



# Rotation Luminaire Goniospectroradiometer (LSG-1700CCD )

## Brochure

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**Leader in Lighting & Electrical Test Instruments**

Rev. 4/13/2021

# Rotation Luminaire Goniospectroradiometer

## 1. System Configuration

The quotation includes all the following items:

**A. Goniophotometric System:**

- Goniometric Rotating Console
- Class 1 Photo Detector
- Line Laser System for Calibrating
- English Measuring Software

**B. LMS-9500 Scientific Grade CCD Spectroradiometer**

**C. CLAMP-9500 Adjustable Tripod for LMS-9500**

**D. SLS-250W DC Distribution Standard Lamp**

**E. DC3010 DC Power Source**

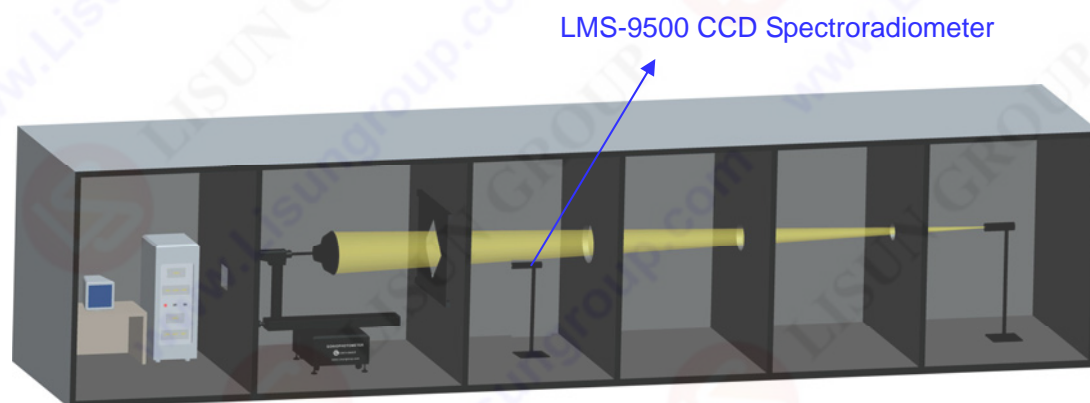
**F. LS2012 Digital Power Meter:** High Accuracy to measure AC and DC voltage, current, power and PF

**G. AC Power Source to give a stably AC Output for luminaries test**

**H. CASE-19IN 19inch Standard Instruments Cabinet**

**I. Three sets of multi-function luminaries clamps**

**J. Oversea Delivery Packing:** all of the instruments and accessories will be packed to meet long distance sea delivery



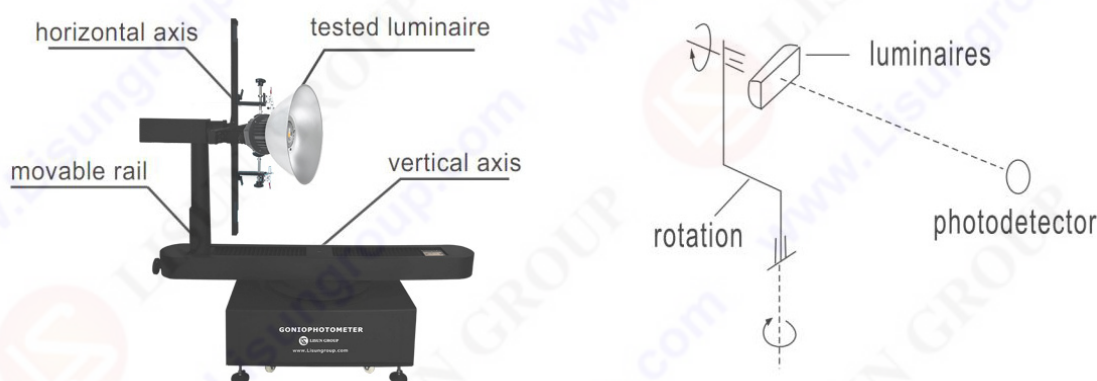
Full View for Rotation Luminaire Goniospectroradiometer

## 2. Working Principle

LSG-1700CCD Goniophotometric System carries out measuring methods of fixed location and rotating luminaires. The measured luminaire is installed on the rotating supporter, 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 luminaires around a vertical axis and a horizontal axis. When tested luminaires 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 C- $\gamma$  coordinates. When getting intensity distribution data, PC will calculate photometric parameters automatically.

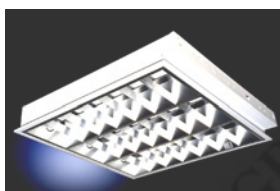
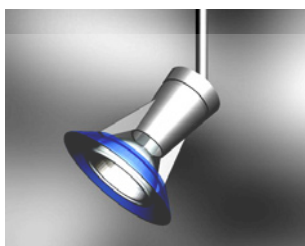
### LSG-1700CCD Single pillar structure (C- $\gamma$ coordinate and Conic coordinate)

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-1700CCD Goniophotometer is for luminous intensity distribution measurements with facility for turning the light source. It is for industrial laboratory measurements the photometric data of luminaires. LSG-1700CCD is used to measure photometric parameters of luminaires 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, luminaire 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.



### 4. Specifications

- Meets the requirements of CIE, IEC, IES LM-79 & GB standards
- Reaching many measurement ways C-Gamma
- 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~10,000lx; Light Intensity 1.0cd ~ 10<sup>7</sup>cd(detector)
- Accuracy of photometry: Class 1
- Testing Accuracy: 3%(Under Standard lamp); Stray Light: less than 0.2%
- The accuracy of angle: 0.2°
- Test CCT and Spectrum Distribution Test for the lamp, the data can be export be excel
- Spectral Range Wavelength: 380~780nm; Wavelength Accuracy:  $\pm 0.2\text{nm}$
- Accuracy of Chromaticity Coordinates x, y:  $\pm 0.0015$
- Correlated Color Temperature Range: 1000~100000K, Resolution: 1K
- English version software can run in Win7, Win8 or Win 10

Max Size for the Testing Lamp (mm)	The max size for the Testing Lamp		Max Weight
	C-Gamma Test with one Pillar	B-Beta Test with Two Pillars	
LSG-1700CCD	1600*550	N/A	40kg

### 5. Laboratory Requirements

- The Dimension of Dark Room for Goniometric Rotating Console and Photometric Light Patch: W3.5m\*H2.5m\*L8m (Other size please check with LISUN engineer)
- Operator Room for controlling cabinet, PC and printer Dimension: W3.0m\*L3m
- 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 formal purchase order was confirmed



## 6. 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.

## 7. Design Standard of Device

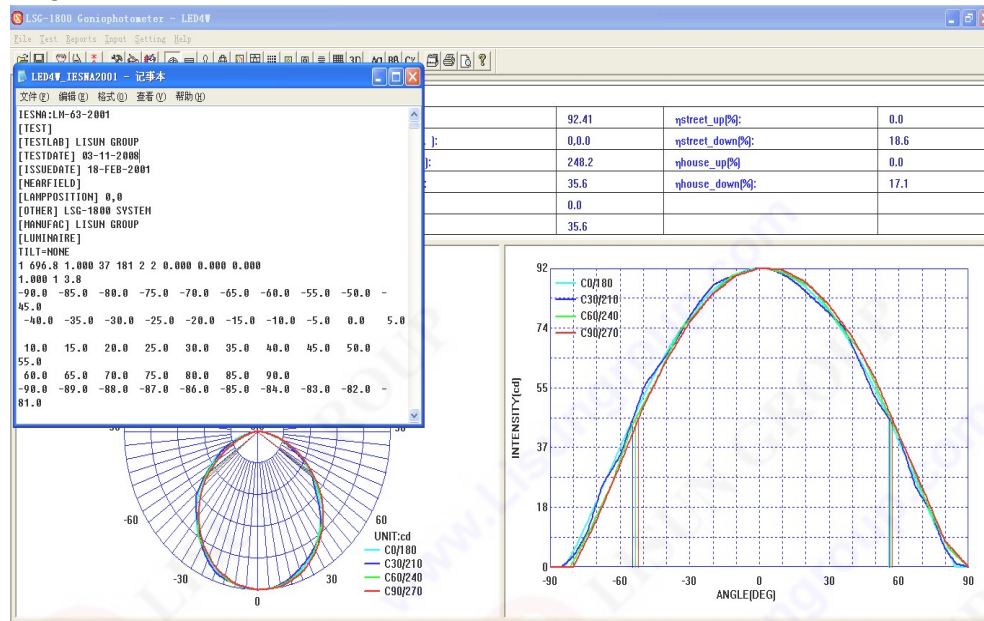
The construction, technical parameter, test & operate steps as well as data processing software of LSG-1700CCD Goniospectroradiometer meet the following requirements:

- 3.1 CIE Pub. NO.70, "The Measurement of Absolute Luminous Intensity Distributions"
- 3.2 CIE DIV. II-TC10, "Photometry of Luminaires"
- 3.3 IES LM-35-1989, "IES Approved Method for Photometric Testing of Floodlights"
- 3.4 IES LM-31, "IES Approved Method for Photometric Testing of Roadway Luminaires"
- 3.5 IES-LM-79, "Electrical and Photometric Measurements of Solid-State Lighting"
- 3.6 GB/T 9467-1988, "Luminosity Test of Indoor Luminaires"
- 3.7 GB/T 9468-1988, "Luminosity Test of Street Luminaires"
- 3.8 IES 61341 "Method of Measurement of Center Beam Intensity Angle of Lamp"
- 3.9 CIE Pub.NO.76, "Photometry-the CIE System of Physical Photometry"

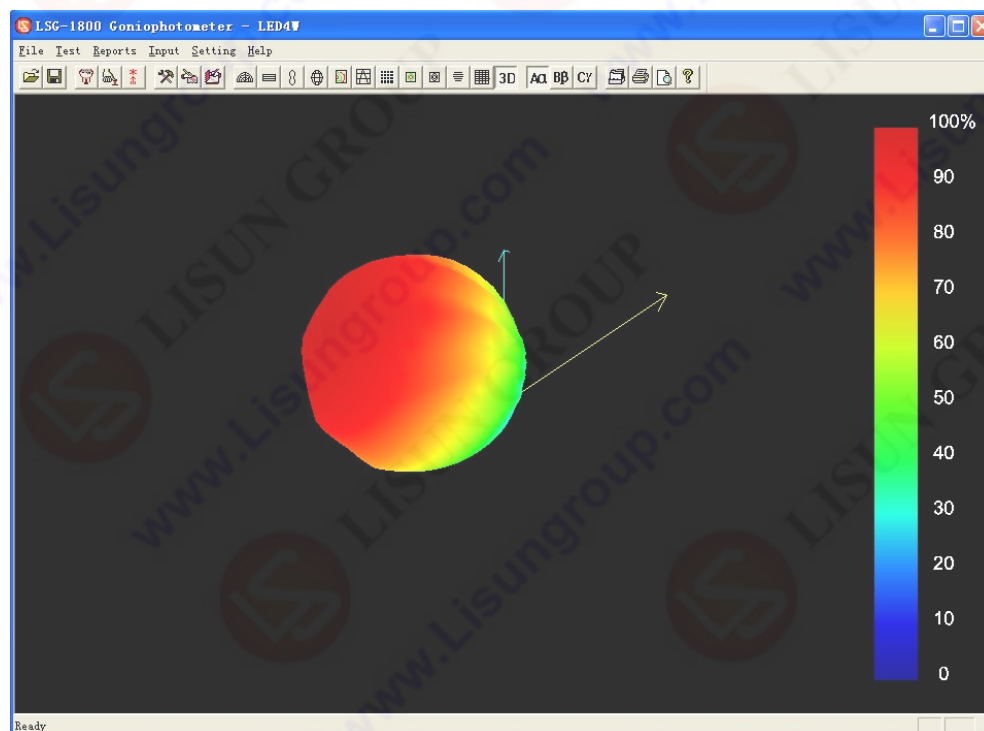
## 8. Application Software

All control of the LSG-1700CCD Goniospectroradiometer 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. It can export IES/LDT files for the luminaire design software such as Dialux

### Export the IES standard format document



### 3D Graph Distribution



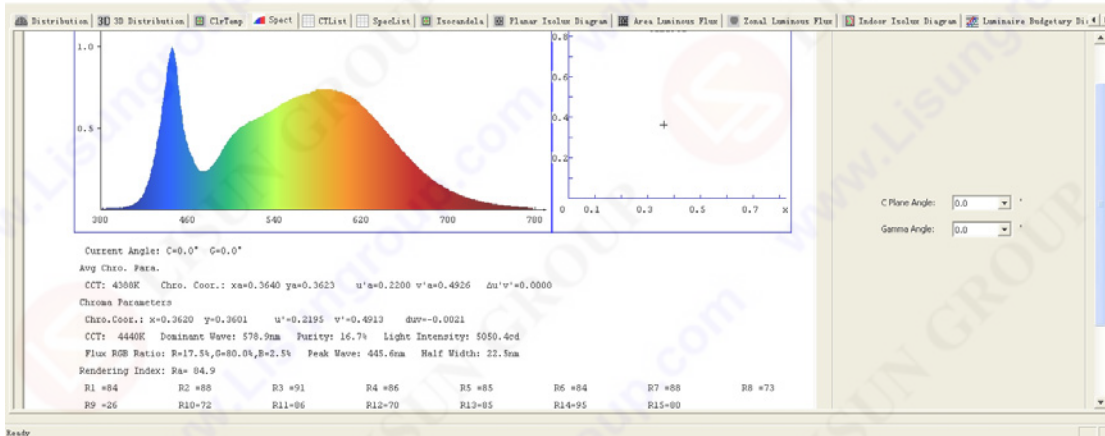
● CCT Distribution Test:



● CCT List:

Gamma/C	0.0 CCT / Δx / Δy	10.0 CCT / Δx / Δy	20.0 CCT / Δx / Δy	30.0 CCT / Δx / Δy	40.0 CCT / Δx / Δy	50.0 CCT / Δx / Δy	60.0 CCT / Δx / Δy	70.0 CCT / Δx / Δy	80.0 CCT / Δx / Δy	90.0 CCT / Δx / Δy
0.0 deg	4482E 0.0014	4482E 0.0015	4482E 0.0014	4482E 0.0015						
10.0 deg	4431E 0.0011	4431E 0.0012	4411E 0.0015	4444E 0.0016						
20.0 deg	4482E 0.0022	4402E 0.0006	4460E 0.0021	4422E 0.0010						
30.0 deg	4402E 0.0006	4388E 0.0008	4370E 0.0006	4348E 0.0008						
40.0 deg	4365E 0.0005	4337E 0.0013	4355E 0.0009	4361E 0.0007						
50.0 deg	4352E 0.0004	4201E 0.0030	4298E 0.0025	4319E 0.0020						
60.0 deg	4377E 0.0004	4242E 0.0042	4308E 0.0022	4294E 0.0020						
70.0 deg	4284E 0.0028	4188E 0.0059	4344E 0.0011	4249E 0.0044						
80.0 deg	4202E 0.0020	4142E 0.0074	4250E 0.0023	4207E 0.0053						
90.0 deg	4117E 0.0079	0E 0.5394	4227E 0.0050	0E 0.5394						

● Spectrum Distribution Test:



● Spectrum List:

No.	C(deg)	Gamma(deg)	CCT(K)	x	y	u'	v'	Er (cd)	Ra	Peak Wave(nm)	Half Width(nm)	Domain Wave(nm)	Peak Sig	Dark Sig
1	0.0	0.0	4440	0.2620	0.3601	0.2195	0.4913	0.0014	5050.4	95	445.6	22.5	579.9	61999
2	0.0	10.0	4431	0.2623	0.3605	0.2195	0.4913	0.0008	5050.6	95	445.4	22.5	579.8	61991
3	0.0	20.0	4402	0.2634	0.3612	0.2200	0.4920	0.0006	4498.9	95	445.6	22.5	579.0	56377
4	0.0	30.0	4395	0.2640	0.3620	0.2203	0.4924	0.0004	2901.6	95	445.5	22.8	579.8	50194
5	0.0	40.0	4383	0.2640	0.3616	0.2202	0.4923	0.0004	3452.9	95	445.5	22.5	579.0	44716
6	0.0	50.0	4377	0.2643	0.3619	0.2203	0.4924	0.0004	2591.9	95	445.9	22.5	579.1	24625
7	0.0	60.0	4377	0.2643	0.3619	0.2203	0.4924	0.0004	2591.9	95	445.9	22.5	579.1	24625
8	0.0	70.0	4284	0.2682	0.3665	0.2211	0.4951	0.0028	1797.1	84	446.5	22.3	578.7	26091
9	0.0	80.0	4282	0.2682	0.3665	0.2211	0.4952	0.0028	1320.5	84	446.7	22.3	578.7	20599
10	0.0	90.0	4117	0.2757	0.3746	0.2230	0.4999	0.0079	505.7	84	446.5	22.5	578.4	12701
11	90.0	0.0	4442	0.2619	0.3599	0.2195	0.4912	0.0015	5053.2	95	446.3	22.5	579.9	61920
12	90.0	10.0	4431	0.2623	0.3600	0.2196	0.4914	0.0012	4945.2	95	446.5	22.5	579.9	60972
13	90.0	20.0	4403	0.2633	0.3613	0.2199	0.4920	0.0008	4663.0	95	446.0	22.8	579.8	56155
14	90.0	30.0	4398	0.2632	0.3634	0.2203	0.4922	0.0008	4240.6	95	446.5	22.5	579.8	53729
15	90.0	40.0	4397	0.2660	0.3642	0.2205	0.4928	0.0013	3690.2	84	446.0	22.8	579.7	47449
16	90.0	50.0	4391	0.2663	0.3669	0.2210	0.4954	0.0020	2982.3	84	446.5	22.8	579.6	38122
17	90.0	60.0	4245	0.2700	0.3699	0.2213	0.4985	0.0042	1950.5	84	445.8	22.5	578.4	27932
18	90.0	70.0	4189	0.2725	0.3715	0.2220	0.4991	0.0059	1016.1	84	446.0	22.5	578.4	17230
19	90.0	80.0	4143	0.2747	0.3742	0.2223	0.4996	0.0074	372.7	84	446.0	21.4	578.2	9099
20	90.0	90.0	0	0.0000	0.0000	0.0000	0.0000	0.5394	0.0	0	0.0	0.0	7507	
21	180.0	0.0	4440	0.2620	0.3601	0.2195	0.4913	0.0014	5050.4	95	446.6	22.5	579.9	61999
22	180.0	10.0	4441	0.2619	0.3600	0.2195	0.4912	0.0015	5011.0	95	446.5	22.5	579.9	61463
23	180.0	20.0	4460	0.2612	0.3589	0.2194	0.4905	0.0021	4772.8	95	445.6	22.5	579.1	59317
24	180.0	30.0	4370	0.2623	0.3630	0.2201	0.4926	0.0008	4173.9	95	446.0	22.5	579.7	52748
25	180.0	40.0	4395	0.2653	0.3637	0.2203	0.4934	0.0009	3776.4	84	445.6	22.5	579.7	48340
26	180.0	50.0	4399	0.2677	0.3664	0.2208	0.4950	0.0026	2794.9	84	445.6	22.5	579.5	37230
27	180.0	60.0	4308	0.2672	0.3657	0.2207	0.4947	0.0022	2239.3	84	445.6	22.5	579.6	31077
28	180.0	70.0	4244	0.2657	0.3637	0.2205	0.4935	0.0011	1527.9	84	445.6	22.3	579.8	22098
29	180.0	80.0	4290	0.2660	0.3666	0.2209	0.4952	0.0020	556.9	84	445.0	22.1	579.6	12559
30	180.0	90.0	4227	0.2709	0.3705	0.2213	0.4974	0.0050	436.9	84	444.5	21.6	579.2	10622
31	270.0	0.0	4442	0.2619	0.3599	0.2195	0.4912	0.0015	5053.2	95	446.3	22.5	579.9	61920
32	270.0	10.0	4414	0.2618	0.3598	0.2195	0.4911	0.0016	5080.1	95	445.0	22.8	579.8	61503
33	270.0	20.0	4422	0.2626	0.3606	0.2197	0.4916	0.0010	4794.4	95	446.5	22.8	579.9	59262
34	270.0	30.0	4416	0.2629	0.3609	0.2198	0.4917	0.0008	4443.1	95	445.8	22.8	579.8	58600
35	270.0	40.0	4381	0.2651	0.3634	0.2200	0.4939	0.0007	3876.5	95	446.4	22.8	579.7	48790

The Next Page is the Test Report by the software

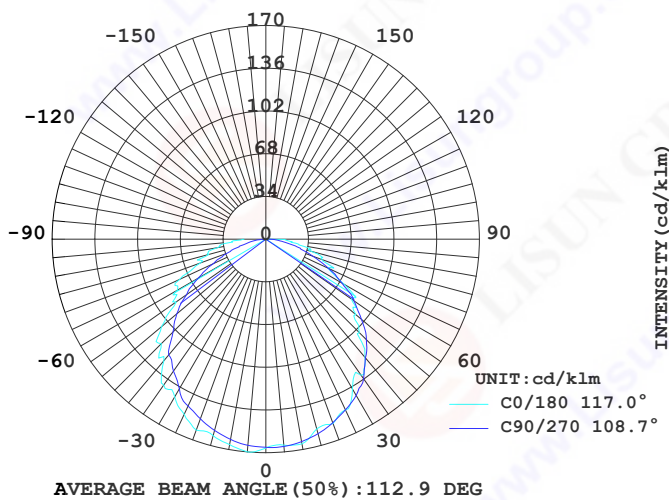
**STREETLIGHT PHOTOMETRIC TEST REPORT**

Report number:

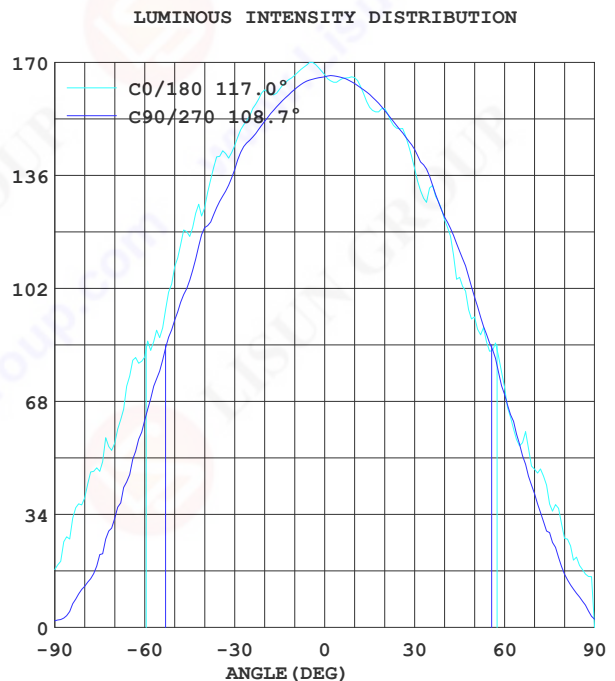
<b>MANUFACTURER:</b>		<b>Address:</b>	
<b>NAME:</b> LED Street Lamp		<b>TYPE:</b> LED-L120W	<b>WEIGHT:</b> 8kg
<b>SPECIFICATION:</b> 120W		<b>DIMENSION:</b> 750*350*85	<b>SERIAL No.:</b> LED-L120W-01

<b>MODEL:</b>	OSRAM	<b>Imax (cd/klm) :</b>	170.2	<b>Effective Flux(lm) :</b>	487.0
<b>NOMINAL POWER (W) :</b>	56	<b>MAXIMUM(C, γ) :</b>	0, 4.0	<b>EEl</b>	1.298
<b>RATED VOLTAGE (V) :</b>	220	<b>EFFICIENCY (%) :</b>	49.3	<b>Voltage (V)</b>	220.0
<b>NOMINAL FLUX (lm) :</b>	10659.4	<b>η street_up (%) :</b>	0.0	<b>Current (A)</b>	0.264
<b>TEST FLUX (lm) :</b>	10659	<b>η street_down (%) :</b>	24.4	<b>Power (W)</b>	56.16
<b>LAMPS QUANTITY:</b>	1	<b>η house_up (%)</b>	0.0	<b>Power Factor</b>	0.966
<b>TOTAL FLUX (lm/klm) :</b>	493.1	<b>η house_down (%) :</b>	24.9	<b>EFFICIENCY (lm/W)</b>	8.8

INTENSITY DISTRIBUTION DIAGRAM  
IN C PLANS



INTENSITY DISTRIBUTION DIAGRAM  
IN C PLANS



Test System:LSG-1700  
 Temperature:25.3DEG  
 Operators:  
 Test Date:2014-05-02

Test Set: 5.0deg/s C-Gamma (TYPE C)  
 Humidity:65.0%  
 Test Distance:11.060 m  
 Remarks:

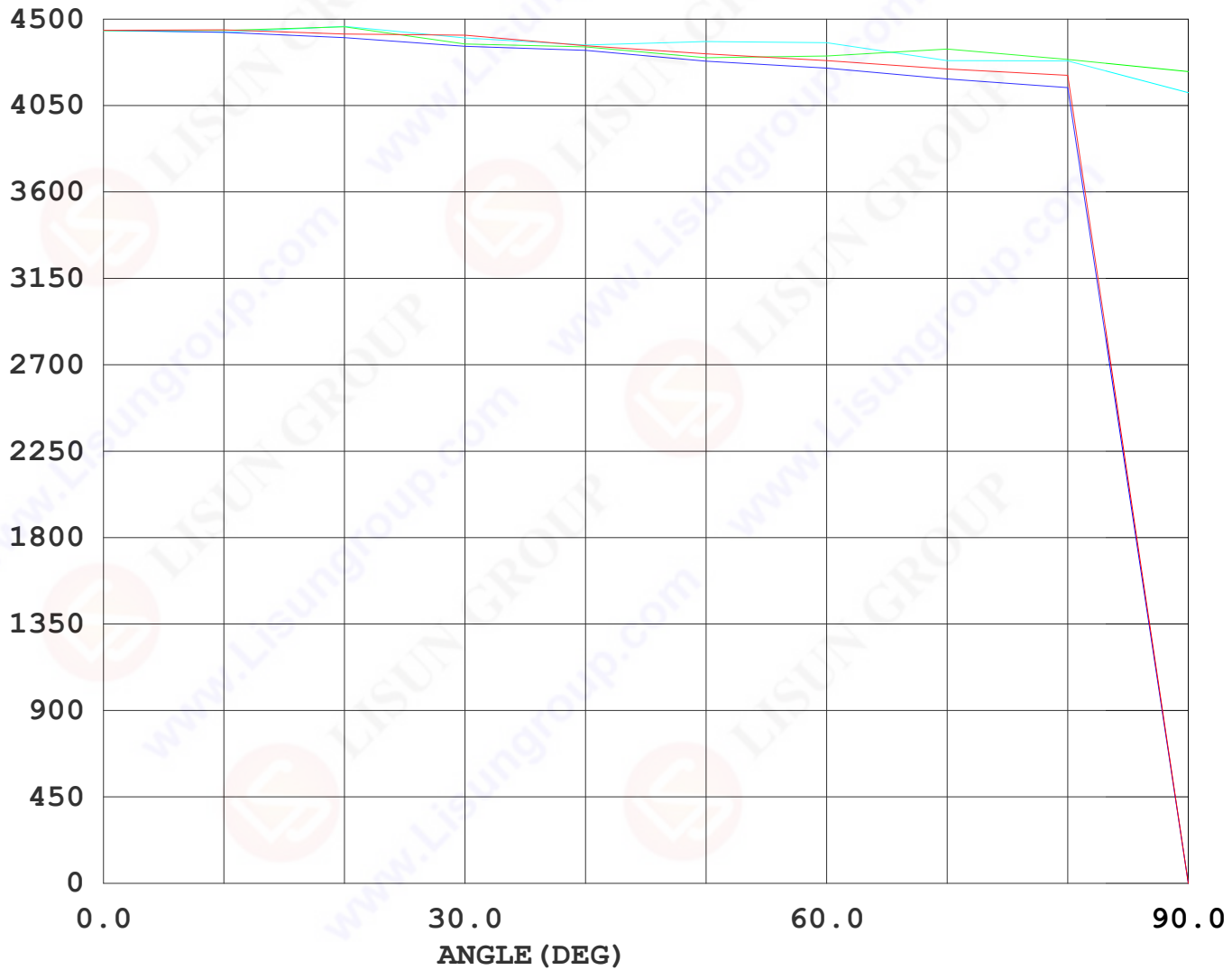


### Color Temperature Distrib

Report number:

<b>MANUFACTURER:</b>	<b>Address:</b>	
<b>NAME:</b> LED Street Lamp	<b>TYPE:</b> LED-L120W	<b>WEIGHT:</b> 8kg
<b>SPECIFICATION:</b> 120W	<b>DIMENSION:</b> 750*350*85	<b>SERIAL No.:</b> LED-L120W-01

## COLOR TEMPERATURE DISTRIBUTION



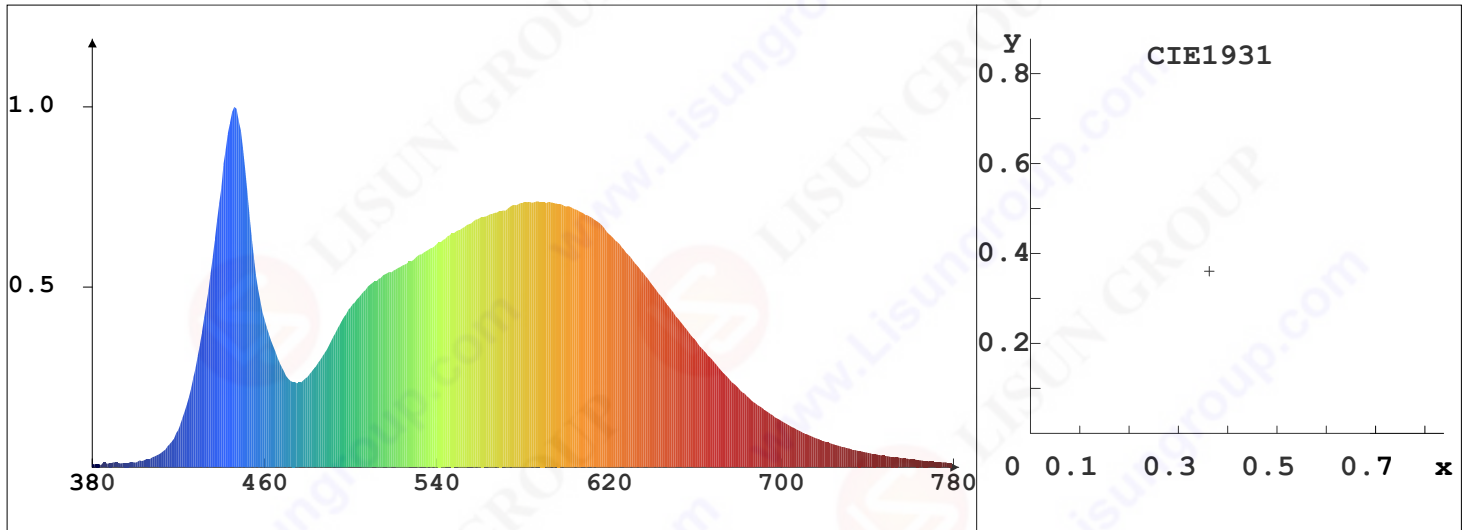
Test System: LSG-1700  
 Temperature: 25.3 DEG  
 Operators:  
 Test Date: 2014-05-02

Test Set: 5.0 deg/s C-Gamma (TYPE C)  
 Humidity: 65.0%  
 Test Distance: 11.060 m  
 Remarks:

### Spectrum Chart

Report number:

<b>MANUFACTURER:</b>	<b>Address:</b>	
<b>NAME:</b> LED Street Lamp	<b>TYPE:</b> LED-L120W	<b>WEIGHT:</b> 8kg
<b>SPECIFICATION:</b> 120W	<b>DIMENSION:</b> 750*350*85	<b>SERIAL No.:</b> LED-L120W-01



Current Angle: C=0.0° G=0.0°

**Avg Chro. Para.**

CCT: 4388K Chro. Coord.: xa=0.3640 ya=0.3623 u'a=0.2200 v'a=0.4926 Δu'v'=0.0000

**Chroma Parameters**

Chro.Coord.: x=0.3620 y=0.3601 u'=0.2195 v'=0.4913 duv=-0.0021

CCT: 4440K Dominant Wave: 578.9nm Purity: 16.7% Light Intensity: 5050.4cd

Flux RGB Ratio: R=17.5%,G=80.0%,B=2.5% Peak Wave: 445.6nm Half Width: 22.5nm

**Rendering Index: Ra= 84.9**

R1 =84 R2 =88 R3 =91 R4 =86 R5 =85 R6 =84 R7 =88 R8 =73

R9 =26 R10=72 R11=86 R12=70 R13=85 R14=95 R15=80

**Instrument State**

Scan Range: 380nm-780nm Integral Time: 2040.0m Peak Signal: 61899 Dark Signal: 4821

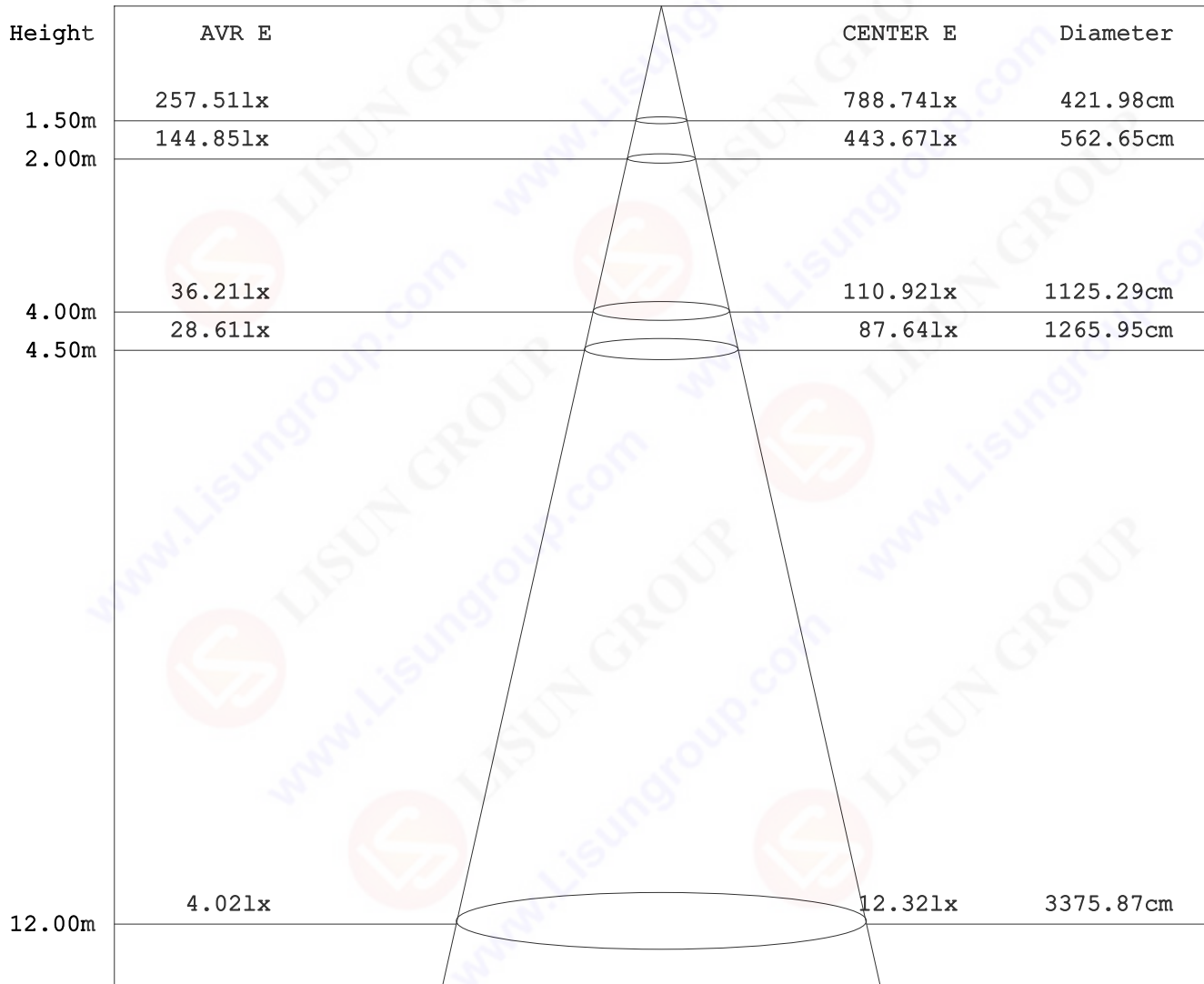
Test System: LSG-1700  
 Temperature: 25.3DEG  
 Operators:  
 Test Date: 2014-05-02

Test Set: 5.0deg/s C-Gamma (TYPE C)  
 Humidity: 65.0%  
 Test Distance: 11.060 m  
 Remarks:

**AVERAGE AND CENTER E Figure**

Report number:

<b>MANUFACTURER:</b>	<b>Address:</b>	
<b>NAME:</b> LED Street Lamp	<b>TYPE:</b> LED-L120W	<b>WEIGHT:</b> 8kg
<b>SPECIFICATION:</b> 120W	<b>DIMENSION:</b> 750*350*85	<b>SERIAL No.:</b> LED-L120W-01



Angle:109.2deg

Test System:LSG-1700  
 Temperature:25.3DEG  
 Operators:  
 Test Date:2014-05-02

Test Set: 5.0deg/s C-Gamma (TYPE C)  
 Humidity:65.0%  
 Test Distance:11.060 m  
 Remarks:

ZONAL FLUX DIAGRAM

Report number:

<b>MANUFACTURER:</b>	<b>Address:</b>	
<b>NAME:</b> LED Street Lamp	<b>TYPE:</b> LED-L120W	<b>WEIGHT:</b> 8kg
<b>SPECIFICATION:</b> 120W	<b>DIMENSION:</b> 750*350*85	<b>SERIAL No.:</b> LED-L120W-01

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	z <sub>0ne</sub>	t <sub>otal</sub>
5.0	170.2	169.0	164.9	162.7	164.8	164.1	165.8	169.4	0- 5	3.975	3.975
10.0	166.3	166.4	162.0	163.0	165.6	164.9	163.8	167.3	5- 10	11.86	15.84
15.0	162.2	161.2	157.8	160.3	156.6	162.6	160.5	162.8	10- 15	19.32	35.16
20.0	161.9	155.5	152.4	150.2	156.4	153.6	155.8	158.1	15- 20	26.01	61.18
25.0	153.9	149.7	146.7	144.7	150.2	148.6	150.0	153.0	20- 25	31.90	93.08
30.0	145.2	144.3	137.9	138.5	138.2	143.3	144.0	148.7	25- 30	37.21	130.2
35.0	141.8	133.5	128.3	131.9	132.3	138.1	136.0	137.8	30- 35	40.70	171.0
40.0	126.4	121.6	120.4	116.3	122.8	121.2	123.5	128.5	35- 40	43.12	214.1
45.0	117.8	117.1	104.6	108.8	105.4	114.0	113.3	121.6	40- 45	43.50	257.6
50.0	108.6	98.18	92.57	95.63	93.57	105.3	99.53	106.2	45- 50	43.22	300.8
55.0	87.30	91.34	77.19	76.12	83.20	85.16	85.67	92.75	50- 55	40.11	340.9
60.0	81.51	73.14	62.49	64.45	72.22	70.57	70.19	84.11	55- 60	36.60	377.5
65.0	75.75	57.91	46.08	58.72	54.68	63.33	55.26	63.43	60- 65	31.82	409.3
70.0	55.48	52.44	32.80	39.18	47.64	46.02	40.30	53.62	65- 70	26.86	436.2
75.0	47.01	36.12	21.96	31.39	37.20	37.19	28.57	43.87	70- 75	21.58	457.8
80.0	39.07	27.56	12.41	22.09	26.86	27.48	16.10	32.48	75- 80	16.50	474.3
85.0	26.65	18.07	4.819	12.51	18.65	19.49	9.203	24.53	80- 85	11.65	485.9
90.0	17.44	9.972	2.008	8.549	0	10.76	2.490	15.14	85- 90	7.162	493.1
95.0									90- 95		
100.0									95-100		
105.0									100-105		
110.0									105-110		
115.0									110-115		
120.0									115-120		
125.0									120-125		
130.0									125-130		
135.0									130-135		
140.0									135-140		
145.0									140-145		
150.0									145-150		
155.0									150-155		
160.0									155-160		
165.0									160-165		
170.0									165-170		
175.0									170-175		
180.0									175-180		
DEG	LUMINOUS INTENSITY:cd/klm									UNIT:lm/klm	

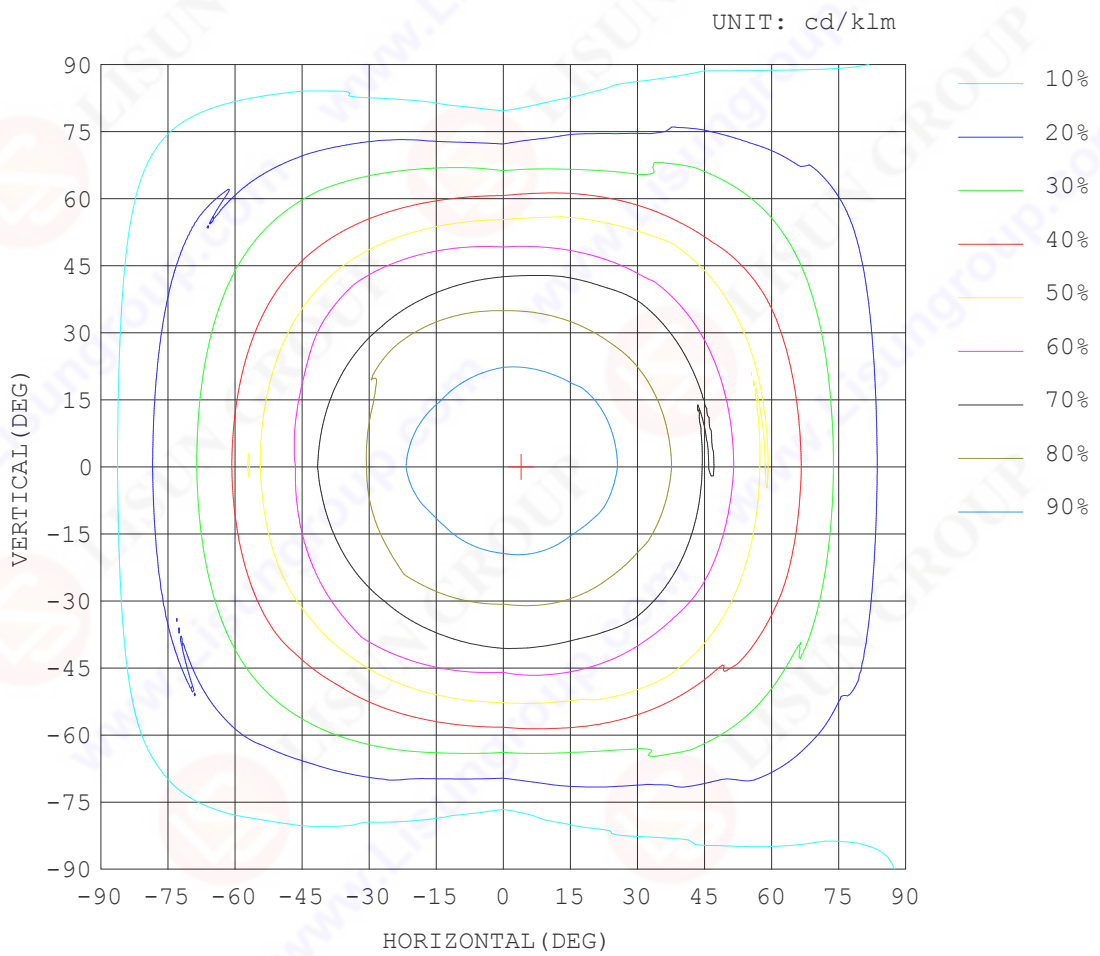
Test System:LSG-1700  
 Temperature:25.3DEG  
 Operators:  
 Test Date:2014-05-02

Test Set: 5.0deg/s C-Gamma (TYPE C)  
 Humidity:65.0%  
 Test Distance:11.060 m  
 Remarks:

ISOCANDELA DIAGRAM

Report number:

<b>MANUFACTURER:</b>	<b>Address:</b>	
<b>NAME: LED Street Lamp</b>	<b>TYPE:LED-L120W</b>	<b>WEIGHT:8kg</b>
<b>SPECIFICATION:120W</b>	<b>DIMENSION: 750*350*85</b>	<b>SERIAL No.:LED-L120W-01</b>



Test System:LSG-1700  
 Temperature:25.3DEG  
 Operators:  
 Test Date:2014-05-02

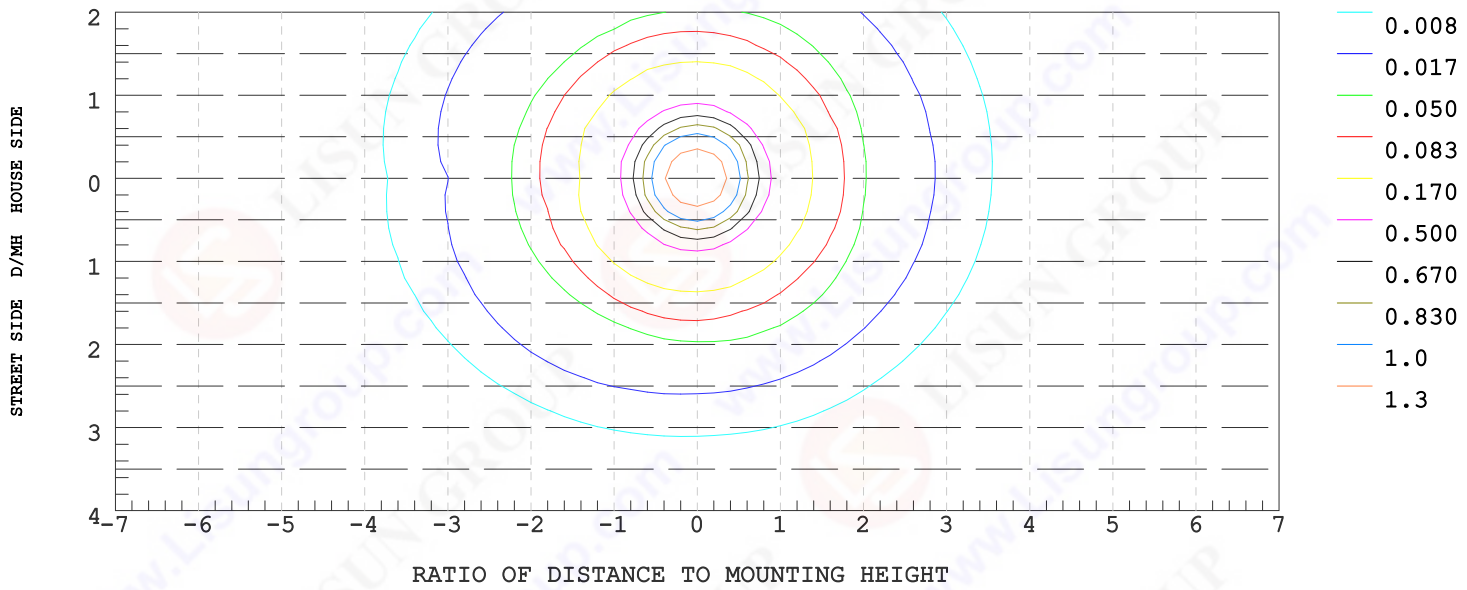
Test Set: 5.0deg/s C-Gamma (TYPE C)  
 Humidity:65.0%  
 Test Distance:11.060 m  
 Remarks:

### ISOLUX DIAGRAM

Report number:

<b>MANUFACTURER:</b>	<b>Address:</b>	
<b>NAME:</b> LED Street Lamp	<b>TYPE:</b> LED-L120W	<b>WEIGHT:</b> 8kg
<b>SPECIFICATION:</b> 120W	<b>DIMENSION:</b> 750*350*85	<b>SERIAL No.:</b> LED-L120W-01

ILLUMINANCE AT MH=10 m, Enadir = 1.66 lx/klm



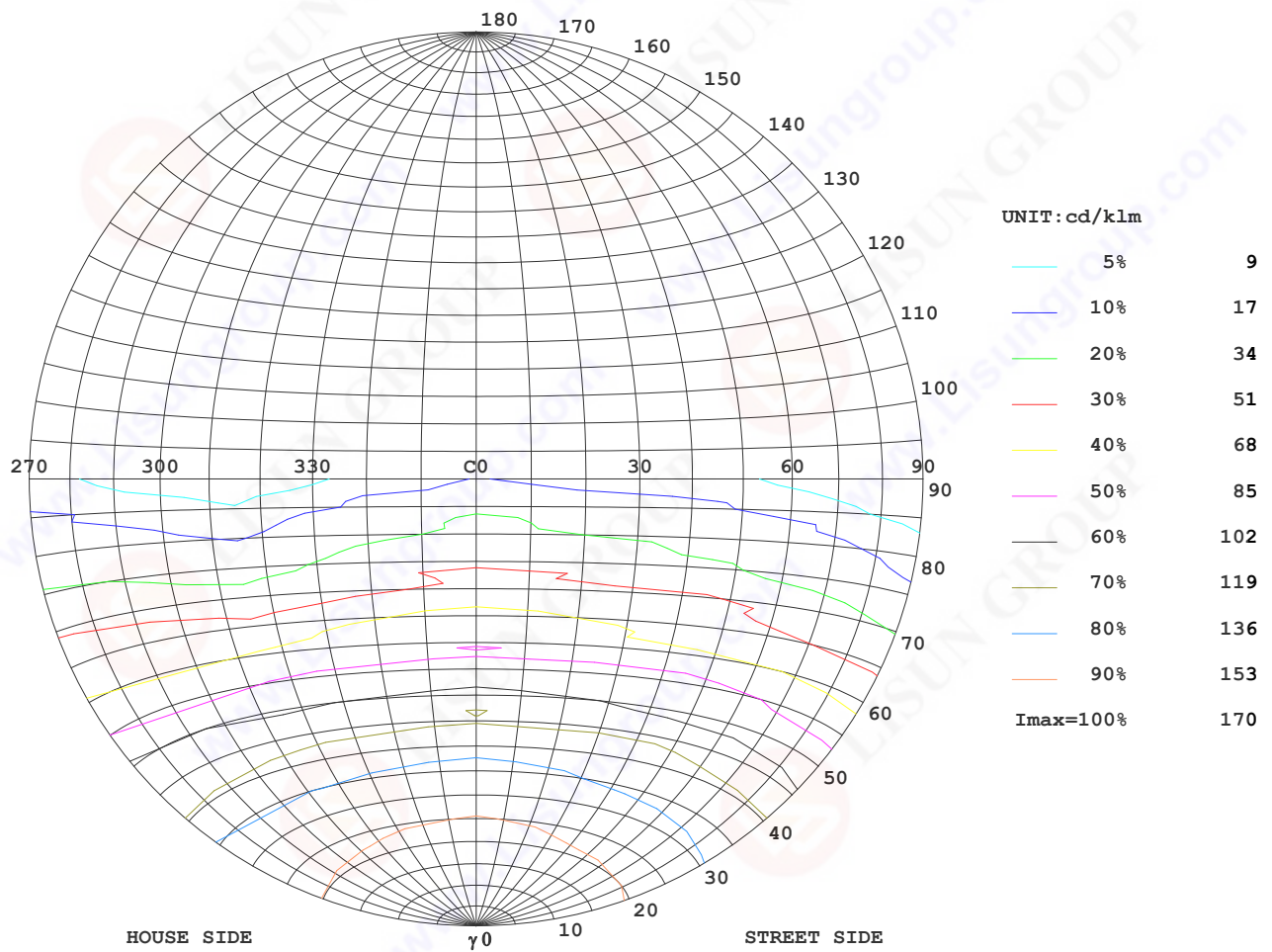
Test System: LSG-1700  
 Temperature: 25.3 DEG  
 Operators:  
 Test Date: 2014-05-02

Test Set: 5.0deg/s C-Gamma (TYPE C)  
 Humidity: 65.0%  
 Test Distance: 11.060 m  
 Remarks:

### ISOCANDELA DIAGRAM

Report number:

<b>MANUFACTURER:</b>	<b>Address:</b>	
<b>NAME:</b> LED Street Lamp	<b>TYPE:</b> LED-L120W	<b>WEIGHT:</b> 8kg
<b>SPECIFICATION:</b> 120W	<b>DIMENSION:</b> 750*350*85	<b>SERIAL No.:</b> LED-L120W-01



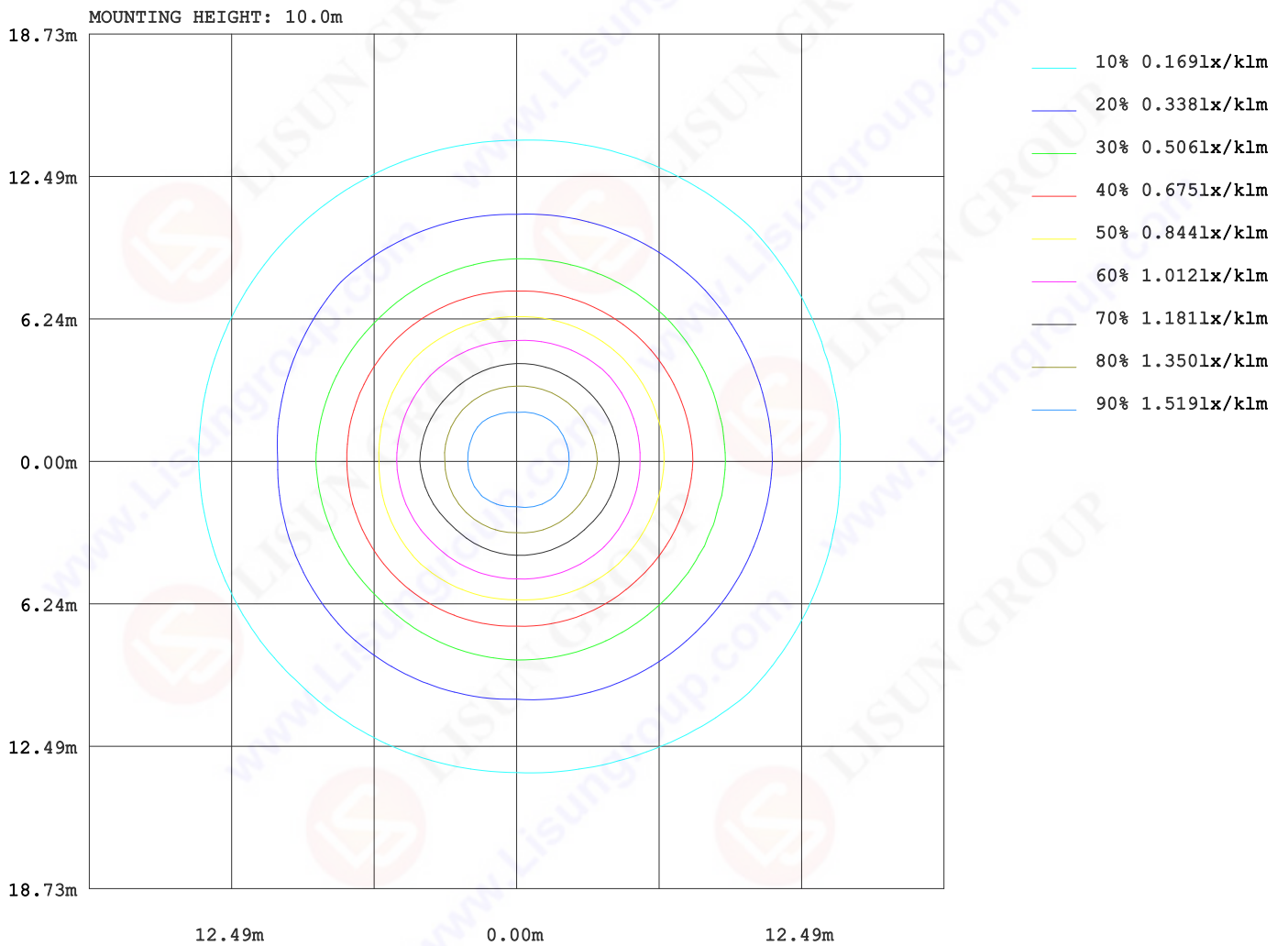
Test System: LSG-1700  
 Temperature: 25.3 DEG  
 Operators:  
 Test Date: 2014-05-02

Test Set: 5.0 deg/s C-Gamma (TYPE C)  
 Humidity: 65.0%  
 Test Distance: 11.060 m  
 Remarks:

### ISOLUX DIAGRAM

Report number:

<b>MANUFACTURER:</b>	<b>Address:</b>	
<b>NAME: LED Street Lamp</b>	<b>TYPE:LED-L120W</b>	<b>WEIGHT:8kg</b>
<b>SPECIFICATION:120W</b>	<b>DIMENSION: 750*350*85</b>	<b>SERIAL No.:LED-L120W-01</b>



Test System:LSG-1700  
 Temperature:25.3DEG  
 Operators:  
 Test Date:2014-05-02

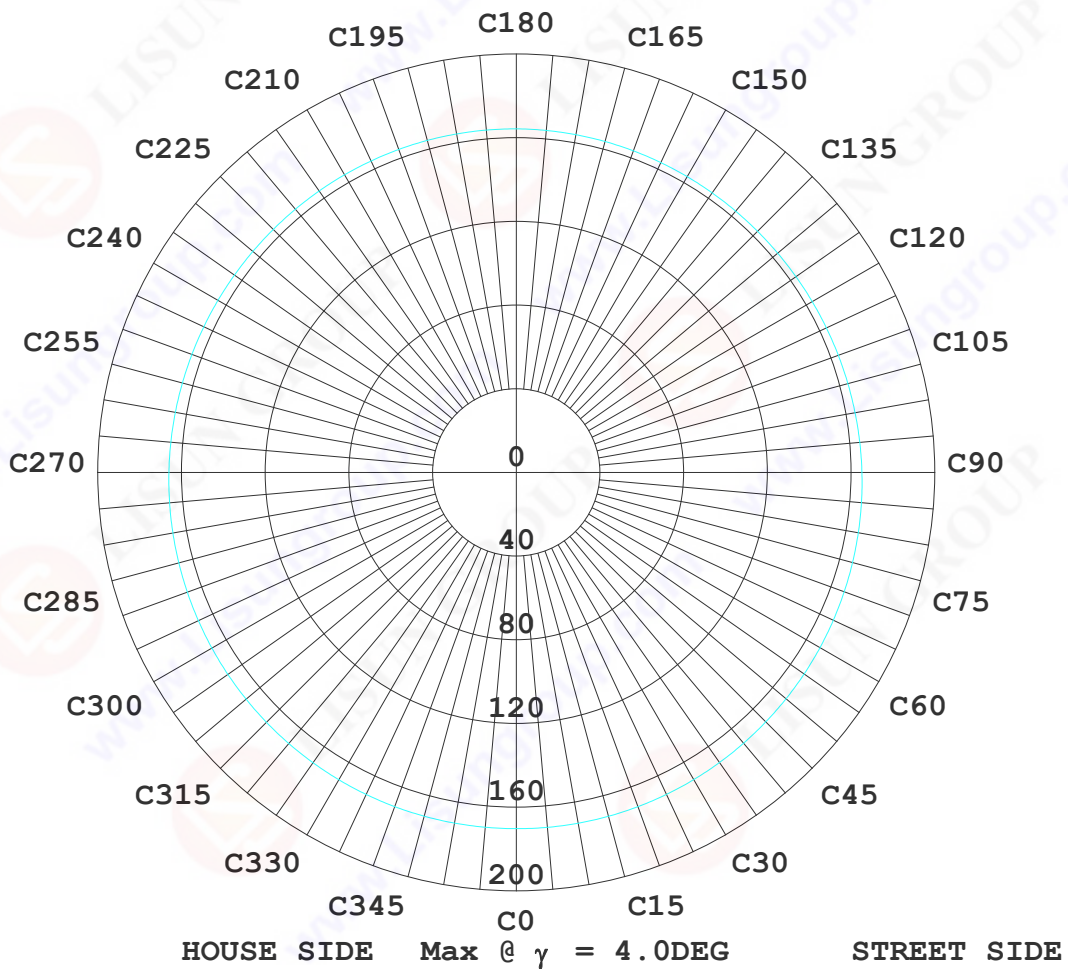
Test Set: 5.0deg/s C-Gamma (TYPE C)  
 Humidity:65.0%  
 Test Distance:11.060 m  
 Remarks:



**ISOCANDELA DIAGRAM**

Report number:

<b>MANUFACTURER:</b>	<b>Address:</b>	
<b>NAME:</b> LED Street Lamp	<b>TYPE:</b> LED-L120W	<b>WEIGHT:</b> 8kg
<b>SPECIFICATION:</b> 120W	<b>DIMENSION:</b> 750*350*85	<b>SERIAL No.:</b> LED-L120W-01



Test System: LSG-1700  
 Temperature: 25.3 DEG  
 Operators:  
 Test Date: 2014-05-02

Test Set: 5.0 deg/s C-Gamma (TYPE C)  
 Humidity: 65.0%  
 Test Distance: 11.060 m  
 Remarks:

AREA LUMINOUS FLUX

Report number:

<b>MANUFACTURER:</b>	<b>Address:</b>	
<b>NAME: LED Street Lamp</b>	<b>TYPE:LED-L120W</b>	<b>WEIGHT:8kg</b>
<b>SPECIFICATION:120W</b>	<b>DIMENSION: 750*350*85</b>	<b>SERIAL No.:LED-L120W-01</b>

		AREA FLUX DIAGRAM																	UNIT:lm/klm		Φ t	Φ a					
VERTICAL (DEG)	90	0.02	0.10	0.17	0.26	0.33	0.37	0.37	0.35	0.30	0.32	0.41	0.46	0.49	0.46	0.37	0.26	0.15	0.05	5.25	2.64						
	80	0.04	0.14	0.27	0.43	0.60	0.73	0.82	0.87	0.87	0.90	0.95	0.94	0.86	0.73	0.56	0.38	0.20	0.05	10.3	10.2						
	70	0.04	0.17	0.37	0.62	0.89	1.20	1.45	1.62	1.68	1.69	1.64	1.49	1.31	1.08	0.76	0.48	0.25	0.06	16.8	16.8						
	60	0.05	0.20	0.47	0.82	1.29	1.67	2.04	2.38	2.57	2.60	2.51	2.25	1.84	1.34	0.96	0.59	0.28	0.07	23.9	23.9						
	50	0.05	0.24	0.56	1.02	1.52	2.16	2.81	3.19	3.40	3.43	3.27	2.89	2.36	1.77	1.14	0.67	0.32	0.07	30.9	30.9						
	40	0.05	0.27	0.65	1.15	1.86	2.67	3.24	3.78	4.06	4.08	3.85	3.44	2.82	2.03	1.36	0.75	0.35	0.08	36.5	36.5						
	30	0.05	0.29	0.70	1.31	2.11	2.90	3.73	4.26	4.51	4.55	4.35	3.83	3.13	2.30	1.48	0.83	0.37	0.08	40.8	40.8						
		0.06	0.31	0.73	1.43	2.22	3.18	3.95	4.49	4.84	4.86	4.60	4.10	3.34	2.49	1.56	0.90	0.39	0.09	43.5	43.5						
		0.06	0.32	0.75	1.48	2.29	3.25	4.08	4.66	4.99	5.07	4.76	4.22	3.45	2.57	1.60	0.94	0.39	0.09	45.0	45.0						
		0.06	0.32	0.74	1.46	2.27	3.23	4.06	4.63	4.96	5.05	4.74	4.20	3.43	2.55	1.59	0.93	0.39	0.09	44.7	44.7						
		0.06	0.31	0.72	1.40	2.17	3.12	3.87	4.40	4.75	4.78	4.52	4.03	3.27	2.44	1.53	0.89	0.38	0.09	42.7	42.7						
	-30	0.05	0.29	0.67	1.27	2.01	2.82	3.60	4.11	4.39	4.44	4.22	3.70	3.03	2.21	1.43	0.82	0.36	0.08	39.5	39.5						
	-40	0.05	0.26	0.61	1.10	1.74	2.50	3.10	3.62	3.87	3.89	3.69	3.28	2.67	1.94	1.28	0.73	0.34	0.08	34.8	34.7						
	-50	0.05	0.23	0.53	0.95	1.42	1.96	2.57	2.97	3.18	3.22	3.06	2.69	2.21	1.61	1.09	0.64	0.31	0.07	28.7	28.7						
	-60	0.04	0.19	0.44	0.74	1.14	1.52	1.85	2.16	2.34	2.38	2.28	2.02	1.62	1.26	0.89	0.54	0.27	0.07	21.7	21.7						
	-70	0.04	0.15	0.34	0.55	0.77	1.01	1.24	1.39	1.44	1.46	1.44	1.34	1.18	0.95	0.67	0.44	0.23	0.06	14.7	14.7						
	-80	0.04	0.12	0.23	0.36	0.50	0.60	0.67	0.70	0.68	0.70	0.76	0.76	0.71	0.62	0.49	0.34	0.18	0.05	8.52	7.91						
	-90	0.02	0.09	0.15	0.21	0.25	0.27	0.27	0.25	0.21	0.22	0.29	0.34	0.36	0.34	0.29	0.22	0.13	0.05	3.96	0.82						
		-90	-80	-70	-60	-50	-40	-30	-20	HORIZONTAL (DEG)										20	30	40	50	60	70	80	90
Φ t	0.83	3.98	9.09	16.6	25.4	35.2	43.7	49.8	53.1	53.7	51.4	46.0	38.1	28.7	19.1	11.3	5.30	1.26	493								
Φ a	0.50	3.60	8.70	16.1	25.0	34.7	43.2	49.2	52.4	53.0	50.8	45.6	37.8	28.5	18.9	11.2	5.21	1.25		487							

Test System:LSG-1700  
 Temperature:25.3DEG  
 Operators:  
 Test Date:2014-05-02

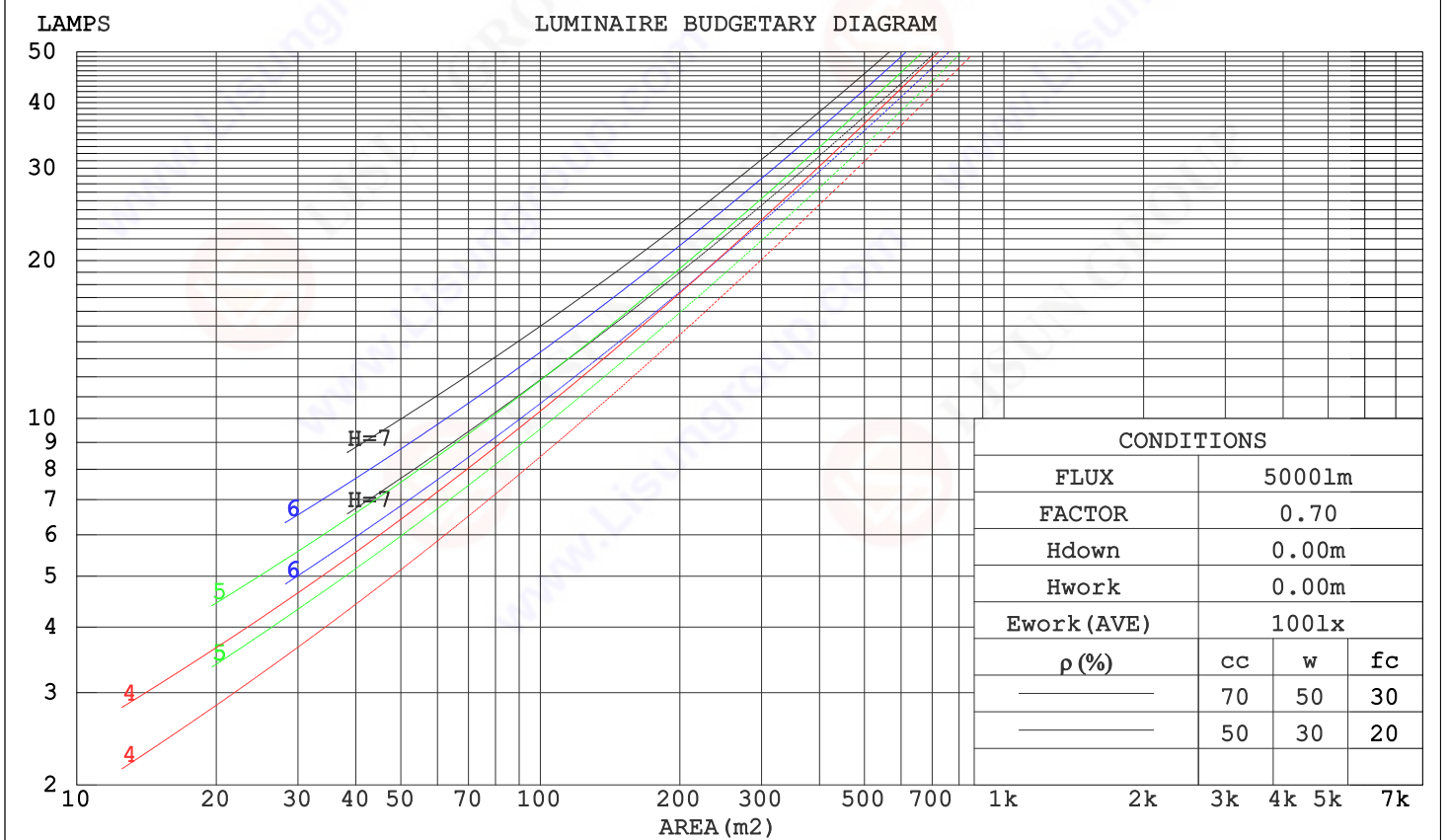
Test Set: 5.0deg/s C-Gamma (TYPE C)  
 Humidity:65.0%  
 Test Distance:11.060 m  
 Remarks:

CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

Report number:

<b>MANUFACTURER:</b>				<b>Address:</b>											
<b>NAME: LED Street Lamp</b>				<b>TYPE:LED-L120W</b>						<b>WEIGHT:8kg</b>					
<b>SPECIFICATION:120W</b>				<b>DIMENSION: 750*350*85</b>						<b>SERIAL No.:LED-L120W-01</b>					

$\rho_{cc}$	80%			70%			50%			30%			10%			0
$\rho_w$	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
$\rho_{fc}$	20%			20%			20%			20%			20%			0
<b>RCR</b>	<b>RCR:Room Cavity Ratio</b>						<b>Coefficients of Utilization(CU)</b>									
0.0	.59	.59	.59	.57	.57	.57	.55	.55	.55	.52	.52	.52	.50	.50	.50	.49
1.0	.51	.48	.46	.50	.47	.46	.47	.46	.44	.45	.44	.43	.44	.43	.41	.40
2.0	.44	.40	.37	.43	.40	.37	.41	.39	.36	.40	.37	.35	.38	.36	.35	.33
3.0	.39	.34	.31	.38	.34	.31	.36	.33	.30	.35	.32	.30	.34	.31	.29	.28
4.0	.34	.30	.26	.33	.29	.26	.32	.29	.26	.31	.28	.25	.30	.27	.25	.24
5.0	.30	.26	.23	.30	.26	.22	.29	.25	.22	.28	.25	.22	.27	.24	.22	.21
6.0	.27	.23	.20	.27	.23	.20	.26	.22	.19	.25	.22	.19	.24	.21	.19	.18
7.0	.25	.20	.17	.24	.20	.17	.24	.20	.17	.23	.20	.17	.22	.19	.17	.16
8.0	.23	.18	.15	.22	.18	.15	.22	.18	.15	.21	.18	.15	.20	.17	.15	.14
9.0	.21	.17	.14	.21	.17	.14	.20	.16	.14	.19	.16	.14	.19	.16	.14	.13
10.0	.19	.15	.13	.19	.15	.13	.18	.15	.13	.18	.15	.12	.18	.15	.12	.12



Test System:LSG-1700  
 Temperature:25.3DEG  
 Operators:  
 Test Date:2014-05-02

Test Set: 5.0deg/s C-Gamma (TYPE C)  
 Humidity:65.0%  
 Test Distance:11.060 m  
 Remarks:

WEC AND CCEC

Report number:

<b>MANUFACTURER:</b>				<b>Address:</b>											
<b>NAME: LED Street Lamp</b>				<b>TYPE:LED-L120W</b>						<b>WEIGHT:8kg</b>					
<b>SPECIFICATION:120W</b>				<b>DIMENSION: 750*350*85</b>						<b>SERIAL No.:LED-L120W-01</b>					

$\rho_{cc}$	80%			70%			50%			30%			10%			0
$\rho_w$	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
$\rho_{fc}$	20%			20%			20%			20%			20%			0
<b>RCR</b>	<b>RCR:Room Cavity Ratio</b>						<b>Wall Exitance Coefficients(WEC)</b>									
0.0																
1.0	.164	.093	.030	.160	.091	.029	.154	.088	.028	.148	.085	.027	.142	.082	.027	
2.0	.150	.082	.025	.147	.081	.025	.141	.078	.024	.135	.076	.024	.131	.074	.023	
3.0	.137	.073	.022	.134	.072	.022	.129	.070	.021	.124	.068	.021	.120	.066	.021	
4.0	.125	.065	.019	.123	.064	.019	.118	.063	.019	.114	.061	.018	.110	.060	.018	
5.0	.115	.059	.017	.113	.058	.017	.109	.057	.017	.105	.056	.017	.102	.054	.016	
6.0	.107	.053	.015	.105	.053	.015	.101	.052	.015	.098	.051	.015	.095	.050	.015	
7.0	.099	.049	.014	.097	.049	.014	.094	.048	.014	.091	.047	.014	.088	.046	.013	
8.0	.092	.045	.013	.091	.045	.013	.088	.044	.013	.085	.043	.012	.083	.043	.012	
9.0	.087	.042	.012	.085	.042	.012	.083	.041	.012	.080	.040	.011	.078	.040	.011	
10.0	.081	.039	.011	.080	.039	.011	.078	.038	.011	.076	.038	.011	.073	.037	.011	

$\rho_{cc}$	80%			70%			50%			30%			10%			0
$\rho_w$	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
$\rho_{fc}$	20%			20%			20%			20%			20%			0
<b>RCR</b>	<b>RCR:Room Cavity Ratio</b>						<b>Ceiling Cavity Exitance Coefficients(CCEC)</b>									
0.0																
1.0	.094	.094	.094	.080	.080	.080	.055	.055	.055	.031	.031	.031	.010	.010	.010	
2.0	.086	.065	.048	.073	.056	.041	.050	.039	.029	.029	.023	.017	.009	.007	.005	
3.0	.082	.056	.036	.070	.049	.031	.048	.034	.022	.028	.020	.013	.009	.006	.004	
4.0	.078	.050	.028	.067	.043	.025	.046	.030	.017	.027	.018	.010	.009	.006	.003	
5.0	.074	.045	.023	.064	.039	.020	.044	.027	.014	.025	.016	.008	.008	.005	.003	
6.0	.071	.041	.019	.061	.035	.017	.042	.025	.012	.024	.014	.007	.008	.005	.002	
7.0	.067	.037	.016	.058	.032	.014	.040	.023	.010	.023	.013	.006	.007	.004	.002	
8.0	.064	.034	.014	.055	.030	.012	.038	.021	.009	.022	.012	.005	.007	.004	.002	
9.0	.061	.032	.012	.052	.028	.011	.036	.019	.008	.021	.011	.005	.007	.004	.002	
10.0	.058	.030	.011	.050	.026	.010	.035	.018	.007	.020	.011	.004	.007	.004	.001	

Test System:LSG-1700  
 Temperature:25.3DEG  
 Operators:  
 Test Date:2014-05-02

Test Set: 5.0deg/s C-Gamma (TYPE C)  
 Humidity:65.0%  
 Test Distance:11.060 m  
 Remarks:

## Uncorrected UGR Table

Report number:

<b>MANUFACTURER:</b>	<b>Address:</b>			
<b>NAME: LED Street Lamp</b>	<b>TYPE:LED-L120W</b>	<b>WEIGHT:8kg</b>		
<b>SPECIFICATION:120W</b>	<b>DIMENSION: 750*350*85</b>	<b>SERIAL No.:LED-L120W-01</b>		

ceiling/cavity	0.7	0.7	0.5	0.5	0.3	0.7	0.7	0.5	0.5	0.3
walls	0.5	0.3	0.5	0.3	0.3	0.5	0.3	0.5	0.3	0.3
working 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	14.7	16.2	14.9	16.4	16.6	13.7	15.3	14.0	15.5	15.7
3H	16.5	17.9	16.8	18.2	18.4	14.9	16.3	15.2	16.6	16.8
4H	17.5	18.9	17.8	19.1	19.4	15.3	16.7	15.6	16.9	17.2
6H	18.5	19.8	18.9	20.1	20.4	15.6	16.9	15.9	17.2	17.4
8H	19.1	20.4	19.5	20.6	20.9	15.7	16.9	16.0	17.2	17.5
12H	19.6	20.8	20.0	21.1	21.5	15.7	16.9	16.1	17.2	17.5
4H 2H	15.2	16.5	15.5	16.8	17.1	14.5	15.8	14.8	16.1	16.3
3H	17.3	18.5	17.6	18.8	19.1	15.9	17.1	16.3	17.4	17.7
4H	18.4	19.5	18.8	19.8	20.1	16.5	17.6	16.9	17.9	18.2
6H	19.6	20.6	20.0	21.0	21.3	16.9	17.9	17.3	18.2	18.6
8H	20.3	21.2	20.7	21.6	22.0	17.1	18.0	17.5	18.4	18.8
12H	21.0	21.8	21.4	22.2	22.6	17.2	18.0	17.6	18.4	18.8
8H 4H	18.7	19.6	19.1	19.9	20.3	17.0	17.9	17.4	18.3	18.7
6H	20.1	20.9	20.5	21.3	21.7	17.7	18.5	18.1	18.9	19.3
8H	21.0	21.7	21.4	22.1	22.5	18.0	18.7	18.5	19.1	19.6
12H	21.8	22.4	22.3	22.8	23.3	18.2	18.8	18.7	19.3	19.8
12H 4H	18.7	19.5	19.1	19.9	20.3	17.1	18.0	17.6	18.4	18.8
6H	20.2	20.9	20.6	21.3	21.8	17.9	18.6	18.4	19.0	19.5
8H	21.1	21.7	21.6	22.2	22.7	18.4	19.0	18.8	19.4	19.9
Variations with the observer position at spacings:										
S = 1.0H	+ 0.1 / - 0.1					+ 0.1 / - 0.2				
1.5H	+ 0.2 / - 0.2					+ 0.3 / - 0.3				
2.0H	+ 0.2 / - 0.3					+ 0.2 / - 0.4				

CIE Pub.117 Corrected 1000 lm Total Lamp Luminous Flux. (8log(F/F0) = 0.0)

Test System:LSG-1700  
 Temperature:25.3DEG  
 Operators:  
 Test Date:2014-05-02

Test Set: 5.0deg/s C-Gamma (TYPE C)  
 Humidity:65.0%  
 Test Distance:11.060 m  
 Remarks:

## UTILIZATION FACTORS TABLE

Report number:

<b>MANUFACTURER:</b>	<b>Address:</b>	
<b>NAME: LED Street Lamp</b>	<b>TYPE:LED-L120W</b>	<b>WEIGHT:8kg</b>
<b>SPECIFICATION:120W</b>	<b>DIMENSION: 750*350*85</b>	<b>SERIAL No.:LED-L120W-01</b>

REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS (PERCENT) $k(RI) \times RCR = 5$									
$k = 0.60$	28	22	19	28	22	19	27	22	19	15
0.80	33	27	23	32	27	23	32	27	23	20
1.00	37	31	28	36	31	28	35	32	27	24
1.25	40	35	32	40	35	31	38	34	31	27
1.50	43	38	34	42	37	34	41	37	34	30
2.00	46	42	39	45	41	38	44	40	37	34
2.50	48	44	41	47	44	41	45	42	40	36
3.00	50	46	43	49	46	43	47	44	42	38
4.00	52	49	46	51	48	46	49	46	44	40
5.00	53	51	48	52	50	48	50	48	46	42
ROOM INDEX	UF(total)									Direct
According to DIN EN 13032-2 2004			Suspended				SHRNOM = 1.25			

Test System:LSG-1700  
 Temperature:25.3DEG  
 Operators:  
 Test Date:2014-05-02

Test Set: 5.0deg/s C-Gamma (TYPE C)  
 Humidity:65.0%  
 Test Distance:11.060 m  
 Remarks:

**LUMINOUS DISTRIBUTION INTENSITY DATA**

Report number:

<b>MANUFACTURER:</b>	<b>Address:</b>	
<b>NAME: LED Street Lamp</b>	<b>TYPE:LED-L120W</b>	<b>WEIGHT:8kg</b>
<b>SPECIFICATION:120W</b>	<b>DIMENSION: 750*350*85</b>	<b>SERIAL No.:LED-L120W-01</b>

UNIT: cd/klm

C (DEG) \ γ (DEG)	0	45	90	135	180	225	270	315
0.0	166	166	166	166	166	166	166	166
5.0	170	169	165	163	165	164	166	169
10.0	166	166	162	163	166	165	164	167
15.0	162	161	158	160	157	163	161	163
20.0	162	156	152	150	156	154	156	158
25.0	154	150	147	145	150	149	150	153
30.0	145	144	138	139	138	143	144	149
35.0	142	134	128	132	132	138	136	138
40.0	126	122	120	116	123	121	124	129
45.0	118	117	105	109	105	114	113	122
50.0	109	98.1	92.5	95.6	93.5	105	99.5	106
55.0	87.3	91.3	77.1	76.1	83.2	85.1	85.6	92.7
60.0	81.5	73.1	62.4	64.4	72.2	70.5	70.1	84.1
65.0	75.7	57.9	46.0	58.7	54.6	63.3	55.2	63.4
70.0	55.4	52.4	32.8	39.1	47.6	46.0	40.3	53.6
75.0	47.0	36.1	21.9	31.3	37.2	37.1	28.5	43.8
80.0	39.0	27.5	12.4	22.0	26.8	27.4	16.1	32.4
85.0	26.6	18.0	4.81	12.5	18.6	19.4	9.20	24.5
90.0	17.4	9.97	2.00	8.54	0.00	10.7	2.49	15.1

Test System:LSG-1700  
 Temperature:25.3DEG  
 Operators:  
 Test Date:2014-05-02

Test Set: 5.0deg/s C-Gamma (TYPE C)  
 Humidity:65.0%  
 Test Distance:11.060 m  
 Remarks: