LM-79-08 TEST REPORT

for

GREEN CREATIVE LTD

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

LED Tube

Model: 12T8/4F/835/HYB

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

3rd Floor, Bld. 2, NO. 96 Longchuanwu Rd Qianjiang Economy Dev. Zone, YuhangDist,
Hangzhou, Zhejiang Province, China 311100
Tel: +86571 86376106
www.ledtestlab.com

Report No.: HZ19090007b

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

Review by: April Zou

Engineer: April Zou
Sep. 10, 2019

Approved by: Jim Zhang

Manager: Jim Zhang
Sep. 10, 2019

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: **12T8/4F/835/HYB**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)/2	Power Factor
129.8	1886.3	14.53	0.9974

CCT (K)	CRI	Stabilization Time (Light & Power)
3503	81.6	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 : Sep. 05, 2019

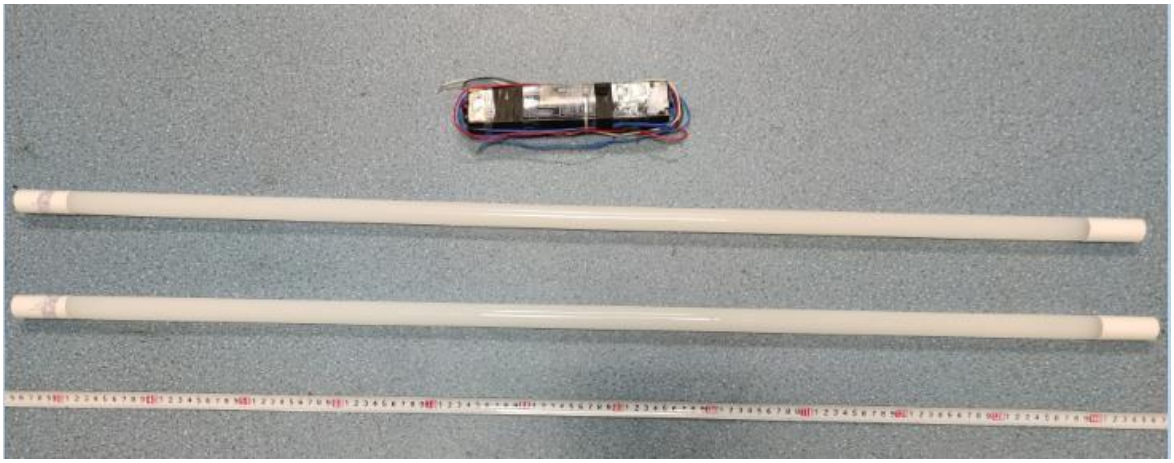
Date of Test : Sep. 09, 2019

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
ANSI/IES TM-30-18 IES Method for Evaluating Light Source Color Rendition

TABLE OF CONTENT

SAMPLE PHOTO



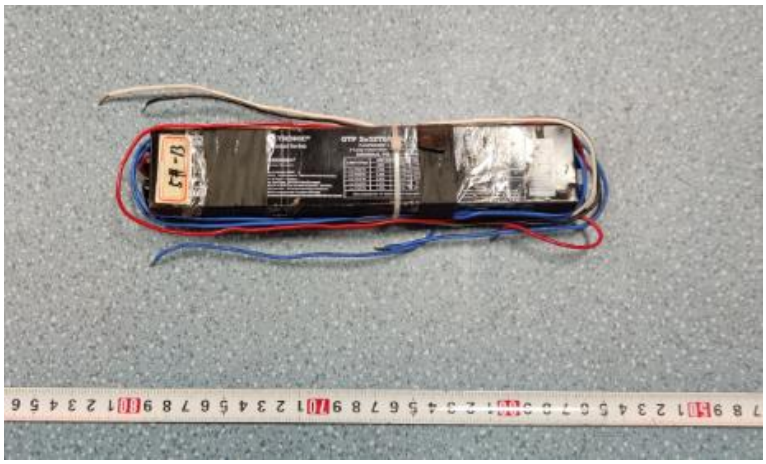


Figure 1- Overview of the sample

Equipment Under Test(EUT)	
Name	: LED Tube
Model	: 12T8/4F/835/HYB
Electrical Ratings	: 120-277V, 60Hz, 12W
Product Description	: 3500K LED tubes supplied by a high frequency fluorescent lamp ballast: QTP 2x32T8/UNV ISN-SC
Manufacturer	: GREEN CREATIVE LTD
Address	: 756 North Zhongshan Rd., Unit B301 Zhabei District, Shanghai

TEST RESULTS

Test ambient temperature was 26.0 ℃.

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	277.0
Voltage frequency (Hz)	60	60
Test Current (A)	0.243	0.111
Power Factor	0.9974	0.9579
Test Power (W)/2	14.53	14.68
THD A%	4.41	13.77
Luminous Efficacy (lm/W)	129.8	128.7
Total Luminous Flux (lm)	1886.3	1889.6
Color Rendering Index (CRI)	81.6	
R9	2.1	
Correlated Color Temperature (CCT)(K)	3503	
Chromaticity Chroma x	0.4048	
Chromaticity Chroma y	0.3900	
Chromaticity Chroma u	0.2357	
Chromaticity Chroma v	0.3406	
Duv	0.0003	
Chromaticity Chroma u ’	0.2357	
Chromaticity Chroma v’	0.5109	

Special Color Rendering Indices	
R1	79.6
R2	89.3
R3	95.8
R4	79.4
R5	79.7
R6	85.5
R7	83.6
R8	59.6
R9	2.1
R10	75
R11	78.1
R12	62.7
R13	82
R14	98.1

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 ℃.

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)	0.245
Power Factor	0.9948
Power (W)/2	14.60
Luminous Efficacy (lm/W)	127.2
Total Luminous Flux (lm)	1857.1
Beam Angle (°)	111.3 (0^o-180^o) / 203.9 (90^o-270^o)
Center Beam Candle Power (cd)	330
Maximum Beam Candle Power (cd)	329.6 (At: C=90.0, Gamma=0.5)
Spacing Criteria	1.25 (0^o-180^o) / 1.41 (90^o-270^o)
Zonal Lumens in the 0 °-60 °Zone	44.80%
Zonal Lumens in the 60 °-90 °Zone	26.73%
Zonal Lumens in the 90 °-120 °Zone	16.73%
Zonal Lumens in the 120 °-180 °Zone	11.74%

Table 3: Test data per Goniophotometer Method

Spectral Power Distribution - Sphere Spectroradiometer Method

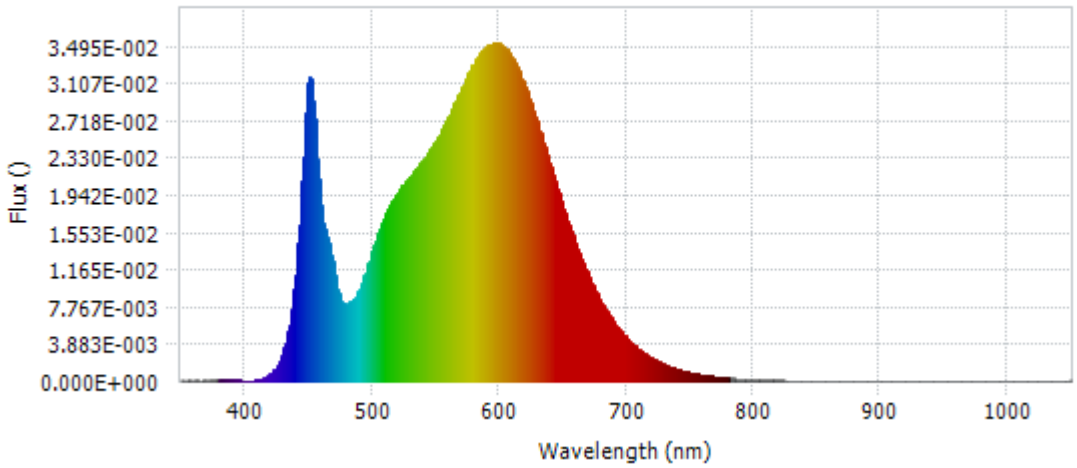
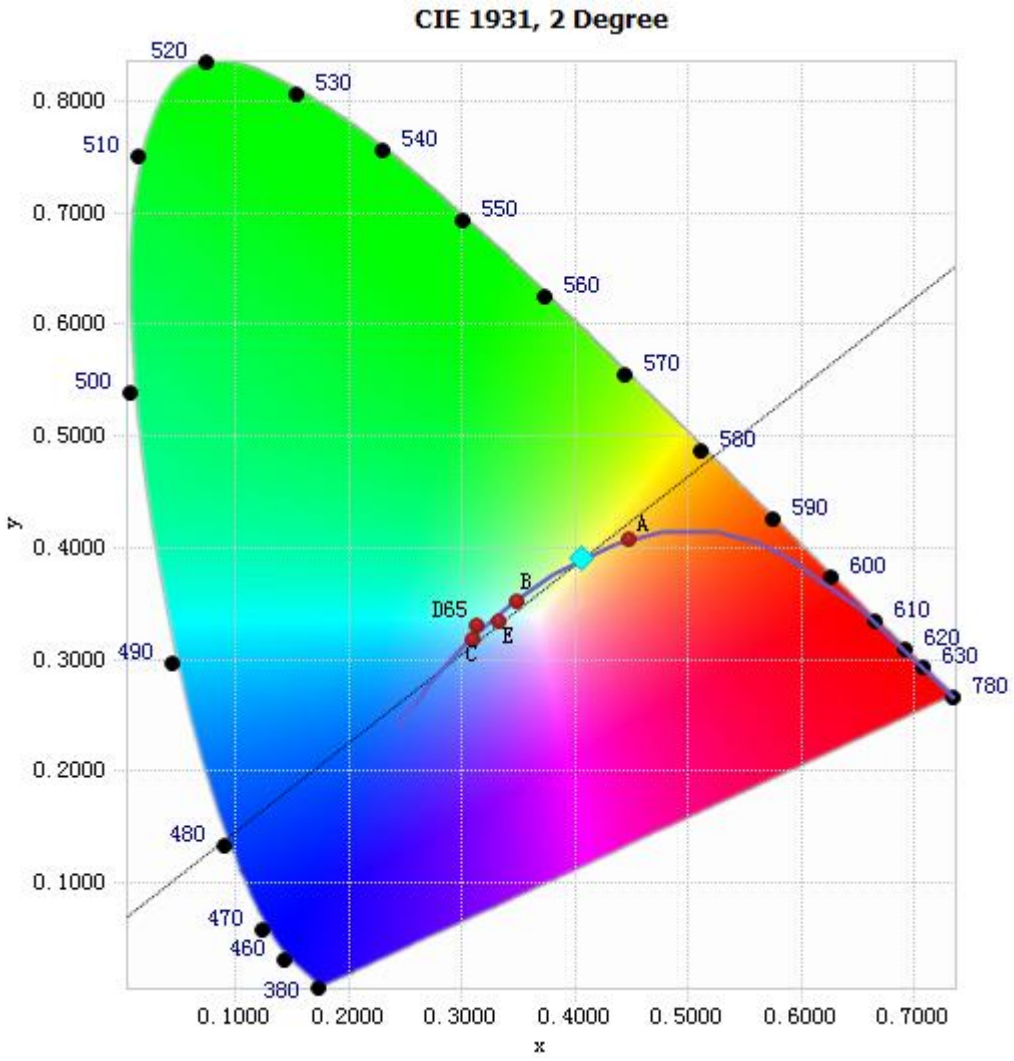


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	1.16E-04	485	8.51E-03	590	3.48E-02	695	5.34E-03
385	1.08E-04	490	9.55E-03	595	3.52E-02	700	4.58E-03
390	1.08E-04	495	1.13E-02	600	3.52E-02	705	3.90E-03
395	1.09E-04	500	1.35E-02	605	3.47E-02	710	3.33E-03
400	7.44E-05	505	1.55E-02	610	3.39E-02	715	2.84E-03
405	7.58E-05	510	1.72E-02	615	3.26E-02	720	2.44E-03
410	1.47E-04	515	1.86E-02	620	3.09E-02	725	2.08E-03
415	3.55E-04	520	1.97E-02	625	2.91E-02	730	1.77E-03
420	7.36E-04	525	2.06E-02	630	2.71E-02	735	1.50E-03
425	1.52E-03	530	2.14E-02	635	2.49E-02	740	1.28E-03
430	3.07E-03	535	2.22E-02	640	2.28E-02	745	1.08E-03
435	5.91E-03	540	2.30E-02	645	2.05E-02	750	9.28E-04
440	1.11E-02	545	2.40E-02	650	1.84E-02	755	7.92E-04
445	2.08E-02	550	2.51E-02	655	1.63E-02	760	6.77E-04
450	3.11E-02	555	2.62E-02	660	1.44E-02	765	5.76E-04
455	2.74E-02	560	2.75E-02	665	1.27E-02	770	4.86E-04
460	1.84E-02	565	2.90E-02	670	1.11E-02	775	4.16E-04
465	1.50E-02	570	3.04E-02	675	9.67E-03	780	3.60E-04
470	1.17E-02	575	3.18E-02	680	8.38E-03		
475	8.69E-03	580	3.30E-02	685	7.24E-03		
480	8.03E-03	585	3.42E-02	690	6.22E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.4048, 0.3900)

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

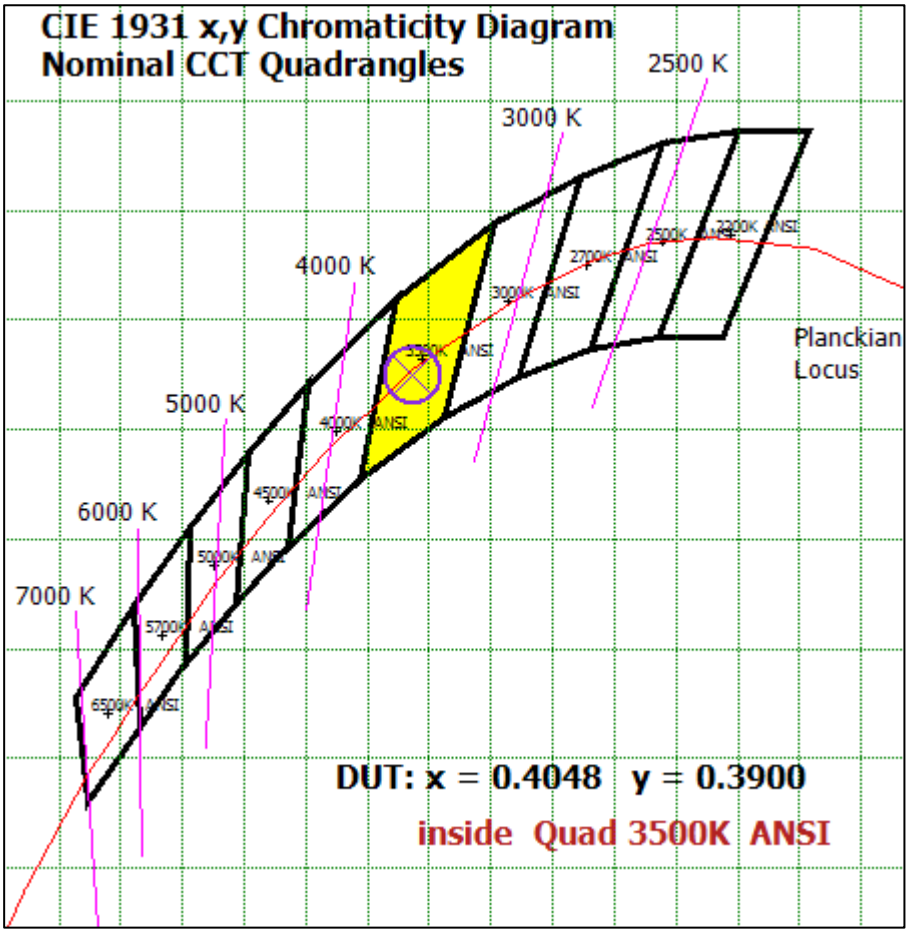
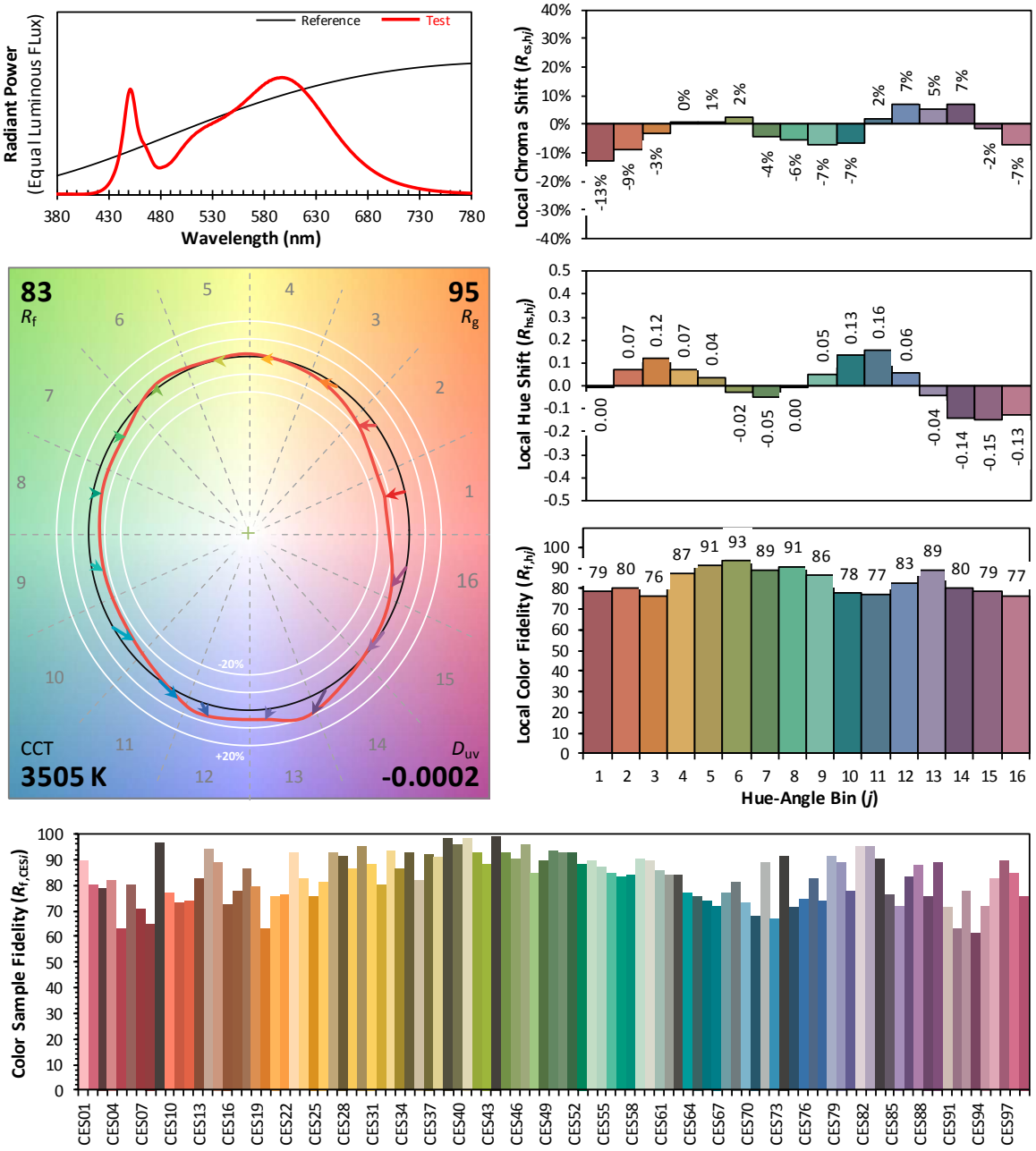


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.4048
y	0.3900
u'	0.2357
v'	0.5109

Chart 4: Full Report Created with the IES TM-30 Calculator

Note: The values in this diagram might be a little different from the values in Table 2 due to rounding.

Zonal Lumen Tabulation- Goniophotometer Method

γ(°)	Lumens	% Total
0- 10	31.252	1.68%
10- 20	90.445	4.87%
20- 30	140.265	7.55%
30- 40	176.096	9.48%
40- 50	195.5	10.53%
50- 60	198.502	10.69%
60- 70	187.373	10.09%
70- 80	166.479	8.96%
80- 90	142.488	7.67%
90-100	121.761	6.56%
100-110	103.132	5.55%
110-120	85.882	4.62%
120-130	70.355	3.79%
130-140	56.089	3.02%
140-150	42.528	2.29%
150-160	29.247	1.57%
160-170	15.445	0.83%
170-180	4.289	0.23%
Total	1857.1	100%

γ(°)	Lumens	% Total
0- 60	832.06	44.80%
60- 90	496.34	26.73%
0-90	1328.4	71.53%
90- 180	528.728	28.47%
0- 180	1857.1	100%

Table 5: Zonal Lumen

Illuminance Plots- Goniophotometer Method

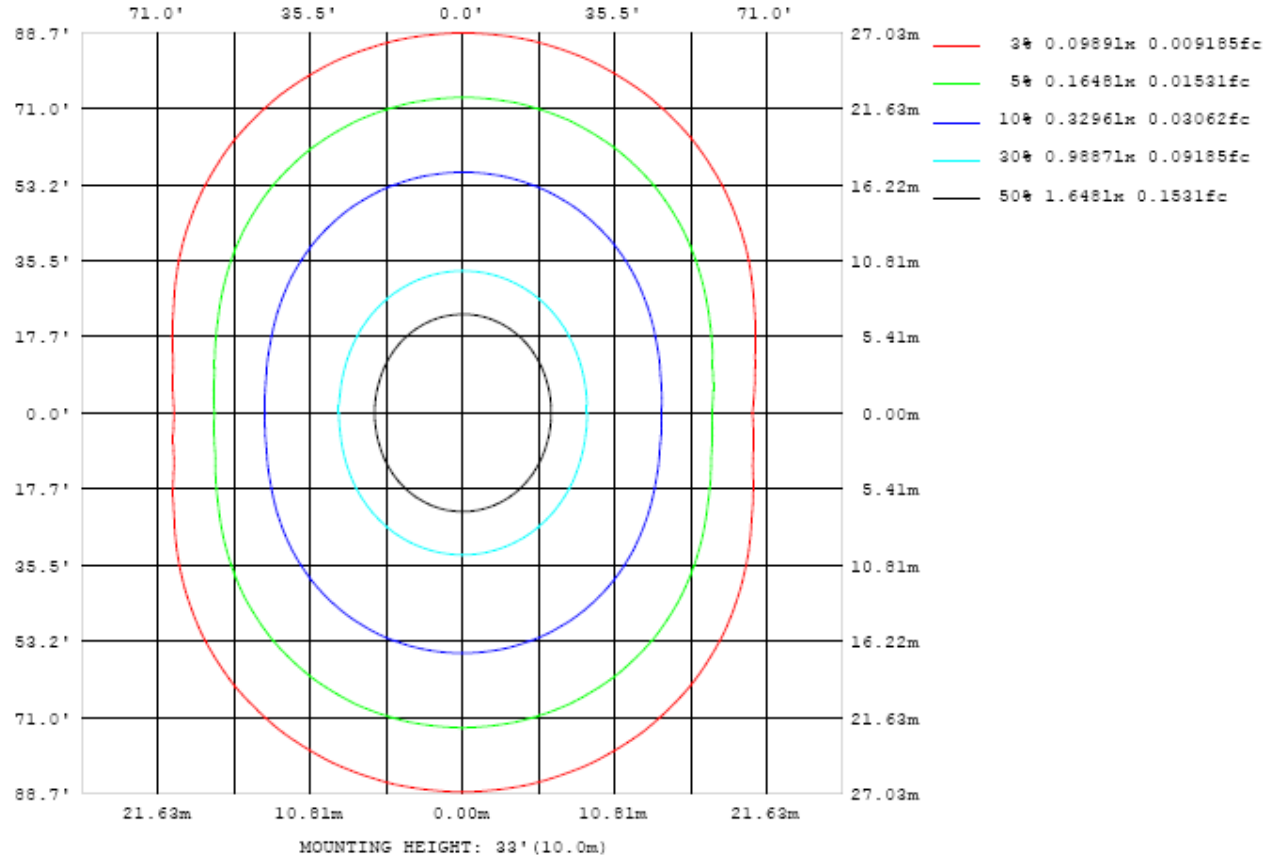


Chart 5: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

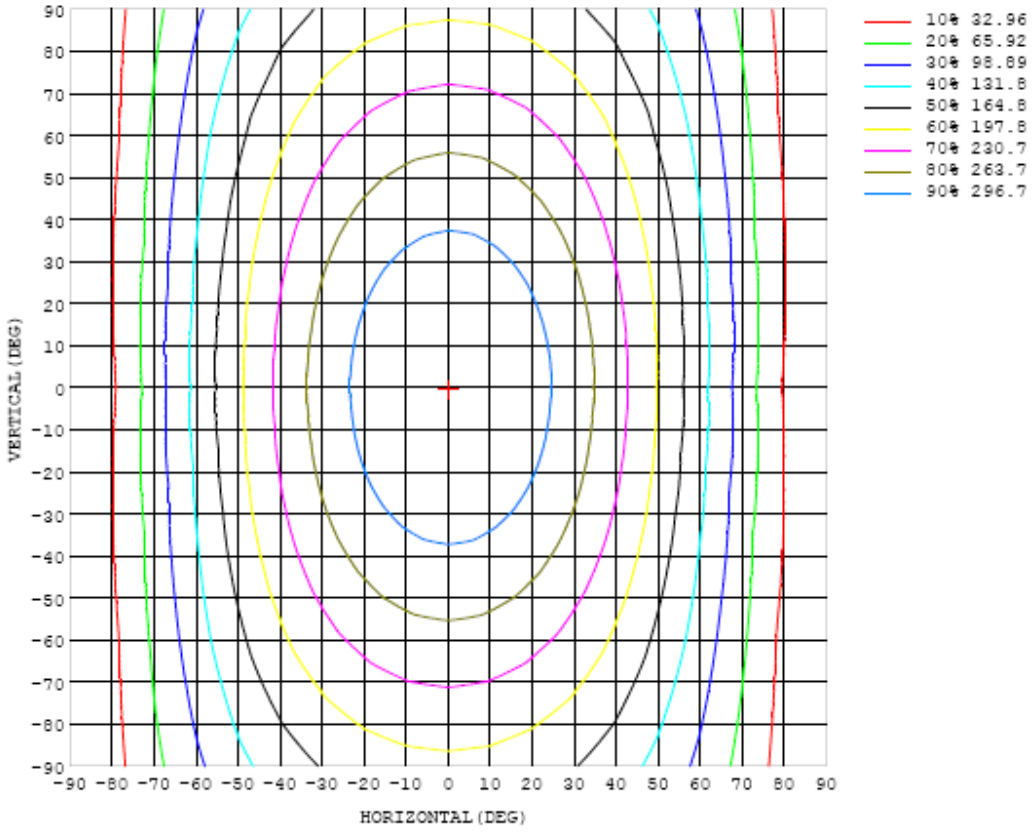


Chart 6: Isocandela Plot

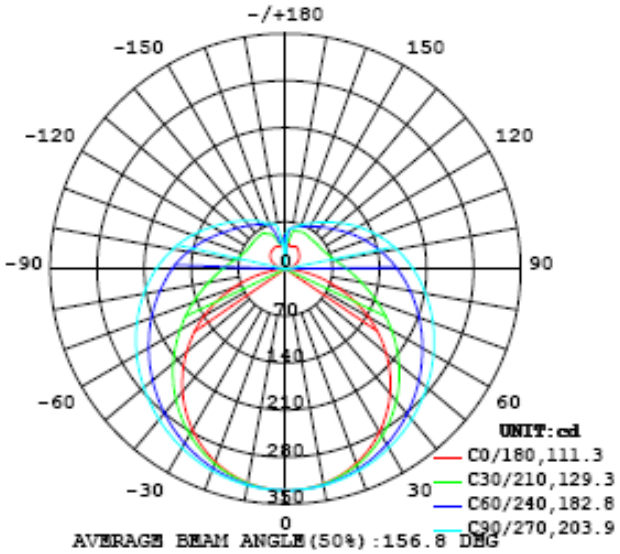


Chart 7: Polar Candela Distribution

Luminous Intensity Data- Goniophotometer Method

Table--1 UNIT: cd

γ (DEG) \ C (DEG)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330
5	328	329	328	329	329	329	329	329	329	329	329	329	329	328	328	328	328	328	328
10	324	324	325	325	326	326	326	327	327	327	327	326	326	325	324	324	323	323	323
15	318	318	318	319	320	321	322	323	324	324	323	323	322	320	319	317	316	316	316
20	308	308	309	311	313	315	317	318	319	319	319	318	316	313	311	309	307	305	305
25	295	296	297	300	303	307	310	312	314	314	313	311	309	305	301	298	294	293	292
30	280	281	283	287	292	297	301	305	307	308	307	304	300	295	290	285	280	277	277
35	262	263	267	273	279	286	292	296	299	300	299	296	291	284	277	270	264	259	259
40	242	244	249	257	265	274	282	287	291	292	291	287	281	272	263	254	245	240	238
45	220	222	229	239	250	261	271	278	282	283	282	277	270	260	248	236	226	218	216
50	196	199	208	221	235	248	259	267	273	274	272	267	258	247	233	218	205	195	192
55	170	174	185	202	219	234	247	257	263	264	262	257	247	233	217	200	183	170	167
60	142	148	162	182	203	221	235	246	252	254	252	246	235	220	202	181	160	144	140
65	114	121	140	164	187	207	223	235	242	244	242	235	223	207	186	163	138	118	111
70	84.8	94.1	118	146	172	194	212	224	231	233	231	224	212	194	172	145	117	92.2	82.6
75	56.7	69.0	97.3	129	158	182	200	213	220	223	220	213	200	182	158	129	97.5	68.1	54.5
80	30.4	46.4	79.6	115	145	170	188	201	209	212	209	202	189	170	145	115	80.7	46.7	28.8
85	9.58	29.2	66.1	102	133	158	177	190	198	201	198	191	177	159	134	103	67.7	30.7	8.67
90	0.46	19.7	55.9	91.4	122	147	166	180	187	190	187	180	167	148	123	92.7	57.9	21.9	0.53
95	2.01	16.3	49.1	82.8	113	137	156	169	177	179	177	169	156	138	114	84.3	51.1	18.4	2.02
100	4.95	16.9	44.7	75.9	104	127	145	158	166	168	166	158	146	128	105	76.9	46.6	18.5	5.44
105	8.80	19.4	42.4	70.3	96.0	118	135	148	155	157	155	148	136	119	97.0	71.7	44.0	20.6	9.98
110	12.7	22.9	42.1	65.9	89.0	109	126	137	144	146	144	137	126	110	89.9	67.0	43.4	23.2	14.7
115	16.9	27.4	42.9	62.9	82.9	101	116	127	133	136	134	127	117	102	83.7	63.8	43.9	27.0	19.3
120	20.7	31.8	44.3	61.2	78.2	94.1	108	117	123	125	123	118	108	94.5	78.6	61.8	44.8	30.9	23.6
125	24.1	35.7	46.0	60.2	74.8	88.0	99.5	108	114	115	114	108	99.7	88.2	75.2	60.5	45.6	34.2	27.1
130	27.0	38.1	47.7	59.6	71.9	82.9	92.7	100.0	105	106	105	100	92.8	83.1	72.1	59.6	47.4	37.2	29.8
135	29.2	39.3	50.2	58.9	69.6	78.6	86.8	93.0	96.9	98.2	96.8	93.0	86.8	78.5	69.5	58.4	49.1	39.3	31.8
140	31.3	41.2	52.0	58.9	67.1	75.4	81.6	86.8	90.1	91.1	89.9	86.7	81.6	75.3	66.8	58.1	50.5	40.9	33.3
145	33.5	44.4	53.9	59.3	64.7	71.8	77.2	81.2	83.9	84.7	83.7	81.1	77.2	71.3	64.4	57.9	51.1	41.0	34.1
150	35.8	47.6	54.8	60.2	64.4	68.3	73.2	76.3	78.2	79.0	78.2	76.5	72.9	67.5	62.5	57.3	52.0	44.3	35.4
155	36.8	48.2	54.4	60.2	63.8	67.0	69.2	72.5	73.9	74.3	73.7	72.1	67.7	64.5	61.0	55.8	50.3	44.9	36.1
160	35.6	45.6	55.5	59.1	62.7	65.1	67.1	68.1	69.7	69.9	69.2	66.8	64.3	62.4	56.0	52.1	43.9	40.2	36.0
165	34.6	41.4	52.2	59.0	61.4	63.7	64.9	65.3	65.1	64.8	64.2	62.2	61.9	53.8	48.7	41.9	37.5	35.2	34.3
170	34.8	36.2	42.0	52.4	58.8	60.2	62.1	63.0	63.0	61.6	61.2	59.9	50.1	42.5	39.2	38.8	38.3	35.5	33.5
175	44.4	43.2	42.0	41.3	42.1	50.0	55.9	58.2	60.5	60.6	56.2	41.9	33.4	34.8	38.9	42.2	44.7	44.2	45.0
180	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4

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	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330		
5	328	328	328	328	328	328	329	329	329	329	329	329	329	329	329	329	328		
10	323	323	324	324	325	326	326	327	327	327	327	326	326	326	325	325	325		
15	316	316	317	319	320	321	322	323	324	324	323	322	321	320	319	318	318		
20	305	307	309	311	313	315	317	319	319	319	318	317	315	313	311	309	308		
25	293	295	298	301	305	308	311	313	314	314	312	310	307	304	301	298	296		
30	277	280	285	290	295	300	304	306	308	307	305	302	298	293	288	284	281		
35	260	264	270	277	284	290	295	299	300	300	297	293	287	280	274	268	264		
40	240	245	254	263	272	280	286	291	292	291	288	282	275	267	258	250	245		
45	218	226	236	248	259	269	277	282	284	283	279	272	263	252	241	230	223		
50	195	205	218	233	246	258	267	273	275	273	269	261	250	236	222	210	200		
55	171	183	199	217	233	247	257	263	265	264	258	249	236	221	204	188	176		
60	146	161	181	201	220	235	246	253	256	254	248	237	223	205	185	166	150		
65	119	139	163	186	207	224	235	243	246	244	237	226	210	190	167	143	124		
70	93.2	118	146	172	194	212	225	232	235	233	226	214	197	175	150	122	97.3		
75	68.4	97.9	130	159	182	201	214	222	225	223	215	203	185	162	134	101	71.9		
80	46.6	81.0	116	147	171	190	203	211	214	212	204	191	173	149	119	84.0	49.5		
85	30.3	67.5	104	135	160	179	192	200	203	201	193	180	163	137	106	69.9	32.4		
90	21.4	57.8	93.6	125	150	169	181	189	192	190	182	170	152	127	95.7	59.6	22.6		
95	17.6	50.6	84.8	115	139	158	171	178	181	179	172	160	141	117	86.5	52.0	18.2		
100	18.2	45.8	77.1	106	129	147	160	168	170	168	161	148	131	107	78.4	46.6	18.3		
105	21.2	44.0	71.0	97.1	119	137	149	156	159	157	150	138	121	98.3	71.8	44.2	21.3		
110	25.4	44.1	67.2	89.8	110	126	138	145	147	145	138	127	111	90.6	67.3	43.7	25.5		
115	29.8	45.3	64.5	84.0	102	117	127	134	136	134	128	117	103	84.7	64.4	44.8	29.9		
120	33.9	47.1	63.2	79.9	95.1	108	118	123	125	124	118	109	95.9	80.2	62.8	47.0	34.0		
125	38.0	49.2	62.6	76.7	89.7	101	109	114	116	115	110	101	90.3	76.7	62.2	49.5	38.4		
130	41.5	51.5	62.5	74.2	85.3	94.4	101	106	108	107	102	95.1	85.6	74.1	62.4	52.0	42.3		
135	44.1	53.7	62.6	72.2	81.3	89.1	94.9	99.3	101	99.4	95.6	89.6	81.7	72.3	62.9	54.3	45.4		
140	45.6	52.7	62.6	70.6	78.0	84.4	88.9	92.6	94.0	92.9	89.7	84.7	78.3	70.9	63.4	56.3	47.3		
145	47.7	56.1	63.1	69.2	75.0	80.2	83.9	85.6	87.9	87.1	84.6	80.6	75.5	69.8	63.9	57.9	48.3		
150	47.2	56.9	61.6	67.8	72.5	76.3	79.2	80.8	82.6	82.0	80.1	77.0	73.2	68.9	64.3	58.8	49.7		
155	45.0	55.2	57.6	65.6	70.1	72.9	75.1	76.3	75.8	77.6	76.2	74.1	71.4	67.9	64.0	59.3	45.7		
160	38.1	46.0	52.7	51.5	61.1	68.1	71.2	72.5	72.2	73.5	72.9	71.7	69.8	67.0	63.2	55.4	40.2		
165	35.1	38.3	42.6	45.3	46.4	51.5	59.5	67.8	69.3	67.0	69.8	68.7	64.5	59.7	58.5	50.1	36.8		
170	34.8	35.1	37.8	41.0	41.9	39.0	39.2	45.7	56.5	66.2	61.5	51.4	54.3	55.3	48.2	38.3	35.2		
175	44.7	44.9	45.9	45.3	46.7	44.6	42.1	30.6	15.0	13.4	42.2	45.6	47.4	48.9	45.6	45.9	45.2		
180	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4		

Table 7: Luminous Intensity Data

EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Goniophotometer system	GO-R5000	HZTE011-01	Aug. 02, 2019	Aug. 01, 2020
Digital Power Meter	PF2010A	HZTE028-01	Aug. 02, 2019	Aug. 01, 2020
AC Power Supply	DPS1060	HZTE001-06	Aug. 02, 2019	Aug. 01, 2020
DC Power Supply	WY12010	HZTE004-03	Aug. 02, 2019	Aug. 01, 2020
Temperature recorder	JM624U	HZTE018-08	Aug. 02, 2019	Aug. 01, 2020
Temperature and humidity recorder	JR900	HZTE018-01	Aug. 02, 2019	Aug. 01, 2020
Standard source	D908	HZTE012-01	Aug. 02, 2019	Aug. 01, 2020
Integrate Sphere system	3M	HZTE015-04	Aug. 02, 2019	Aug. 01, 2020
Digital Power Meter	WT210	HZTE008-01	Aug. 02, 2019	Aug. 01, 2020
AC Power Supply	PCR 500L	HZTE001-07	Aug. 02, 2019	Aug. 01, 2020
DC Power Supply	IT6154	HZTE004-04	Aug. 02, 2019	Aug. 01, 2020
Standard source	SCL-1400	HZTE012-02	Aug. 02, 2019	Aug. 01, 2020
Temperature and humidity recorder	JR900	HZTE018-02	Aug. 02, 2019	Aug. 01, 2020
Temperature Meter	TES1310	HZTE017-01	Aug. 02, 2019	Aug. 01, 2020

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.

3rd Floor, Bld. 2, NO. 96 Longchuanwu Rd Qianjiang Economy Dev. Zone, YuhangDist,
Hangzhou, Zhejiang Province, China 311100
Tel: +86 571 86376106 www.ledtestlab.com

The uncertainty of integrating sphere system reported in this document is expended 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 expended uncertainty is 2.3% with a coverage factor k=2.

Color Characteristics Measurements

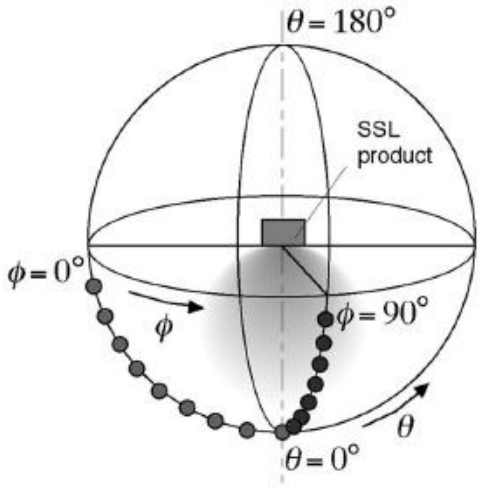
The color characteristics of SSL products include chromaticity coordinates, correlated color temperature, and color rendering index. These characteristics of SSL products may be spatially non-uniform, and thus, in order that they can be specified accurately, the color quantities shall be measured as 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°/180° and C=90°/270°) 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, Δu'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 ***