

LM-79-08 Test Report

for

GREEN CREATIVE LTD

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

LED Tube System

Model: 11T5HE/3F/835/EXT/A2

(LED tube model: 11T5HE/3F/835/EXT 2pcs and LED driver model: 15T8T5HEDRIVER/2CH 1pcs)

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ18080024ap

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

Review by:



Engineer: April Zou

Aug. 29, 2018

Approved by:



Manager: Jim Zhang

Aug. 29, 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: 11T5HE/3F/830/EXT/A2

Luminous Efficacy (Lumens /Watt)	Luminous Flux per lamp (Lumens)	Power (Watts)/2	Power Factor
122.0	1596.0	13.09	0.9939
CCT (K)	CRI	Stabilization Time (Light & Power)	
3066	82.5	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 : Jul. 30, 2018

Date of Test : Aug. 03, 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

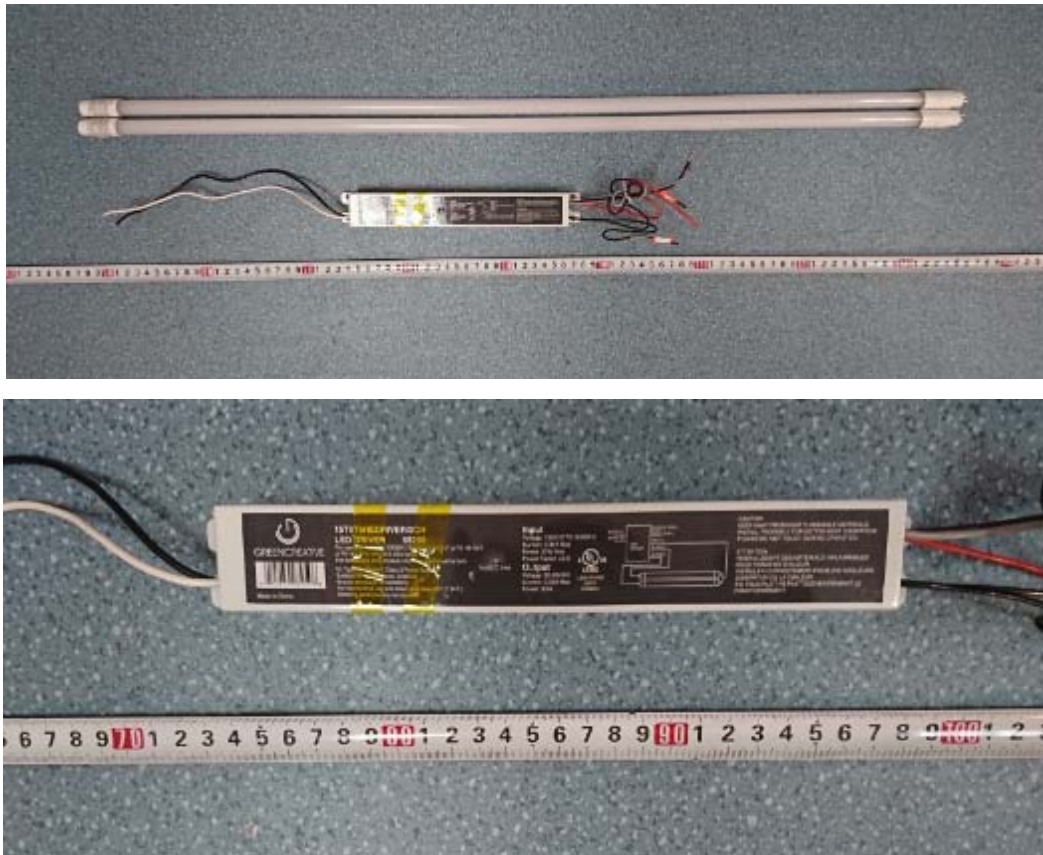


Figure 1- Overview of the sample

Equipment Under Test (EUT)

Name	: LED Tube System
Model	: 11T5HE/3F/830/EXT/A2
Electrical Ratings	: 120-277V, 50/60Hz
Product Description	: 3000K LED tube model: 11T5HE/3F/830/EXT 2 LED tubes supplied by a LED driver: 15T8T5HEDRIVER/2CH
Manufacturer	: GREEN CREATIVE LTD
Address	: 756 North Zhongshan Rd., Unit B301 Zhabei District, Shanghai

TEST RESULTS

Test ambient temperature was 25.1 °C.

Base orientation was horizontal. 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)	0.219	0.103
Power Factor	0.9939	0.9438
Test Power (W)/2	13.09	13.43
THD A%	4.30	9.87
Luminous Efficacy (lm/W)	122.0	119.0
Luminous Flux per lamp (lm)	1596.0	1597.0
Color Rendering Index (CRI)	82.5	
R9	5.8	
Correlated Color Temperature (CCT)(K)	3066	
Chromaticity Chroma x	0.4322	
Chromaticity Chroma y	0.4026	
Chromaticity Chroma u	0.2482	
Chromaticity Chroma v	0.3467	
Duv	0.0001	
Chromaticity Chroma u'	0.2482	
Chromaticity Chroma v'	0.5201	

Special Color Rendering Indices	
R1	80.9
R2	91.1
R3	96.1
R4	80.3
R5	81.2
R6	89.2
R7	82.5
R8	58.6
R9	5.8
R10	79.8
R11	79.8
R12	70.5
R13	83.4
R14	98.5
Rf	83
Rg	96

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)	0.220
Power Factor	0.9940
Test Power (W)/2	13.11
Luminous Efficacy (lm/W)	120.4
Luminous Flux per lamp (lm)	1577.5
Beam Angle (°)	117.5
Center Beam Candle Power (cd)	441
Spacing Criteria	1.22 (0°-180°)/ 1.30 (90°-270°)
Zonal Lumens in the 0°-60°Zone	63.87%
Zonal Lumens in the 60°-90°Zone	25.72%
Zonal Lumens in the 90°-120°Zone	7.77%
Zonal Lumens in the 120°-180°Zone	2.64%

Table 3: Test data per Goniophotometer Method

Spectral Power Distribution - Sphere Spectroradiometer Method

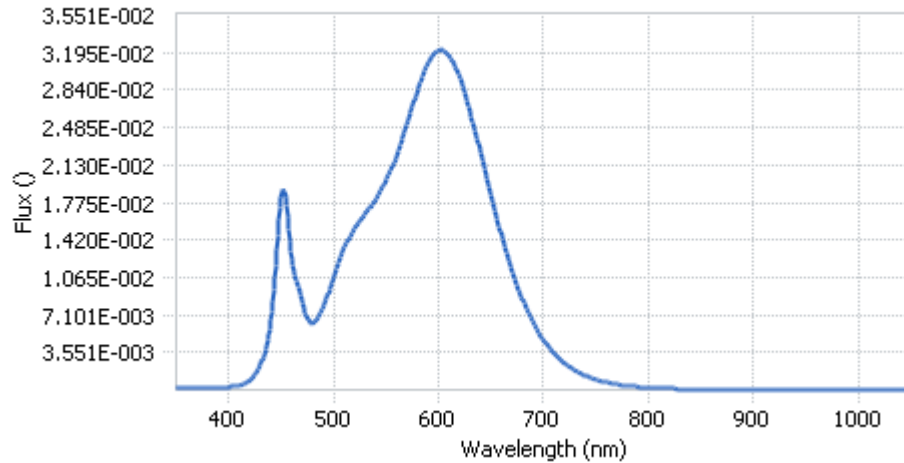
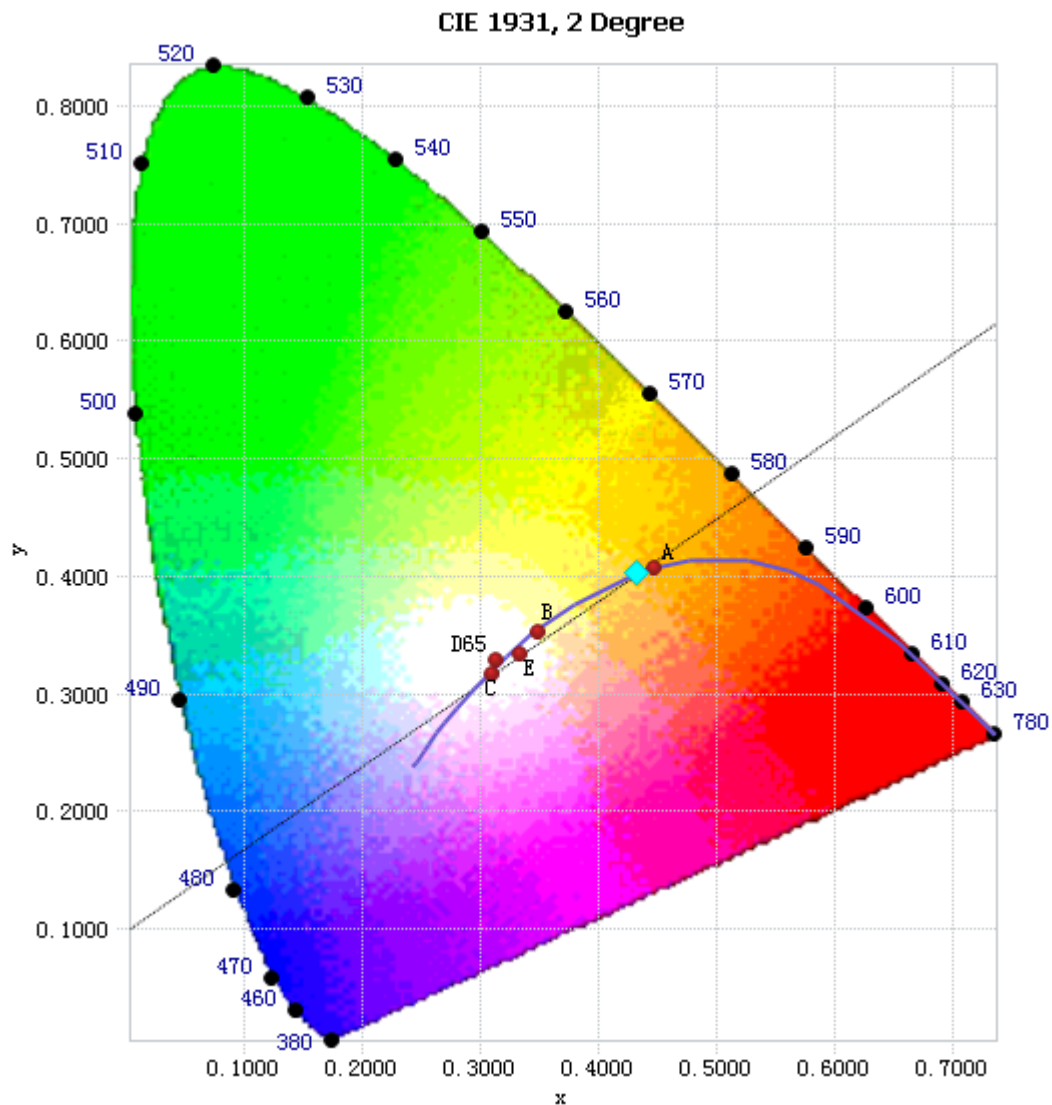


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	2.68E-04	485	6.88E-03	590	3.10E-02	695	5.51E-03
385	2.65E-04	490	7.80E-03	595	3.17E-02	700	4.73E-03
390	2.65E-04	495	9.16E-03	600	3.21E-02	705	4.04E-03
395	2.84E-04	500	1.07E-02	605	3.21E-02	710	3.45E-03
400	2.85E-04	505	1.22E-02	610	3.17E-02	715	2.97E-03
405	3.45E-04	510	1.34E-02	615	3.09E-02	720	2.54E-03
410	4.37E-04	515	1.45E-02	620	2.96E-02	725	2.17E-03
415	6.15E-04	520	1.54E-02	625	2.81E-02	730	1.85E-03
420	9.34E-04	525	1.61E-02	630	2.64E-02	735	1.58E-03
425	1.47E-03	530	1.67E-02	635	2.45E-02	740	1.34E-03
430	2.34E-03	535	1.73E-02	640	2.24E-02	745	1.15E-03
435	3.83E-03	540	1.80E-02	645	2.04E-02	750	9.82E-04
440	6.57E-03	545	1.89E-02	650	1.84E-02	755	8.38E-04
445	1.19E-02	550	1.99E-02	655	1.64E-02	760	7.21E-04
450	1.83E-02	555	2.10E-02	660	1.47E-02	765	6.16E-04
455	1.74E-02	560	2.22E-02	665	1.29E-02	770	5.30E-04
460	1.24E-02	565	2.37E-02	670	1.13E-02	775	4.54E-04
465	1.02E-02	570	2.53E-02	675	9.86E-03	780	3.87E-04
470	8.52E-03	575	2.69E-02	680	8.57E-03		
475	6.74E-03	580	2.85E-02	685	7.43E-03		
480	6.34E-03	585	2.99E-02	690	6.41E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.4322, 0.4026)

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

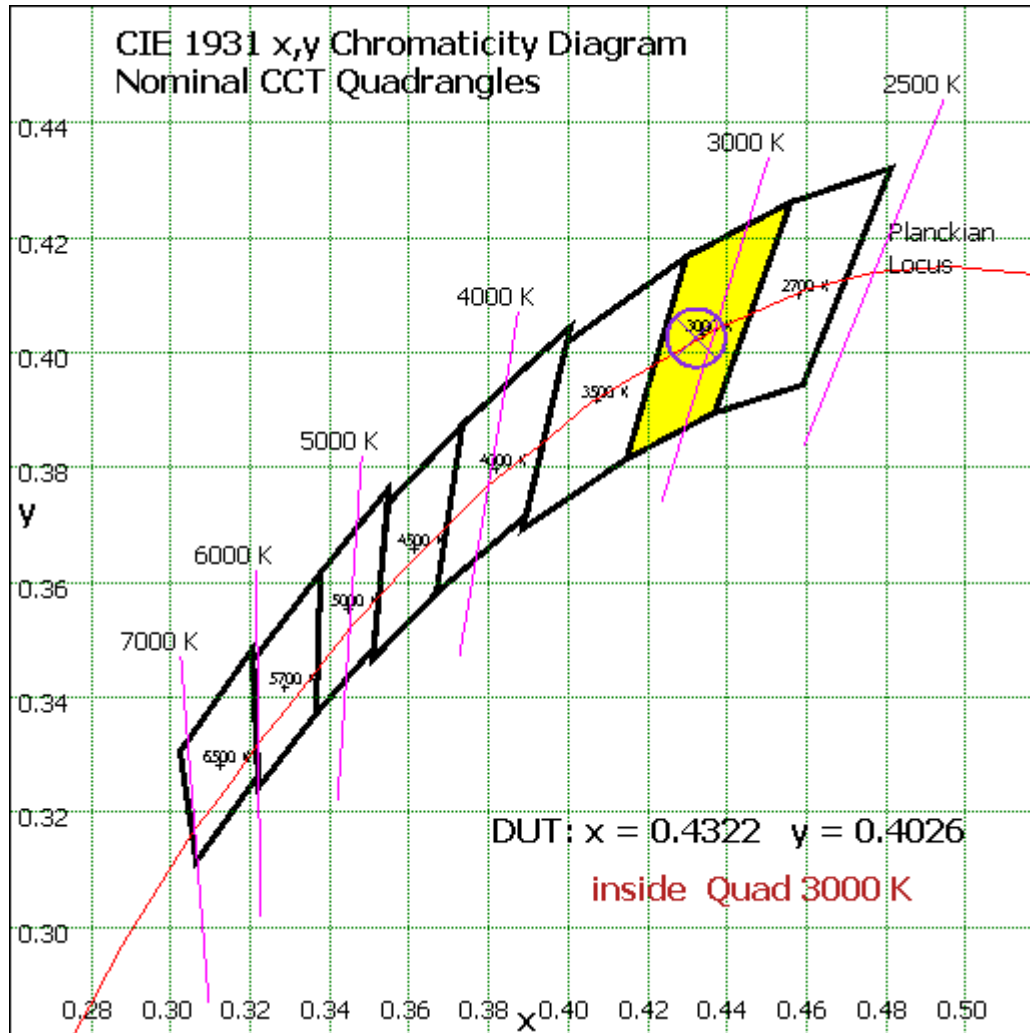


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Zonal Lumen Tabulation- Goniophotometer Method

$\gamma(^{\circ})$	Lumens	% Total
0- 10	41.704	2.64%
10- 20	119.474	7.57%
20- 30	181.267	11.49%
30- 40	219.395	13.91%
40- 50	230.321	14.60%
50- 60	215.32	13.65%
60- 70	180.29	11.43%
70- 80	134.7	8.54%
80- 90	90.695	5.75%
90-100	59.198	3.75%
100-110	38.515	2.44%
110-120	24.919	1.58%
120-130	16.563	1.05%
130-140	11.015	0.70%
140-150	7.112	0.45%
150-160	4.284	0.27%
160-170	2.118	0.13%
170-180	0.599	0.04%
Total	1577.5	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	1007.481	63.87%
60- 90	405.685	25.72%
0-90	1413.166	89.58%
90- 180	164.323	10.42%
0- 180	1577.5	100%

Table 5: Zonal Lumen Data

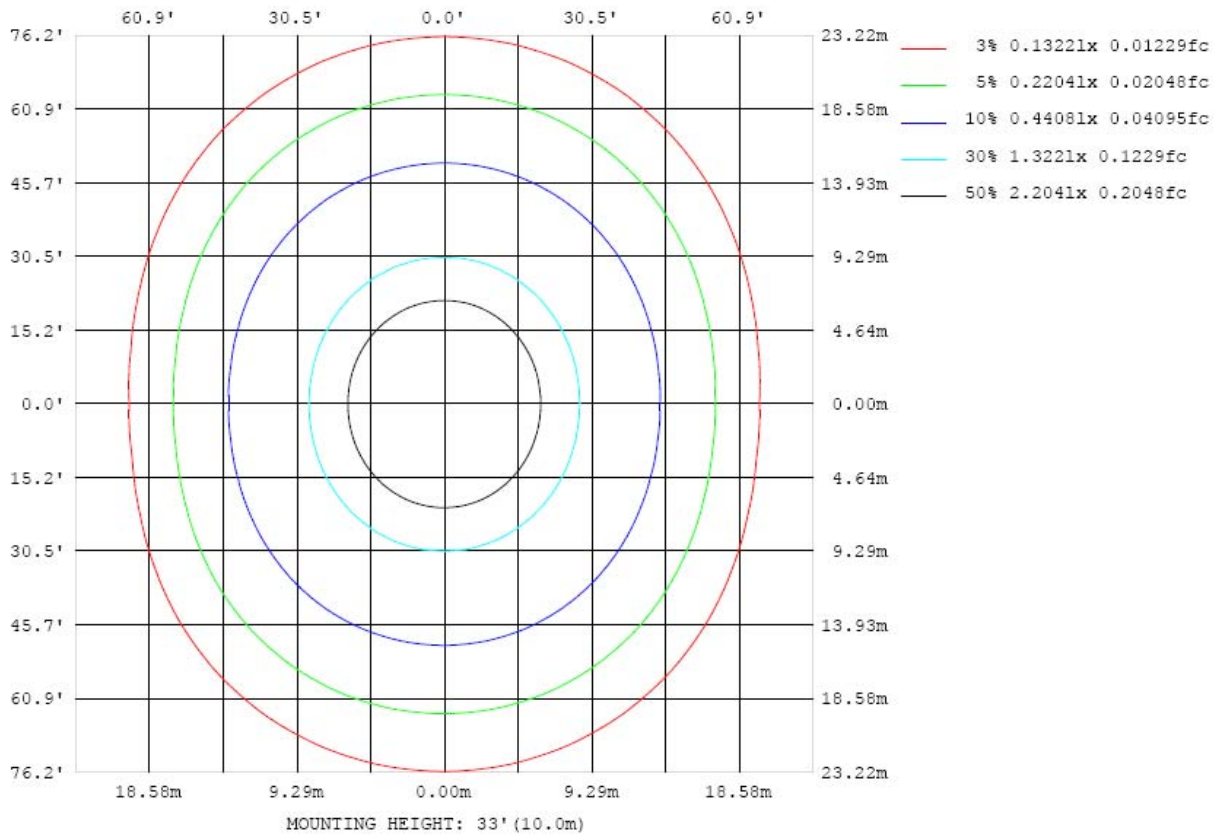


Chart 4: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

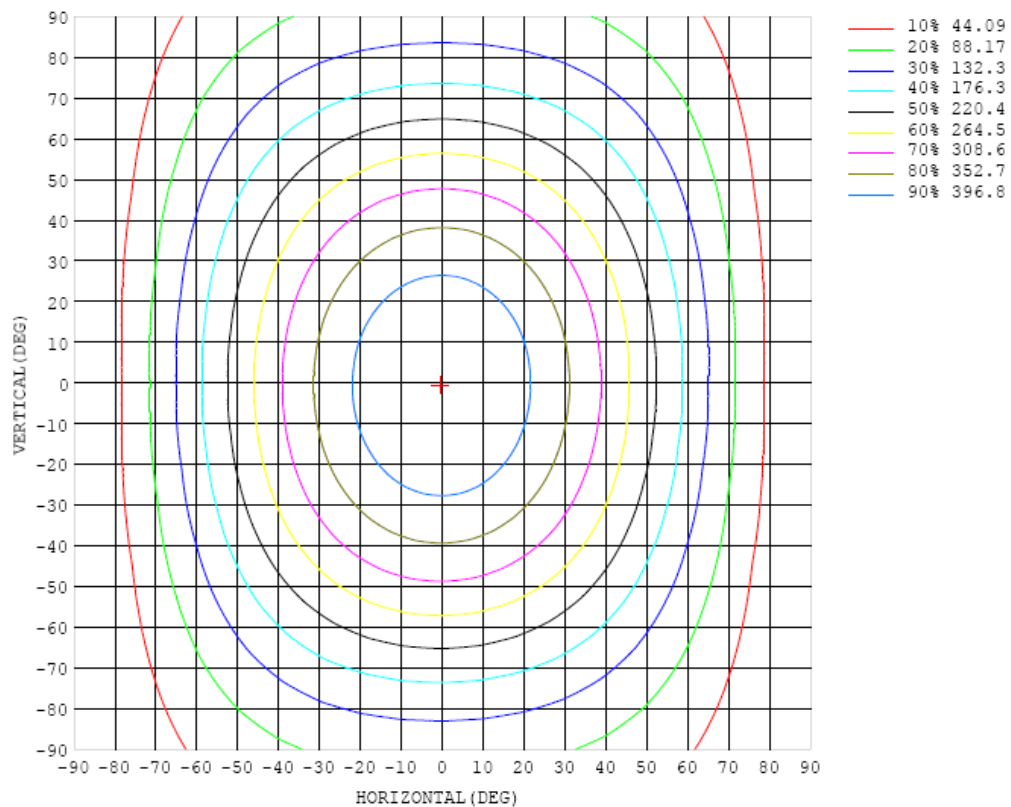


Chart 5: Isocandela Plot

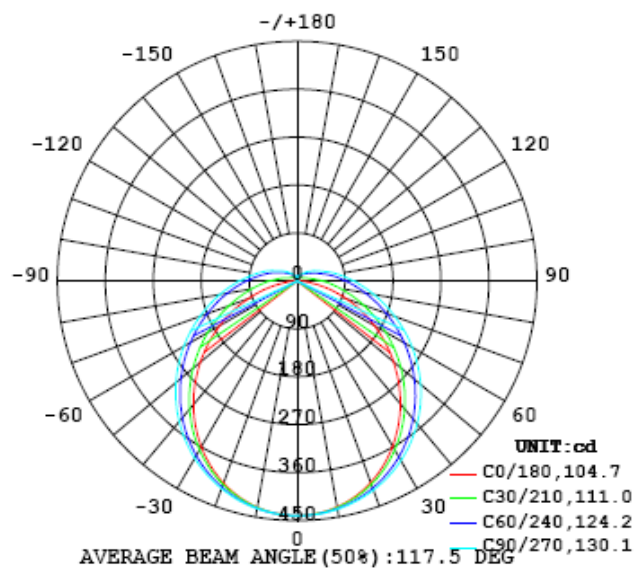


Chart 6: Polar Candela Distribution

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	441	441	441	441	441	441	441	441	441	441	441	441	441	441	441	441	441	441	441
5	438	438	438	438	439	439	439	439	439	440	440	440	439	439	439	439	439	439	439
10	431	431	432	432	433	433	434	435	435	435	435	435	434	434	433	433	432	432	432
15	419	419	420	421	423	424	426	427	428	428	428	427	426	425	424	422	421	420	420
20	403	403	405	407	409	412	414	416	418	418	418	417	415	413	410	408	406	405	404
25	382	383	385	388	392	396	399	402	404	405	405	403	400	397	393	390	387	385	384
30	358	359	362	366	371	377	382	386	388	389	389	387	383	378	373	368	364	361	360
35	331	332	336	341	348	355	361	366	370	371	370	367	363	357	350	344	338	334	333
40	301	303	307	314	322	331	338	345	349	350	349	346	340	333	325	317	309	305	303
45	269	271	276	285	295	305	313	321	325	327	326	322	316	307	297	287	279	273	271
50	236	238	244	254	266	277	287	295	301	303	301	297	290	280	268	257	247	240	237
55	202	204	211	223	236	249	260	269	274	276	275	270	262	252	239	226	213	205	203
60	167	170	179	192	206	220	232	241	247	249	248	243	235	223	209	194	180	170	168
65	132	136	146	161	177	192	205	214	220	222	221	216	207	195	180	164	148	136	133
70	98.4	102	115	132	150	165	178	187	193	195	194	189	181	168	153	135	117	102	98.1
75	65.9	70.9	86.8	106	124	140	153	162	168	170	168	164	155	143	127	108	88.1	71.0	64.6
80	35.9	43.5	62.5	82.4	101	117	130	139	144	146	145	140	132	120	104	84.6	63.9	43.7	34.3
85	11.9	22.1	42.5	63.3	81.6	97.1	109	117	123	124	123	119	111	99.3	83.8	65.4	43.9	22.7	10.5
90	0.26	9.50	27.9	47.6	65.6	79.9	91.2	99.2	104	106	105	100	92.9	81.8	67.5	49.4	29.3	10.3	0.15
95	0.37	4.22	17.9	35.4	52.0	65.9	76.0	83.6	88.2	89.7	88.5	84.6	77.5	67.5	53.7	37.0	19.2	5.00	0.36
100	0.54	2.97	12.3	25.6	40.5	53.4	63.5	70.6	74.6	75.9	75.7	71.4	64.7	54.8	42.0	27.3	13.5	3.53	0.50
105	0.87	2.69	9.46	20.0	31.4	42.2	51.3	58.2	62.3	63.7	62.6	59.0	52.5	43.5	33.1	21.5	10.5	3.15	0.91
110	1.35	2.96	7.96	16.2	25.8	34.8	42.2	47.7	51.1	52.4	51.6	48.5	43.3	36.2	27.2	17.5	8.94	3.34	1.36
115	1.78	3.36	7.18	13.7	21.5	29.2	35.6	40.4	43.3	44.4	43.7	41.1	36.5	30.2	22.7	14.8	8.11	3.65	1.90
120	2.38	3.64	6.86	11.9	18.3	24.6	30.1	34.3	36.8	37.8	37.1	34.8	30.9	25.6	19.3	12.9	7.67	3.98	2.46
125	2.99	4.01	6.77	10.7	15.8	21.0	25.6	29.2	31.4	32.2	31.6	29.6	26.3	21.9	16.7	11.7	7.39	4.15	3.04
130	3.64	4.25	6.78	10.0	13.9	18.2	21.9	24.9	26.8	27.5	26.9	25.2	22.5	18.8	14.7	10.7	7.26	4.31	3.56
135	4.32	4.56	6.74	9.35	12.6	15.9	18.9	21.3	22.9	23.4	23.0	21.6	19.3	16.4	13.1	9.87	6.91	4.37	4.09
140	4.97	4.62	6.17	8.19	11.5	14.0	16.4	18.3	19.5	20.0	19.7	18.5	16.7	14.5	12.0	8.76	6.45	4.47	4.74
145	5.63	4.45	6.08	7.92	10.3	12.6	14.3	15.7	16.7	17.1	16.8	16.0	14.6	12.9	10.7	8.20	6.17	4.48	5.40
150	6.04	4.32	5.59	7.60	8.63	11.0	12.5	13.7	14.4	14.6	14.5	13.8	12.8	11.3	8.98	7.63	6.20	4.47	6.05
155	6.65	4.67	5.28	7.10	8.51	9.16	10.7	11.7	12.2	12.6	12.5	11.9	10.7	8.94	8.58	7.07	5.89	4.68	6.71
160	7.02	5.35	4.60	5.89	7.46	8.93	9.67	9.77	9.92	9.93	9.80	9.29	8.80	8.27	6.30	5.51	4.99	4.88	6.30
165	7.22	5.48	4.56	4.73	5.21	7.15	8.25	8.85	9.08	9.12	8.99	7.78	6.44	5.19	4.98	4.57	4.51	4.78	5.95
170	7.21	5.24	4.63	4.51	4.53	4.54	5.11	5.68	7.17	7.46	4.65	5.10	5.19	4.97	4.48	4.48	4.48	4.78	5.30
175	6.96	5.81	5.31	5.51	5.44	5.50	5.93	6.25	6.33	3.60	6.45	6.41	6.13	5.77	5.37	5.06	4.96	4.79	4.85
180	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78

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	441	441	441	441	441	441	441	441	441	441	441	441	441	441	441	441	441		
5	439	439	439	439	439	439	439	439	439	439	439	439	439	439	438	438	438		
10	432	432	432	433	433	434	434	434	434	434	433	433	433	432	431	431	431		
15	420	421	422	423	424	425	425	426	426	426	425	424	423	422	421	420	419		
20	404	405	407	409	411	412	414	415	415	415	413	412	410	408	406	404	403		
25	384	386	388	391	394	397	399	401	401	401	399	396	394	390	387	385	383		
30	361	363	367	371	375	379	382	384	385	384	382	378	374	370	365	362	359		
35	334	337	342	347	353	358	362	365	366	365	362	358	352	346	341	336	332		
40	304	308	314	322	329	335	340	344	345	343	340	335	328	321	313	307	303		
45	273	278	286	294	303	311	317	320	322	320	316	310	302	293	284	277	271		
50	240	246	255	266	276	285	292	296	297	296	291	284	275	265	254	245	239		
55	206	213	224	237	248	258	266	270	272	270	265	258	248	236	224	213	205		
60	172	181	194	208	221	231	239	244	246	244	239	231	220	207	194	181	172		
65	138	150	165	180	194	205	213	218	220	218	213	204	193	179	165	150	139		
70	105	119	136	154	168	179	188	192	194	192	187	179	168	154	137	120	106		
75	73.2	90.7	110	128	144	156	164	168	170	168	164	156	144	129	111	91.9	75.0		
80	45.3	65.9	87.1	106	121	133	141	146	147	146	141	133	121	106	87.9	67.3	47.4		
85	23.8	45.7	67.3	86.2	101	113	121	125	127	125	121	113	102	86.6	68.1	46.9	25.5		
90	10.8	30.8	51.4	69.5	84.2	95.1	103	107	108	107	103	95.1	84.3	69.9	52.1	31.8	11.7		
95	4.86	20.7	39.0	55.8	69.5	79.9	86.9	90.9	92.2	90.9	86.9	79.9	69.7	56.2	39.6	21.4	5.29		
100	3.34	13.6	29.4	44.7	57.3	67.0	73.6	77.4	78.6	77.4	73.6	67.0	57.5	45.1	30.1	14.2	3.46		
105	3.13	10.3	21.9	34.7	46.9	56.0	62.2	65.7	66.9	65.8	62.2	56.1	47.2	35.5	22.3	10.4	3.11		
110	3.36	8.56	17.5	27.6	36.8	45.4	51.7	55.3	56.5	55.3	51.8	45.7	37.3	27.7	17.5	8.42	3.29		
115	3.69	7.66	14.5	22.6	30.5	37.0	41.8	44.8	45.9	44.9	41.9	37.0	30.5	22.7	14.4	7.46	3.60		
120	4.13	7.26	12.5	19.0	25.5	31.0	35.1	37.6	38.3	37.5	35.0	30.9	25.4	19.0	12.2	7.05	4.03		
125	4.59	7.08	11.1	16.2	21.5	26.1	29.6	31.6	32.4	31.7	29.5	26.0	21.4	16.1	10.9	6.94	4.53		
130	5.04	7.04	10.2	14.2	18.4	22.1	25.0	26.8	27.4	26.8	25.0	22.1	18.3	14.0	10.0	6.95	5.03		
135	5.43	7.00	9.53	12.6	15.9	18.9	21.2	22.7	23.2	22.7	21.2	18.9	15.8	12.5	9.47	7.06	5.54		
140	5.94	7.06	9.03	11.4	13.9	16.3	18.1	19.3	19.7	19.3	18.1	16.3	13.9	11.4	9.06	7.20	6.05		
145	6.36	7.11	8.64	10.5	12.3	14.1	15.6	16.5	16.8	16.5	15.5	14.1	12.3	10.5	8.75	7.37	6.51		
150	6.66	7.39	8.14	9.68	11.1	12.4	13.4	14.0	14.2	14.0	13.4	12.3	11.1	9.77	8.54	7.56	6.89		
155	6.94	7.51	8.02	8.99	10.1	10.9	11.6	12.1	12.3	12.1	11.7	11.0	10.1	9.23	8.40	7.74	7.28		
160	7.26	7.54	7.91	8.34	9.12	9.81	10.3	10.6	10.7	10.6	10.3	9.90	9.38	8.83	8.32	7.90	7.65		
165	6.50	7.13	7.60	8.02	8.30	8.72	9.14	9.39	9.47	9.45	9.33	9.11	8.83	8.54	8.27	8.04	7.89		
170	5.70	6.03	6.60	7.28	7.82	8.07	8.02	8.25	8.64	8.67	8.61	8.53	8.43	8.31	8.19	8.09	8.11		
175	5.05	5.09	5.37	5.94	6.68	7.36	7.80	7.82	7.74	7.78	7.85	7.99	8.13	8.14	8.08	8.08	7.86		
180	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78		

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 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 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

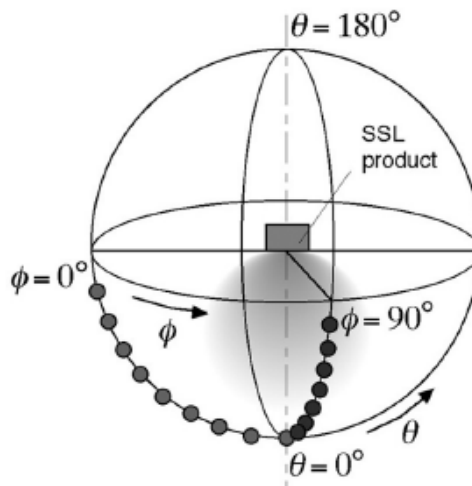
The color characteristics of SSL products include chromaticity coordinates, correlated color temperature, and color rendering index. These characteristics of SSL products may be spatially non-uniform, and thus, in order that they can be specified accurately, the color quantities shall be measured as 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° 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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