



## LM-79-08 Test Report

for

### Revolution Lighting Technologies, Inc.

2280 Ward Ave. Simi Valley, CA 93065

### LED Tube

Model: 203100-115

### Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ18110016ao

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

Review by:

Engineer: April Zou  
Nov. 30, 2018

Approved by:



Manager: Jim Zhang  
Nov. 30, 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: 203100-115

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
136.3	1553.0	11.39	0.9817
CCT (K)	CRI	Stabilization Time (Light & Power)	
4952	82.3	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** : Nov. 12, 2018

**Date of Test** : Nov. 21, 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 Photo



Figure 1- Overview of the sample

### Equipment Under Test (EUT)

<b>Name</b>	: LED Tube
<b>Model</b>	: 203100-115
<b>Electrical Ratings</b>	: 120-277V, 60Hz
<b>Product Description</b>	: 5000K
<b>Manufacturer</b>	: Revolution Lighting Technologies, Inc.
<b>Address</b>	: 2280 Ward Ave. Simi Valley, CA 93065

## TEST RESULTS

Test ambient temperature was 24.9°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 65 minutes.

### Sphere-Spectroradiometer Method

Parameter	Result	
	Test Voltage (V)	120.0
Voltage frequency (Hz)	60	60
Test Current (A)	0.097	0.046
Power Factor	0.9817	0.9401
Test Power (W)	11.39	11.89
THD A%	17.59	23.79
Luminous Efficacy (lm/W)	136.3	132.1
Total Luminous Flux (lm)	1553.0	1571.0
Color Rendering Index (CRI)	82.3	
R9	3	
Correlated Color Temperature (CCT)(K)	4952	
Chromaticity Chroma x	0.3472	
Chromaticity Chroma y	0.3606	
Chromaticity Chroma u	0.2093	
Chromaticity Chroma v	0.3262	
Duv	0.0036	
Chromaticity Chroma u'	0.2093	
Chromaticity Chroma v'	0.4893	

Special Color Rendering Indices	
R1	79.9
R2	87.9
R3	93.7
R4	81
R5	80.2
R6	82.9
R7	87.4
R8	65.7
R9	3
R10	71.3
R11	79.9
R12	56.9
R13	82.1
R14	96.7

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 25.0 °C.

The photometric distance is 30 m.

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)	0.097
Power Factor	0.9815
Power (W)	11.41
Luminous Efficacy (lm/W)	134.3
Total Luminous Flux (lm)	1532.3
Beam Angle ( ° )	104.7 (0°-180°) /128.4(90°-270°)
Center Beam Candle Power (cd)	434
Maximum Beam Candle Power (cd)	434.1 (At: C=30.0, Gamma=2.0)
Spacing Criteria	1.20 (0°-180°) /1.30 (90°-270°)
Zonal Lumens in the 0 °-60 °Zone	64.61%
Zonal Lumens in the 60 °-90 °Zone	25.47%
Zonal Lumens in the 90 °-120 °Zone	7.53%
Zonal Lumens in the 120 °-180 °Zone	2.39%

Table 3: Test data per Goniophotometer Method

### Spectral Power Distribution - Sphere Spectroradiometer Method

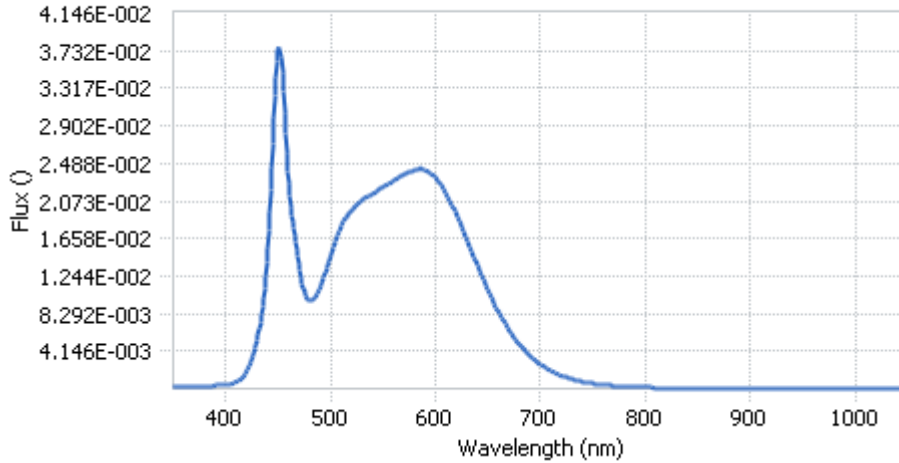
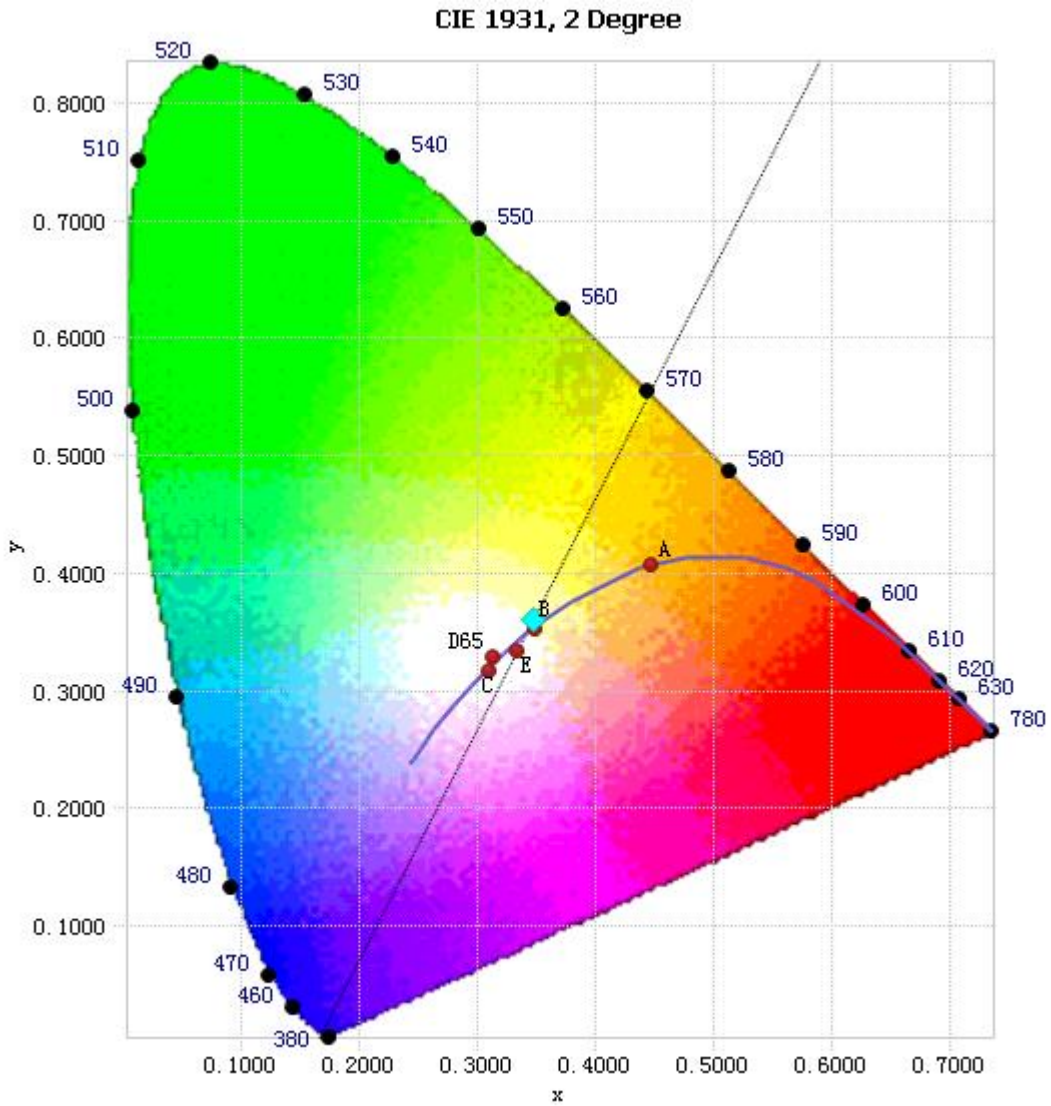


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	3.09E-04	485	1.01E-02	590	2.41E-02	695	3.13E-03
385	3.10E-04	490	1.11E-02	595	2.38E-02	700	2.69E-03
390	3.48E-04	495	1.28E-02	600	2.33E-02	705	2.32E-03
395	3.81E-04	500	1.47E-02	605	2.26E-02	710	1.98E-03
400	4.29E-04	505	1.65E-02	610	2.16E-02	715	1.69E-03
405	5.26E-04	510	1.79E-02	615	2.05E-02	720	1.45E-03
410	7.48E-04	515	1.90E-02	620	1.92E-02	725	1.25E-03
415	1.19E-03	520	1.98E-02	625	1.78E-02	730	1.07E-03
420	1.94E-03	525	2.03E-02	630	1.64E-02	735	9.04E-04
425	3.25E-03	530	2.09E-02	635	1.50E-02	740	7.80E-04
430	5.41E-03	535	2.12E-02	640	1.36E-02	745	6.63E-04
435	9.03E-03	540	2.16E-02	645	1.22E-02	750	5.70E-04
440	1.56E-02	545	2.19E-02	650	1.09E-02	755	4.93E-04
445	2.70E-02	550	2.22E-02	655	9.66E-03	760	4.26E-04
450	3.74E-02	555	2.26E-02	660	8.50E-03	765	3.64E-04
455	3.28E-02	560	2.30E-02	665	7.44E-03	770	3.17E-04
460	2.25E-02	565	2.34E-02	670	6.49E-03	775	2.72E-04
465	1.76E-02	570	2.37E-02	675	5.65E-03	780	2.40E-04
470	1.37E-02	575	2.39E-02	680	4.91E-03		
475	1.05E-02	580	2.42E-02	685	4.24E-03		
480	9.68E-03	585	2.43E-02	690	3.64E-03		

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

**Chromaticity Diagram - Sphere Spectroradiometer Method**



Tristimulus values(x, y): (0.3472, 0.3606)

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

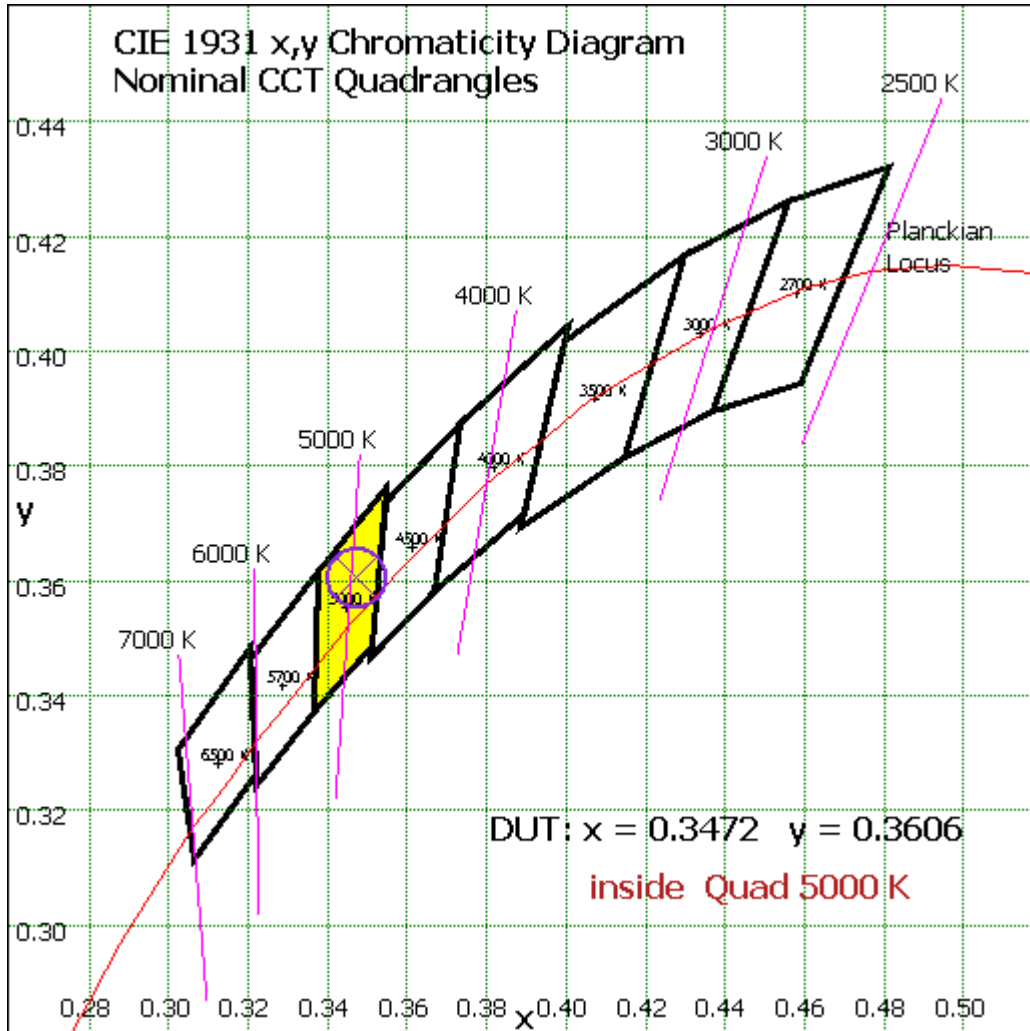


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

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

**Zonal Lumen Tabulation- Goniophotometer Method**

$\gamma(^{\circ})$	Lumens	% Total
0- 10	40.985	2.67%
10- 20	117.529	7.67%
20- 30	178.513	11.65%
30- 40	216.08	14.10%
40- 50	226.37	14.77%
50- 60	210.511	13.74%
60- 70	174.794	11.41%
70- 80	129.291	8.44%
80- 90	86.245	5.63%
90-100	55.907	3.65%
100-110	36.248	2.37%
110-120	23.232	1.52%
120-130	14.95	0.98%
130-140	9.662	0.63%
140-150	6.071	0.40%
150-160	3.632	0.24%
160-170	1.821	0.12%
170-180	0.479	0.03%
Total	1532.3	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	989.988	64.61%
60- 90	390.33	25.47%
0-90	1380.318	90.08%
90- 180	152.002	9.92%
0- 180	1532.3	100%

Table 5: Zonal Lumen Data

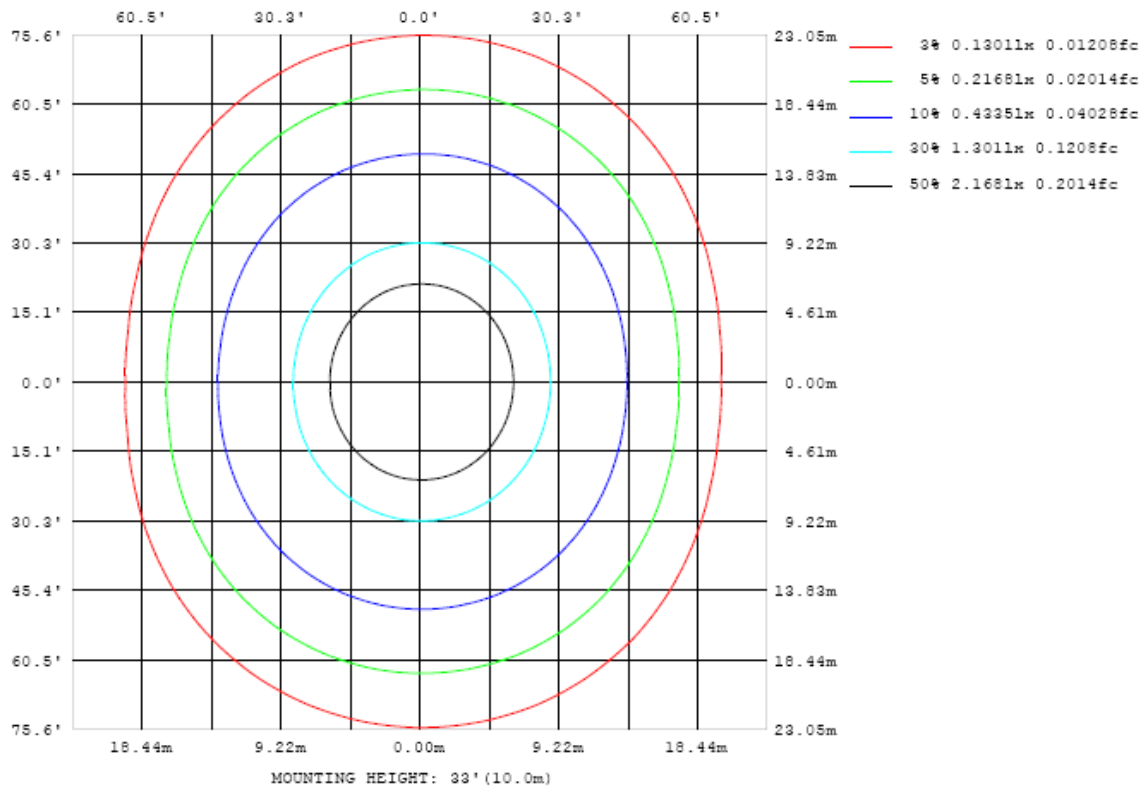


Chart 4: Beam Angle

### Luminous Intensity Distribution Plots- Goniophotometer Method

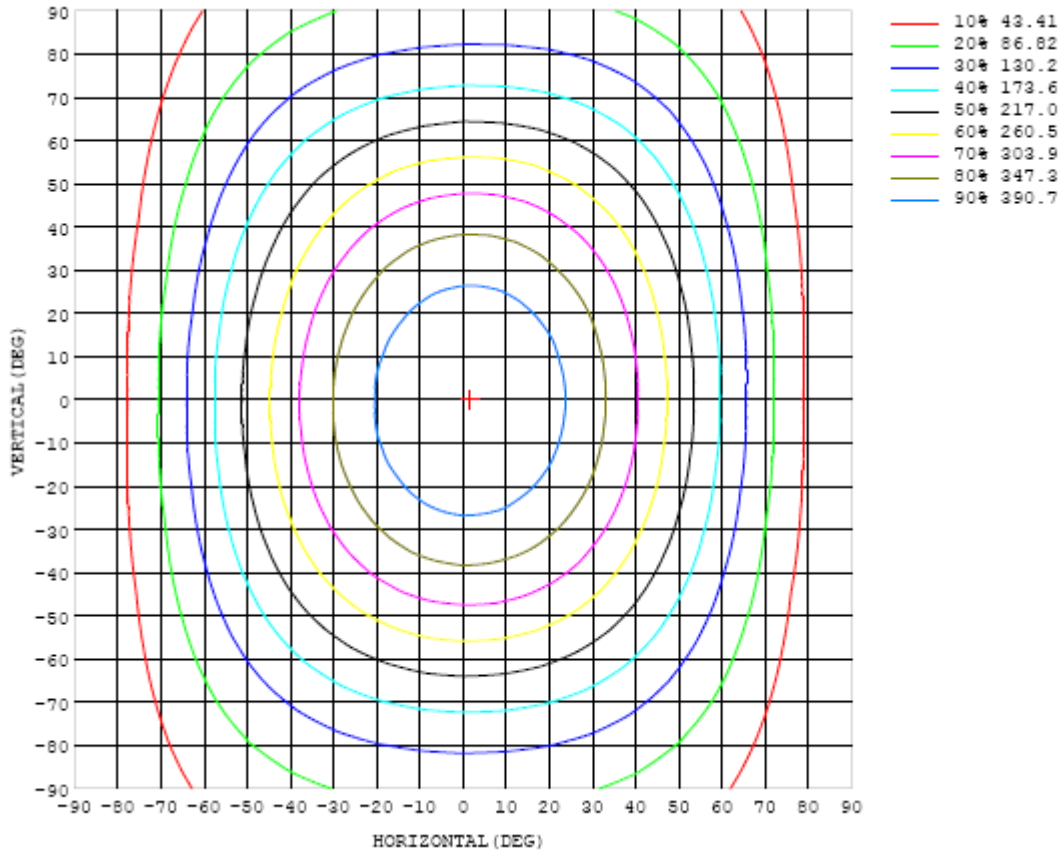


Chart 5: Illuminance Plot (Footcandles)

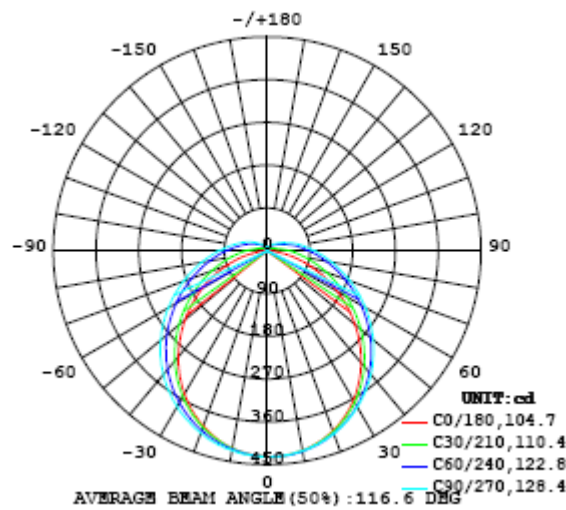


Chart 6: Polar Candela Distribution

**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	434	434	434	434	434	434	434	434	434	434	434	434	434	434	434	434	434	434	434
5	432	432	432	432	433	433	432	432	432	432	432	432	431	431	430	430	430	430	430
10	427	427	427	427	427	428	428	428	427	427	428	427	426	424	424	423	422	422	422
15	417	417	418	418	419	420	421	421	420	420	419	418	417	415	413	412	411	410	409
20	404	405	404	405	407	408	410	411	410	409	408	406	405	402	399	397	396	395	392
25	386	385	387	389	391	393	395	396	397	396	395	393	389	386	382	379	376	374	372
30	363	364	366	368	371	375	377	379	380	379	378	375	372	367	362	357	353	350	348
35	337	337	340	344	349	353	357	360	361	361	359	355	351	345	338	332	327	323	321
40	307	308	312	318	323	329	334	338	340	339	337	334	328	321	313	305	298	293	291
45	275	276	281	288	296	304	310	314	316	316	314	310	303	294	285	276	268	261	259
50	241	243	249	257	267	276	283	288	291	291	289	284	276	267	257	245	236	228	225
55	206	208	215	225	237	247	256	262	264	265	263	258	249	239	227	215	203	195	192
60	170	173	181	193	206	219	228	235	238	238	236	231	222	211	199	185	172	161	158
65	134	138	148	163	177	190	201	207	211	212	209	204	196	184	171	156	141	129	124
70	99.5	104	116	133	149	163	174	181	185	186	183	178	170	158	144	128	112	97.0	90.8
75	66.3	71.7	87.5	106	123	138	149	156	160	161	159	154	146	134	120	103	84.9	68.0	59.4
80	36.3	43.7	62.6	82.5	101	115	126	133	137	138	136	131	124	113	98.7	81.5	62.9	43.1	31.2
85	12.0	21.6	42.3	62.8	80.6	95.2	106	113	116	118	116	111	104	93.7	80.1	63.4	43.9	23.6	9.23
90	0.69	8.72	27.4	47.2	64.6	78.1	88.4	95.2	98.6	99.8	98.2	94.2	87.4	77.7	64.9	48.7	30.1	11.8	0.38
95	0.32	3.45	17.2	34.8	51.0	63.8	73.4	80.1	83.4	84.6	83.2	79.4	73.2	64.4	52.1	37.0	20.3	5.70	0.31
100	0.50	2.20	11.3	25.0	39.3	51.9	61.5	66.9	70.3	71.4	70.2	67.0	61.1	52.7	41.3	27.4	13.8	3.93	0.47
105	0.74	1.99	8.25	18.7	30.2	40.9	49.5	55.5	59.1	60.1	59.0	55.9	50.2	42.0	31.7	21.0	10.6	3.18	0.80
110	1.10	2.22	6.55	14.6	23.9	32.6	39.8	44.8	48.1	49.3	48.4	45.4	40.3	33.8	25.8	16.8	8.66	3.18	1.20
115	1.53	2.53	5.74	11.9	19.4	26.7	32.8	37.2	39.8	40.7	40.1	37.6	33.7	28.0	21.1	14.0	7.58	3.27	1.64
120	1.97	2.85	5.42	10.0	16.0	22.0	27.2	31.0	33.4	34.3	33.7	31.6	28.1	23.4	17.7	11.8	6.65	3.41	2.09
125	2.41	3.12	5.22	8.80	13.5	18.4	22.7	26.0	28.1	28.8	28.3	26.5	23.6	19.7	15.1	10.4	6.12	3.67	2.56
130	2.91	3.56	5.14	7.59	11.5	15.6	19.1	21.9	23.5	24.3	23.8	22.3	19.9	16.7	12.9	8.99	6.12	3.89	3.01
135	3.45	3.90	5.24	7.39	9.88	13.2	16.2	18.4	19.8	20.4	20.1	18.9	16.9	14.2	11.1	8.15	5.91	4.06	3.39
140	4.00	4.19	5.39	6.89	8.99	11.1	13.6	15.5	16.7	17.2	16.9	16.0	14.3	12.2	9.80	7.68	5.88	4.19	3.77
145	4.52	4.36	5.47	6.60	8.15	9.92	11.5	12.8	13.7	14.2	14.1	13.5	12.3	10.8	8.97	7.17	5.93	4.22	4.17
150	4.97	4.24	5.46	6.54	7.43	8.64	9.96	11.0	11.7	11.9	11.9	11.5	10.7	9.50	8.12	6.82	5.90	4.17	4.65
155	5.46	4.23	5.58	6.42	7.06	7.84	8.55	9.24	9.83	10.1	10.1	9.93	9.35	8.52	7.34	6.61	5.96	4.02	5.19
160	5.88	4.12	4.79	5.97	6.95	7.36	7.77	8.25	8.61	8.84	8.84	8.65	8.28	7.65	6.74	6.17	5.28	3.77	5.05
165	5.63	4.33	4.04	4.41	5.80	6.92	7.31	7.53	7.72	7.79	7.81	7.56	6.79	5.72	5.25	4.75	4.06	3.77	4.54
170	5.37	4.14	3.85	3.77	5.80	6.92	7.31	7.53	7.72	7.79	7.81	7.56	6.79	5.72	5.25	4.75	4.06	3.77	4.54
175	4.85	4.31	4.21	4.13	4.45	4.86	5.05	5.04	4.51	2.28	4.37	4.95	5.00	4.70	4.48	4.26	3.96	3.76	3.82
180	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42

Table 6: Luminous Intensity Data

Table--2 UNIT: cd

C (DEG) y (DEG)	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350		
0	434	434	434	434	434	434	434	434	434	434	434	434	434	434	434	434	434		
5	430	430	430	429	431	430	431	431	431	431	432	431	433	433	432	432	432		
10	422	422	422	423	423	424	426	426	426	427	427	427	427	428	427	427	427		
15	410	410	411	412	413	415	417	418	419	419	420	419	418	419	418	417	418		
20	394	394	396	398	400	403	406	407	408	409	409	408	408	406	406	404	405		
25	373	374	377	381	384	387	391	394	394	395	396	394	393	391	389	386	385		
30	349	351	355	359	364	369	374	377	379	380	379	377	375	372	369	366	363		
35	322	324	330	336	343	349	355	358	360	361	360	357	354	350	346	341	338		
40	292	296	302	310	318	326	333	337	340	341	339	336	331	326	319	313	308		
45	260	265	273	283	293	301	309	314	317	318	316	312	306	298	290	283	278		
50	227	233	242	254	265	275	285	290	293	294	291	286	279	270	260	250	244		
55	193	200	211	224	237	248	258	264	267	268	265	259	251	241	229	217	209		
60	160	168	181	195	209	221	231	237	240	241	238	232	223	211	197	184	174		
65	127	138	152	167	182	194	205	210	214	214	211	205	195	182	167	152	140		
70	95.1	108	124	141	156	169	179	184	188	188	185	178	168	154	138	121	107		
75	65.1	80.4	99.1	117	133	145	154	159	162	163	160	153	143	129	112	92.6	75.5		
80	38.9	57.1	76.8	95.2	111	123	132	137	140	140	137	131	120	106	88.0	67.7	47.9		
85	19.0	38.5	58.6	76.5	91.7	103	112	117	119	119	116	110	99.7	85.8	68.1	47.4	26.3		
90	7.80	25.3	44.1	61.3	75.3	86.3	94.2	98.8	101	101	97.8	92.0	82.2	68.9	52.0	32.3	12.7		
95	3.48	16.9	33.3	48.9	61.9	72.1	79.3	83.6	85.7	85.3	82.5	76.7	67.6	55.2	39.6	22.1	6.35		
100	2.54	11.3	25.3	39.1	51.0	60.3	66.9	70.8	72.7	72.2	69.5	64.1	55.7	44.3	30.2	15.4	3.91		
105	2.33	8.54	19.1	31.3	41.9	50.4	56.4	60.3	61.8	61.3	58.7	53.6	45.8	35.4	23.2	11.1	3.11		
110	2.58	7.10	15.0	24.6	34.3	42.1	47.7	51.1	52.4	51.9	49.5	44.7	37.5	28.1	17.9	8.71	2.90		
115	2.92	6.35	12.5	20.1	27.6	34.5	39.8	43.0	44.3	43.8	41.4	36.8	30.1	22.3	14.3	7.39	3.07		
120	3.28	5.91	10.8	16.8	22.9	28.2	32.5	35.3	36.5	36.0	33.7	29.8	24.6	18.5	12.1	6.45	3.26		
125	3.73	5.86	9.51	14.3	19.3	23.7	27.1	29.3	30.2	29.7	28.0	24.8	20.5	15.6	10.4	6.05	3.55		
130	4.18	5.77	8.42	12.5	16.5	20.0	22.8	24.7	25.3	24.9	23.5	20.8	17.3	13.3	8.98	5.84	4.01		
135	4.59	5.94	8.01	10.8	14.1	17.1	19.3	20.7	21.3	21.0	19.8	17.6	14.8	11.4	8.20	5.85	4.47		
140	4.94	6.00	7.67	9.57	12.0	14.5	16.4	17.5	18.0	17.7	16.7	14.9	12.6	9.83	7.67	5.90	4.86		
145	5.23	5.98	7.34	8.83	10.3	12.0	13.7	14.8	15.1	14.9	14.0	12.4	10.5	8.92	7.36	5.96	5.21		
150	5.57	6.07	6.98	8.21	9.38	10.3	11.1	11.8	12.1	11.9	11.2	10.5	9.46	8.27	7.05	6.07	5.57		
155	5.79	6.12	6.71	7.58	8.52	9.29	9.90	10.3	10.4	10.3	9.95	9.36	8.57	7.67	6.80	6.19	5.90		
160	5.91	6.22	6.48	6.85	7.56	8.25	8.66	8.95	9.04	8.97	8.73	8.31	7.76	7.17	6.69	6.39	6.13		
165	5.35	5.68	6.33	6.50	6.81	7.20	7.62	7.77	7.84	7.81	7.68	7.44	7.13	6.88	6.70	6.51	6.46		
170	4.49	4.72	5.05	5.70	6.23	6.63	6.68	6.75	7.02	7.03	7.00	6.93	6.85	6.77	6.64	6.56	6.46		
175	3.81	3.95	4.04	4.22	4.61	5.36	6.12	6.22	6.01	6.08	6.23	6.45	6.50	6.48	6.56	6.46	5.84		
180	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42		

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  $4\pi$ . 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.

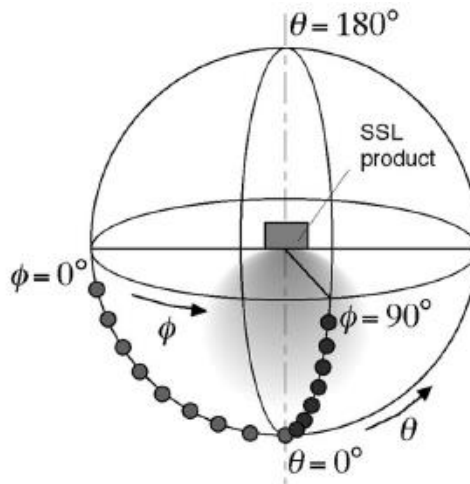
### **Color Spatial Uniformity**

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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