

LM-79-08 Test Report

for

GREEN CREATIVE LTD

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

LED lamp

Model: 9.5PLV/835/DIR/RC

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Hangzhou, Zhejiang Province, China 311100

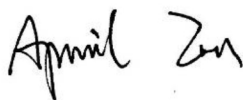
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Report No.: HZ18100024j

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

Review by:



Engineer: April Zou
Nov. 02, 2018

Approved by:



Manager: Jim Zhang
Nov. 02, 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: **9.5PLV/835/DIR/RC**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)/2	Power Factor
104.3	1176.0	11.27	0.9950
CCT (K)	CRI	Stabilization Time (Light & Power)	
3392	83.2	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 : Oct. 30, 2018

Date of Test : Oct. 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

TABLE OF CONTENT

LM-79-08 Test Report.....	1
Test Summary.....	2
Sample Photos.....	4
TEST RESULTS	5
Goniophotometer Method	6
Spectral Power Distribution - Sphere Spectroradiometer Method	7
Chromaticity Diagram - Sphere Spectroradiometer Method.....	8
Nominal CCT Quadrangles – Sphere Spectroradiometer Method	9
Zonal Lumen Tabulation- Goniophotometer Method	10
Luminous Intensity Distribution Plots- Goniophotometer Method.....	12
Luminous Intensity Data- Goniophotometer Method.....	13
EQUIPMENT LIST	15
TEST METHODS	15
Seasoning of SSL Product.....	15
Sphere-Spectroradiometer Method- Photometric and Electrical Measurements.....	15
Goniophotometer Method	16
Photometric and Electrical Measurements.....	16
Color Characteristics Measurements.....	16
Color Spatial Uniformity	16

Sample Photos

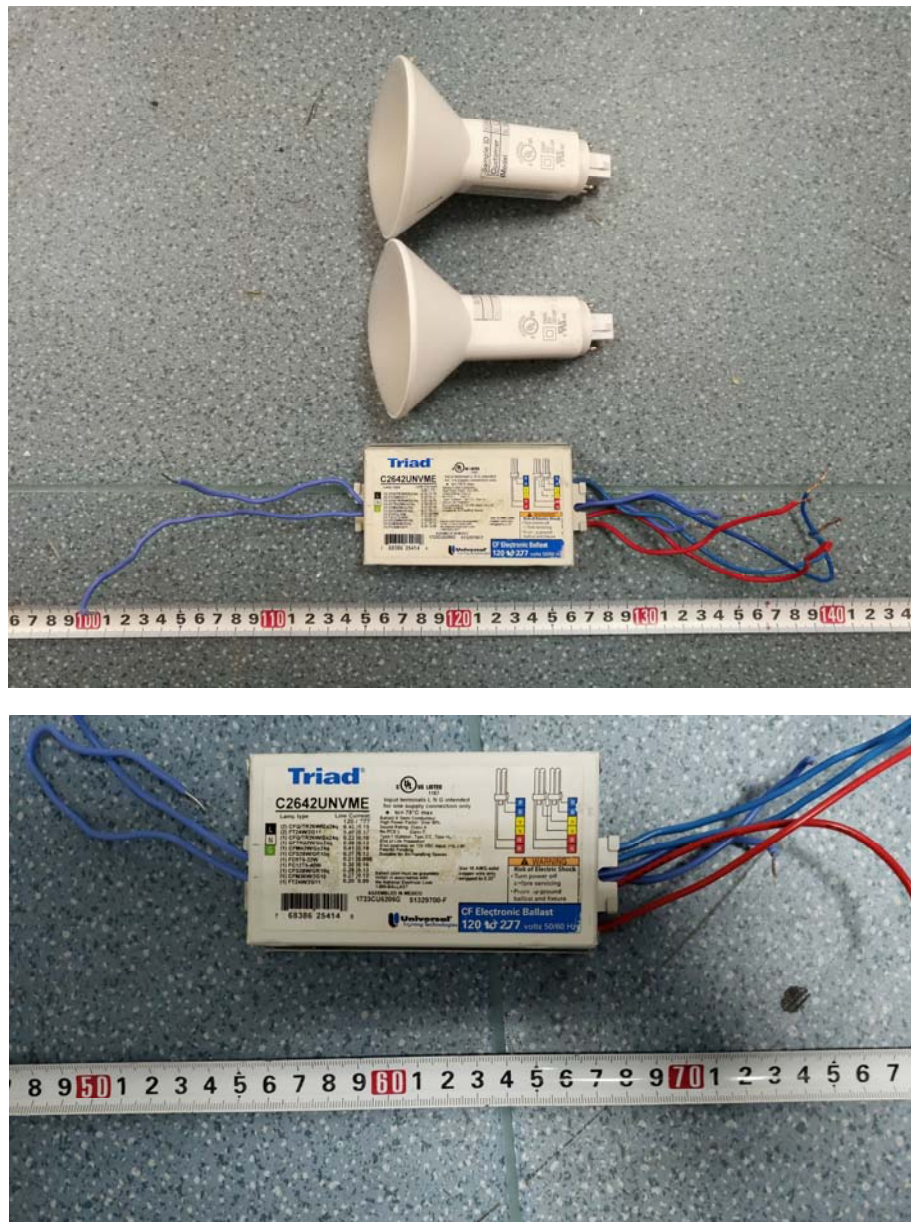


Figure 1- Overview of the sample

Equipment Under Test (EUT)

Name	: LED lamp
Model	: 9.5PLV/835/DIR/RC
Electrical Ratings	: 120-277V, 50/60Hz, 9.5W
Product Description	: 3500K LED Tubes supplied by a high frequency fluorescent lamp ballast: C2642UNVME
Manufacturer	: GREEN CREATIVE LTD
Address	: 756 North Zhongshan Rd., Unit B301 Zhabei District, Shanghai

TEST RESULTS

Test ambient temperature was 25.0°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)	0.189	0.084
Power Factor	0.9950	0.9762
Test Power (W)/2	11.27	11.34
THD A%	8.40	8.46
Luminous Efficacy (lm/W)	104.3	103.7
Total Luminous Flux (lm)	1176.0	1176.0
Color Rendering Index (CRI)	83.2	
R9	9	
Correlated Color Temperature (CCT)(K)	3392	
Chromaticity Chroma x	0.4118	
Chromaticity Chroma y	0.3948	
Chromaticity Chroma u	0.2383	
Chromaticity Chroma v	0.3426	
Duv	0.0001	
Chromaticity Chroma u'	0.2383	
Chromaticity Chroma v'	0.5139	

Special Color Rendering Indices	
R1	81.5
R2	91
R3	96.5
R4	81
R5	81.6
R6	88.2
R7	84.2
R8	61.6
R9	9
R10	78.8
R11	80
R12	68.4
R13	83.9
R14	98.6
Rf	83
Rg	95

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 24.9°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)	0.188
Power Factor	0.9952
Test Power (W)/2	11.23
Luminous Efficacy (lm/W)	106.6
Total Luminous Flux (lm)	1197.4
Beam Angle (°)	92.0
Center Beam Candle Power (cd)	520
Spacing Criteria	1.20 (0°-180°)/ 1.14 (90°-270°)
Zonal Lumens in the 0°-60°Zone	81.74%
Zonal Lumens in the 60°-90°Zone	17.11%
Zonal Lumens in the 90°-120°Zone	1.06%
Zonal Lumens in the 120°-180°Zone	0.09%

Table 3: Test data per Goniophotometer Method

Spectral Power Distribution - Sphere Spectroradiometer Method

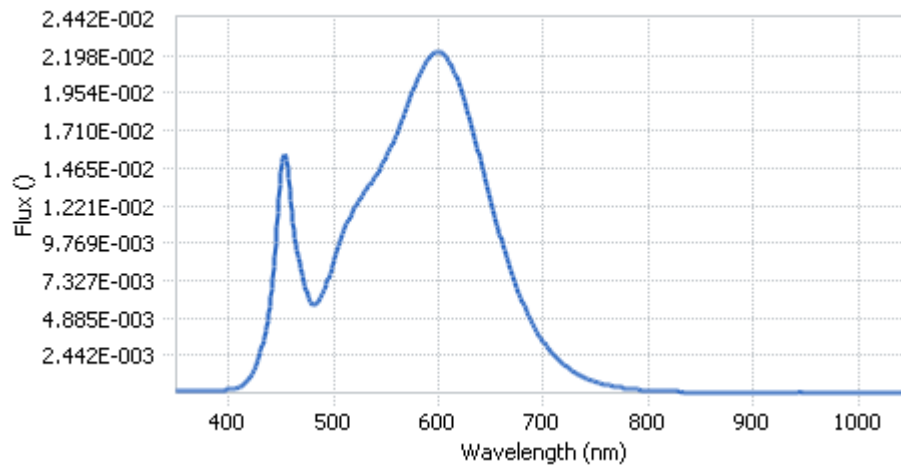


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	1.65E-04	485	5.94E-03	590	2.17E-02	695	3.85E-03
385	1.65E-04	490	6.53E-03	595	2.21E-02	700	3.31E-03
390	1.80E-04	495	7.45E-03	600	2.22E-02	705	2.84E-03
395	1.95E-04	500	8.57E-03	605	2.21E-02	710	2.44E-03
400	2.21E-04	505	9.68E-03	610	2.16E-02	715	2.10E-03
405	2.79E-04	510	1.06E-02	615	2.09E-02	720	1.82E-03
410	3.86E-04	515	1.15E-02	620	2.00E-02	725	1.55E-03
415	6.20E-04	520	1.21E-02	625	1.89E-02	730	1.33E-03
420	1.00E-03	525	1.27E-02	630	1.78E-02	735	1.13E-03
425	1.61E-03	530	1.32E-02	635	1.65E-02	740	9.71E-04
430	2.58E-03	535	1.36E-02	640	1.51E-02	745	8.31E-04
435	4.03E-03	540	1.42E-02	645	1.38E-02	750	7.17E-04
440	6.22E-03	545	1.47E-02	650	1.24E-02	755	6.10E-04
445	9.85E-03	550	1.54E-02	655	1.12E-02	760	5.29E-04
450	1.43E-02	555	1.61E-02	660	9.95E-03	765	4.54E-04
455	1.52E-02	560	1.69E-02	665	8.78E-03	770	3.91E-04
460	1.18E-02	565	1.77E-02	670	7.73E-03	775	3.37E-04
465	9.30E-03	570	1.87E-02	675	6.76E-03	780	2.92E-04
470	7.85E-03	575	1.96E-02	680	5.92E-03		
475	6.41E-03	580	2.05E-02	685	5.16E-03		
480	5.71E-03	585	2.12E-02	690	4.44E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method

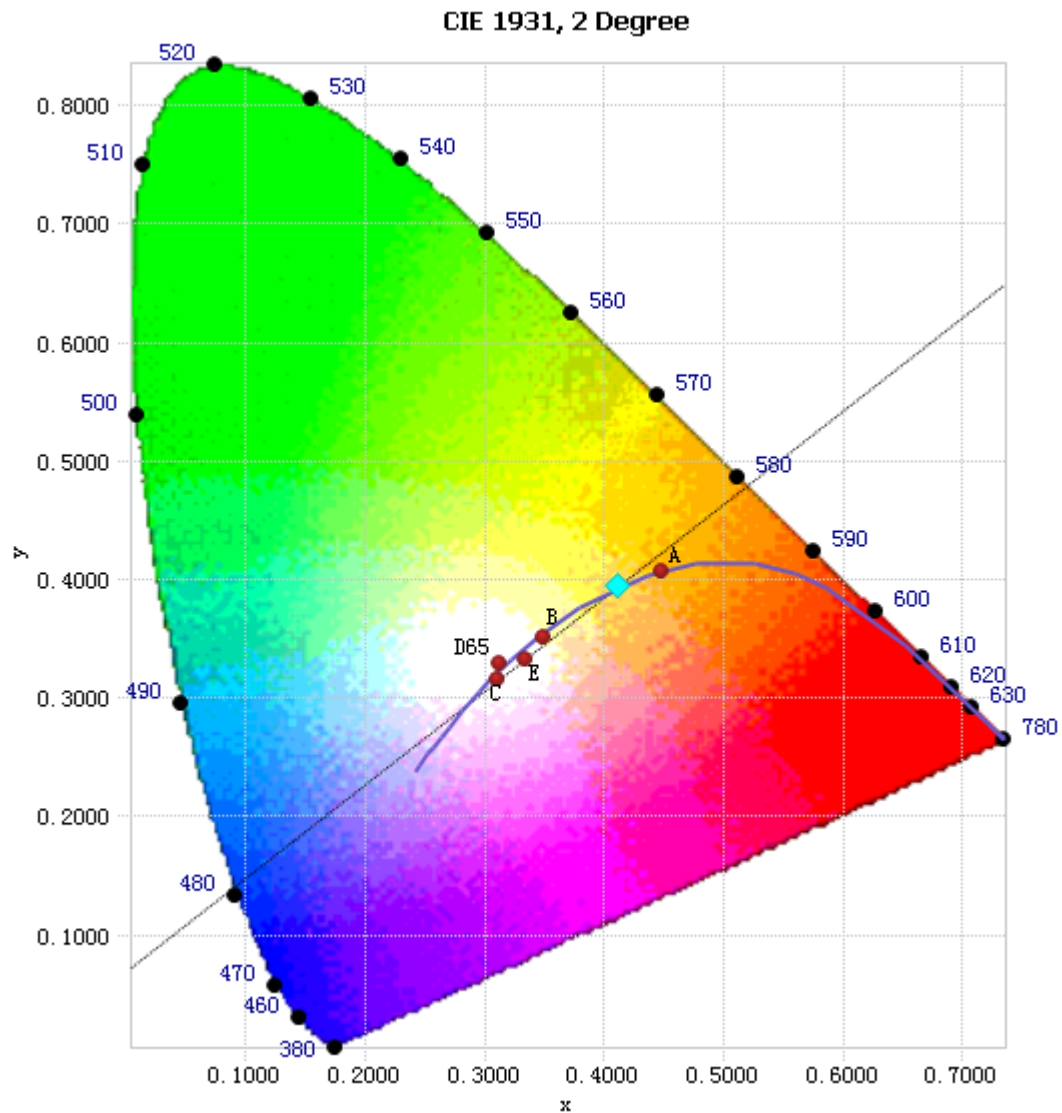


Chart 2: Chromaticity Diagram per Sphere - Spectroradiometer Method

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

Nominal CCT Quadrangles – Sphere Spectroradiometer Method

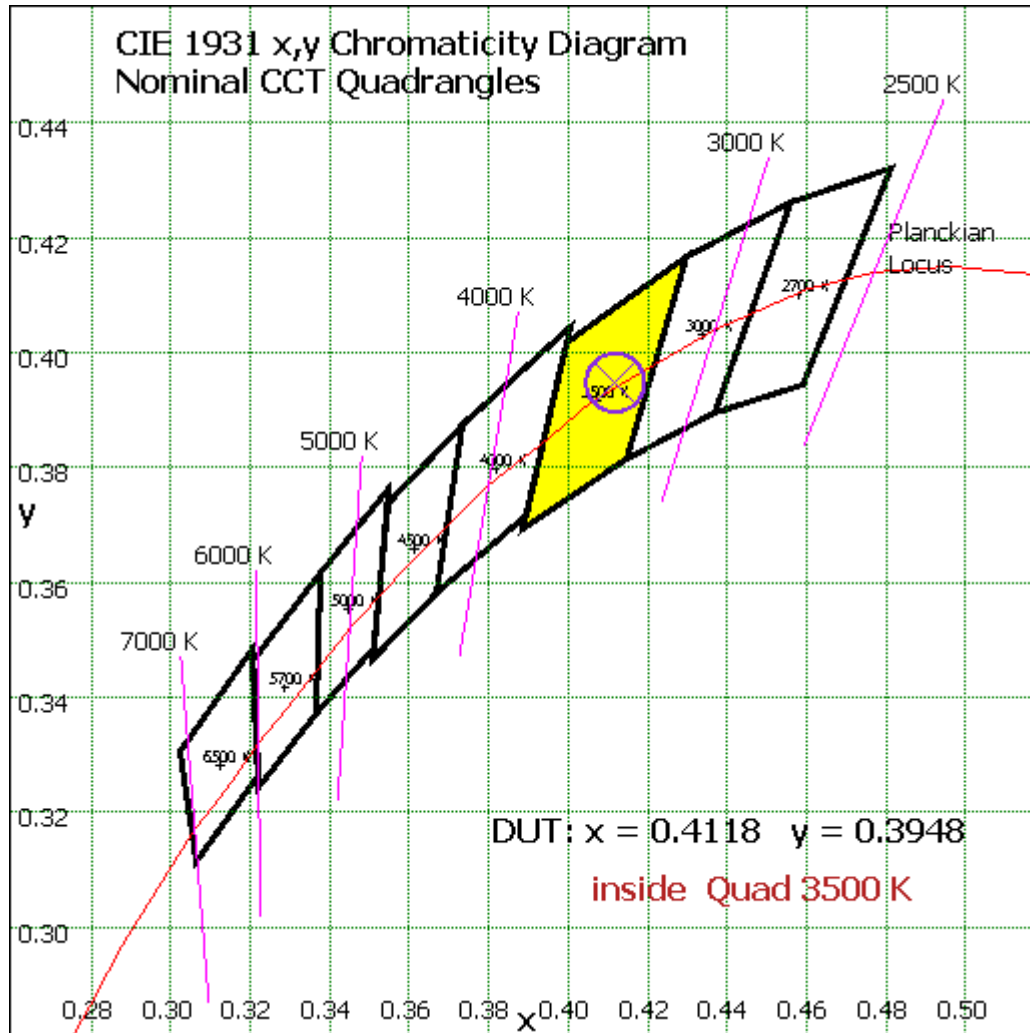


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Zonal Lumen Tabulation- Goniophotometer Method

$\gamma(^{\circ})$	Lumens	% Total
0- 10	48.977	4.09%
10- 20	137.191	11.46%
20- 30	198.361	16.57%
30- 40	222.198	18.56%
40- 50	207.789	17.35%
50- 60	164.322	13.72%
60- 70	110.311	9.21%
70- 80	63.685	5.32%
80- 90	30.904	2.58%
90-100	10.645	0.89%
100-110	1.817	0.15%
110-120	0.18	0.02%
120-130	0.162	0.01%
130-140	0.221	0.02%
140-150	0.25	0.02%
150-160	0.221	0.02%
160-170	0.149	0.01%
170-180	0.052	0.00%
Total	1197.4	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	978.838	81.74%
60- 90	204.9	17.11%
0-90	1183.738	98.86%
90- 180	13.697	1.14%
0- 180	1197.4	100%

Table 5: Zonal Lumen Data

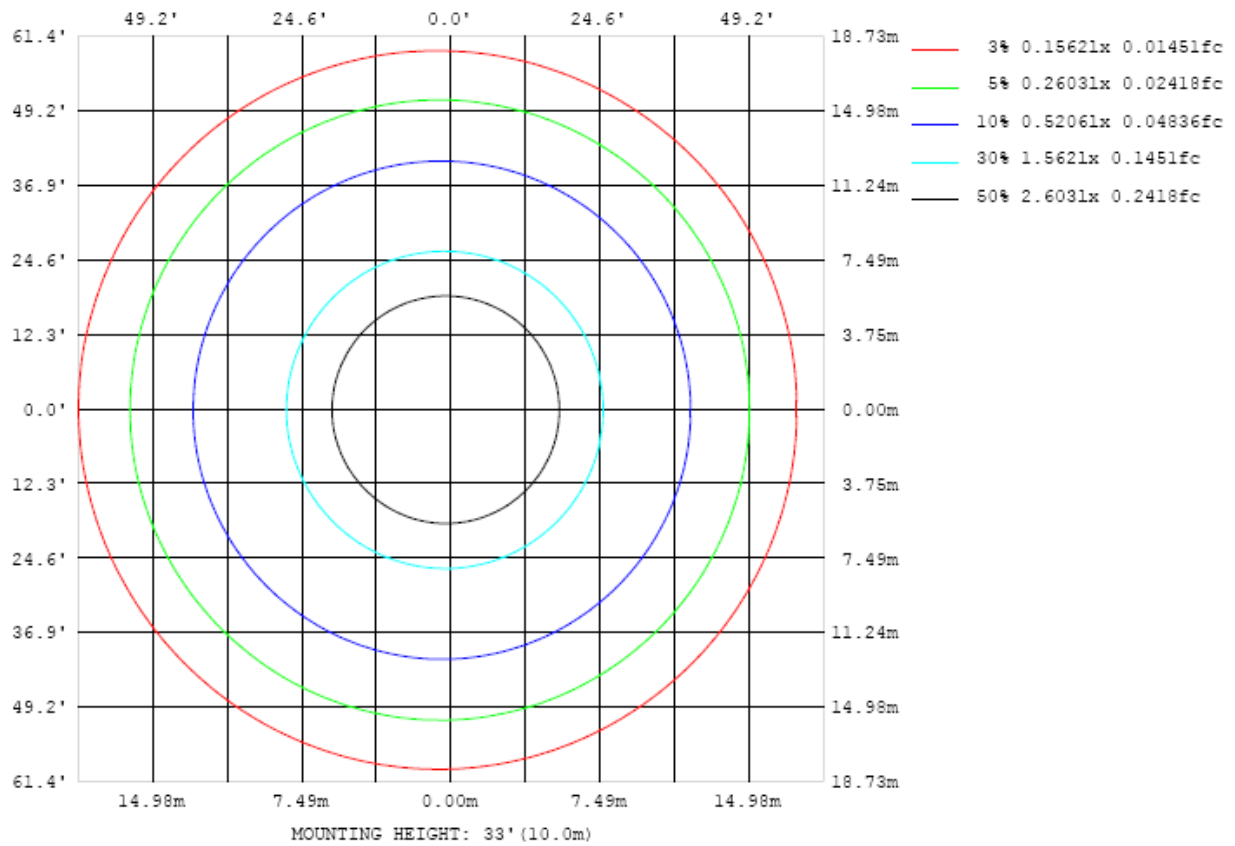


Chart 4: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

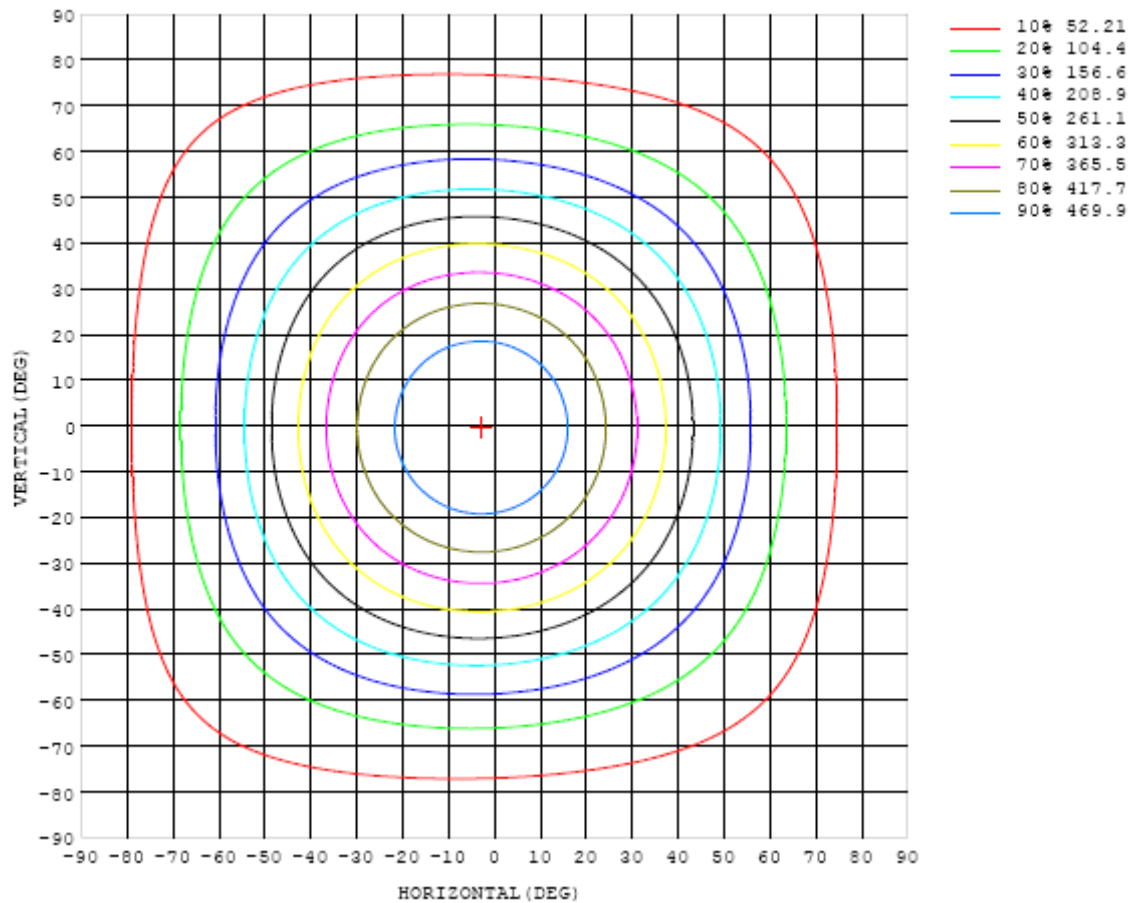


Chart 5: Isocandela Plot

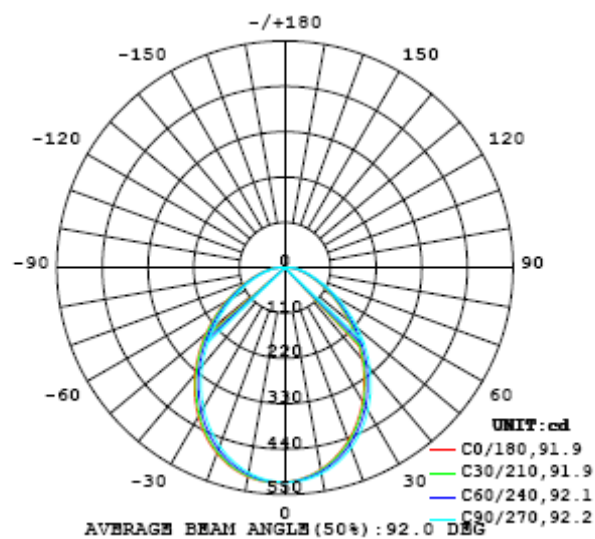


Chart 6: Polar Candela Distribution

Luminous Intensity Data- Goniophotometer Method

Table--1

UNIT: cd

C (DEG) y (DEG)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520
5	512	513	513	513	514	514	515	516	517	518	518	519	520	520	521	521	521	522	521
10	497	497	498	499	500	501	502	504	505	507	509	510	511	512	513	514	514	515	515
15	475	475	476	477	479	481	483	485	487	489	491	493	495	497	498	499	500	501	500
20	446	447	448	450	452	454	456	459	462	465	468	470	472	474	476	477	478	479	479
25	412	413	414	416	419	421	425	428	432	435	438	440	443	445	447	449	450	451	451
30	374	375	377	379	382	385	388	392	396	400	403	406	408	411	413	415	416	418	417
35	333	334	336	338	341	344	348	352	356	360	364	367	370	372	374	377	378	379	379
40	290	291	293	295	298	301	305	310	314	318	322	325	328	331	333	335	337	338	338
45	246	247	249	251	254	257	261	265	269	274	278	281	284	287	289	291	293	294	294
50	203	204	205	207	210	213	217	221	225	229	233	236	239	242	244	247	248	249	249
55	163	164	165	166	169	171	175	178	182	186	190	193	195	198	200	202	204	205	205
60	127	127	128	130	132	134	137	140	143	146	149	152	154	157	159	161	162	163	164
65	95.9	96.4	97.2	98.4	99.9	102	104	106	109	111	114	116	118	120	122	124	125	126	127
70	70.5	71.2	71.9	72.7	73.7	75.1	76.7	78.5	80.5	82.5	84.3	86.1	87.9	89.5	90.9	92.3	93.5	94.4	94.9
75	51.0	51.4	51.9	52.6	53.5	54.6	55.8	57.2	58.6	60.4	61.4	62.8	64.1	65.4	66.8	67.6	68.4	68.8	69.2
80	35.3	35.6	35.9	36.5	37.2	38.0	39.0	40.0	41.1	42.2	43.2	44.1	45.2	46.1	46.9	47.7	48.4	48.9	48.8
85	23.0	23.2	23.5	23.9	24.4	25.1	25.8	26.6	27.4	28.2	29.0	29.7	30.5	31.0	31.7	32.2	32.8	33.2	33.2
90	13.7	13.8	14.1	14.4	14.8	15.2	15.7	16.2	16.9	17.5	18.0	18.5	19.1	19.5	20.0	20.4	20.7	21.0	20.9
95	7.10	7.20	7.40	7.64	7.84	8.15	8.45	8.77	9.15	9.52	9.89	10.2	10.6	10.9	11.2	11.5	11.7	11.9	11.7
100	2.87	2.99	3.12	3.27	3.43	3.58	3.76	3.90	4.07	4.25	4.43	4.62	4.80	4.96	5.14	5.32	5.48	5.59	5.61
105	0.88	0.96	1.04	1.13	1.21	1.27	1.33	1.38	1.42	1.47	1.52	1.56	1.62	1.69	1.76	1.85	1.95	2.02	2.06
110	0.24	0.28	0.34	0.39	0.43	0.45	0.46	0.45	0.43	0.41	0.40	0.39	0.39	0.40	0.42	0.45	0.49	0.52	0.56
115	0.12	0.12	0.13	0.15	0.17	0.18	0.18	0.17	0.14	0.12	0.11	0.10	0.11	0.11	0.11	0.11	0.11	0.13	0.16
120	0.15	0.15	0.15	0.15	0.14	0.14	0.14	0.14	0.14	0.13	0.13	0.13	0.13	0.12	0.12	0.12	0.12	0.12	0.14
125	0.18	0.18	0.18	0.18	0.18	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.16	0.15	0.15	0.15	0.15	0.18
130	0.22	0.22	0.22	0.22	0.22	0.21	0.21	0.21	0.21	0.20	0.20	0.20	0.19	0.19	0.19	0.19	0.19	0.19	0.23
135	0.27	0.27	0.27	0.27	0.26	0.26	0.26	0.26	0.25	0.25	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.31
140	0.31	0.31	0.31	0.31	0.31	0.31	0.30	0.30	0.30	0.29	0.29	0.29	0.29	0.28	0.28	0.28	0.28	0.28	0.38
145	0.36	0.35	0.35	0.35	0.35	0.34	0.34	0.34	0.34	0.33	0.33	0.33	0.33	0.32	0.32	0.32	0.32	0.32	0.45
150	0.39	0.39	0.38	0.38	0.38	0.38	0.38	0.37	0.37	0.37	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.50
155	0.42	0.42	0.42	0.42	0.41	0.41	0.41	0.41	0.41	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.54
160	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.43	0.43	0.43	0.43	0.57
165	0.48	0.48	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.58
170	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.58
175	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.57
180	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58

Table 6: Luminous Intensity Data

Table--2

UNIT: cd

C (DGG) y (DGG)	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350		
0	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520	520		
5	521	521	520	520	519	519	518	517	517	515	515	514	513	513	513	512	512		
10	514	514	513	512	510	509	508	506	505	503	502	500	499	498	498	497	497		
15	500	499	498	496	494	492	490	488	486	484	481	479	478	477	476	475	474		
20	478	477	476	473	471	469	466	463	460	457	455	452	450	449	447	446	446		
25	450	449	447	444	442	439	435	432	429	425	422	419	417	415	414	412	412		
30	416	414	412	410	407	403	400	396	392	388	385	382	379	377	375	374	374		
35	378	376	374	371	368	364	360	356	352	348	345	341	338	336	335	333	332		
40	336	335	332	329	326	322	318	314	310	306	302	298	295	293	291	290	289		
45	293	291	289	286	282	279	274	271	266	262	258	254	252	249	247	246	245		
50	248	246	244	241	238	234	231	226	222	218	215	211	209	206	204	203	203		
55	204	202	200	198	195	192	188	185	181	177	174	171	168	166	165	163	163		
60	163	162	160	158	156	153	150	146	143	140	137	134	132	130	129	128	127		
65	126	125	124	122	120	117	115	112	109	106	104	102	100	98.7	97.6	96.6	96.3		
70	94.6	93.7	92.6	91.1	89.4	87.3	85.2	82.8	80.8	78.7	76.8	75.1	73.8	72.8	71.7	71.1	70.8		
75	68.9	68.3	67.4	66.2	64.9	63.3	61.6	60.0	58.5	56.9	55.4	54.2	53.2	52.3	51.6	51.0	50.8		
80	48.7	48.1	47.5	46.6	45.6	44.4	43.2	42.1	40.7	39.6	38.6	37.7	36.9	36.3	35.8	35.4	35.1		
85	33.0	32.5	32.0	31.3	30.6	29.7	28.9	28.0	27.0	26.2	25.4	24.7	24.2	23.8	23.4	23.1	22.9		
90	20.7	20.5	20.1	19.6	19.1	18.5	17.8	17.2	16.6	16.0	15.5	14.9	14.5	14.2	13.9	13.7	13.5		
95	11.7	11.5	11.2	10.9	10.5	10.1	9.70	9.23	8.79	8.37	8.00	7.69	7.45	7.24	7.09	6.95	6.90		
100	5.60	5.51	5.37	5.18	4.96	4.69	4.40	4.11	3.83	3.58	3.36	3.18	3.06	2.95	2.87	2.83	2.82		
105	2.08	2.06	2.00	1.91	1.80	1.65	1.49	1.34	1.21	1.09	1.00	0.93	0.88	0.85	0.83	0.83	0.84		
110	0.58	0.59	0.59	0.56	0.51	0.46	0.39	0.33	0.28	0.24	0.22	0.21	0.20	0.20	0.20	0.20	0.22		
115	0.18	0.19	0.19	0.18	0.17	0.15	0.13	0.12	0.12	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.14		
120	0.14	0.14	0.14	0.14	0.14	0.14	0.15	0.15	0.15	0.15	0.16	0.16	0.16	0.16	0.16	0.17	0.17		
125	0.18	0.18	0.18	0.18	0.18	0.19	0.19	0.19	0.19	0.20	0.20	0.20	0.20	0.20	0.21	0.21	0.21		
130	0.23	0.24	0.24	0.24	0.24	0.24	0.25	0.25	0.25	0.26	0.26	0.26	0.26	0.27	0.27	0.27	0.27		
135	0.31	0.31	0.31	0.31	0.31	0.32	0.32	0.32	0.33	0.33	0.33	0.34	0.34	0.34	0.34	0.34	0.34		
140	0.38	0.38	0.38	0.39	0.39	0.39	0.39	0.40	0.40	0.40	0.41	0.41	0.41	0.41	0.42	0.42	0.42		
145	0.45	0.45	0.45	0.46	0.46	0.46	0.46	0.47	0.47	0.47	0.48	0.48	0.48	0.48	0.48	0.49	0.49		
150	0.50	0.51	0.51	0.51	0.51	0.51	0.52	0.52	0.52	0.52	0.53	0.53	0.53	0.53	0.54	0.54	0.54		
155	0.54	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.56	0.56	0.56	0.56	0.56	0.57	0.57	0.57	0.57		
160	0.57	0.57	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.59	0.59	0.59	0.59	0.59		
165	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59		
170	0.59	0.59	0.59	0.59	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58		
175	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.56	0.56	0.56	0.56		
180	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58		

Table 7: Luminous Intensity Data

EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Goniophotometer system	GO-R5000	HZTE011-01	Aug. 14, 2018	Aug. 13, 2019
Digital Power Meter	PF2010A	HZTE028-01	Sep. 12, 2018	Sep. 11, 2019
AC Power Supply	DPS1060	HZTE001-06	Aug. 09, 2018	Aug. 08, 2019
DC Power Supply	WY12010	HZTE004-03	Aug. 09, 2018	Aug. 08, 2019
Temperature recorder	JM624U	HZTE018-08	Aug. 09, 2018	Aug. 08, 2019
Temperature and humidity recorder	JR900	HZTE018-01	Aug. 09, 2018	Aug. 08, 2019
Standard source	D908	HZTE012-01	Aug. 14, 2018	Aug. 13, 2019
Integrate Sphere system	2M	HZTE015-01	Aug. 16, 2018	Aug. 15, 2019
Digital Power Meter	WT210	HZTE008-01	Aug. 02, 2018	Aug. 01, 2019
AC Power Supply	PCR 500L	HZTE001-07	Aug. 09, 2018	Aug. 08, 2019
DC Power Supply	IT6154	HZTE004-04	Aug. 09, 2018	Aug. 08, 2019
Standard source	SCL-1400	HZTE012-02	Aug. 16, 2018	Aug. 15, 2019
Temperature and humidity recorder	JR900	HZTE018-02	Aug. 09, 2018	Aug. 08, 2019
Temperature Meter	TES1310	HZTE017-01	Aug. 09, 2018	Aug. 08, 2019

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

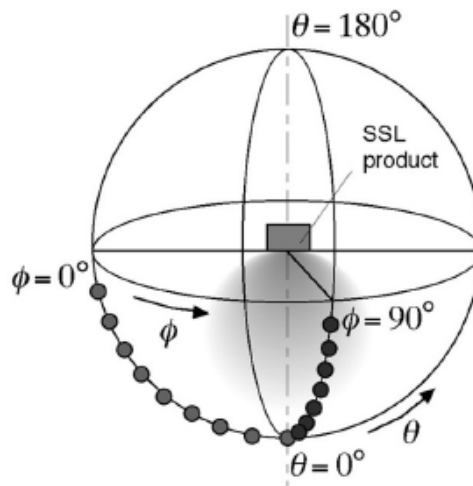
The color characteristics of SSL products include chromaticity coordinates, correlated color temperature, and color rendering index. These characteristics of SSL products may be spatially non-uniform, and thus, in order that they can be specified accurately, the color quantities shall be measured as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