



LM-79-08 Test Report

for

GREEN CREATIVE LTD

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

T5HO

Model: 10.5T5HO/2F/835/DIR

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ18030001c

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

Review by:

Engineer: April Zou
Mar. 02, 2018

Approved by:



Manager: Jim Zhang
Mar. 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: 10.5T5HO/2F/835/DIR

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
113.5	1593.0	14.03	0.9825
CCT (K)	CRI	Stabilization Time (Light & Power)	
3380	81.9	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 : Mar. 01, 2018

Date of Test : Mar. 02, 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

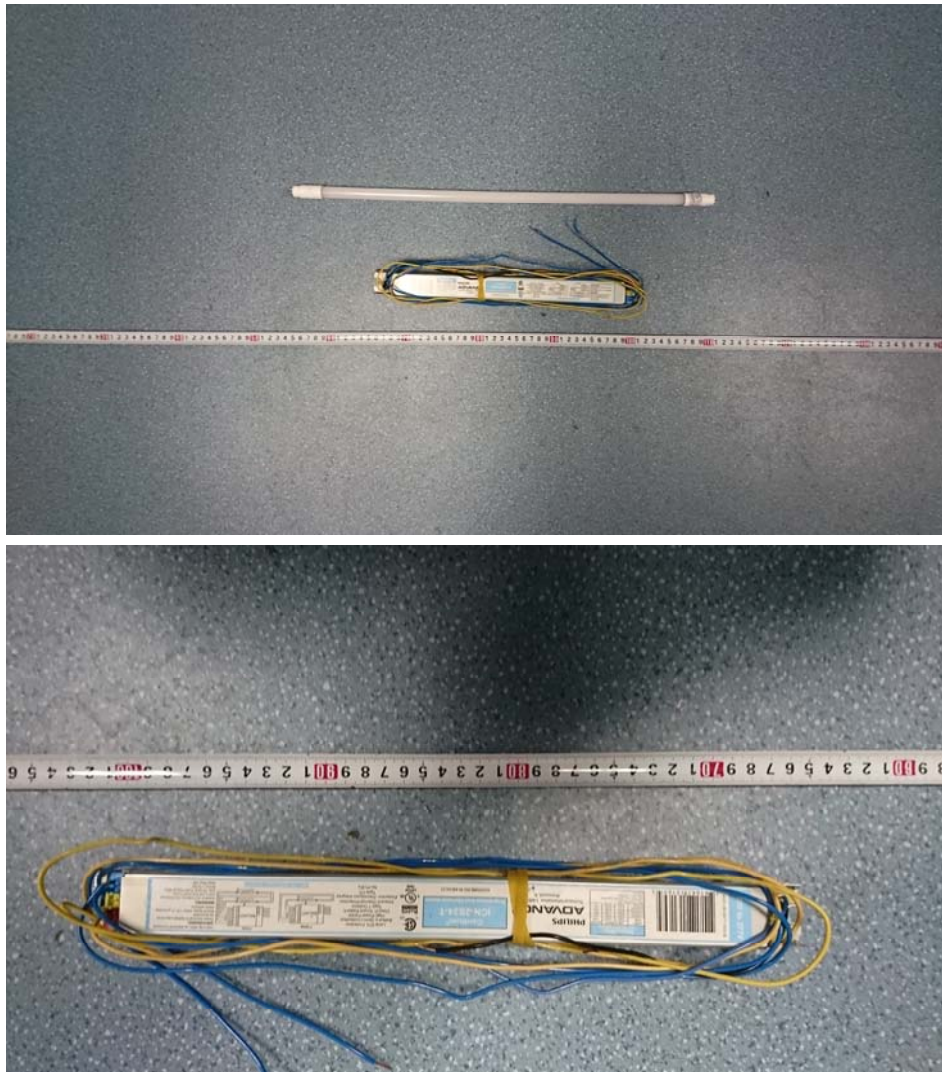


Figure 1- Overview of the sample

Equipment Under Test (EUT)

Name	: T5HO
Model	: 10.5T5HO/2F/835/DIR
Electrical Ratings	: 120-277V, 60Hz, 10.5W
Product Description	: 3500K LED Tubes supplied by a high frequency fluorescent lamp ballast: ICN-2S24-T
Manufacturer	: GREEN CREATIVE LTD
Address	: 756 North Zhongshan Rd., Unit B301 Zhabei District, Shanghai

TEST RESULTS

Test ambient temperature was 24.9°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)	0.119	0.062
Power Factor	0.9825	0.8565
Test Power (W)	14.03	14.70
THD A%	15.91	21.34
Luminous Efficacy (lm/W)	113.5	109.0
Total Luminous Flux (lm)	1593.0	1602.0
Color Rendering Index (CRI)	81.9	
R9	0.7	
Correlated Color Temperature (CCT)(K)	3380	
Chromaticity Chroma x	0.4129	
Chromaticity Chroma y	0.3961	
Chromaticity Chroma u	0.2384	
Chromaticity Chroma v	0.3431	
Duv	0.0002	
Chromaticity Chroma u'	0.2384	
Chromaticity Chroma v'	0.5146	

Special Color Rendering Indices	
R1	80.3
R2	91.2
R3	95.5
R4	79
R5	80.4
R6	88.6
R7	82.3
R8	57.8
R9	0.7
R10	79.4
R11	77.9
R12	66.7
R13	83.2
R14	98.2
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 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)	0.120
Power Factor	0.9829
Test Power (W)	14.13
Luminous Efficacy (lm/W)	114.4
Total Luminous Flux (lm)	1616.7
Beam Angle (°)	121.7
Center Beam Candle Power (cd)	431
Spacing Criteria	1.21 (0°-180°)/ 1.33 (90°-270°)
Zonal Lumens in the 0°-60°Zone	61.71%
Zonal Lumens in the 60°-90°Zone	26.83%
Zonal Lumens in the 90°-120°Zone	8.89%
Zonal Lumens in the 120°-180°Zone	2.57%

Table 3: Test data per Goniophotometer Method

Spectral Power Distribution - Sphere Spectroradiometer Method

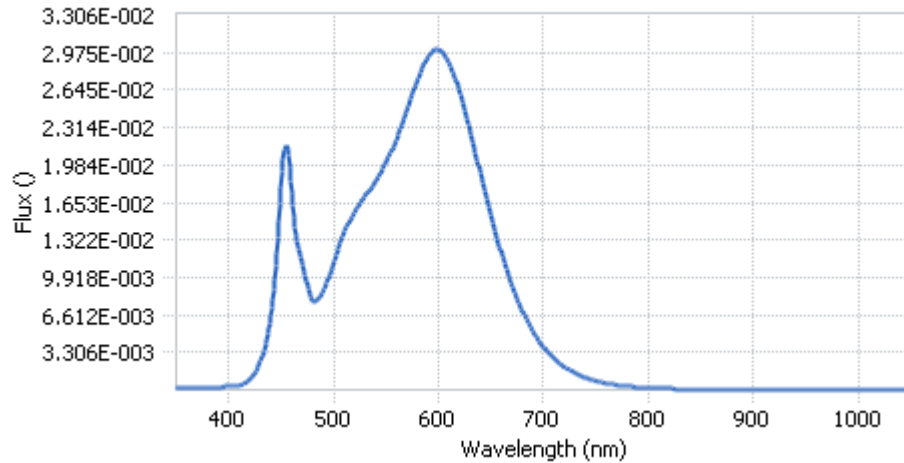


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	2.52E-04	485	7.94E-03	590	2.94E-02	695	4.42E-03
385	2.25E-04	490	8.70E-03	595	3.00E-02	700	3.79E-03
390	2.38E-04	495	9.85E-03	600	3.00E-02	705	3.24E-03
395	2.80E-04	500	1.13E-02	605	2.97E-02	710	2.77E-03
400	3.00E-04	505	1.27E-02	610	2.89E-02	715	2.37E-03
405	3.37E-04	510	1.39E-02	615	2.78E-02	720	2.03E-03
410	4.12E-04	515	1.50E-02	620	2.62E-02	725	1.74E-03
415	6.06E-04	520	1.57E-02	625	2.46E-02	730	1.48E-03
420	9.34E-04	525	1.64E-02	630	2.28E-02	735	1.26E-03
425	1.48E-03	530	1.71E-02	635	2.09E-02	740	1.08E-03
430	2.47E-03	535	1.77E-02	640	1.90E-02	745	9.19E-04
435	4.00E-03	540	1.84E-02	645	1.71E-02	750	7.91E-04
440	6.55E-03	545	1.92E-02	650	1.54E-02	755	6.80E-04
445	1.10E-02	550	2.01E-02	655	1.36E-02	760	5.81E-04
450	1.78E-02	555	2.11E-02	660	1.21E-02	765	5.03E-04
455	2.17E-02	560	2.21E-02	665	1.06E-02	770	4.31E-04
460	1.74E-02	565	2.34E-02	670	9.20E-03	775	3.73E-04
465	1.32E-02	570	2.48E-02	675	8.00E-03	780	3.21E-04
470	1.13E-02	575	2.60E-02	680	6.94E-03		
475	9.20E-03	580	2.74E-02	685	6.00E-03		
480	7.85E-03	585	2.86E-02	690	5.16E-03		

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

The diagram is a CIE 1931 color space plot with x and y axes. The x-axis ranges from 0.1000 to 0.7000, and the y-axis ranges from 0.1000 to 0.8000. The visible spectrum is shown as a curved boundary with points labeled 380, 400, 420, 440, 460, 480, 500, 520, 540, 560, 580, 600, 620, 640, 660, 680, and 700. A straight line connects the points 380 and 700. A curved line, likely the D65 illuminant, is shown with points labeled A, B, C, D, E, and F. A cyan diamond is located at approximately (0.41, 0.40). The interior of the triangle is filled with a color gradient from blue to red.

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

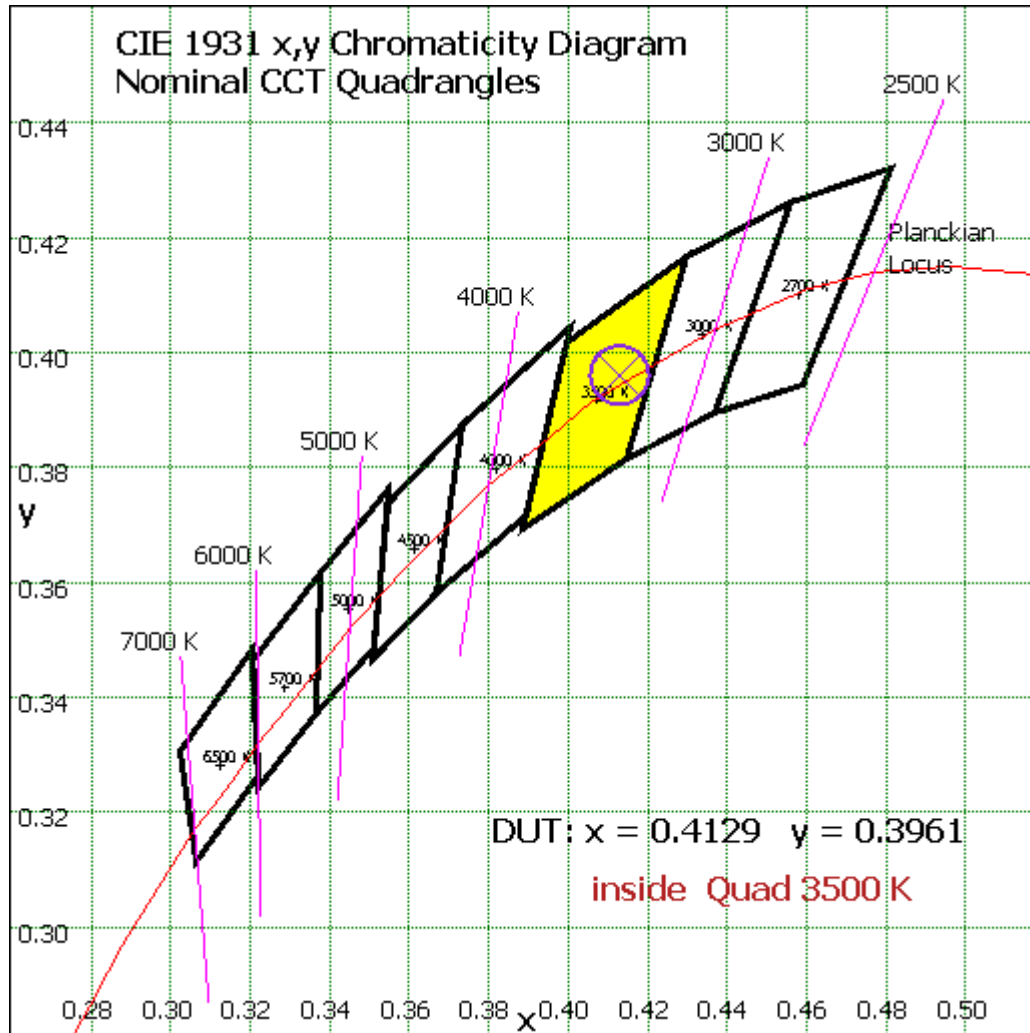


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Zonal Lumen Tabulation- Goniophotometer Method

$\gamma(^{\circ})$	Lumens	% Total
0- 10	40.725	2.52%
10- 20	116.767	7.22%
20- 30	177.574	10.98%
30- 40	216.036	13.36%
40- 50	228.988	14.16%
50- 60	217.518	13.45%
60- 70	186.704	11.55%
70- 80	144.692	8.95%
80- 90	102.426	6.34%
90-100	69.84	4.32%
100-110	45.702	2.83%
110-120	28.099	1.74%
120-130	17.75	1.10%
130-140	11.043	0.68%
140-150	6.65	0.41%
150-160	3.846	0.24%
160-170	1.86	0.12%
170-180	0.446	0.03%
Total	1616.7	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	997.608	61.71%
60- 90	433.822	26.83%
0-90	1431.43	88.54%
90- 180	185.236	11.46%
0- 180	1616.7	100%

Table 5: Zonal Lumen Data

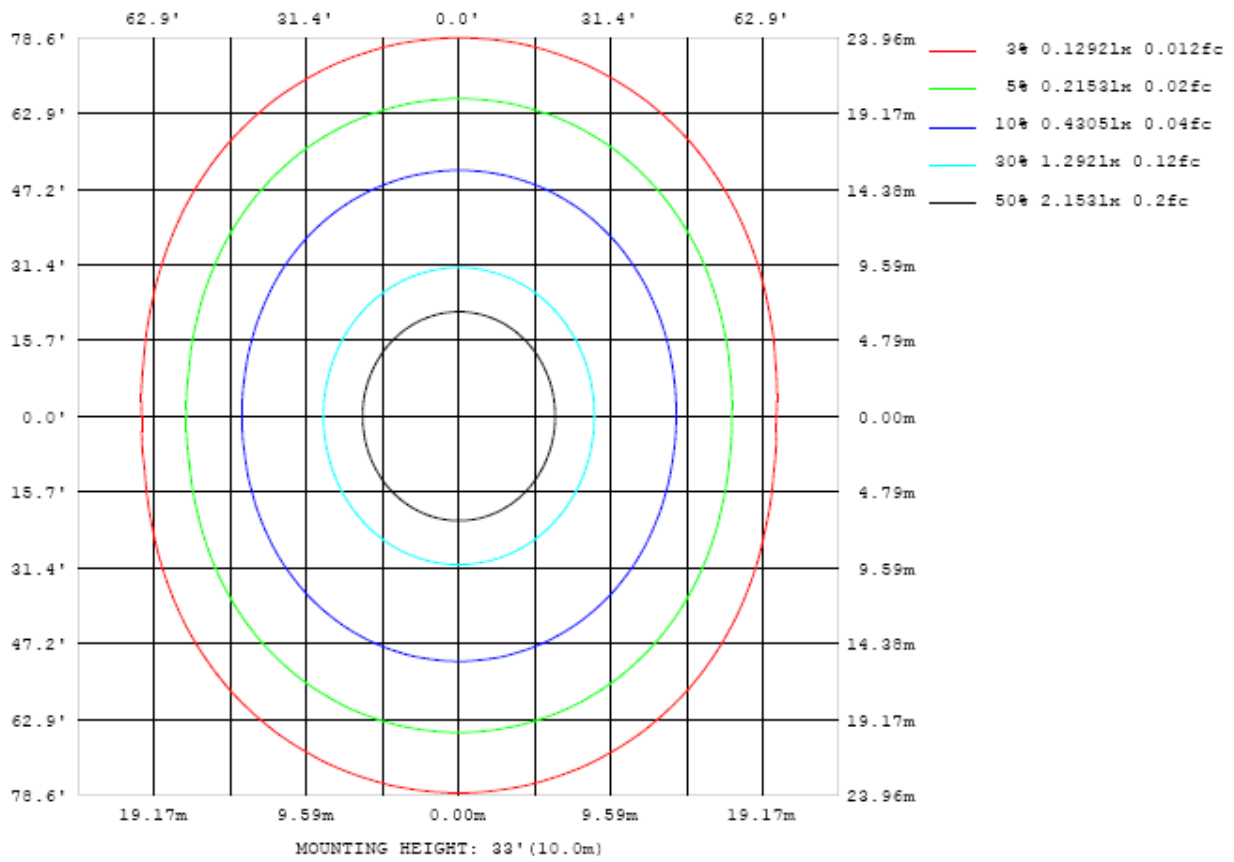


Chart 4: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

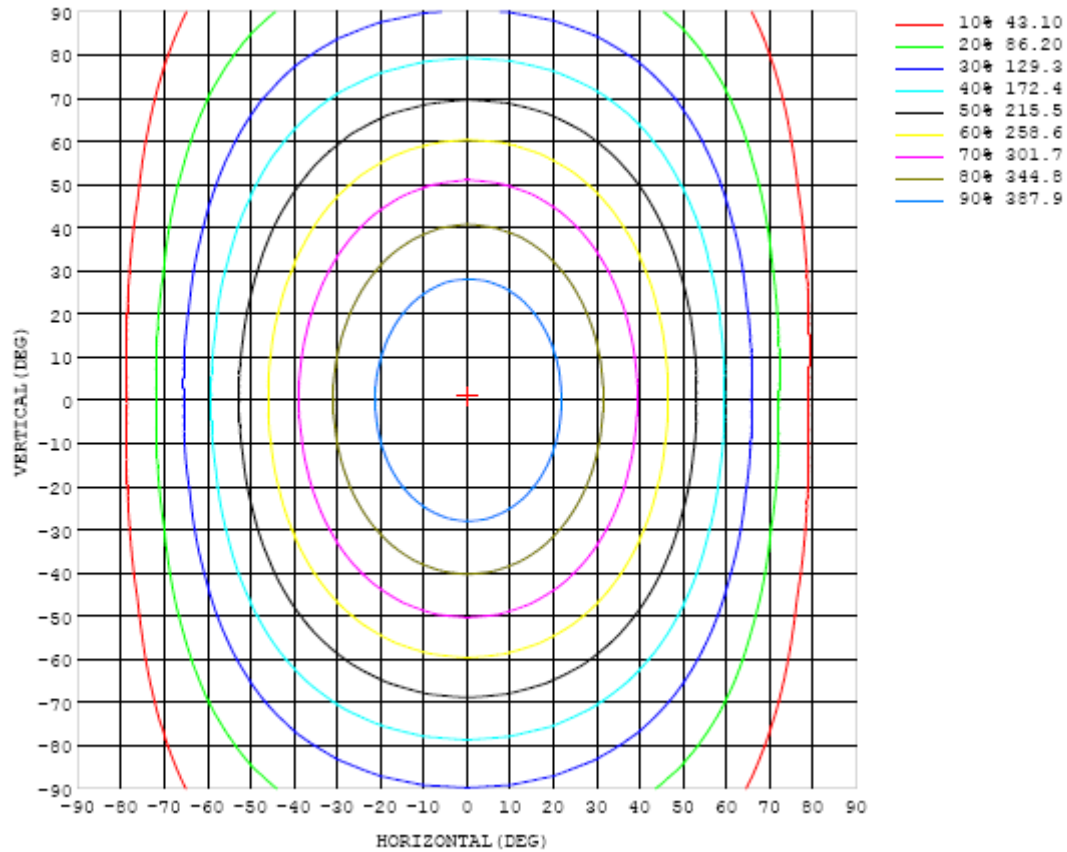


Chart 5: Isocandela Plot

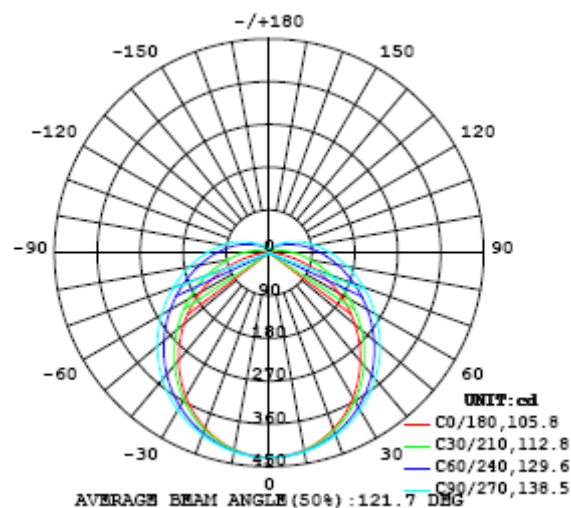


Chart 6: Polar Candela Distribution

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	431	431	431	431	431	431	431	431	431	431	431	431	431	431	431	431	431	431	431
5	428	428	428	429	429	429	429	429	429	429	429	429	429	428	428	428	428	428	428
10	421	422	422	423	423	424	424	425	425	425	425	424	424	423	422	421	421	420	420
15	410	410	411	412	414	415	416	417	418	418	418	417	416	414	412	411	410	409	408
20	394	395	396	398	401	403	405	407	408	409	408	406	404	402	399	396	394	393	392
25	375	376	378	381	384	388	391	394	396	397	396	393	390	386	382	378	375	373	373
30	352	353	355	360	364	370	375	378	381	382	381	378	373	368	363	357	353	350	350
35	326	327	331	336	342	349	356	361	364	365	363	360	354	348	340	334	328	324	324
40	298	299	303	310	318	326	334	341	345	346	344	340	333	325	316	308	301	296	295
45	267	269	274	282	292	302	312	319	324	325	323	318	310	301	290	280	272	266	265
50	236	238	244	253	265	277	288	296	302	303	301	295	287	275	263	251	241	235	233
55	203	205	212	224	237	251	263	272	278	280	278	272	262	250	236	222	210	202	200
60	169	172	181	194	209	225	238	248	255	257	254	248	237	224	208	193	179	169	167
65	135	138	150	165	182	199	213	224	231	234	231	224	213	198	182	164	148	136	133
70	100	105	119	138	157	174	190	201	208	210	208	201	189	174	156	137	118	103	98.7
75	67.3	73.5	90.9	112	133	151	167	179	186	188	186	178	167	151	132	112	90.7	72.6	65.5
80	37.0	45.8	66.6	88.9	110	130	146	157	164	167	164	157	146	130	111	89.3	66.8	45.5	35.1
85	12.7	23.8	45.9	69.5	91.1	110	126	137	145	147	145	138	126	111	91.8	70.2	47.0	24.5	11.4
90	0.61	10.5	30.8	53.4	74.2	92.9	108	120	126	129	126	120	109	93.5	75.2	54.4	32.0	11.5	0.28
95	0.43	4.36	20.0	40.3	60.3	77.7	92.3	103	110	112	110	103	92.8	78.6	61.4	41.6	21.3	5.22	0.47
100	0.59	2.82	12.8	29.0	47.8	64.5	78.0	88.1	94.4	96.5	94.5	88.5	78.4	65.6	48.8	30.4	14.2	3.52	0.53
105	0.79	1.97	9.40	21.5	36.0	51.0	64.3	73.7	79.8	82.0	80.2	74.3	65.3	52.2	37.0	23.1	10.6	2.92	0.91
110	1.15	2.03	7.55	17.0	28.5	40.1	50.8	59.5	65.3	67.6	65.7	60.3	51.7	41.4	29.9	18.2	8.77	3.05	1.30
115	1.53	2.61	5.41	13.8	23.2	32.9	41.6	48.5	52.9	54.5	53.4	49.2	42.6	34.0	24.4	15.2	7.76	3.34	1.72
120	1.94	3.01	5.53	11.6	19.2	27.1	34.3	40.1	43.7	45.2	44.1	40.7	35.2	28.1	20.3	13.0	7.14	3.61	2.15
125	2.38	3.43	5.37	8.88	15.9	22.6	28.5	33.2	36.2	37.4	36.5	33.7	29.2	23.5	17.1	11.2	6.71	3.86	2.56
130	2.84	3.82	5.45	7.98	12.6	18.7	23.8	27.6	30.0	31.0	30.2	27.9	24.3	19.6	14.4	9.60	6.38	3.96	2.82
135	3.27	3.91	5.56	8.06	10.5	14.8	19.6	22.9	24.9	25.7	25.1	23.2	20.2	16.0	12.0	9.01	6.15	4.18	3.17
140	3.69	3.94	5.64	7.51	10.1	12.2	15.0	17.8	20.2	21.0	20.4	18.4	15.6	13.3	11.0	8.42	6.00	4.13	3.66
145	4.08	3.94	5.50	7.39	9.03	11.3	13.1	14.9	16.2	16.7	15.7	14.6	13.5	11.9	9.86	7.87	5.70	4.01	4.13
150	4.47	3.86	5.07	6.82	8.51	9.77	11.2	12.6	13.5	13.9	13.7	12.9	11.7	10.4	9.03	7.41	5.46	4.03	4.30
155	4.50	3.70	4.50	6.24	7.85	8.90	9.82	10.6	11.1	11.4	11.4	10.9	10.2	9.33	8.18	6.36	4.73	3.95	4.05
160	4.90	3.61	4.02	5.24	6.20	7.98	8.65	9.32	9.73	9.92	9.86	9.56	9.04	8.32	6.82	5.53	4.26	3.79	4.19
165	5.02	3.82	3.73	4.47	5.48	5.64	7.09	8.06	8.40	8.55	8.48	8.30	7.58	6.66	5.75	4.56	3.76	3.92	4.20
170	4.24	3.82	3.79	3.81	3.82	4.29	5.71	6.46	6.14	6.14	6.25	5.06	4.48	3.98	3.84	3.81	3.71	3.68	3.62
175	3.69	3.70	3.72	3.72	3.70	3.77	3.76	3.79	3.37	1.77	2.90	3.33	3.38	3.28	3.15	3.15	3.05	3.01	3.29
180	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35

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	431	431	431	431	431	431	431	431	431	431	431	431	431	431	431	431	431		
5	428	428	428	428	428	429	429	429	429	429	429	429	429	429	428	428	428		
10	420	421	421	422	423	423	424	424	425	425	424	424	424	423	422	422	422		
15	409	410	411	412	414	415	416	417	418	418	417	416	415	414	412	411	410		
20	393	394	396	399	402	404	406	408	409	408	407	405	403	401	398	396	395		
25	374	375	378	382	386	390	393	396	397	396	394	392	388	385	381	378	376		
30	351	353	358	363	368	374	378	381	383	382	379	376	371	365	360	356	353		
35	325	328	334	341	348	355	360	364	366	365	362	357	351	343	337	332	328		
40	297	301	308	317	326	334	341	346	348	346	343	336	328	320	311	304	300		
45	267	272	281	291	302	312	320	325	328	326	322	314	305	294	284	276	270		
50	236	242	252	264	277	288	298	304	306	304	299	291	280	267	256	246	239		
55	203	211	222	237	251	264	274	281	284	282	276	267	254	240	226	215	207		
60	170	180	194	210	225	240	250	257	260	258	252	242	228	213	198	184	174		
65	137	149	165	183	200	215	227	234	237	235	228	218	203	186	169	153	141		
70	105	119	138	158	176	191	203	211	214	212	205	194	179	161	142	123	108		
75	73.2	91.8	113	134	153	168	181	188	191	189	182	171	156	137	116	94.7	76.8		
80	45.7	66.8	90.2	112	132	148	160	167	170	167	161	150	134	115	93.2	70.0	48.8		
85	24.0	46.6	70.3	92.4	112	128	140	147	150	148	141	130	114	95.2	73.2	49.3	26.7		
90	10.9	31.6	54.1	75.7	94.3	110	121	128	131	129	122	111	96.4	77.8	56.4	33.6	12.5		
95	4.72	20.8	41.2	61.1	79.0	93.6	104	111	114	112	105	95.1	80.6	63.0	43.1	22.4	5.31		
100	2.93	13.3	29.8	48.8	65.4	79.2	89.3	95.6	98.0	96.1	90.3	80.5	67.0	50.3	31.6	13.9	3.14		
105	2.77	9.78	21.8	36.3	52.0	65.4	75.3	81.4	83.6	81.8	76.2	66.8	53.4	37.8	22.6	9.89	2.71		
110	2.87	7.92	17.3	28.6	40.4	50.7	59.5	65.7	67.9	66.1	60.3	51.5	40.9	29.1	17.5	7.62	2.76		
115	3.03	7.05	14.2	23.3	32.8	41.2	47.9	52.2	53.7	52.3	48.2	41.6	33.1	23.5	13.9	6.63	2.96		
120	3.25	6.56	12.1	19.4	27.1	34.0	39.5	43.0	44.2	43.1	39.7	34.2	27.1	19.3	11.5	6.24	3.28		
125	3.62	6.25	10.6	16.3	22.4	28.1	32.7	35.6	36.7	35.7	32.9	28.3	22.5	15.9	10.0	6.05	3.62		
130	3.65	6.00	9.32	13.7	18.7	23.3	27.1	29.5	30.4	29.6	27.2	23.5	18.7	13.5	9.16	6.00	4.01		
135	3.80	5.98	8.59	12.0	15.8	19.4	22.5	24.4	25.1	24.4	22.5	19.5	15.8	11.9	8.54	6.05	4.43		
140	4.42	5.89	8.08	10.6	13.5	16.3	18.6	20.1	20.6	20.1	18.6	16.3	13.4	10.6	8.05	6.15	4.86		
145	5.08	6.07	7.66	9.57	11.6	13.7	15.5	16.6	16.9	16.6	15.4	13.6	11.6	9.53	7.71	6.30	5.25		
150	5.06	5.85	7.28	8.75	10.2	11.7	12.8	13.6	13.9	13.6	12.8	11.6	10.2	8.75	7.47	6.44	5.58		
155	4.94	5.77	6.91	8.07	9.08	10.0	10.8	11.3	11.5	11.4	10.8	10.1	9.14	8.17	7.31	6.59	5.73		
160	5.76	5.72	6.17	7.17	8.09	8.73	9.22	9.58	9.73	9.63	9.34	8.90	8.34	7.74	7.18	6.59	5.78		
165	5.46	6.30	5.95	6.15	7.08	7.69	7.93	8.27	8.39	8.37	8.23	7.98	7.69	7.33	6.97	6.52	6.05		
170	3.98	5.10	5.84	5.93	6.01	6.03	6.73	7.22	7.29	7.30	7.25	7.14	6.97	6.85	6.54	6.18	5.24		
175	3.42	3.49	3.83	4.30	4.93	5.40	5.28	5.58	6.27	6.54	6.64	6.62	6.57	6.44	5.93	5.01	4.08		
180	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35		

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 FA19 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 FA19 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

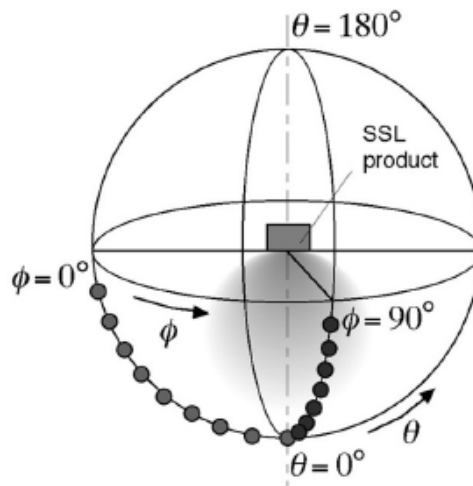
The color characteristics of SSL products include chromaticity coordinates, correlated color temperature, and color rendering index. These characteristics of SSL products may be spatially non-uniform, and thus, in order that they can be specified accurately, the color quantities shall be measured as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