LM-79-08 Test Report

for

Philips Lighting (China) Investment Co., Ltd

Building 9, Lane 888, Tianlin Road, Minhang District, Shanghai China

TYPEB LED TUBE

Model: 9290019340

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

3rd Floor, Bld. 2, NO. 96 Longchuanwu Rd Qianjiang Economy Dev. Zone, Yuhang Dist, Hangzhou, Zhejiang Province, China 311100

Tel: +86 571 86376106

www.ledtestlab.com

Report No.: HZ18060001c

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

Review by: April Zou

Engineer: April Zou

Jun. 06, 2018

Approved by: Jim Zhang

Manager: Jim Zhang

Jun. 06, 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: **9290019340**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
145.5	1203.0	8.27	0.9822

CCT (K)	CRI	Stabilization Time (Light & Power)
3955	83.0	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	: Jun. 01, 2018
Date of Test	: Jun. 01, 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

Sample Photo

Figure 1- Overview of the sample

Equipment Under Test (EUT)	
Name	: TYPEB LED TUBE
Model	: 9290019340
Electrical Ratings	: 120-277V, 50/60Hz, 8.5W
Product Description	: 8.5T8PRO/24-840/BB11/G FB
Manufacturer	: Philips Lighting (China) Investment Co., Ltd
Address	: Building 9, Lane 888, Tianlin Road, Minhang District, Shanghai China

TEST RESULTS

Test ambient temperature was 25.0℃.

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 65 minutes.

Sphere-Spectroradiometer Method

Parameter	Result	
Test Voltage (V)	120.0	277.0
Voltage frequency (Hz)	60	60
Test Current (A)	0.070	0.034
Power Factor	0.9822	0.9232
Test Power (W)	8.27	8.56
THD A%	17.74	21.13
Luminous Efficacy (lm/W)	145.5	141.2
Total Luminous Flux (lm)	1203.0	1209.0
Color Rendering Index (CRI)	83.0	
R9	5	
Correlated Color Temperature (CCT) (K)	3955	
Chromaticity Chroma x	0.3834	
Chromaticity Chroma y	0.3819	
Chromaticity Chroma u	0.2250	
Chromaticity Chroma v	0.3362	
Duv	0.0015	
Chromaticity Chroma u ’	0.2250	
Chromaticity Chroma v’	0.5043	

Special Color Rendering Indices	
R1	81
R2	90.9
R3	96
R4	80.3
R5	81.3
R6	87.4
R7	84.7
R8	62.2
R9	5
R10	78.5
R11	79.2
R12	64.8
R13	83.7
R14	98.3
Rf	82
Rg	93

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 24.6℃.

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)	0.071
Power Factor	0.9791
Test Power (W)	8.30
Luminous Efficacy (lm/W)	139.9
Total Luminous Flux (lm)	1161.3
Beam Angle (°)	108.1 (0°-180°)/ 211.2 (90°-270°)
Center Beam Candle Power (cd)	205
Maximum Beam Candle Power (cd)	205.7 (At: C=270.0, Gamma=2.5)
Spacing Criteria	1.23 (0°-180°)/ 1.44 (90°-270°)
Zonal Lumens in the 0°-60°Zone	44.59%
Zonal Lumens in the 60°-90°Zone	27.07%
Zonal Lumens in the 90°-120°Zone	16.83%
Zonal Lumens in the 120°-180°Zone	11.51%

Table 3: Test data per Goniophotometer Method

Spectral Power Distribution - Sphere Spectroradiometer Method

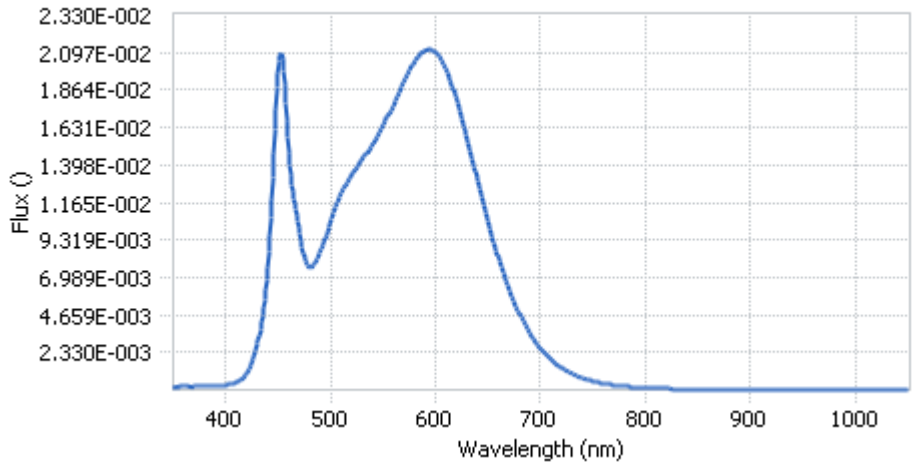
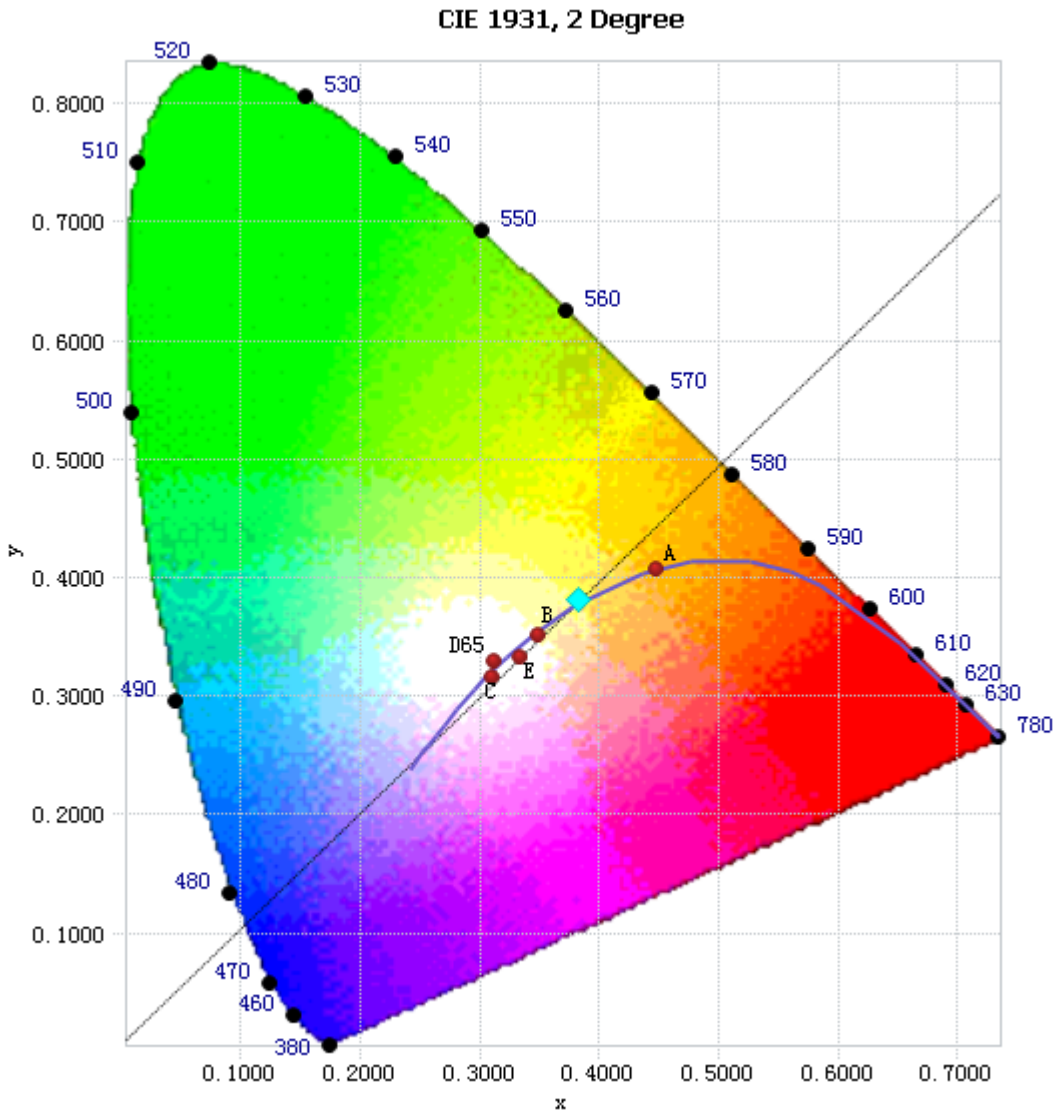


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	2.33E-04	485	7.91E-03	590	2.11E-02	695	3.01E-03
385	2.22E-04	490	8.57E-03	595	2.12E-02	700	2.58E-03
390	2.48E-04	495	9.46E-03	600	2.10E-02	705	2.21E-03
395	2.60E-04	500	1.05E-02	605	2.06E-02	710	1.88E-03
400	2.87E-04	505	1.15E-02	610	2.00E-02	715	1.61E-03
405	3.44E-04	510	1.23E-02	615	1.91E-02	720	1.38E-03
410	4.54E-04	515	1.29E-02	620	1.80E-02	725	1.19E-03
415	6.82E-04	520	1.34E-02	625	1.68E-02	730	1.01E-03
420	1.05E-03	525	1.38E-02	630	1.56E-02	735	8.58E-04
425	1.74E-03	530	1.43E-02	635	1.43E-02	740	7.39E-04
430	2.83E-03	535	1.47E-02	640	1.30E-02	745	6.31E-04
435	4.62E-03	540	1.53E-02	645	1.17E-02	750	5.38E-04
440	7.64E-03	545	1.58E-02	650	1.05E-02	755	4.61E-04
445	1.32E-02	550	1.64E-02	655	9.27E-03	760	3.98E-04
450	1.98E-02	555	1.71E-02	660	8.18E-03	765	3.45E-04
455	1.98E-02	560	1.77E-02	665	7.18E-03	770	2.94E-04
460	1.48E-02	565	1.85E-02	670	6.27E-03	775	2.53E-04
465	1.19E-02	570	1.92E-02	675	5.44E-03	780	2.20E-04
470	1.00E-02	575	1.98E-02	680	4.71E-03		
475	8.22E-03	580	2.04E-02	685	4.07E-03		
480	7.58E-03	585	2.09E-02	690	3.51E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.3834, 0.3819)

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

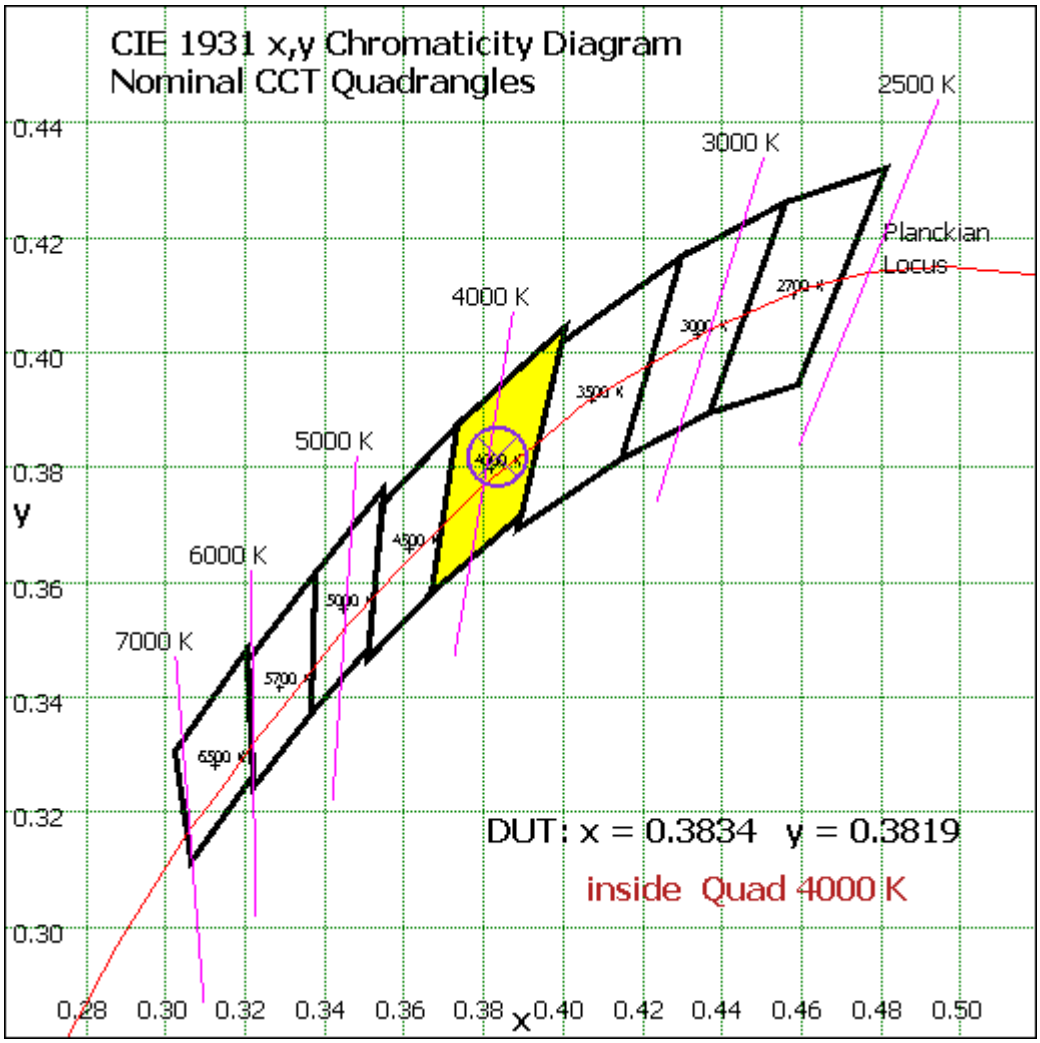


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Zonal Lumen Tabulation- Goniophotometer Method

γ(°)	Lumens	% Total
0- 10	19.484	1.68%
10- 20	56.337	4.85%
20- 30	87.24	7.51%
30- 40	109.425	9.42%
40- 50	121.587	10.47%
50- 60	123.767	10.66%
60- 70	117.53	10.12%
70- 80	105.52	9.09%
80- 90	91.325	7.86%
90-100	77.97	6.71%
100-110	64.742	5.57%
110-120	52.74	4.54%
120-130	42.733	3.68%
130-140	34.189	2.94%
140-150	26.112	2.25%
150-160	18.094	1.56%
160-170	10.065	0.87%
170-180	2.489	0.21%
Total	1161.3	100%

γ(°)	Lumens	% Total
0- 60	517.84	44.59%
60- 90	314.375	27.07%
0-90	832.215	71.66%
90- 180	329.134	28.34%
0- 180	1161.3	100%

Table 5: Zonal Lumen Data

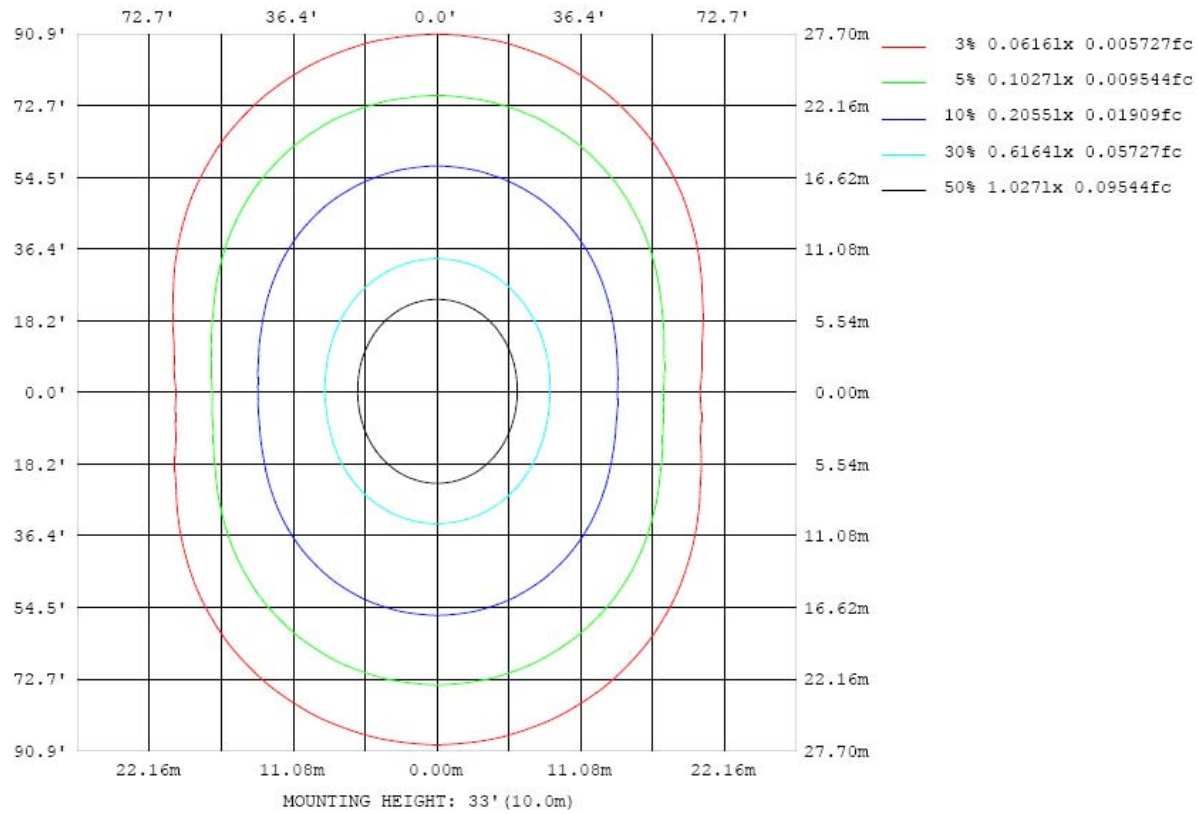


Chart 4: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

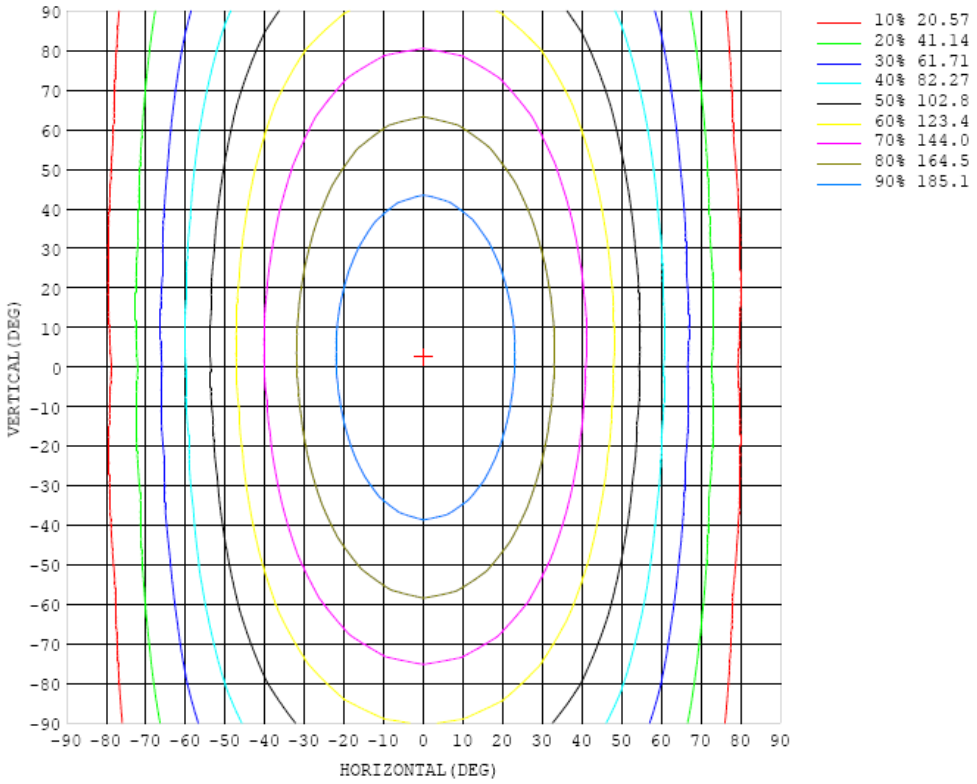


Chart 5: Isocandela Plot

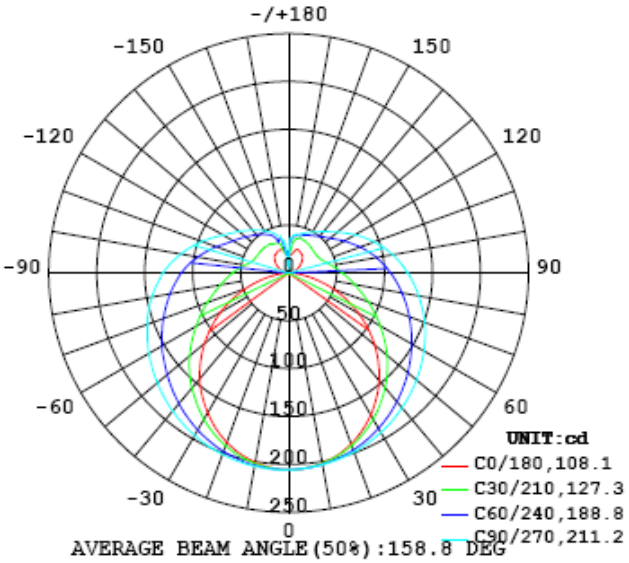


Chart 6: Polar Candela Distribution

Luminous Intensity Data- Goniophotometer Method

Table--1 UNIT: cd

γ (DEG) \ C (DEG)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205
5	205	205	205	205	205	205	205	205	205	205	205	205	205	204	204	204	204	204	204
10	202	202	202	202	202	203	203	203	203	203	203	203	202	202	202	201	201	201	201
15	197	197	197	198	199	199	200	201	201	201	201	201	200	199	198	197	196	196	196
20	190	190	191	192	194	195	197	198	199	199	198	197	196	194	192	191	189	188	188
25	181	182	183	185	187	190	192	194	195	196	195	194	191	189	186	183	181	180	179
30	171	171	173	176	180	184	187	190	192	192	191	189	186	182	178	174	171	169	169
35	159	160	163	167	172	177	182	185	188	188	187	185	180	175	170	165	160	157	157
40	147	147	151	156	163	170	176	180	183	184	183	179	174	168	161	154	148	144	144
45	132	133	138	145	153	162	169	175	178	179	177	174	168	160	151	143	135	130	130
50	117	119	125	134	144	154	162	169	173	174	172	168	161	152	142	131	122	116	114
55	101	103	111	122	134	145	155	162	167	168	167	162	154	144	132	120	108	100	98.4
60	84.1	87.4	97.1	110	124	137	148	156	161	163	161	155	147	136	122	108	94.5	84.7	81.8
65	67.1	71.3	83.4	98.9	115	129	141	150	155	157	155	149	140	128	113	97.0	81.1	68.9	64.8
70	50.2	56.0	70.3	88.2	106	121	134	143	149	151	148	143	133	120	104	86.5	69.5	53.7	47.9
75	33.5	41.0	58.6	78.4	97.2	114	127	136	142	144	142	136	126	113	96.0	76.8	57.0	39.2	31.6
80	18.4	27.9	48.1	69.6	89.4	106	120	130	136	138	135	129	119	106	88.4	68.6	46.9	26.6	17.0
85	6.80	17.9	39.8	62.4	82.2	99.4	113	123	129	131	129	123	113	98.7	81.4	61.5	39.0	17.1	5.50
90	0.62	12.1	33.6	55.9	75.6	92.7	106	116	122	124	122	116	106	92.2	75.1	55.4	33.2	11.9	0.51
95	1.36	9.38	29.2	50.6	70.5	86.4	99.8	109	115	117	115	109	99.6	86.2	69.5	50.3	29.1	9.47	1.32
100	2.79	9.06	25.8	45.6	64.3	80.0	93.0	102	108	110	108	102	93.0	80.0	64.3	45.7	26.0	9.51	2.86
105	4.71	10.2	23.8	41.4	58.8	73.7	86.1	95.2	101	103	101	95.3	86.2	73.8	59.0	41.7	24.1	11.0	5.11
110	7.03	12.1	23.2	38.1	53.8	68.1	79.3	87.9	93.1	95.0	93.2	88.1	79.5	68.2	54.1	38.5	24.0	13.3	7.77
115	9.67	14.9	23.6	36.0	49.5	62.4	72.7	80.7	85.6	87.3	85.7	80.9	72.9	62.6	49.9	36.5	24.7	16.2	10.6
120	12.4	18.0	24.6	34.8	46.1	57.3	66.9	73.8	78.3	79.9	78.4	74.0	67.2	57.6	46.5	35.7	26.0	19.0	13.3
125	15.1	21.0	25.9	34.5	43.8	53.0	61.2	67.7	71.3	72.8	71.4	67.9	61.5	53.2	44.5	35.4	27.5	21.8	16.0
130	17.8	23.9	27.8	34.5	42.3	49.9	56.5	61.7	65.1	66.4	65.2	61.9	56.8	50.3	43.0	35.6	29.1	24.6	18.5
135	20.2	26.7	29.8	34.9	41.2	47.5	52.9	57.2	59.8	60.9	59.9	57.3	53.2	47.8	41.9	36.0	30.7	26.9	20.7
140	22.5	28.9	31.9	35.6	40.6	45.6	49.9	53.3	55.5	56.3	55.6	53.5	50.2	45.9	41.2	36.6	31.9	29.1	22.9
145	23.9	30.1	33.7	36.5	40.2	44.1	47.4	50.1	51.8	52.4	51.8	50.2	47.6	44.3	40.7	36.9	33.4	30.0	24.0
150	24.8	31.2	35.0	37.0	40.0	42.9	45.4	47.4	48.6	49.1	48.7	47.5	45.5	43.1	40.5	36.9	34.8	30.5	24.6
155	25.7	32.4	36.5	37.6	39.0	41.7	43.8	45.2	46.1	46.4	46.1	45.2	43.9	42.2	39.9	37.9	36.1	32.7	25.8
160	26.1	31.8	35.5	38.1	39.2	40.2	42.2	42.9	44.1	44.2	44.0	43.5	42.7	41.6	40.0	38.8	36.9	31.9	25.0
165	23.6	31.3	35.3	37.3	39.0	40.2	40.7	40.9	41.0	41.2	41.3	41.5	41.2	40.7	39.9	38.3	36.4	33.0	26.2
170	20.3	23.3	28.5	34.1	37.8	39.2	39.5	40.0	40.6	40.8	40.6	40.2	40.0	39.7	37.3	32.3	29.7	27.2	23.8
175	18.8	18.8	19.4	22.8	29.3	34.9	36.1	36.2	36.3	36.6	36.6	36.2	33.3	26.8	22.8	20.5	19.5	20.0	20.7
180	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.57

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	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205		
5	204	204	205	205	205	205	205	205	206	205	205	205	205	205	205	205	205		
10	201	202	202	203	203	204	204	205	205	205	205	204	204	203	203	202	202		
15	196	197	198	199	200	202	203	203	204	203	203	202	201	200	199	198	197		
20	189	190	192	194	196	198	200	201	202	201	201	199	197	195	194	192	191		
25	180	182	185	188	191	194	197	198	199	199	197	195	193	189	187	184	182		
30	170	173	177	181	185	190	193	195	196	195	193	191	187	182	178	175	172		
35	159	162	167	173	179	184	188	191	192	191	189	185	180	174	169	164	161		
40	146	151	157	164	171	178	183	187	188	187	184	179	173	166	159	153	149		
45	132	138	146	155	164	172	178	182	184	182	179	173	165	157	148	141	135		
50	117	125	135	146	156	165	173	177	179	177	173	166	157	147	137	127	120		
55	102	111	123	136	149	159	167	172	174	172	167	159	150	138	125	113	105		
60	86.4	97.3	112	127	141	153	161	166	168	166	161	153	141	128	113	99.3	88.9		
65	70.6	83.9	101	117	133	146	155	161	163	160	155	146	133	118	102	85.5	72.7		
70	55.1	71.1	90.1	109	125	139	149	155	157	155	149	139	126	109	90.8	72.3	56.8		
75	40.7	59.4	80.6	101	118	132	143	149	151	149	143	132	118	101	80.9	60.1	41.8		
80	28.0	49.5	72.2	93.1	111	125	136	143	145	142	136	125	111	92.9	72.2	49.5	28.5		
85	18.6	41.5	64.9	86.1	104	119	129	136	138	136	129	119	104	85.8	64.6	41.1	18.3		
90	13.3	35.7	58.8	79.7	97.7	112	123	129	131	129	122	112	97.3	79.3	58.2	35.0	12.5		
95	9.85	30.4	52.5	73.0	90.5	104	115	121	123	121	115	104	90.1	72.4	51.8	29.4	8.81		
100	9.66	26.4	46.7	66.1	82.8	96.3	106	112	114	112	106	96.1	82.4	65.4	45.7	25.0	8.61		
105	11.5	25.0	41.9	59.6	75.4	88.2	97.7	103	105	103	97.4	87.9	74.8	58.7	40.6	23.3	10.7		
110	13.8	25.1	39.4	54.2	68.3	80.2	89.1	94.4	96.3	94.3	88.8	79.9	67.6	53.1	37.6	22.9	13.1		
115	15.9	26.2	38.1	50.7	62.6	72.7	80.7	85.7	87.4	85.5	80.4	72.2	61.6	49.1	35.8	24.0	15.8		
120	17.9	27.2	37.4	48.2	58.4	67.2	73.8	77.8	79.1	77.6	73.3	66.5	57.4	46.4	35.0	25.8	18.1		
125	19.7	28.1	37.2	46.3	55.1	62.6	68.3	71.7	72.8	71.5	67.9	62.0	54.0	44.6	35.4	27.4	20.0		
130	21.3	28.9	37.1	44.9	52.2	58.6	63.5	66.5	67.5	66.3	63.2	58.1	51.4	43.5	36.0	29.3	22.4		
135	22.8	29.7	36.8	43.6	49.9	55.2	59.3	61.8	62.6	61.6	59.0	54.8	49.3	42.9	36.4	30.6	24.2		
140	24.2	30.3	36.5	42.5	47.8	52.3	55.7	57.7	58.4	57.6	55.4	51.9	47.3	42.0	36.7	31.0	25.7		
145	24.8	30.7	36.3	41.1	45.7	49.5	52.3	54.0	54.6	53.9	52.1	49.2	45.3	41.3	37.0	31.8	26.0		
150	24.5	30.5	34.9	39.4	43.5	46.5	48.9	50.4	50.9	50.3	48.8	46.6	43.9	40.2	36.5	32.7	25.6		
155	24.6	29.9	34.3	36.3	40.2	43.6	45.6	46.8	47.3	47.0	46.0	44.5	41.9	38.9	36.9	32.5	25.8		
160	23.5	28.4	33.2	35.8	36.5	38.3	41.7	43.4	43.9	43.9	43.1	41.1	39.6	38.8	37.1	31.7	24.5		
165	21.5	23.9	29.0	33.6	35.8	37.1	32.1	37.8	40.0	40.0	39.9	39.8	38.9	37.8	32.8	28.7	23.0		
170	20.4	19.9	20.6	21.4	24.4	25.7	29.8	35.6	30.7	36.6	38.1	37.1	33.9	25.0	21.5	20.3	19.8		
175	20.7	19.8	19.3	19.2	19.0	18.8	18.2	15.9	12.7	15.2	19.0	19.6	19.1	19.0	18.9	18.8	18.8		
180	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.57		

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 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

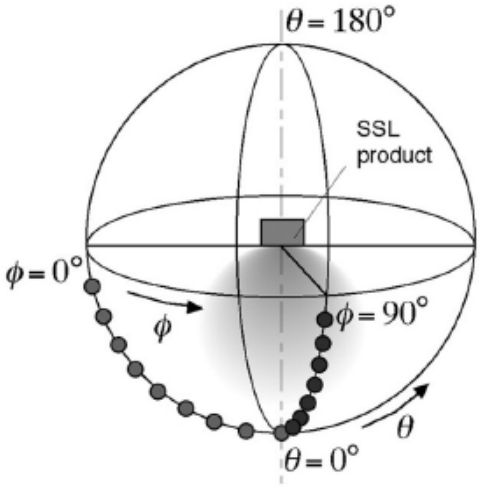
The color characteristics of SSL products include chromaticity coordinates, correlated color temperature, and color rendering index. These characteristics of SSL products may be spatially non-uniform, and thus, in order that they can be specified accurately, the color quantities shall be measured as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