436.0	438.3	438.8	439.8	438.6	437.4	435.9			
G2.0	433.5	437.5	439.0	440.3	438.2	435.7	433.0			
G3.0	427.7	433.0	435.5	437.2	434.6	430.8	426.6			
G4.0	419.0	425.7	429.0	431.2	428.1	423.7	418.4			
G5.0	407.7	416.1	420.2	422.6	419.5	414.1	407.6			
G6.0	393.4	403.2	407.9	409.9	406.9	400.8	393.6			
G7.0	378.2	388.6	393.8	396.9	393.8	387.1	378.3			
G8.0	359.9	372.6	377.1	382.4	377.7	371.7	360.6			
G9.0	341.0	353.6	360.4	363.9	361.4	353.2	342.9			
G10.0	321.9	334.0	341.8	346.3	342.7	334.2	324.3			
G11.0	298.7	312.5	321.0	324.4	320.9	311.8	301.9			
G12.0	277.8	292.0	300.0	303.9	300.3	290.8	279.2			
G13.0	254.9	269.8	277.9	281.2	277.5	268.4	256.1			
G14.0	230.3	245.7	253.8	256.7	252.4	242.0	229.9			
G15.0	206.5	223.0	230.9	233.4	227.5	215.7	203.8			
G16.0	182.2	199.1	203.9	208.9	201.0	191.2	177.8			
G17.0	160.0	174.8	180.7	183.6	175.9	164.6	155.7			
G18.0	140.1	152.9	158.2	160.8	154.3	143.8	135.6			
G19.0	119.9	131.1	137.6	139.3	133.6	122.8	115.8			
G20.0	104.7	114.6	120.9	121.0	116.0	107.0	100.0			
G21.0	90.6	99.4	105.6	105.6	100.9	92.6	86.0			
G22.0	77.8	85.9	91.0	90.4	85.5	79.4	73.8			
G23.0	67.0	74.9	79.3	78.6	73.4	68.2	64.3			
G24.0	57.5	65.4	67.1	68.1	62.8	58.6	54.9			
G25.0	50.2	56.5	58.1	57.5	54.3	49.9	48.0			
G26.0	44.1	49.0	50.1	49.4	47.1	43.5	42.0			
G27.0	38.4	42.6	42.9	42.4	40.7	38.0	36.5			
G28.0	33.5	37.5	38.0	37.5	35.5	33.0	31.5			
G29.0	28.5	32.6	33.2	32.5	30.8	28.2	27.2			
G30.0	24.2	27.2	28.2	27.7	26.0	24.0	23.2			
G31.0	20.8	23.4	24.0	24.1	22.6	21.1	20.2			
G32.0	17.8	20.1	20.5	20.8	19.4	18.4	17.6			
G33.0	15.6	17.2	17.8	17.9	17.0	16.0	15.5			
G34.0	13.7	15.0	15.4	15.7	14.9	14.2	13.7			
G35.0	12.0	13.1	13.4	13.6	13.1	12.6	12.1			
G36.0	10.7	11.7	12.0	12.2	11.7	11.3	10.8			

C Plane (°):0.0-360.0: 22.5

Test Lab: LISUN

Test Type: TYPE C

Temperature: 25

Operator: Jacky

Gamma Plane (°):0.0-90.0:1.0

Test Device: LSG-1200A

Distance: 1.000 m

Humidity: 65

Inspector:

Candlepower Table (Continue 4)

Unit: cd

G\C	C225.0	C247.5	C270.0	C292.5	C315.0	C337.5	C360.0			
G37.0	9.8	10.4	10.7	10.9	10.5	10.1	9.9			
G38.0	8.7	9.3	9.6	9.7	9.4	9.2	8.9			
G39.0	7.9	8.5	8.8	8.8	8.7	8.4	8.3			
G40.0	7.3	7.8	8.0	8.1	8.0	7.7	7.6			
G41.0	6.8	7.2	7.5	7.5	7.5	7.2	7.1			
G42.0	6.4	6.8	6.9	7.0	7.0	6.8	6.6			
G43.0	6.1	6.3	6.6	6.6	6.6	6.5	6.3			
G44.0	5.8	6.0	6.3	6.2	6.3	6.2	5.9			
G45.0	5.5	5.8	5.9	6.0	6.0	5.9	5.6			
G46.0	5.3	5.6	5.6	5.7	5.8	5.7	5.4			
G47.0	5.1	5.4	5.4	5.5	5.6	5.5	5.2			
G48.0	5.1	5.2	5.3	5.3	5.4	5.3	5.1			
G49.0	4.9	5.2	5.2	5.2	5.4	5.1	5.0			
G50.0	4.9	5.1	5.1	5.1	5.3	5.1	4.8			
G51.0	4.8	5.0	4.8	5.0	5.1	4.9	4.7			
G52.0	4.7	4.9	4.7	4.8	4.9	4.8	4.6			
G53.0	4.5	4.7	4.6	4.7	4.8	4.6	4.5			
G54.0	4.3	4.5	4.4	4.5	4.6	4.5	4.3			
G55.0	4.1	4.4	4.2	4.3	4.5	4.4	4.1			
G56.0	3.9	4.1	4.0	4.1	4.2	4.1	3.9			
G57.0	3.6	4.0	3.8	3.9	3.9	3.9	3.7			
G58.0	3.4	3.7	3.6	3.7	3.7	3.6	3.4			
G59.0	3.1	3.5	3.4	3.5	3.3	3.3	3.1			
G60.0	2.8	3.2	3.2	3.2	3.2	3.0	2.9			
G61.0	2.5	2.9	2.9	3.0	2.8	2.8	2.6			
G62.0	2.2	2.6	2.6	2.7	2.6	2.5	2.3			
G63.0	2.0	2.3	2.3	2.4	2.4	2.2	2.0			
G64.0	1.7	2.0	2.0	2.0	2.1	1.9	1.7			
G65.0	1.5	1.7	1.7	1.8	1.8	1.5	1.5			
G66.0	1.2	1.5	1.4	1.5	1.5	1.3	1.2			
G67.0	0.9	1.2	1.2	1.2	1.3	1.1	0.9			
G68.0	0.8	0.9	1.0	1.0	1.0	0.8	0.8			
G69.0	0.5	0.7	0.6	0.7	0.7	0.5	0.5			
G70.0	0.3	0.3	0.5	0.4	0.4	0.3	0.2			
G71.0	0.0	0.1	0.2	0.2	0.3	0.1	0.0			
G72.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
G73.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			

C Plane (°):0.0-360.0: 22.5
 Test Lab: LISUN
 Test Type: TYPE C
 Temperature: 25
 Operator: Jacky

Gamma Plane (°):0.0-90.0:1.0
 Test Device: LSG-1200A
 Distance: 1.000 m
 Humidity: 65
 Inspector:



Color Properties

Chromaticity Coordinate: $x=0.4651$ $y=0.4138$ $u(u')=0.2645$ $v=0.3529$ $v'=0.5293$
Correlated Color Temperature: $T_c=2653K$ ($duv=0.00074$)

Measurement Flux: 539.5lm, PAR: 2.189W, PPF: 11.100umol/s

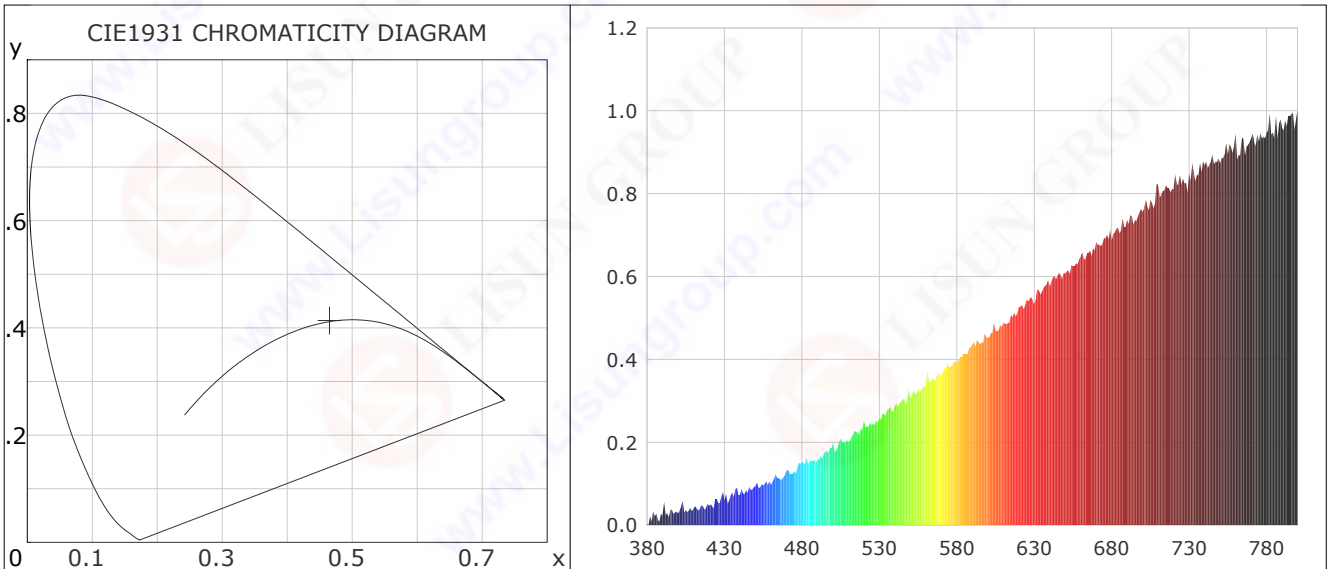
Peak Wavelength: 800nm Half Bandwidth: 185.4nm
Dominant Wavelength: 584.2nm Color Purity: 0.638

Color Ratio: R=0.269 G=0.704 B=0.027

TM30: Rf=99, Rg=99

Color Render Index: Ra= 99.5
R1 =99.5 R2 =99.5 R3 =99.5 R4 =99.4 R5 =99.3 R6 =99.1 R7 =99.7 R8 =99.6
R9 =98.8 R10=98.8 R11=99.3 R12=98.1 R13=99.4 R14=99.7 R15=99.3

Color Quality Scale: Qa= 96.2 Qf= 98.8 Qp= 98.5 Qg= 96.4
Q1 =96.7 Q2 =97.2 Q3 =97.1 Q4 =96.9 Q5 =96.6 Q6 =96.2 Q7 =95.9 Q8 =95.7
Q9 =95.0 Q10=95.5 Q11=96.0 Q12=96.5 Q13=96.7 Q14=97.2 Q15=0.0



C Plane (°):0.0-360.0: 45.0
Test Lab: LISUN
Test Type: TYPE C
Temperature: 25°
Operator: Jacky

Gamma Plane (°):0.0-90.0:1.0
Test Device: LSG-1200A
Distance: 1.000 m
Humidity: 60
Inspector:

