

LM-79-08 Test Report

for

GREEN CREATIVE LTD

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

LED Tube System

Model: 11T5HE/3F/840/EXT/A2

(LED tube model: 11T5HE/3F/840/EXT 2pcs and LED driver model: 15T8T5HEDRIVER/2CH 1pcs)

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ18080024aq

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/840/EXT/A2

Luminous Efficacy (Lumens /Watt)	Luminous Flux per lamp (Lumens)	Power (Watts)/2	Power Factor
132.2	1717.0	12.99	0.9940
CCT (K)	CRI	Stabilization Time (Light & Power)	
4024	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

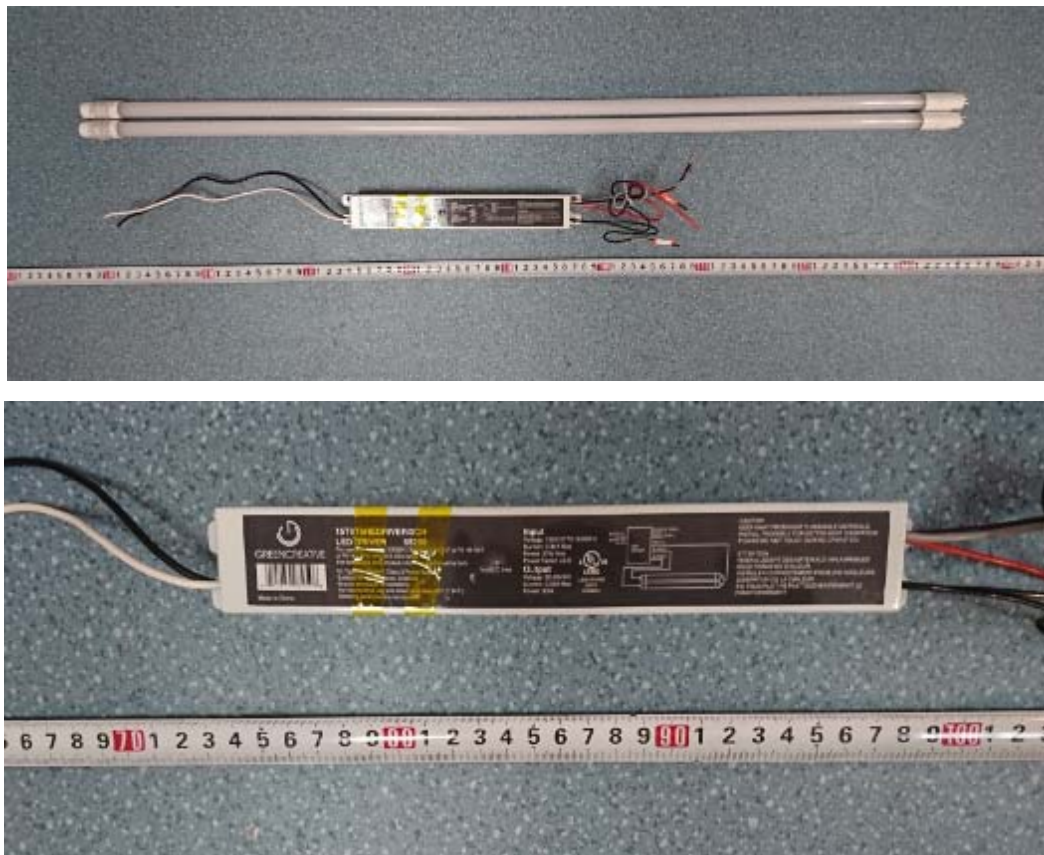


Figure 1- Overview of the sample

Equipment Under Test (EUT)

Name	: LED Tube System
Model	: 11T5HE/3F/840/EXT/A2
Electrical Ratings	: 120-277V, 50/60Hz
Product Description	: 4000K LED tube model: 11T5HE/3F/840/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 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)	0.218	0.102
Power Factor	0.9940	0.9442
Test Power (W)/2	12.99	13.34
THD A%	4.53	10.04
Luminous Efficacy (lm/W)	132.2	128.7
Luminous Flux per lamp (lm)	1717.0	1717.0
Color Rendering Index (CRI)	82.5	
R9	4.3	
Correlated Color Temperature (CCT)(K)	4024	
Chromaticity Chroma x	0.3806	
Chromaticity Chroma y	0.3811	
Chromaticity Chroma u	0.2235	
Chromaticity Chroma v	0.3357	
Duv	0.0013	
Chromaticity Chroma u'	0.2235	
Chromaticity Chroma v'	0.5035	

Special Color Rendering Indices	
R1	80.4
R2	89.2
R3	95.5
R4	81
R5	80.6
R6	85.1
R7	85.7
R8	63
R9	4.3
R10	74.4
R11	79.9
R12	61
R13	82.7
R14	97.8
Rf	82
Rg	94

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)	0.218
Power Factor	0.9942
Test Power (W)/2	13.02
Luminous Efficacy (lm/W)	130.6
Luminous Flux per lamp (lm)	1700.2
Beam Angle (°)	117.7
Center Beam Candle Power (cd)	473
Spacing Criteria	1.20 (0°-180°)/ 1.30 (90°-270°)
Zonal Lumens in the 0°-60°Zone	63.62%
Zonal Lumens in the 60°-90°Zone	25.71%
Zonal Lumens in the 90°-120°Zone	7.86%
Zonal Lumens in the 120°-180°Zone	2.80%

Table 3: Test data per Goniophotometer Method

Spectral Power Distribution - Sphere Spectroradiometer Method

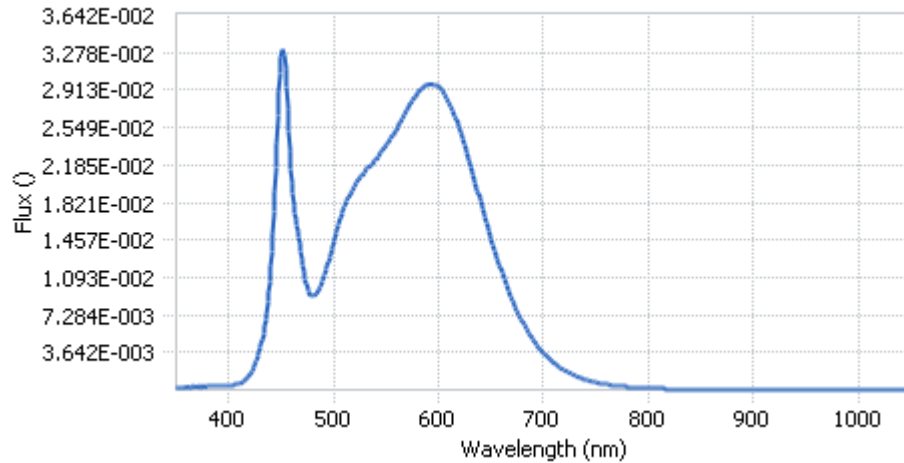
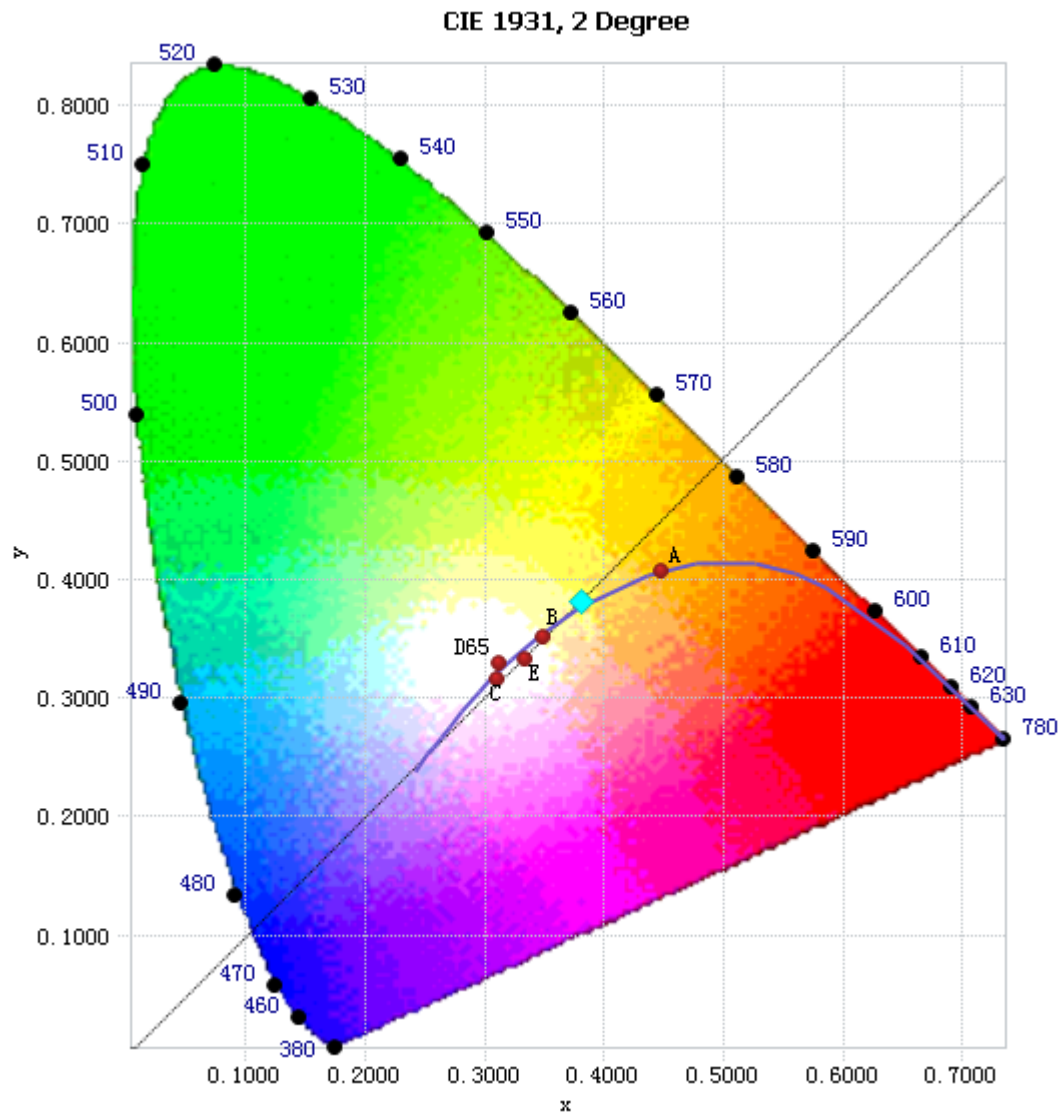


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	3.46E-04	485	9.66E-03	590	2.97E-02	695	4.19E-03
385	3.40E-04	490	1.07E-02	595	2.97E-02	700	3.58E-03
390	3.55E-04	495	1.24E-02	600	2.94E-02	705	3.07E-03
395	3.80E-04	500	1.44E-02	605	2.88E-02	710	2.61E-03
400	4.17E-04	505	1.63E-02	610	2.79E-02	715	2.24E-03
405	4.91E-04	510	1.77E-02	615	2.68E-02	720	1.91E-03
410	6.43E-04	515	1.90E-02	620	2.53E-02	725	1.63E-03
415	9.21E-04	520	1.99E-02	625	2.37E-02	730	1.39E-03
420	1.50E-03	525	2.06E-02	630	2.20E-02	735	1.19E-03
425	2.47E-03	530	2.13E-02	635	2.01E-02	740	1.01E-03
430	4.09E-03	535	2.18E-02	640	1.83E-02	745	8.61E-04
435	6.85E-03	540	2.24E-02	645	1.64E-02	750	7.39E-04
440	1.20E-02	545	2.31E-02	650	1.47E-02	755	6.38E-04
445	2.16E-02	550	2.38E-02	655	1.30E-02	760	5.46E-04
450	3.24E-02	555	2.45E-02	660	1.15E-02	765	4.68E-04
455	2.94E-02	560	2.54E-02	665	1.01E-02	770	4.06E-04
460	2.00E-02	565	2.63E-02	670	8.78E-03	775	3.47E-04
465	1.60E-02	570	2.73E-02	675	7.65E-03	780	2.97E-04
470	1.28E-02	575	2.81E-02	680	6.60E-03		
475	9.83E-03	580	2.89E-02	685	5.71E-03		
480	9.08E-03	585	2.94E-02	690	4.90E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.3806, 0.3811)

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

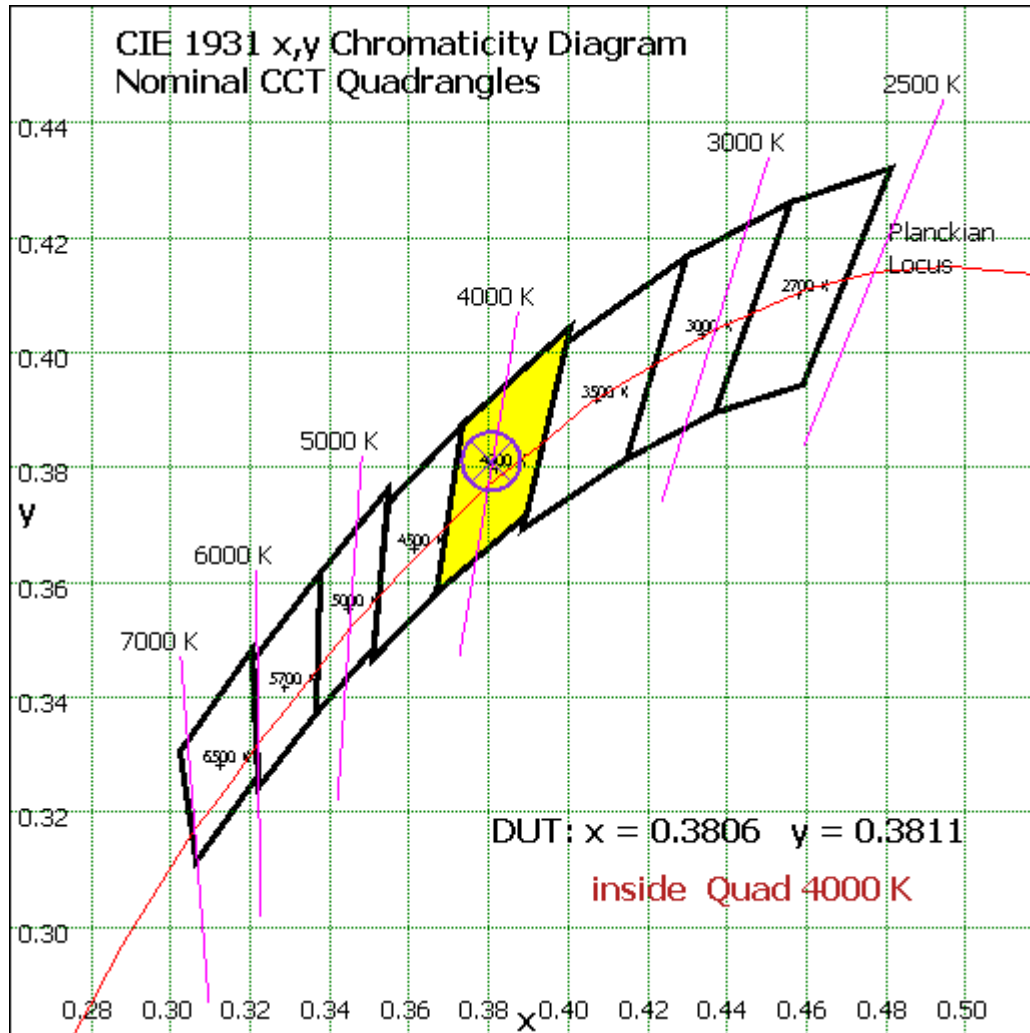


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Zonal Lumen Tabulation- Goniophotometer Method

$\gamma(^{\circ})$	Lumens	% Total
0- 10	44.726	2.63%
10- 20	128.146	7.54%
20- 30	194.503	11.44%
30- 40	235.547	13.85%
40- 50	247.37	14.55%
50- 60	231.429	13.61%
60- 70	194.012	11.41%
70- 80	145.172	8.54%
80- 90	97.98	5.76%
90-100	64.205	3.78%
100-110	42.03	2.47%
110-120	27.373	1.61%
120-130	18.411	1.08%
130-140	12.494	0.73%
140-150	8.292	0.49%
150-160	5.117	0.30%
160-170	2.615	0.15%
170-180	0.759	0.04%
Total	1700.2	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	1081.721	63.62%
60- 90	437.164	25.71%
0-90	1518.885	89.34%
90- 180	181.296	10.66%
0- 180	1700.2	100%

Table 5: Zonal Lumen Data

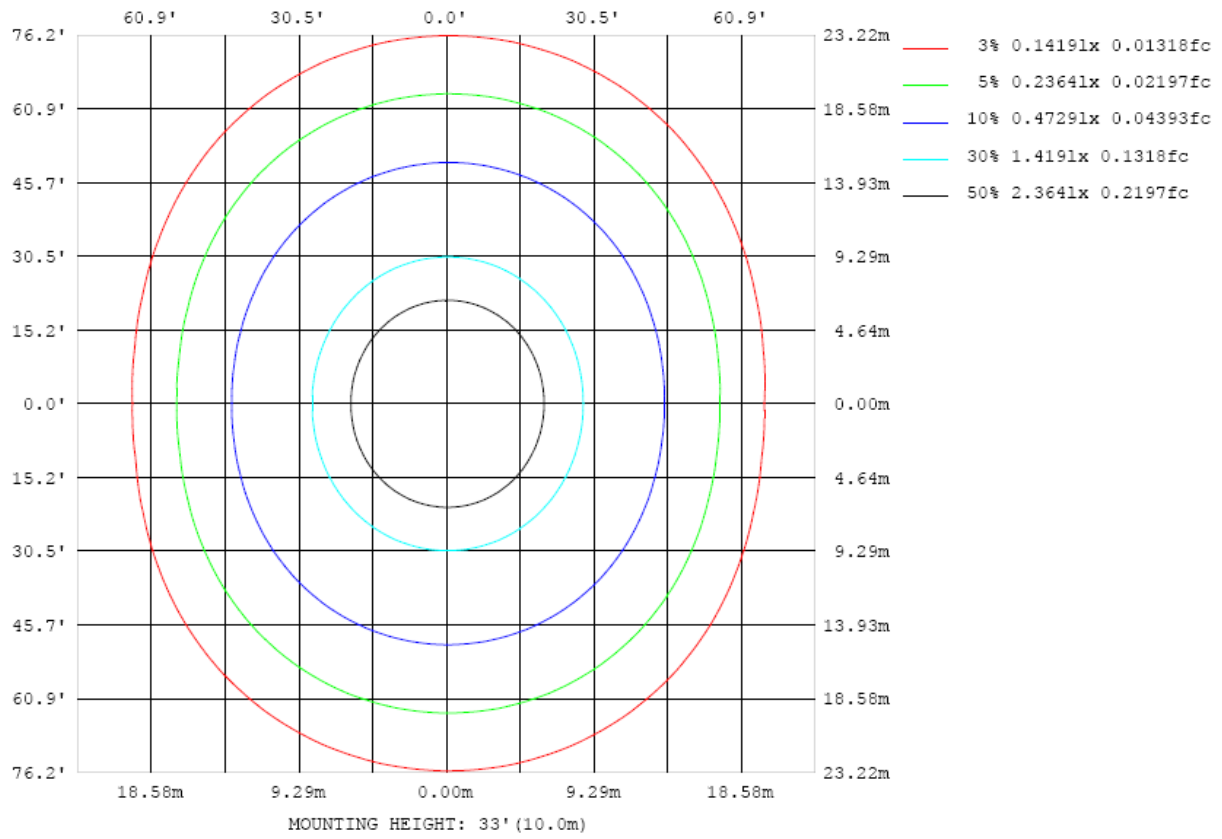


Chart 4: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

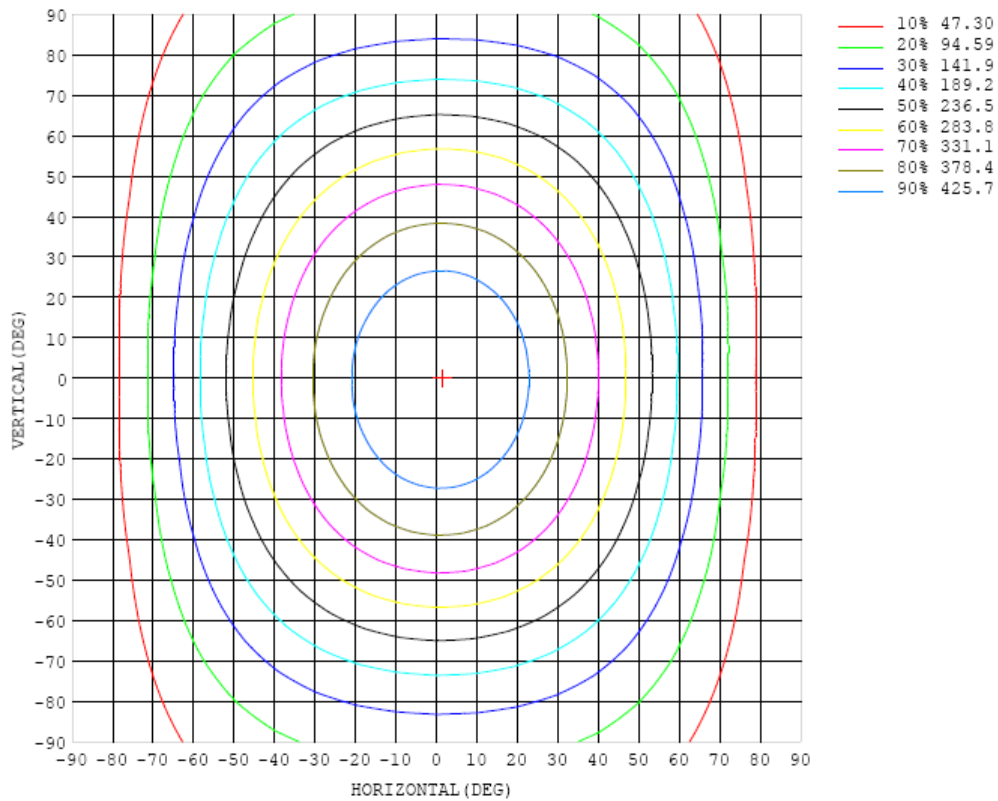


Chart 5: Isocandela Plot

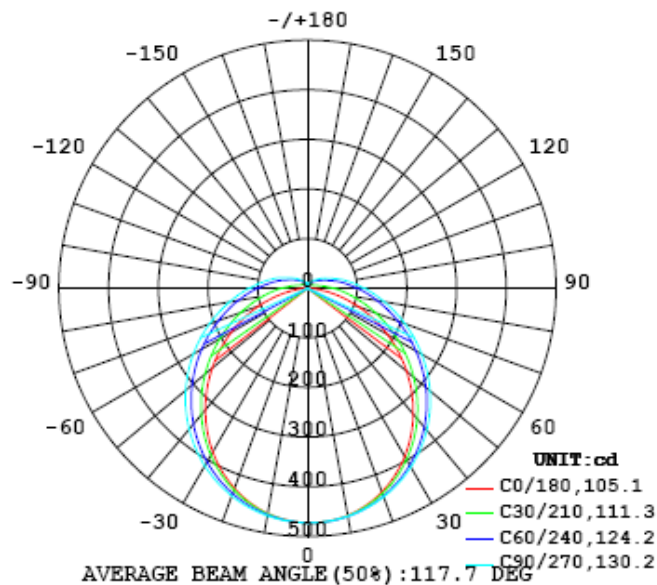


Chart 6: Polar Candela Distribution

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	473	473	473	473	473	473	473	473	473	473	473	473	473	473	473	473	473	473	473
5	471	471	471	471	472	472	472	472	472	471	471	471	471	471	470	470	469	469	469
10	465	465	465	466	466	466	467	467	467	467	466	465	465	464	463	462	461	461	461
15	453	454	454	455	456	457	458	459	459	459	458	457	455	453	452	450	449	448	447
20	437	437	439	440	442	444	446	447	448	447	446	445	442	439	436	434	432	430	429
25	416	417	419	421	424	427	430	432	433	433	432	430	426	422	418	414	411	408	407
30	391	392	395	398	403	408	412	415	416	416	414	411	407	401	395	390	385	382	381
35	362	364	367	372	378	384	390	394	396	396	394	390	385	378	371	363	357	353	352
40	331	332	337	343	351	359	365	370	373	373	371	367	360	352	343	334	327	322	320
45	297	298	304	312	322	331	339	345	348	348	346	341	333	324	313	303	294	288	286
50	261	263	269	279	290	301	311	317	321	322	319	314	305	295	283	270	260	252	250
55	223	226	233	245	258	271	281	289	293	294	291	285	276	264	251	237	225	216	214
60	185	188	198	211	226	240	252	260	264	265	262	256	247	234	220	204	190	180	177
65	147	151	162	178	195	210	222	231	236	236	234	228	218	205	189	172	156	144	140
70	109	114	128	146	165	181	194	203	207	208	206	200	190	177	160	142	124	109	104
75	73.1	79.1	96.6	117	137	154	167	176	181	182	179	173	164	150	134	114	93.8	75.8	68.7
80	40.0	48.5	69.4	91.5	112	129	142	151	156	157	154	149	139	126	110	89.8	68.2	46.9	36.8
85	13.2	24.3	47.0	70.1	90.4	107	120	128	133	134	132	127	118	105	89.0	69.6	47.2	24.7	11.4
90	0.39	10.2	30.8	52.9	72.6	88.5	101	109	113	115	112	108	99.3	87.3	72.0	53.1	31.8	11.5	0.15
95	0.37	4.37	19.9	39.5	57.9	72.9	84.1	91.9	96.2	97.4	95.6	91.1	83.2	72.2	57.8	40.2	21.2	5.64	0.35
100	0.62	3.10	13.2	28.7	45.2	59.5	70.3	77.4	81.5	82.7	81.1	76.9	69.9	59.3	45.6	29.6	14.8	3.99	0.67
105	1.11	2.91	10.3	21.8	34.7	47.1	57.2	64.4	68.5	69.8	68.3	64.2	57.1	47.3	35.7	23.3	11.5	3.63	1.19
110	1.75	3.34	8.63	17.7	28.2	38.1	46.3	52.5	56.2	57.4	56.2	52.7	46.9	39.0	29.3	18.9	9.84	3.90	1.80
115	2.40	3.87	7.84	14.9	23.5	31.9	38.9	44.1	47.2	48.3	47.3	44.4	39.4	32.6	24.4	16.1	8.97	4.29	2.46
120	3.12	4.17	7.58	13.0	19.9	26.9	32.8	37.3	40.1	41.0	40.1	37.6	33.3	27.6	20.8	14.2	8.58	4.62	3.17
125	3.87	4.43	7.49	11.9	17.2	22.9	27.9	31.7	34.1	34.9	34.1	32.0	28.3	23.6	18.1	12.9	8.23	4.70	3.88
130	4.67	4.69	7.60	11.2	15.3	19.8	23.8	27.0	29.0	29.7	29.1	27.3	24.3	20.3	16.0	11.9	7.77	4.47	4.58
135	5.50	5.19	7.44	10.4	13.9	17.4	20.6	23.1	24.8	25.4	24.9	23.4	21.0	17.9	14.5	11.0	7.72	5.01	5.29
140	6.31	5.41	6.87	8.95	12.7	15.5	17.9	19.9	21.2	21.7	21.3	20.2	18.3	15.9	13.2	9.76	7.29	5.34	6.05
145	7.14	5.55	7.28	8.44	11.3	13.9	15.8	17.3	18.3	18.7	18.4	17.5	16.1	14.2	11.8	8.77	7.40	5.51	6.85
150	7.69	5.33	7.20	8.43	9.39	12.1	13.9	15.2	15.9	16.2	16.0	15.4	14.2	12.4	9.76	8.43	7.54	5.58	7.67
155	8.43	5.65	6.85	8.45	9.01	10.2	12.0	13.0	13.6	14.2	14.0	13.1	12.0	10.0	8.22	8.25	7.13	5.80	8.52
160	8.99	6.67	5.83	7.52	8.93	9.80	9.89	10.8	11.4	11.3	10.9	10.2	8.69	9.01	7.81	6.73	6.06	6.05	7.97
165	9.31	7.05	5.46	5.77	6.64	9.06	9.95	10.0	10.3	10.4	10.2	8.81	7.58	6.42	6.06	5.51	5.54	5.81	7.44
170	9.32	6.87	6.04	5.42	5.39	5.61	6.52	7.56	9.20	10.3	6.00	6.06	6.22	5.99	5.46	5.52	5.52	5.86	6.56
175	9.03	7.69	6.95	7.11	6.91	6.81	7.24	7.62	7.68	4.19	7.88	7.79	7.45	7.02	6.54	6.24	6.19	6.05	6.12
180	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34

Table 6: Luminous Intensity Data

Table--2

UNIT: cd

γ (DEG) \ C (DEG)	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350		
0	473	473	473	473	473	473	473	473	473	473	473	473	473	473	473	473	473		
5	469	469	469	470	470	470	470	470	471	471	471	471	471	471	471	471	471		
10	461	461	462	462	463	464	464	465	465	466	466	466	466	466	465	465	465		
15	447	448	449	451	452	454	455	456	457	457	457	457	456	456	454	454	453		
20	430	431	433	435	438	440	442	444	445	446	445	444	443	441	440	438	437		
25	408	410	413	416	420	424	427	429	431	431	430	428	426	424	421	418	417		
30	382	385	389	394	399	404	408	411	413	413	412	410	406	402	398	395	392		
35	353	357	362	368	375	382	387	391	393	393	392	388	383	378	372	367	364		
40	322	326	333	341	349	357	364	368	370	371	368	364	358	351	343	337	333		
45	288	293	302	311	321	331	338	343	346	346	343	338	330	321	312	305	299		
50	253	259	269	281	292	303	311	317	320	320	317	310	301	291	280	271	264		
55	217	225	236	250	263	275	284	290	293	293	289	282	272	260	247	236	227		
60	181	190	204	219	233	246	256	262	265	265	261	253	242	229	214	200	190		
65	145	157	172	189	204	218	228	234	237	237	233	224	213	198	181	166	154		
70	110	124	143	161	177	190	200	207	210	209	205	197	184	169	151	133	118		
75	76.6	94.3	115	135	152	165	174	181	184	183	179	170	159	142	123	102	83.3		
80	47.0	68.0	90.3	111	128	141	151	157	160	159	155	146	134	117	97.1	74.4	52.6		
85	24.2	46.7	69.6	89.9	107	120	129	135	137	137	132	124	112	95.5	75.1	51.7	28.3		
90	10.7	31.2	52.8	72.4	88.6	101	110	115	118	117	113	105	92.9	77.0	57.3	34.9	13.2		
95	5.06	20.9	40.1	58.1	73.2	85.0	93.2	98.2	100	99.4	95.4	87.9	76.7	61.8	43.5	23.5	6.11		
100	3.64	14.2	30.3	46.6	60.5	71.4	79.1	83.7	85.6	84.7	80.8	73.8	63.3	49.5	33.0	15.9	4.08		
105	3.65	11.0	23.1	36.6	49.7	59.8	67.0	71.3	73.0	72.1	68.4	61.8	52.0	39.0	24.7	11.8	3.76		
110	4.03	9.48	18.8	29.5	39.7	49.0	56.0	60.2	61.8	60.9	57.2	50.6	41.3	30.7	19.6	9.71	4.04		
115	4.56	8.81	15.9	24.6	33.1	40.3	45.8	49.2	50.6	49.6	46.4	41.1	33.9	25.3	16.3	8.79	4.52		
120	5.17	8.59	14.2	21.1	28.0	34.0	38.6	41.4	42.5	41.7	39.0	34.6	28.5	21.5	14.2	8.47	5.11		
125	5.78	8.54	13.0	18.5	24.1	29.0	32.8	35.2	36.1	35.4	33.2	29.4	24.4	18.6	12.8	8.47	5.77		
130	6.37	8.60	12.1	16.4	20.9	25.0	28.2	30.2	30.9	30.3	28.4	25.2	21.2	16.4	12.0	8.60	6.43		
135	6.96	8.76	11.5	14.9	18.5	21.8	24.3	26.0	26.5	26.0	24.5	21.9	18.6	14.9	11.5	8.83	7.10		
140	7.61	8.94	11.2	13.8	16.6	19.1	21.2	22.4	22.9	22.5	21.2	19.2	16.6	13.8	11.2	9.09	7.74		
145	8.15	9.05	10.8	12.9	15.0	17.0	18.5	19.5	19.8	19.5	18.5	17.0	15.0	12.8	10.9	9.35	8.33		
150	8.59	9.46	10.6	12.1	13.7	15.1	16.3	17.0	17.3	17.0	16.3	15.1	13.6	12.2	10.8	9.62	8.81		
155	8.91	9.63	10.2	11.5	12.6	13.6	14.3	14.9	15.1	14.9	14.4	13.6	12.6	11.6	10.7	9.86	9.30		
160	9.32	9.73	10.1	10.6	11.6	12.4	12.9	13.2	13.3	13.3	12.9	12.5	11.8	11.2	10.6	10.1	9.76		
165	8.30	9.22	9.83	10.2	10.6	11.3	11.7	11.9	12.0	12.0	11.8	11.6	11.3	10.9	10.6	10.3	10.1		
170	7.15	7.65	8.47	9.38	9.99	10.3	10.5	10.8	11.1	11.1	11.0	10.9	10.8	10.6	10.5	10.3	10.3		
175	6.33	6.40	6.78	7.56	8.58	9.44	9.98	9.96	9.85	10.1	10.3	10.3	10.4	10.4	10.3	10.3	10.1		
180	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34	7.34		

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

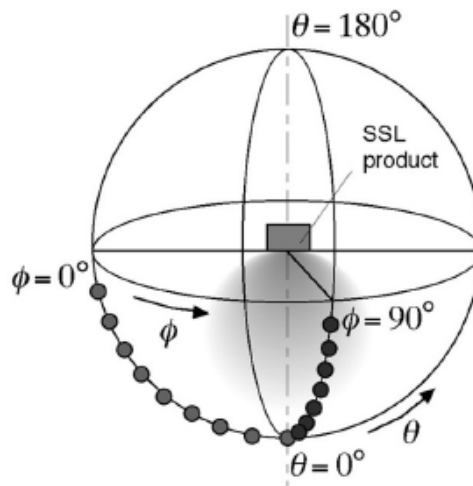
The color characteristics of SSL products include chromaticity coordinates, correlated color temperature, and color rendering index. These characteristics of SSL products may be spatially non-uniform, and thus, in order that they can be specified accurately, the color quantities shall be measured as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