



LM-79-08 Test Report

for

GREEN CREATIVE LTD

756 North Zhongshan Rd., Unit B301 Zhabei District, Shanghai

LED PLL

Model: 17PLL/830/DIR

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ15100038a

The laboratory that conducted the testing detailed in this report has been accredited for SSL by NVLAP.

Review by:

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Oct. 28, 2015

Approved by:



Jim Zhang

Manager: Jim Zhang
Oct. 28, 2015

Note: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Test Summary

Sample Tested: 17PLL/830/DIR

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
100.8	2191.0	21.74	0.9949
CCT (K)	CRI	Stabilization Time (Light & Power)	
3105	85.0	65	

Table 1: Executive Data Summary

Note: The above results are recorded/ derived from measurements made using an Integrating Sphere.

Test specifications:

Date of Receipt	: Oct. 26, 2015
Date of Test	: Oct. 26, 2015 to Oct. 27, 2015
Test item	: Total Luminous Flux, Luminous Distribution Intensity, Luminous Efficacy, Correlated Color Temperature, Color Rendering Index, Chromaticity Coordinate, Electrical parameters
Reference Standard	: IESNA LM-79-2008 Approved Method for the Electrical and Photometric Measurements of Solid-State Lighting Products

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Sample Photos

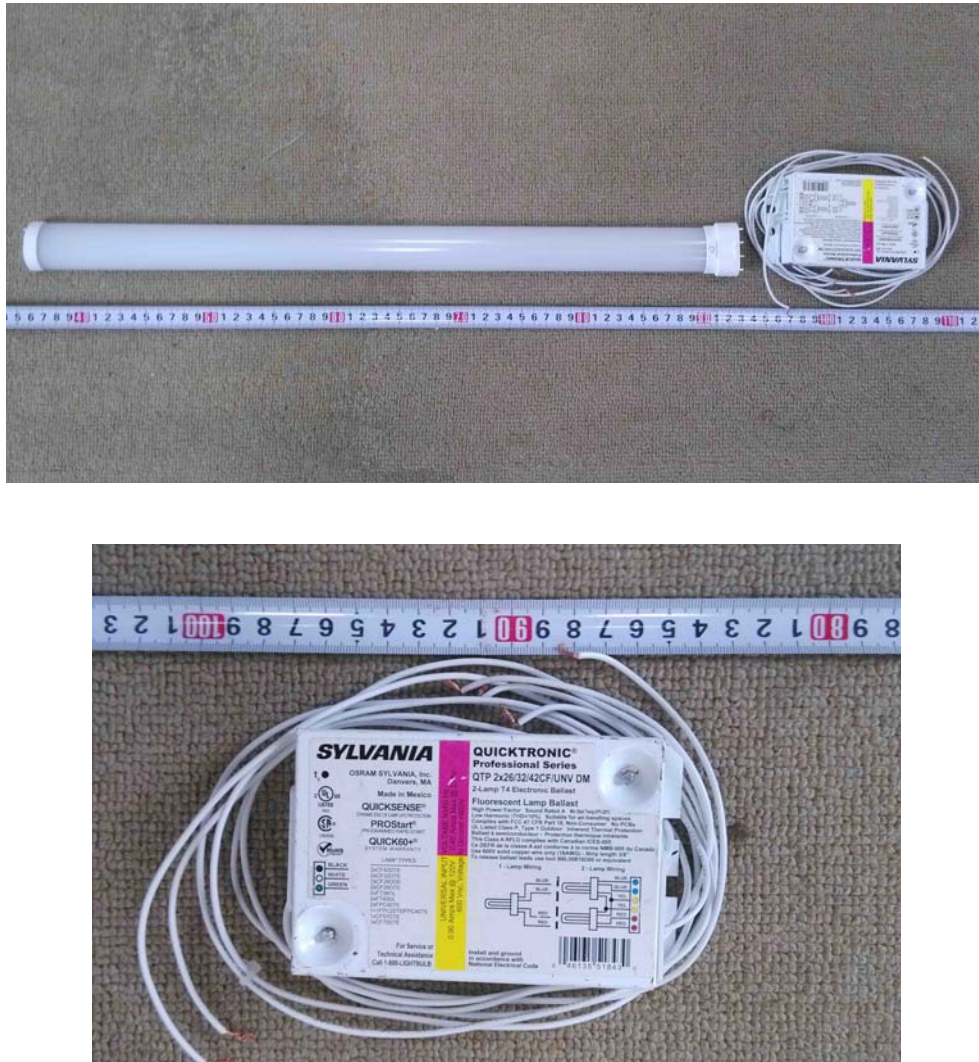


Figure 1- Overview of the sample

Equipment Under Test (EUT)

Name	: LED PLL
Model	: 17PLL/830/DIR
Electrical Ratings	: 120-277Vac, 50/60Hz, 17W
Product Description	: 2G11 base, 3000K, Frosted lens LED PLL supplied by a high frequency fluorescent lamp ballast:SYLVANIA QTP 2x26/32/42 CF/UNV DM
Manufacturer	: GREEN CREATIVE LTD
Address	: 756 North Zhongshan Rd., Unit B301 Zhabei District, Shanghai

TEST RESULTS

Test ambient temperature was 25.2°C.

Base orientation was Horizontal. Test was conducted without a dimmer in the circuit.

The stabilization time of the sample was 65 minutes, and the total operating time including stabilization was 75 minutes.

Sphere-Spectroradiometer Method

Parameter	Result	
Test Voltage (V)	120.0	277.0
Voltage frequency (Hz)	60	60
Test Current (A)	0.182	0.090
Power Factor	0.9949	0.8929
Test Power (W)	21.74	22.36
THD A%	8.87	22.84
Luminous Efficacy (lm/W)	100.8	
Total Luminous Flux (lm)	2191.0	
Color Rendering Index (CRI)	85.0	
R9	17.3	
Correlated Color Temperature (CCT) (K)	3105	
Chromaticity Chroma x	0.4276	
Chromaticity Chroma y	0.3973	
Chromaticity Chroma u	0.2474	
Chromaticity Chroma v	0.3449	
Duv	0.0019	
Chromaticity Chroma u'	0.2474	
Chromaticity Chroma v'	0.5173	

Special Color Rendering Indices	
R1	84.7
R2	95.1
R3	93.2
R4	82.6
R5	85.5
R6	94.1
R7	82.5
R8	62.3
R9	17.3
R10	88.9
R11	82.7
R12	79.4
R13	87.6
R14	96.9

Table 2: Test data per Sphere-Spectroradiometer Method

Note: According to CIE 1976 (u',v') diagram, $u' = u = 4x/(-2x+12y+3)$, $v' = 3v/2 = 9y/(-2x+12y+3)$.

Goniophotometer Method

Test ambient temperature was 25.1°C.

The photometric distance is 30m.

Luminous data was taken at 0.5°vertical intervals and 10°horizontal intervals.

Parameter	Result
Test Voltage (V)	120.0
Voltage frequency (Hz)	60
Test Current (A)	0.183
Power Factor	0.9946
Test Power (W)	21.80
Luminous Efficacy (lm/W)	101.4
Total Luminous Flux (lm)	2211.6
Beam Angle (°)	117.5
Center Beam Candle Power (cd)	618
Spacing Criteria	1.23 (0°-180°)/ 1.29(90°-270°)
Zonal Lumens in the 0°-60°Zone	63.57%
Zonal Lumens in the 60°-90°Zone	25.22%
Zonal Lumens in the 90°-120°Zone	7.35%
Zonal Lumens in the 120°-180°Zone	3.86%

Table 3: Test data per Goniophotometer Method

Spectral Power Distribution - Sphere Spectroradiometer Method

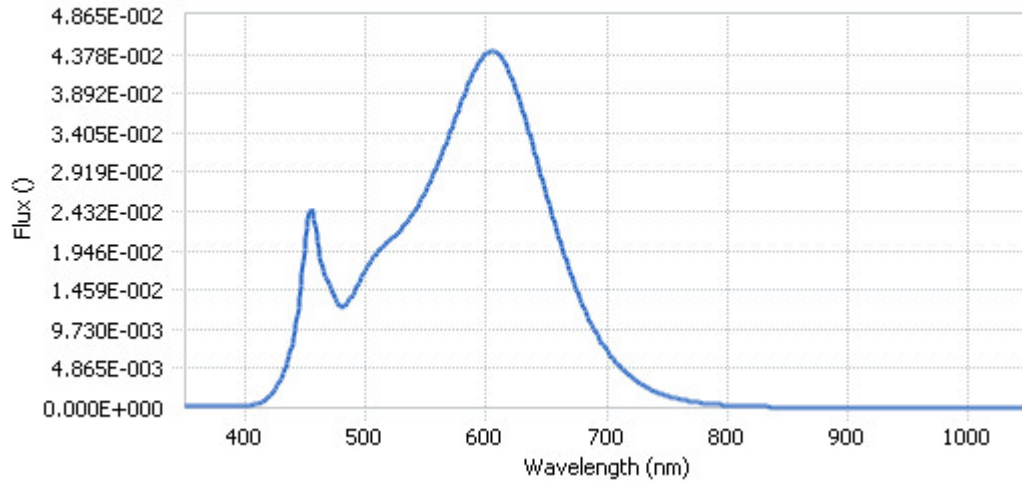


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	2.62E-04	485	1.31E-02	590	4.17E-02	695	8.29E-03
385	2.29E-04	490	1.43E-02	595	4.30E-02	700	7.15E-03
390	2.53E-04	495	1.57E-02	600	4.39E-02	705	6.10E-03
395	2.85E-04	500	1.70E-02	605	4.42E-02	710	5.25E-03
400	2.90E-04	505	1.84E-02	610	4.38E-02	715	4.49E-03
405	3.58E-04	510	1.93E-02	615	4.29E-02	720	3.85E-03
410	5.03E-04	515	2.01E-02	620	4.12E-02	725	3.29E-03
415	8.40E-04	520	2.08E-02	625	3.93E-02	730	2.81E-03
420	1.43E-03	525	2.14E-02	630	3.70E-02	735	2.39E-03
425	2.41E-03	530	2.22E-02	635	3.44E-02	740	2.04E-03
430	3.81E-03	535	2.31E-02	640	3.18E-02	745	1.74E-03
435	5.88E-03	540	2.42E-02	645	2.91E-02	750	1.47E-03
440	8.80E-03	545	2.55E-02	650	2.65E-02	755	1.26E-03
445	1.37E-02	550	2.69E-02	655	2.39E-02	760	1.09E-03
450	2.11E-02	555	2.86E-02	660	2.15E-02	765	9.30E-04
455	2.46E-02	560	3.03E-02	665	1.90E-02	770	7.94E-04
460	2.06E-02	565	3.22E-02	670	1.68E-02	775	6.88E-04
465	1.68E-02	570	3.42E-02	675	1.47E-02	780	5.87E-04
470	1.51E-02	575	3.61E-02	680	1.28E-02		
475	1.33E-02	580	3.81E-02	685	1.12E-02		
480	1.25E-02	585	4.01E-02	690	9.66E-03		

Table 4: Spectral Power Distribution Numerical Data per Sphere - Spectroradiometer Method

The diagram is a CIE 1931, 2 Degree color space plot. The horizontal axis is labeled 'x' and ranges from 0.1000 to 0.7000. The vertical axis is labeled 'y' and ranges from 0.1000 to 0.8000. The plot shows the visible spectrum as a curved boundary, with colors transitioning from violet at the top left, through blue, green, yellow, orange, and red to magenta at the bottom right. A straight line, the line of purpuration, connects the ends of the visible spectrum. Several points are marked along the spectrum with labels: 480, 490, 500, 510, 520, 530, 540, 550, 560, 570, 580, 590, 600, 610, 620, 630, 640, 650, 660, 670, 680, 690, 700. A specific point is highlighted with a red dot and labeled 'A' at approximately (0.44, 0.41). Other points labeled include D65 (white point), B, C, and E. The area inside the spectrum boundary is filled with a color gradient corresponding to the visible spectrum.

Chart 2: Chromaticity Diagram per Sphere - Spectroradiometer Method

Note: The location on the diagram of the tristimulus coordinates are indicated by the blue diamond.

Nominal CCT Quadrangles – Sphere Spectroradiometer Method

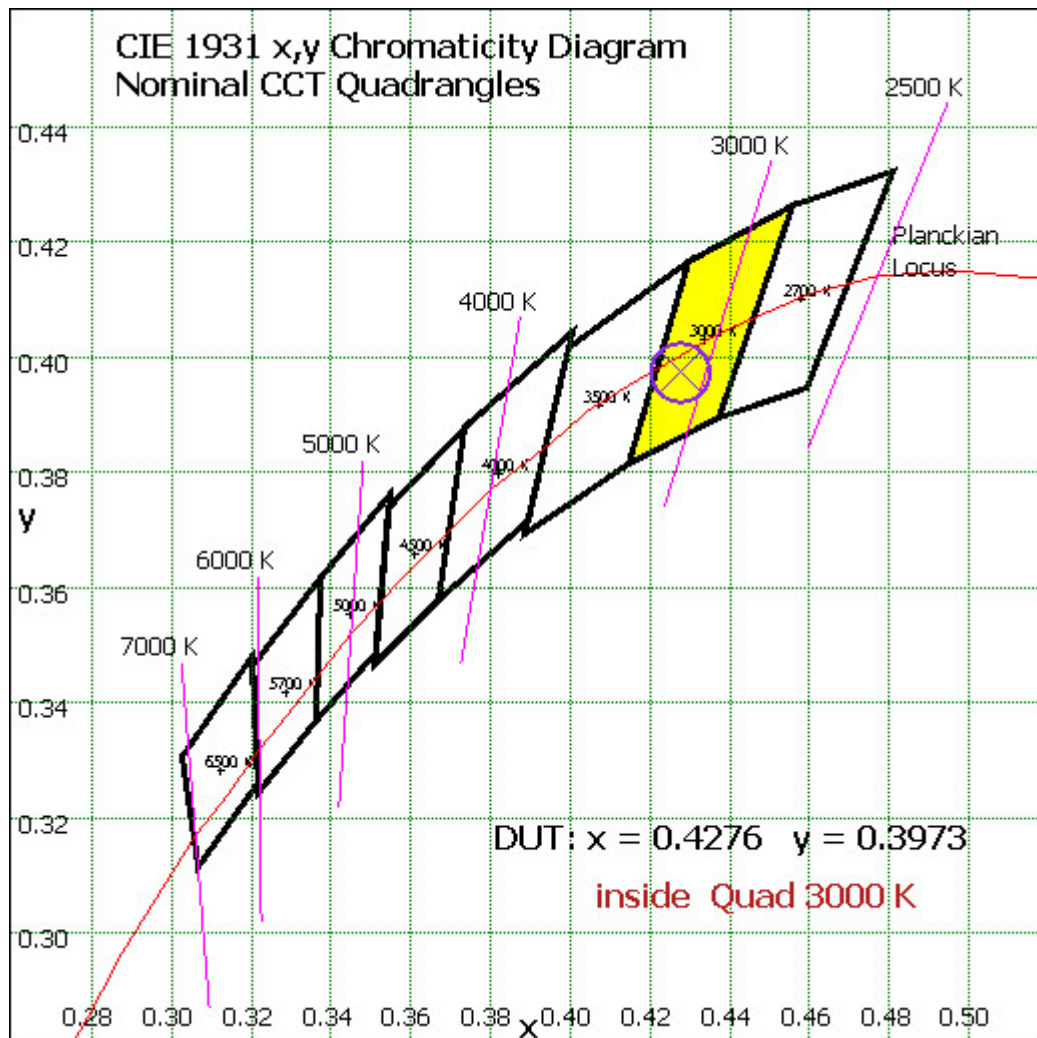


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

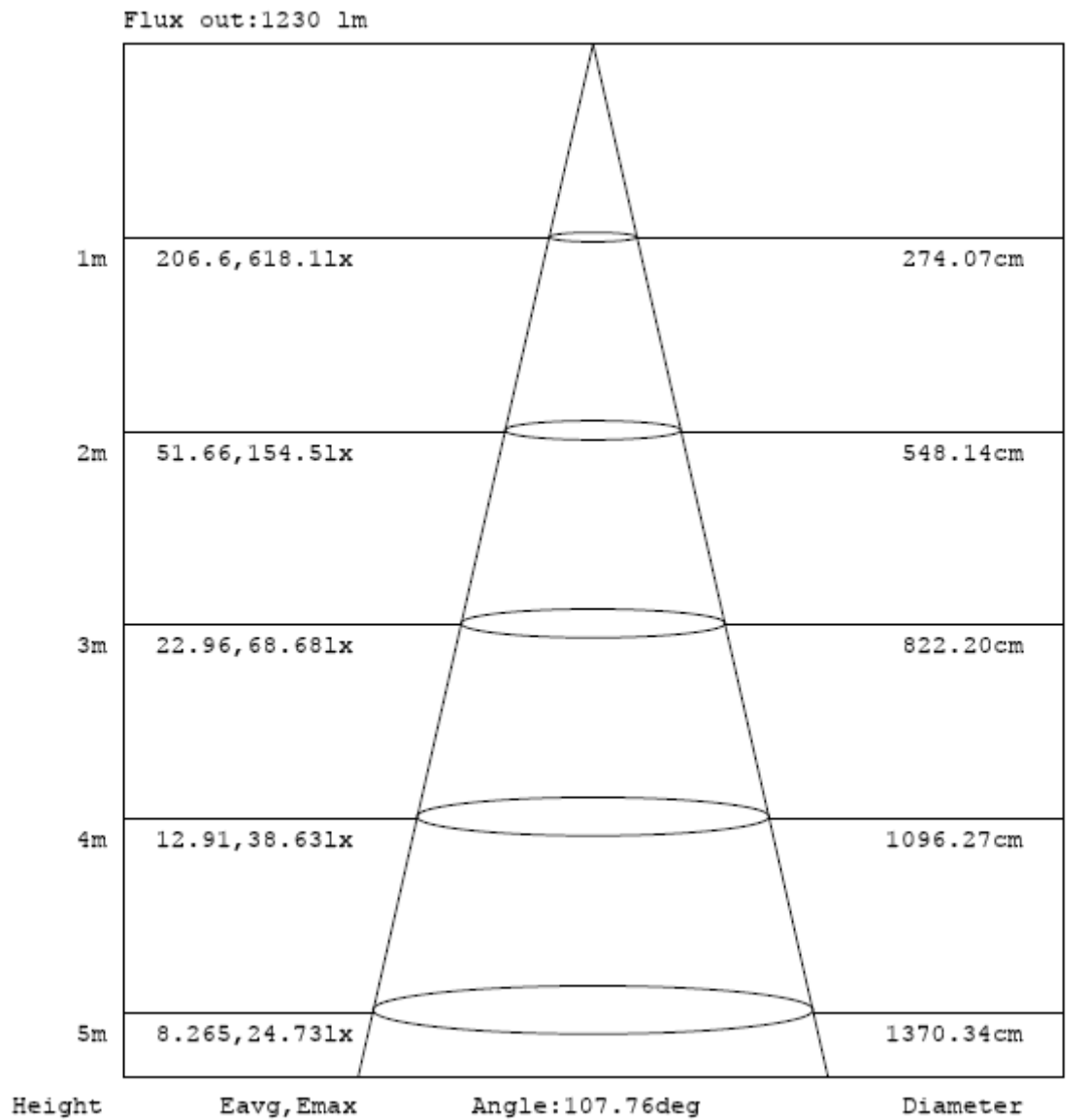
Zonal Lumen Tabulation- Goniophotometer Method

$\gamma(^{\circ})$	Lumens	% Total
0- 10	58.45	2.64%
10- 20	167.161	7.56%
20- 30	252.948	11.44%
30- 40	305.635	13.82%
40- 50	321.001	14.51%
50- 60	300.633	13.59%
60- 70	251.444	11.37%
70- 80	185.444	8.39%
80- 90	120.932	5.47%
90-100	77.124	3.49%
100-110	50.886	2.30%
110-120	34.597	1.56%
120-130	25.391	1.15%
130-140	20.581	0.93%
140-150	16.964	0.77%
150-160	12.948	0.59%
160-170	7.442	0.34%
170-180	1.994	0.09%
Total	2211.6	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	1405.828	63.57%
60- 90	557.82	25.22%
0-90	1963.648	88.79%
90- 180	247.927	11.21%
0- 180	2211.6	100%

Table 5: Zonal Lumen Data

Illuminance Plots- Goniophotometer Method



Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

Chart 4: Beam Angle

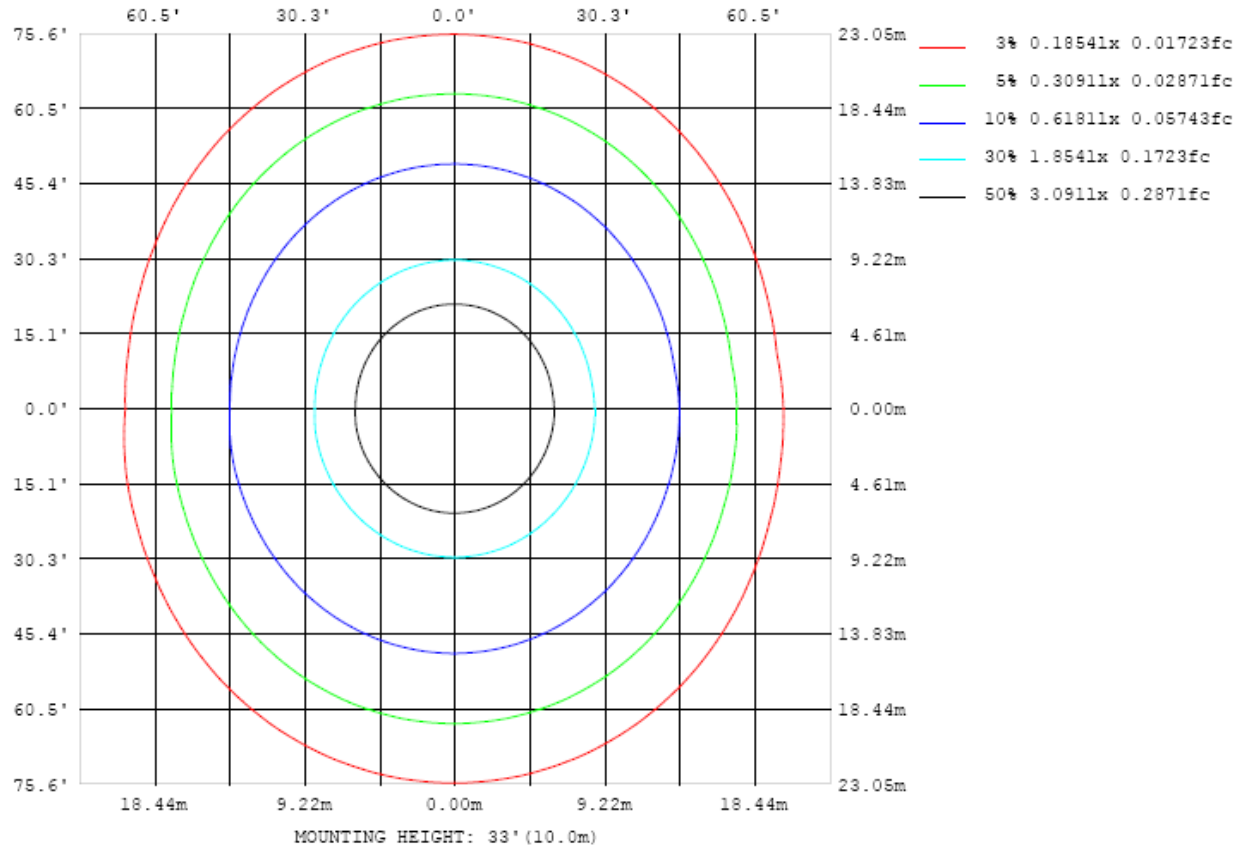


Chart 5: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

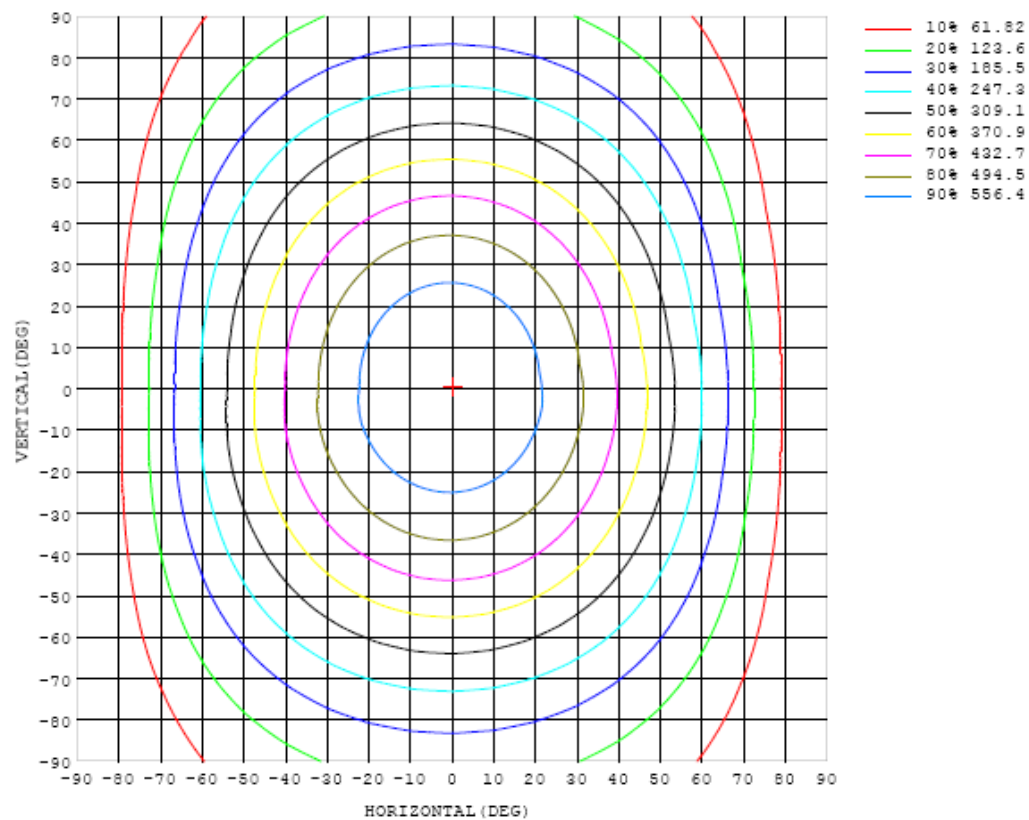


Chart 6: Isocandela Plot

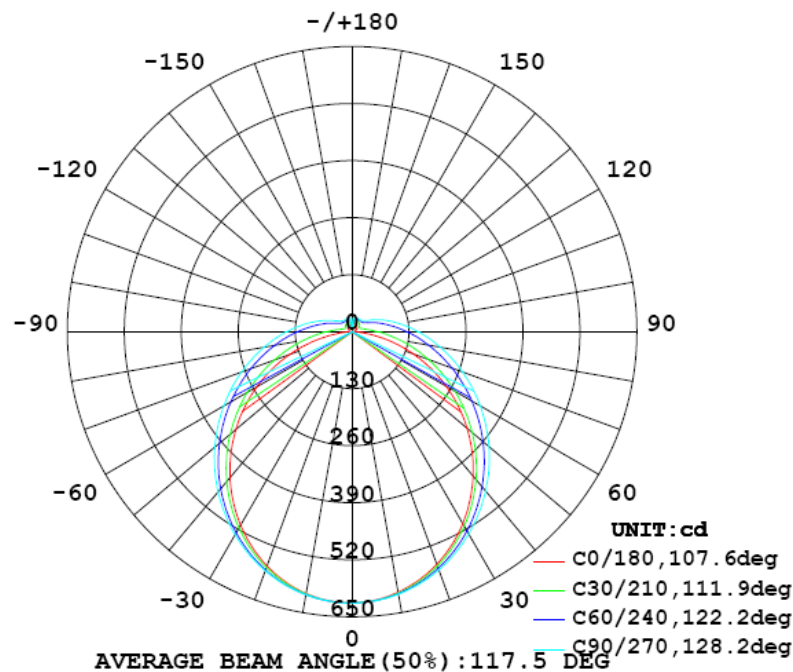


Chart 7: Polar Candela Distribution

Luminous Intensity Data- Goniophotometer Method

Table--1

UNIT: cd

C (DEG) γ (DEG)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	618	618	618	618	618	618	618	618	618	618	618	618	618	618	618	618	618	618	618
5	614	614	614	615	615	615	615	615	615	615	615	616	616	616	616	616	615	615	615
10	603	604	605	605	605	606	606	607	607	608	608	608	608	608	608	608	607	606	606
15	586	589	589	589	590	591	593	594	594	595	595	595	595	595	594	594	593	591	590
20	564	567	567	568	570	572	574	576	577	578	578	578	577	576	574	573	573	570	568
25	537	539	540	542	545	548	551	554	556	557	557	556	554	552	550	548	547	544	541
30	505	507	509	512	515	520	524	528	530	532	532	530	528	525	522	519	516	514	509
35	469	471	473	477	482	488	494	499	502	504	504	502	498	494	489	485	482	479	473
40	429	432	434	440	446	454	461	467	472	474	473	470	466	460	454	448	444	440	434
45	387	390	393	399	408	417	426	434	439	441	441	437	431	424	416	408	403	399	391
50	342	345	350	358	368	379	390	399	405	408	407	402	395	386	376	367	360	355	347
55	296	299	304	314	327	340	353	363	370	372	371	366	357	347	335	324	315	309	300
60	247	251	258	271	286	301	315	327	334	337	336	330	320	307	293	280	269	262	252
65	198	202	212	227	245	262	278	291	299	302	300	293	282	268	252	236	223	213	202
70	149	154	167	185	205	225	242	256	265	268	266	258	246	230	212	193	176	165	151
75	99.4	107	124	146	168	190	208	223	232	235	233	225	212	195	174	153	133	117	102
80	53.6	63.8	85.3	110	136	159	177	192	201	204	202	194	180	162	140	116	91.8	71.7	55.8
85	17.9	30.3	54.5	81.1	107	130	150	164	173	176	173	165	152	133	110	84.7	58.1	34.8	18.3
90	0.57	12.0	33.8	58.9	83.7	106	125	139	148	151	149	140	126	108	85.7	60.7	35.0	12.9	0.28
95	1.27	6.02	22.2	43.5	65.9	86.6	104	117	126	129	126	118	105	87.6	66.8	44.1	22.1	5.53	0.81
100	2.91	5.42	15.8	33.0	52.3	70.7	86.7	98.9	106	109	107	99.2	87.1	71.1	52.4	32.8	15.2	4.67	2.26
105	5.22	6.84	13.1	25.9	42.0	58.1	72.1	83.0	89.9	92.3	90.0	83.2	72.2	57.9	41.7	25.3	12.3	5.98	4.04
110	7.76	8.86	12.9	21.6	34.2	47.8	60.1	69.6	75.7	77.8	75.7	69.5	59.8	47.4	33.5	20.8	12.0	8.16	6.20
115	9.75	11.1	14.1	19.9	28.8	39.5	49.9	58.2	63.4	65.2	63.4	57.9	49.5	38.8	28.1	19.1	13.2	10.3	8.06
120	11.5	13.0	16.0	19.8	26.1	33.9	41.6	48.3	52.8	54.3	52.6	48.0	41.1	33.2	25.4	19.0	15.1	12.6	10.4
125	13.6	15.2	18.1	20.8	25.1	30.7	36.4	41.3	44.6	45.6	44.4	40.9	35.8	30.0	24.5	20.0	17.4	14.2	12.3
130	14.7	16.5	20.2	22.3	25.2	29.2	33.3	36.8	39.1	39.9	38.9	36.4	32.7	28.5	24.6	21.5	19.2	15.5	13.6
135	15.5	17.2	22.0	24.1	26.1	28.8	31.6	34.1	35.8	36.4	35.6	33.8	31.1	28.1	25.4	23.4	21.3	16.2	14.2
140	16.2	18.1	22.7	25.2	27.1	29.1	31.0	32.7	33.8	34.2	33.7	32.5	30.6	28.5	26.7	25.2	22.8	16.4	14.4
145	16.8	19.0	23.0	26.7	27.0	30.0	31.1	32.2	32.9	33.1	32.8	32.2	30.9	29.4	28.2	26.8	23.6	17.0	14.4
150	18.3	20.5	24.2	28.0	29.0	30.4	31.7	32.3	32.8	32.9	32.7	32.4	31.6	30.6	29.7	27.7	23.5	18.3	15.6
155	19.7	22.1	24.8	28.0	29.7	29.8	31.6	32.8	33.0	33.1	33.0	32.9	32.5	31.6	30.3	28.8	25.1	20.0	16.2
160	18.4	20.6	24.7	27.8	29.8	30.5	30.1	32.5	33.0	33.1	33.2	33.3	33.1	32.2	30.9	29.0	25.0	19.5	15.8
165	18.2	19.0	20.9	23.4	27.2	30.6	31.0	30.1	31.7	31.8	33.3	33.4	32.8	32.1	31.2	29.6	25.1	18.4	15.0
170	18.3	18.3	18.6	19.4	20.7	24.1	29.2	31.9	30.9	29.4	31.3	31.8	31.7	31.7	31.0	28.0	23.1	16.5	15.9
175	18.2	18.3	18.2	18.0	17.9	18.2	18.5	21.1	25.1	28.6	29.9	29.8	28.8	28.3	26.1	21.5	16.8	15.2	15.0
180	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1

Table 6: Luminous Intensity Data

Table--2

UNIT: cd

C (DEG) γ (DEG)	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350		
0	618	618	618	618	618	618	618	618	618	618	618	618	618	618	618	618	618		
5	615	616	616	616	616	616	616	616	616	616	616	615	615	615	614	614	614		
10	606	607	607	608	608	609	609	609	609	608	608	607	606	605	604	604	603		
15	590	591	592	594	595	596	597	597	597	596	595	593	592	590	589	587	586		
20	569	570	572	574	576	578	579	580	580	579	577	575	573	570	567	565	563		
25	542	544	547	550	553	556	558	559	559	558	556	552	548	544	541	538	535		
30	511	513	517	521	525	529	533	534	535	533	530	525	520	515	510	506	502		
35	475	478	483	488	494	500	504	506	507	505	501	495	489	481	475	470	466		
40	436	440	446	453	460	467	472	476	476	474	469	462	454	445	437	431	426		
45	394	399	406	414	424	432	439	443	444	441	435	427	417	406	397	389	383		
50	349	355	364	374	385	396	403	408	409	407	400	390	379	366	354	345	338		
55	303	310	320	333	346	358	367	373	374	371	364	353	339	325	311	299	291		
60	255	264	276	291	306	320	331	337	339	335	327	315	299	283	267	253	243		
65	206	217	232	250	267	283	294	302	303	300	291	278	260	242	223	206	194		
70	157	171	189	210	229	246	259	267	269	265	256	242	223	202	180	160	145		
75	109	127	149	172	194	212	225	233	236	232	222	207	188	165	141	117	97.9		
80	65.4	86.8	113	138	161	180	194	202	204	201	191	176	156	132	106	79.1	56.9		
85	30.7	55.2	82.0	108	131	151	165	173	176	172	163	147	127	103	76.8	50.1	25.4		
90	11.5	33.6	59.4	83.9	106	125	139	147	150	146	137	123	103	80.4	55.9	30.7	9.68		
95	5.06	21.0	42.8	65.5	85.6	103	116	124	127	124	115	101	83.4	63.0	40.6	19.6	4.88		
100	4.28	14.4	31.5	50.9	69.2	84.7	96.8	104	107	104	95.9	83.5	67.8	49.4	30.3	14.0	4.97		
105	5.78	11.6	24.1	39.8	55.9	69.4	80.2	87.0	89.2	86.7	79.7	69.1	55.0	38.9	23.7	12.2	6.45		
110	7.81	11.6	19.8	32.0	44.8	57.0	66.7	71.7	74.1	71.7	66.4	56.6	44.4	31.6	20.2	12.4	8.46		
115	8.87	12.7	18.4	26.8	37.0	46.8	54.5	59.6	61.3	59.5	54.4	46.5	36.9	27.1	19.1	13.8	10.1		
120	10.3	14.2	18.5	24.3	31.6	39.1	45.5	49.6	51.0	49.6	45.5	39.3	32.0	24.9	19.5	15.5	12.3		
125	12.2	16.0	19.3	23.7	28.7	34.0	38.8	42.0	43.1	42.1	39.1	34.6	29.4	24.5	20.6	17.3	14.1		
130	14.3	17.6	20.6	23.8	27.6	31.3	34.6	36.9	37.8	37.1	35.1	31.9	28.3	24.9	22.0	19.2	16.0		
135	16.4	18.7	21.8	24.3	27.3	30.1	32.5	34.1	34.8	34.4	32.9	30.7	28.2	25.6	23.3	20.7	17.6		
140	18.0	19.6	22.9	25.4	27.3	29.7	31.4	32.6	33.1	32.8	31.9	30.4	28.5	26.7	24.7	22.2	19.0		
145	18.4	21.9	24.0	26.4	28.1	29.5	31.0	32.0	32.3	32.2	31.7	30.7	29.3	27.7	25.7	23.5	20.1		
150	18.5	22.9	24.5	26.8	28.9	30.0	30.9	31.5	31.9	32.1	31.9	31.2	29.9	28.2	26.3	24.0	20.4		
155	18.9	24.5	27.3	27.4	28.9	30.4	31.3	31.9	32.1	32.3	32.1	31.7	30.5	28.7	27.6	25.1	20.6		
160	16.6	20.9	25.7	29.1	29.5	29.6	30.6	31.6	31.9	32.1	31.7	31.0	30.2	28.4	26.4	23.4	20.1		
165	14.8	16.7	20.3	25.5	30.4	31.3	30.7	30.8	31.0	31.1	30.3	28.6	25.6	23.8	21.0	19.7	18.9		
170	14.8	13.7	15.6	16.4	19.7	26.2	29.5	31.4	32.0	26.6	21.2	19.2	18.4	18.5	18.1	18.2	18.3		
175	14.4	16.3	17.3	17.0	16.7	17.2	18.4	13.9	10.6	12.7	17.4	20.9	21.9	21.5	20.8	19.3	18.8		
180	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1		

Table 7: Luminous Intensity Data

EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Goniophotometer system	GO-R5000	HZTE011-01	Jul. 17, 2015	Jul. 16, 2016
Digital Power Meter	PF2010A	HZTE028-01	Jul. 17, 2015	Jul. 16, 2016
AC Power Supply	PCR 500L	HZTE001-08	Jul. 17, 2015	Jul. 16, 2016
DC Power Supply	WY12010	HZTE004-03	Jul. 17, 2015	Jul. 16, 2016
Temperature Meter	TES1310	HZTE017-01	Jul. 17, 2015	Jul. 16, 2016
Standard source	D908	HZTE012-01	Jul. 23, 2015	Jul. 22, 2016
Integrate Sphere system	2M	HZTE015-01	Jul. 16, 2015	Jul. 15, 2016
Digital Power Meter	WT210	HZTE008-01	Jul. 17, 2015	Jul. 16, 2016
AC Power Supply	PCR 500L	HZTE001-07	Jul. 17, 2015	Jul. 16, 2016
DC Power Supply	6154	HZTE004-04	Jul. 17, 2015	Jul. 16, 2016
Temperature and humidity recorder	JR900	HZTE018-01	Jul. 21, 2015	Jul. 20, 2016
Standard source	SCL-1400	HZTE012-02	Oct. 21, 2015	Oct. 20, 2016

Table 8: Test Equipment List

TEST METHODS

Seasoning of SSL Product

For the purpose of rating new SSL products, SSL products shall be tested with no seasoning. Therefore, no seasoning was performed.

Sphere-Spectroradiometer Method- Photometric and Electrical Measurements

A Labsphere Model CDS 2100 Spectroradiometer and Two Meter Sphere was used to measure correlated color temperature, chromaticity coordinates, and the color rendering index for each SSL unit. The coating reflectance of each sphere is 98%. The measure geometry is 4π . Self-absorption correction is conducted in testing. Bandwidth of spectroradiometer is 350nm-1050nm.

Ambient temperature was measured at a position inside the sphere. Each SSL unit was operated on the client provided driver at the rated input voltage in its designated orientation.

The stabilization time typically ranges from 30 min (small integrated LED lamps) to 2 or more hours for large SSL luminaires). It can be judged that stability is reached when the variation (maximum – minimum) of at least 3 readings of the light output and electrical power over a period of 30 min, taken 15 minutes apart, is less than 0.5 %.

Electrical measurements including voltage, current, and power were measured using the Yokogawa Power Analyzer.

The standard reference of the integrated sphere system is halogen incandescent lamp, the intensity distribution type is omni-directional, and is traceable to the National Institute of Standards and Technology.

The uncertainty of integrating sphere system reported in this document is expanded uncertainty is 1.06% with a coverage factor $k=2$.

Goniophotometer Method

Photometric and Electrical Measurements

An EVERFINE Type C Model GO-R5000 Goniophotometer was used to measure the intensity at each angle of distribution for each sample. The photometric distance is 2.475m for near-field measurement or 30m for far-field measurement. Bandwidth of spectroradiometer is 380nm-780nm.

Ambient temperature was measured at the same height of the sample mounted on the Goniophotometer equipment. Each SSL unit was operated on the client provided driver at the rated input voltage in its designated orientation.

The stabilization time typically ranges from 30 min (small integrated LED lamps) to 2 or more hours for large SSL luminaires). It can be judged that stability is reached when the variation (maximum – minimum) of at least 3 readings of the light output and electrical power over a period of 30 min, taken 15 minutes apart, is less than 0.5 %.

Electrical measurements including voltage, current, and power were measured using the Everfine Digital Power Meter.

Some graphics were created with Photometric Plus software.

The standard reference of the Goniophotometer system is halogen incandescent lamp, the intensity distribution type is omni-directional, and is traceable to the National Institute of Metrology P.R. China.

The uncertainty of goniophotometer system reported in this document is expanded uncertainty is 1.94% with a coverage factor $k=2$.

Color Characteristics Measurements

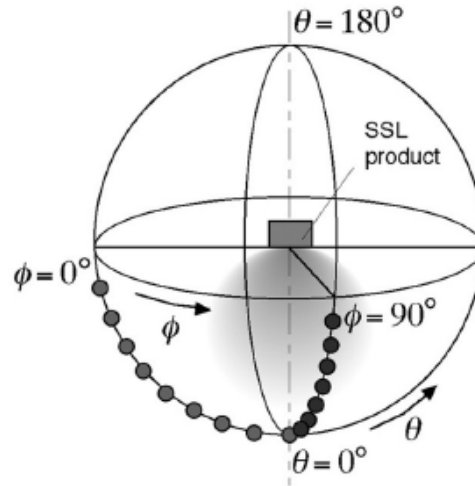
The color characteristics of SSL products include chromaticity coordinates, correlated color temperature, and color rendering index. These characteristics of SSL products may be spatially non-uniform, and thus, in order that they can be specified accurately, the color quantities shall be measured as values that are spatially average, weighted to intensity, over the angular range where light is intentionally emitted from the SSL product. The color characteristics measurements are using gonio-spectroradiometer.

Color Spatial Uniformity

The characteristics of SSL products may be spatially non-uniform, the chromaticity coordinate shall be measured at two vertical planes ($C=0^\circ/180^\circ$ and $C=90^\circ/270^\circ$) and at 10° or less intervals for vertical angle until the light output dropped to below 10% of the peak intensity. The averaged weighted chromaticity coordinate was calculated from these points. The data was then analyzed to check for delta color differences of the u' , v' chromaticity coordinates. The spatial non-uniformity of chromaticity, $\Delta u'v'$, is determined as the maximum deviation (distance on the CIE (u' , v') diagram) among all measured points from the spatially averaged

chromaticity coordinate.

The geometry for the chromaticity measurement using gonio-spectroradiometer is shown as following.



*** End of Report ***

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