



## LM-79-08 Test Report

for

### GREEN CREATIVE LTD

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

### Horizontally-Mounted Lamps

**Model: 15.5PLH/835/BYP**

### Laboratory: Leading Testing Laboratories

**NVLAP CODE: 200960-0**

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Report No.: HZ18050047c

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

Review by:

Engineer: April Zou  
Jun. 05, 2018

Approved by:



Manager: Jim Zhang  
Jun. 05, 2018

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: **15.5PLH/835/BYP**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
127.0	1930.0	15.20	0.9770
CCT (K)	CRI	Stabilization Time (Light & Power)	
3406	82.6	60	

Table 1: Executive Data Summary

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

### Test specifications:

**Date of Receipt** : May 25, 2018

**Date of Test** : May 30, 2018

**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)

<b>Name</b>	: Horizontally-Mounted Lamps
<b>Model</b>	: 15.5PLH/835/BYP
<b>Electrical Ratings</b>	: 120-277V, 50/60Hz, 15.5W
<b>Product Description</b>	: 3500K
<b>Manufacturer</b>	: GREEN CREATIVE LTD
<b>Address</b>	: 756 North Zhongshan Rd., Unit B301 Zhabei District, Shanghai

## TEST RESULTS

Test ambient temperature was 24.9°C.

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

The stabilization time of the sample was 60 minutes, and the total operating time including stabilization was 70 minutes.

### Sphere-Spectroradiometer Method

Parameter	Result	
Test Voltage (V)	120.0	277.0
Voltage frequency (Hz)	60	60
Test Current (A)	0.129	0.059
Power Factor	0.9770	0.9457
Test Power (W)	15.20	15.44
THD A%	20.03	16.77
Luminous Efficacy (lm/W)	127.0	125.5
Total Luminous Flux (lm)	1930.0	1937.0
Color Rendering Index (CRI)	82.6	
R9	6.6	
Correlated Color Temperature (CCT)(K)	3406	
Chromaticity Chroma x	0.4110	
Chromaticity Chroma y	0.3945	
Chromaticity Chroma u	0.2379	
Chromaticity Chroma v	0.3424	
Duv	0	
Chromaticity Chroma u'	0.2379	
Chromaticity Chroma v'	0.5137	

Special Color Rendering Indices	
R1	82
R2	93.9
R3	93
R4	78.2
R5	82
R6	91.8
R7	81.3
R8	59
R9	6.6
R10	85.4
R11	77.2
R12	69.6
R13	85.4
R14	96.7
Rf	81
Rg	92

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 24.7°C.

The photometric distance is 2.47m.

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)	0.131
Power Factor	0.9766
Test Power (W)	15.39
Luminous Efficacy (lm/W)	127.8
Total Luminous Flux (lm)	1966.9
Beam Angle (°)	106.6
Center Beam Candle Power (cd)	685
Spacing Criteria	1.22 (0°-180°)/ 1.26 (90°-270°)
Zonal Lumens in the 0°-60°Zone	75.44%
Zonal Lumens in the 60°-90°Zone	21.35%
Zonal Lumens in the 90°-120°Zone	2.76%
Zonal Lumens in the 120°-180°Zone	0.45%

Table 3: Test data per Goniophotometer Method

## Spectral Power Distribution - Sphere Spectroradiometer Method

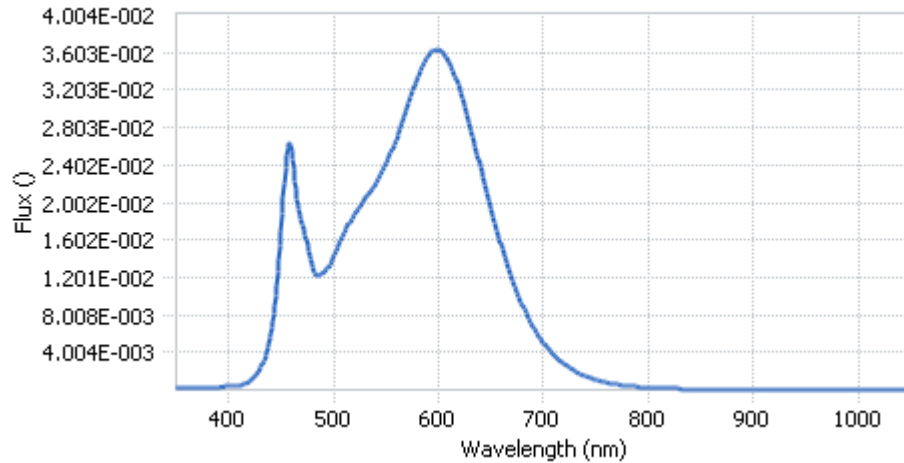


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	3.17E-04	485	1.22E-02	590	3.56E-02	695	5.83E-03
385	2.92E-04	490	1.25E-02	595	3.62E-02	700	5.03E-03
390	3.14E-04	495	1.31E-02	600	3.63E-02	705	4.30E-03
395	3.39E-04	500	1.43E-02	605	3.59E-02	710	3.70E-03
400	3.56E-04	505	1.56E-02	610	3.50E-02	715	3.17E-03
405	3.91E-04	510	1.68E-02	615	3.37E-02	720	2.73E-03
410	4.86E-04	515	1.79E-02	620	3.21E-02	725	2.35E-03
415	6.48E-04	520	1.88E-02	625	3.01E-02	730	2.00E-03
420	9.44E-04	525	1.96E-02	630	2.81E-02	735	1.71E-03
425	1.46E-03	530	2.05E-02	635	2.59E-02	740	1.46E-03
430	2.28E-03	535	2.11E-02	640	2.37E-02	745	1.26E-03
435	3.67E-03	540	2.20E-02	645	2.15E-02	750	1.07E-03
440	6.06E-03	545	2.30E-02	650	1.93E-02	755	9.30E-04
445	1.01E-02	550	2.41E-02	655	1.72E-02	760	7.98E-04
450	1.70E-02	555	2.54E-02	660	1.53E-02	765	6.85E-04
455	2.51E-02	560	2.68E-02	665	1.35E-02	770	5.84E-04
460	2.55E-02	565	2.86E-02	670	1.19E-02	775	5.04E-04
465	2.04E-02	570	3.02E-02	675	1.03E-02	780	4.34E-04
470	1.79E-02	575	3.19E-02	680	9.02E-03		
475	1.54E-02	580	3.34E-02	685	7.81E-03		
480	1.30E-02	585	3.48E-02	690	6.75E-03		

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

## Chromaticity Diagram - Sphere Spectroradiometer Method

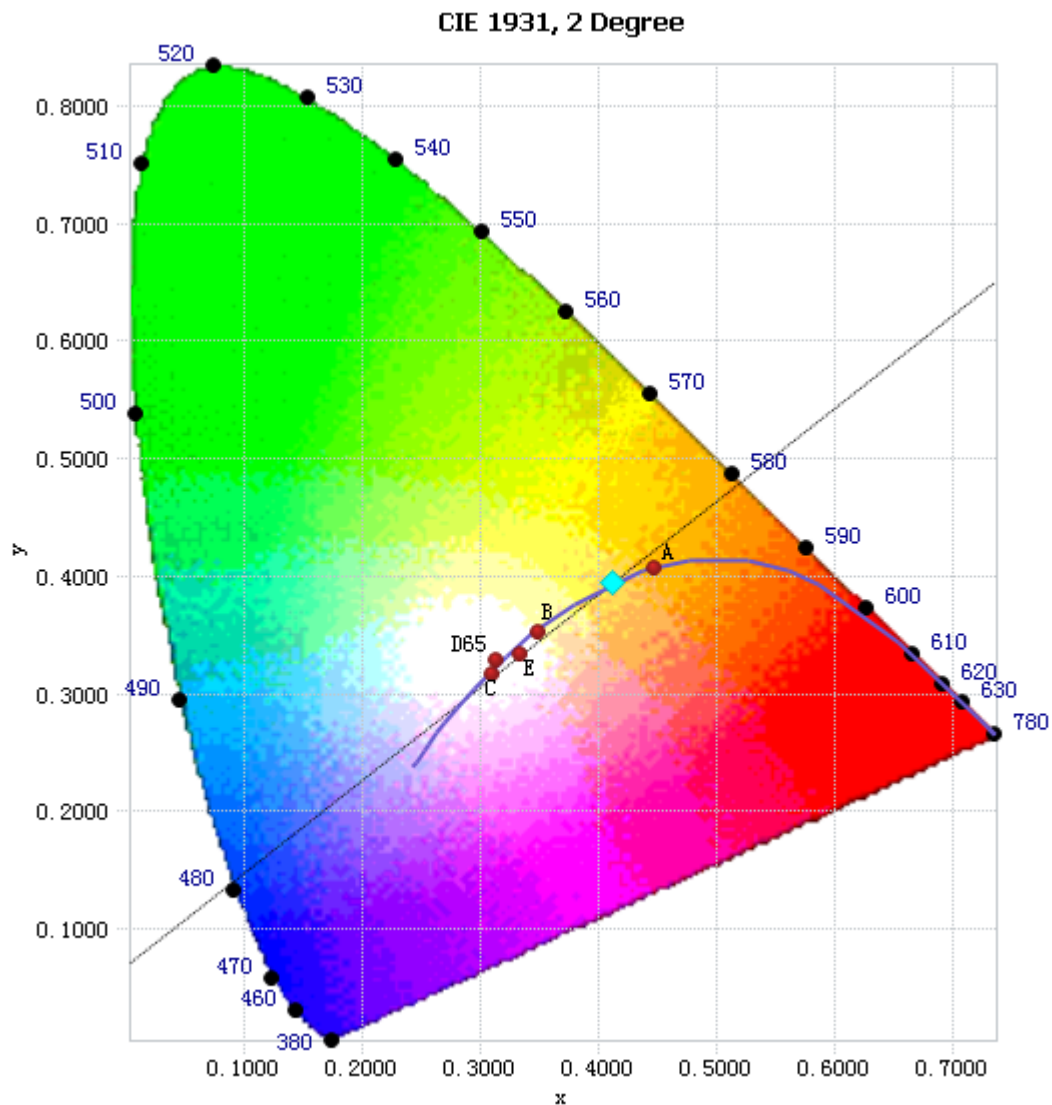


Chart 2: Chromaticity Diagram per Sphere - Spectroradiometer Method

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



### Nominal CCT Quadrangles – Sphere Spectroradiometer Method

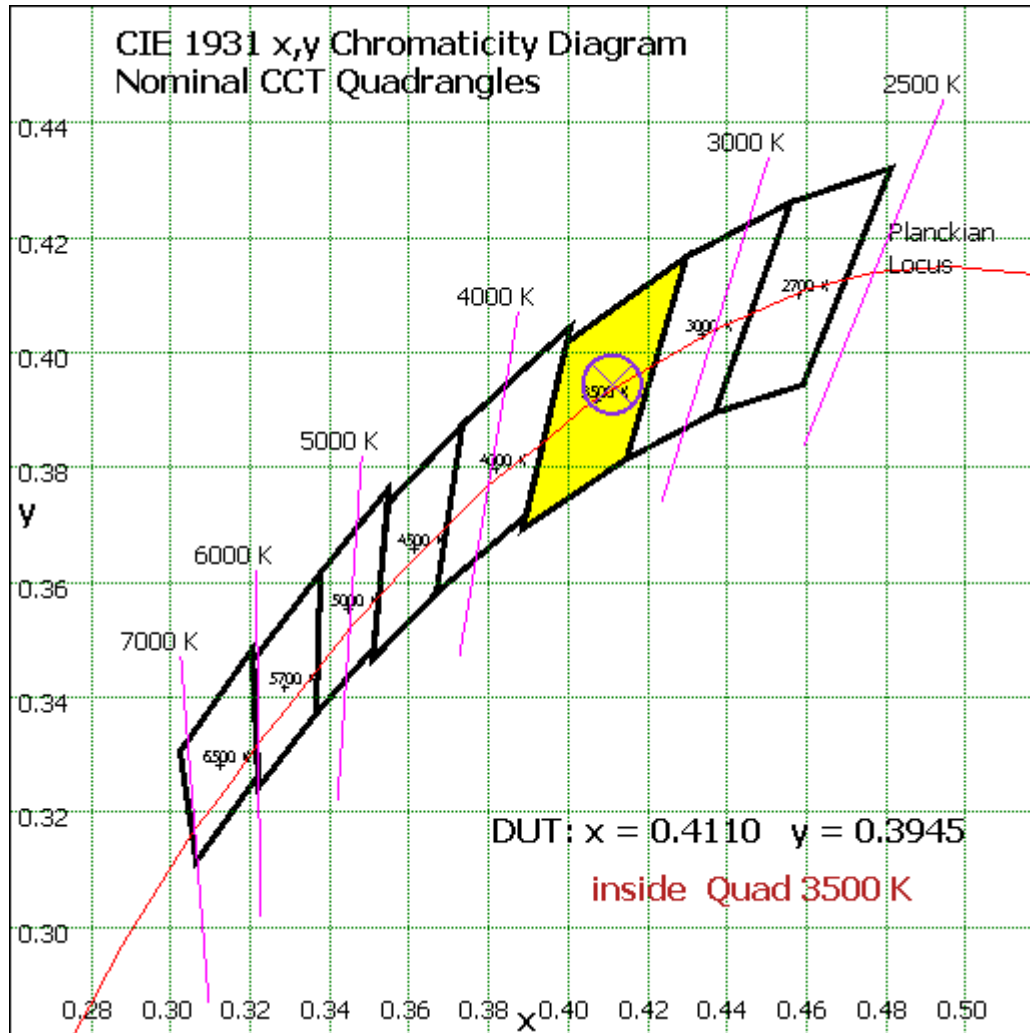


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

### Zonal Lumen Tabulation- Goniophotometer Method

$\gamma(^{\circ})$	Lumens	% Total
0- 10	65.006	3.31%
10- 20	186.537	9.48%
20- 30	279.87	14.23%
30- 40	330.457	16.80%
40- 50	331.928	16.88%
50- 60	289.954	14.74%
60- 70	219.711	11.17%
70- 80	136.702	6.95%
80- 90	63.567	3.23%
90-100	28.781	1.46%
100-110	16.093	0.82%
110-120	9.371	0.48%
120-130	5.021	0.26%
130-140	2.354	0.12%
140-150	0.887	0.05%
150-160	0.345	0.02%
160-170	0.198	0.01%
170-180	0.069	0.00%
Total	1966.9	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	1483.752	75.44%
60- 90	419.98	21.35%
0-90	1903.732	96.79%
90- 180	63.119	3.21%
0- 180	1966.9	100%

Table 5: Zonal Lumen Data

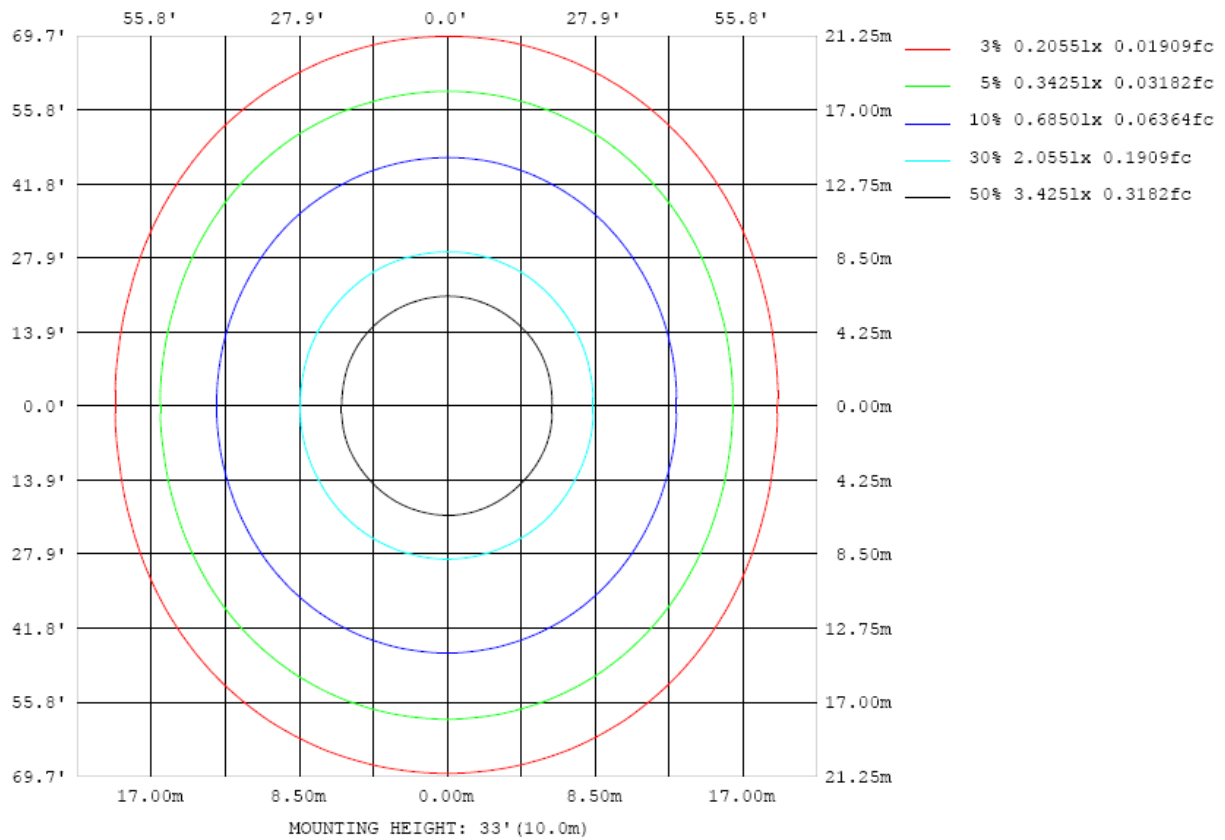


Chart 4: Illuminance Plot (Footcandles)

## Luminous Intensity Distribution Plots- Goniophotometer Method

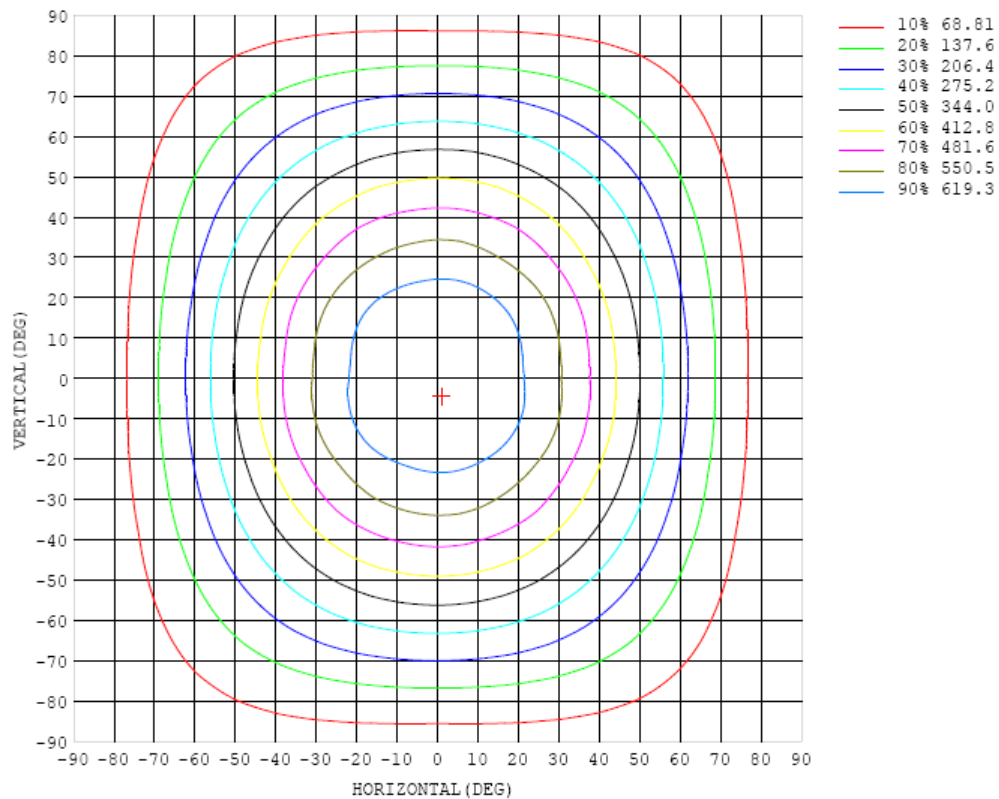


Chart 5: Isocandela Plot

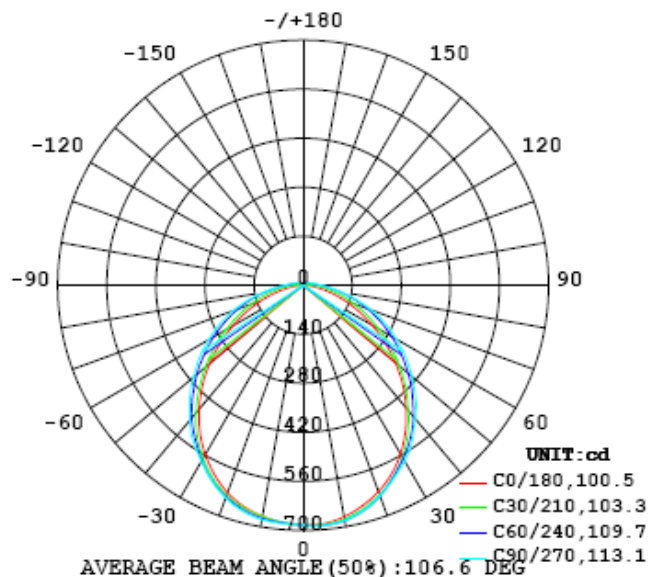


Chart 6: Polar Candela Distribution

## 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	685	685	685	685	685	685	685	685	685	685	685	685	685	685	685	685	685	685	685
5	683	683	684	686	687	687	688	688	688	688	688	687	686	685	684	683	681	681	680
10	671	673	675	678	680	681	682	682	682	681	681	680	679	678	677	675	674	671	670
15	652	655	658	661	663	665	666	667	667	666	665	664	663	663	662	662	660	657	654
20	627	630	634	637	638	640	641	641	641	639	639	638	639	640	640	640	638	634	630
25	595	600	604	606	607	606	606	608	610	610	608	606	607	608	609	608	606	602	598
30	556	561	565	567	567	568	571	576	579	579	577	575	573	570	568	568	567	563	559
35	508	513	518	519	523	528	534	538	541	541	540	539	536	530	524	522	521	518	513
40	457	461	464	467	474	484	489	492	496	497	495	493	490	485	478	471	468	466	462
45	402	406	408	413	423	432	440	447	452	453	452	449	442	434	427	417	411	410	407
50	344	347	350	359	368	381	391	397	403	405	403	399	393	384	372	363	354	351	348
55	285	287	292	302	316	329	341	349	354	357	355	351	343	332	320	307	297	290	289
60	227	229	237	249	264	278	291	300	306	308	306	301	293	281	268	254	241	233	231
65	174	176	185	200	215	229	243	251	256	258	256	252	244	233	219	203	189	179	177
70	125	128	139	154	170	183	194	202	205	207	206	202	196	186	173	158	142	131	127
75	81.7	85.9	97.8	113	128	139	148	153	155	156	155	153	149	141	130	116	101	87.4	82.5
80	45.8	50.9	63.9	77.5	90.0	99.1	105	108	109	109	109	108	105	99.7	91.5	79.5	65.3	51.7	45.0
85	19.1	24.4	36.5	49.2	59.7	66.4	70.6	72.6	72.6	72.2	72.6	72.5	70.9	67.5	60.8	50.7	38.0	25.1	18.5
90	4.66	8.83	19.4	30.4	39.3	45.6	49.2	50.8	50.9	50.5	51.0	51.2	50.0	46.7	40.8	32.0	20.9	9.58	2.46
95	0.45	3.17	10.6	19.6	27.5	33.2	36.7	38.2	38.4	38.3	38.7	38.8	37.6	34.5	28.9	21.1	11.8	3.78	0.11
100	0.14	1.50	6.20	13.1	19.8	25.0	28.3	30.0	30.4	30.4	30.7	30.6	29.3	26.3	21.2	14.5	7.29	1.94	0.12
105	0.11	0.90	3.88	9.09	14.7	19.3	22.5	24.2	24.8	24.9	25.1	24.8	23.4	20.5	15.9	10.2	4.64	1.16	0.15
110	0.14	0.57	2.52	6.34	10.9	15.0	18.0	19.7	20.5	20.6	20.8	20.3	18.8	16.0	11.9	7.28	3.07	0.74	0.17
115	0.17	0.37	1.69	4.47	8.09	11.5	14.2	16.0	16.8	17.0	17.1	16.4	14.9	12.3	8.91	5.15	2.04	0.44	0.20
120	0.22	0.32	1.14	3.11	5.88	8.74	11.0	12.6	13.5	13.7	13.7	13.0	11.6	9.38	6.51	3.62	1.33	0.30	0.24
125	0.25	0.33	0.82	2.13	4.20	6.44	8.41	9.79	10.6	10.8	10.7	10.1	8.85	6.97	4.69	2.46	0.88	0.33	0.31
130	0.32	0.36	0.61	1.40	2.91	4.63	6.18	7.40	8.07	8.32	8.23	7.66	6.54	5.02	3.28	1.64	0.62	0.34	0.39
135	0.39	0.39	0.50	0.94	1.91	3.20	4.40	5.33	5.90	6.11	6.02	5.54	4.67	3.50	2.16	1.07	0.50	0.38	0.48
140	0.46	0.46	0.48	0.67	1.18	2.04	2.93	3.67	4.13	4.30	4.22	3.84	3.14	2.23	1.33	0.70	0.47	0.45	0.55
145	0.50	0.51	0.52	0.55	0.73	1.19	1.79	2.29	2.61	2.73	2.70	2.39	1.92	1.32	0.85	0.61	0.51	0.49	0.61
150	0.53	0.53	0.54	0.55	0.57	0.67	0.93	1.21	1.43	1.53	1.49	1.29	1.00	0.76	0.66	0.58	0.53	0.51	0.61
155	0.57	0.57	0.57	0.57	0.58	0.58	0.59	0.63	0.67	0.71	0.70	0.65	0.64	0.64	0.61	0.58	0.56	0.55	0.61
160	0.61	0.61	0.61	0.61	0.61	0.60	0.60	0.60	0.59	0.59	0.60	0.61	0.62	0.62	0.61	0.61	0.60	0.60	0.61
165	0.65	0.64	0.64	0.63	0.63	0.63	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.63	0.63	0.63	0.64	0.64	0.63
170	0.70	0.70	0.69	0.69	0.68	0.67	0.67	0.66	0.66	0.66	0.66	0.66	0.67	0.67	0.68	0.68	0.69	0.69	0.69
175	0.74	0.73	0.71	0.71	0.70	0.70	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.70	0.70	0.70	0.71	0.72	0.73
180	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75

Table 6: Luminous Intensity Data

Table--2

UNIT: cd

$\gamma$ (DEG) \ C (DEG)	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350		
0	685	685	685	685	685	685	685	685	685	685	685	685	685	685	685	685	685		
5	680	679	679	679	680	681	682	682	682	683	683	683	682	682	682	682	682		
10	669	669	671	672	674	675	677	678	679	680	680	678	677	675	673	672	670		
15	654	655	658	661	662	663	665	666	667	668	668	666	664	661	657	654	651		
20	630	634	638	642	643	643	644	645	647	648	647	645	642	639	635	631	627		
25	598	603	609	613	615	615	615	615	616	617	617	615	613	610	607	602	597		
30	560	566	571	575	577	577	578	579	581	581	579	576	575	574	570	565	558		
35	515	522	527	530	533	537	541	543	546	546	541	536	531	529	525	519	511		
40	464	471	476	480	487	495	500	501	503	503	499	495	487	478	473	467	460		
45	409	415	420	429	439	445	451	454	457	456	451	445	438	426	417	412	405		
50	351	358	364	376	386	396	404	406	408	408	403	396	384	374	362	354	348		
55	292	299	309	321	335	344	354	359	361	360	353	344	333	320	307	296	289		
60	234	242	255	269	283	296	304	309	311	310	304	295	282	268	253	239	231		
65	181	190	204	219	234	246	255	261	263	262	256	246	233	219	204	189	178		
70	131	143	158	174	188	198	206	211	212	212	207	198	188	173	158	142	130		
75	87.1	100	116	131	144	152	158	161	162	162	159	153	144	132	117	101	87.8		
80	50.6	64.2	79.5	92.7	102	109	112	114	114	114	113	109	103	93.4	80.6	65.6	52.3		
85	23.8	36.4	49.7	60.7	68.3	72.9	75.3	75.7	75.3	75.6	75.1	72.9	68.6	61.4	51.0	38.2	25.7		
90	8.29	19.2	30.6	39.9	46.5	50.3	51.9	51.9	51.3	51.5	51.3	49.7	46.2	40.1	31.4	20.7	9.91		
95	2.94	10.4	19.9	28.1	34.1	37.7	39.2	39.2	38.6	38.6	38.4	36.9	33.7	28.2	20.5	11.5	3.84		
100	1.14	6.25	13.4	20.5	25.9	29.3	30.8	31.0	30.6	30.5	30.1	28.6	25.5	20.5	13.9	6.92	1.89		
105	0.97	2.76	9.23	15.3	20.1	23.4	25.0	25.4	25.1	25.0	24.4	22.8	19.8	15.3	9.71	4.45	1.20		
110	0.73	2.51	5.01	11.2	15.8	18.7	20.4	21.0	20.9	20.7	20.0	18.4	15.5	11.4	6.90	2.95	0.83		
115	0.54	1.55	4.53	7.84	11.9	14.9	16.6	17.3	17.3	17.1	16.3	14.6	11.9	8.53	4.96	2.08	0.62		
120	0.38	1.21	3.10	5.90	9.04	11.4	13.0	13.8	13.9	13.7	12.8	11.3	9.08	6.32	3.51	1.48	0.51		
125	0.42	0.82	1.83	4.16	6.69	8.72	10.1	10.8	11.0	10.7	10.0	8.70	6.84	4.59	2.40	1.04	0.41		
130	0.49	0.68	1.30	2.68	4.73	6.52	7.69	8.33	8.47	8.27	7.65	6.55	5.02	3.18	1.50	0.60	0.38		
135	0.57	0.69	0.93	1.78	3.01	4.62	5.71	6.25	6.38	6.22	5.70	4.76	3.27	1.74	0.94	0.58	0.47		
140	0.66	0.75	0.82	1.26	1.98	2.66	3.64	4.45	4.63	4.46	3.71	2.61	1.85	1.20	0.78	0.64	0.55		
145	0.74	0.79	0.86	1.04	1.34	1.80	2.17	2.38	2.36	2.23	1.97	1.62	1.23	0.90	0.74	0.70	0.61		
150	0.78	0.80	0.88	0.94	1.03	1.22	1.38	1.39	1.39	1.35	1.24	1.07	0.90	0.79	0.76	0.75	0.63		
155	0.78	0.77	0.78	0.78	0.77	0.78	0.85	0.90	0.91	0.90	0.85	0.81	0.79	0.78	0.77	0.78	0.64		
160	0.79	0.79	0.79	0.79	0.79	0.78	0.79	0.79	0.78	0.77	0.77	0.78	0.79	0.79	0.79	0.79	0.62		
165	0.75	0.80	0.80	0.80	0.79	0.79	0.78	0.77	0.77	0.77	0.77	0.78	0.78	0.83	0.83	0.78	0.66		
170	0.69	0.79	0.79	0.79	0.78	0.78	0.77	0.77	0.76	0.76	0.76	0.77	0.77	0.78	0.79	0.70	0.70		
175	0.74	0.75	0.75	0.76	0.76	0.76	0.76	0.75	0.75	0.75	0.75	0.76	0.76	0.76	0.76	0.75	0.75		
180	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75		

Table 7: Luminous Intensity Data

## EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Goniophotometer system	GO-R5000	HZTE011-01	Aug. 23, 2017	Aug. 22, 2018
Digital Power Meter	PF2010A	HZTE028-01	Aug. 10, 2017	Aug. 09, 2018
AC Power Supply	DPS1060	HZTE001-06	Aug. 10, 2017	Aug. 09, 2018
DC Power Supply	WY12010	HZTE004-03	Aug. 10, 2017	Aug. 09, 2018
Temperature recorder	JM624U	HZTE018-08	Aug. 17, 2017	Aug. 16, 2018
Temperature and humidity recorder	JR900	HZTE018-01	Aug. 16, 2017	Aug. 15, 2018
Standard source	D908	HZTE012-01	Aug. 20, 2017	Aug. 19, 2018
Integrate Sphere system	2M	HZTE015-01	Aug. 23, 2017	Aug. 22, 2018
Digital Power Meter	WT210	HZTE008-01	Aug. 10, 2017	Aug. 09, 2018
AC Power Supply	PCR 500L	HZTE001-07	Aug. 10, 2017	Aug. 09, 2018
DC Power Supply	IT6154	HZTE004-04	Aug. 10, 2017	Aug. 09, 2018
Standard source	SCL-1400	HZTE012-02	Aug. 20, 2017	Aug. 19, 2018
Temperature and humidity recorder	JR900	HZTE018-02	Aug. 16, 2017	Aug. 15, 2018
Temperature Meter	TES1310	HZTE017-01	Aug. 17, 2017	Aug. 16, 2018

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  $4\pi$ . 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 2.1% 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 2.3% 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  $10^\circ$  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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