



LM-79-08 Test Report

for

ABOVE ALL LIGHTING INC

1501 Industrial Way N. Toms River, NJ 08755.

V-Line Flood Light

Model: FL100401

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ17030090s

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

Reviewed by:

April Zou

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Apr. 13, 2017

Approved by:  *Jim Zhang*

Manager: Jim Zhang

Apr. 13, 2017

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: **FL100401**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
116.4	11561.0	99.33	0.9946
CCT (K)	CRI	BUG	Stabilization Time (Light & Power)
3846	64.5	B3-U2-G1	60

Table 1: Executive Data Summary

Test specifications:

Date of Receipt	: Mar. 24, 2017
Date of Test	: Apr. 11, 2017
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)

Name	: V-Line Flood Light
Model	: FL100401
Electrical Ratings	: 120~277Vac, 50/60Hz
Product Description	: 4000K Manufacturer of light source: Samsung Model of light source: LH351B
Manufacturer	: ABOVE ALL LIGHTING (SHANGHAI) Co., Ltd.
Address	: Room 1012, North Minch Fortune 108 Plaza, # 1839 Qixin road, Shanghai

TEST RESULTS

Test ambient temperature was 24.6°C.

Base orientation was Base up. 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 85 minutes.

The photometric distance of Goniophotometer is 2.47 m.

Luminous data was taken at 0.5° vertical intervals and 10.0° horizontal intervals.

Parameter	Result	
Test Voltage (V)	120.0	277.0
Voltage frequency (Hz)	60	60
Test Current (A)	0.832	0.380
Power Factor	0.9946	0.9358
Test Power (W)	99.33	98.39
THD A%	7.75	15.32
Luminous Efficacy (lm/W)	116.4	117.2
Total Luminous Flux (lm)	11561.0	11534.0
Color Rendering Index (CRI)	64.5	
R9	-55	
Correlated Color Temperature (CCT) (K)	3846	
Chromaticity (Chroma x, Chroma y)	(0.3929, 0.3990)	
Chromaticity (Chroma u, Chroma v)	(0.2244, 0.3419)	
Chromaticity (Chroma u', Chroma v')	(0.2244, 0.5129)	
Duv	0.0067	
Average Beam Angle (°)	85.0	
Center Beam Candle Power (cd)	6305	
Spacing Criteria	0.66 (0°-180°)/ 1.44 (90°-270°)	
Zonal Lumens in the 0°-60°Zone	93.96%	
Zonal Lumens in the 60°-90°Zone	5.89%	
Zonal Lumens in the 90°-120°Zone	0.06%	
Zonal Lumens in the 120°-180°Zone	0.08%	

Special Color Rendering Indices	
R1	60
R2	71
R3	80
R4	64
R5	59
R6	59
R7	78
R8	45
R9	-55
R10	31
R11	56
R12	25
R13	61
R14	88

Table 2: Test data per Goniophotometer Method

Note: According to CIE 1976 (u',v') diagram, $u' = u = 4x/(-2x+12y+3)$, $v' = 3v/2 = 9y/(-2x+12y+3)$.

Spectral Power Distribution

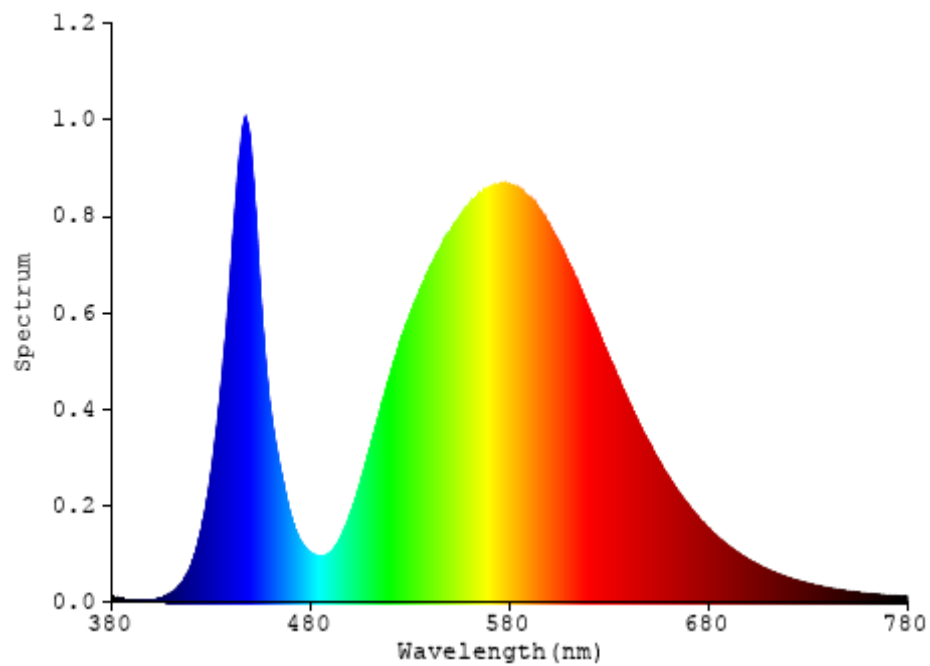


Chart 1: Spectral Power Distribution

Zonal Lumen Tabulation

$\gamma(^{\circ})$	Lumens	% Total
0- 10	590.086	5.10%
10- 20	1641.425	14.20%
20- 30	2310.25	19.98%
30- 40	2498.17	21.61%
40- 50	2312.345	20.00%
50- 60	1510.965	13.07%
60- 70	596.094	5.16%
70- 80	83.544	0.72%
80- 90	1.899	0.02%
90-100	0.203	0.00%
100-110	2.393	0.02%
110-120	4.286	0.04%
120-130	2.928	0.03%
130-140	1.935	0.02%
140-150	1.869	0.02%
150-160	1.578	0.01%
160-170	1.053	0.01%
170-180	0.371	0.00%
Total	11561.4	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	10863.24	93.96%
60- 90	681.537	5.89%
0-90	11544.78	99.86%
90- 180	16.616	0.14%
0- 180	11561.4	100%

Table 3: Zonal Lumen Data

Note: The Flux in this table might be a little different from the total flux in Table 2 due to rounding.

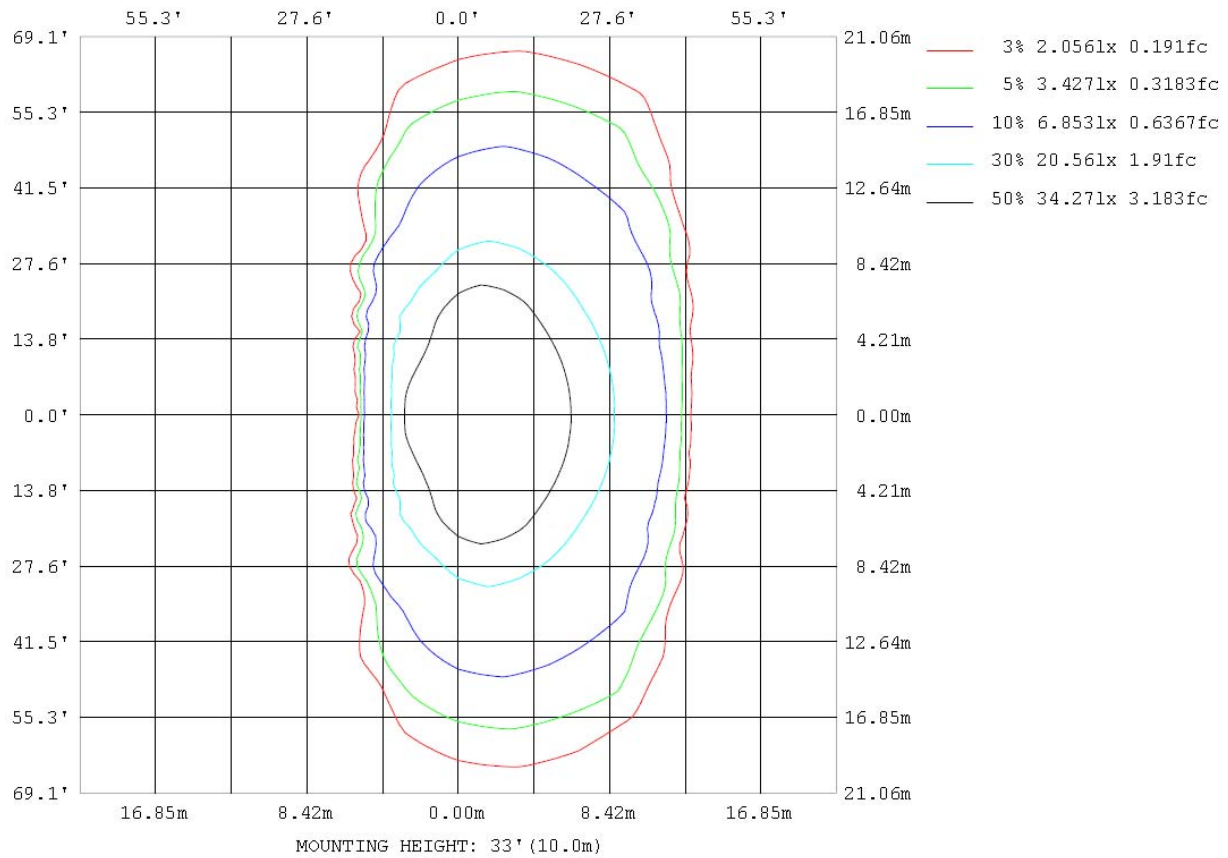


Chart 2: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots

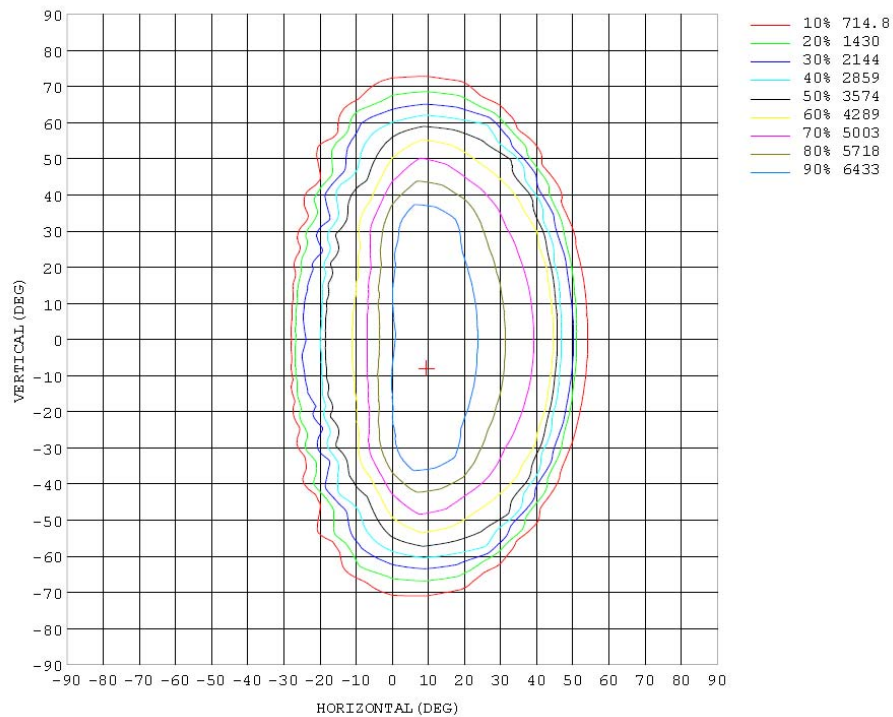


Chart 3: Isocandela Plot

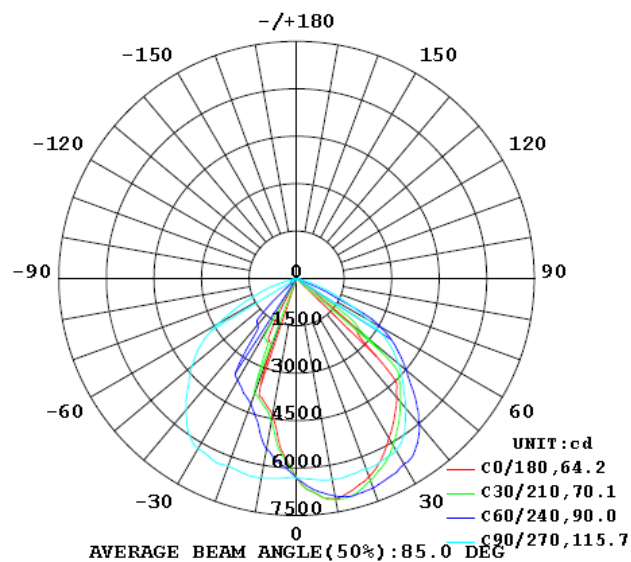


Chart 4: Polar Candela Distribution

Luminous Intensity Data

Table--1

UNIT: cd

C (DEG) γ (DEG)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	6305	6305	6305	6305	6305	6305	6305	6305	6305	6305	6305	6305	6305	6305	6305	6305	6305	6305	6305
5	6817	6830	6822	6811	6788	6760	6718	6637	6528	6377	6222	6065	5911	5797	5671	5569	5511	5483	5459
10	7066	7080	7074	7084	7109	7097	6985	6899	6768	6455	6150	5850	5504	5141	4797	4611	4488	4424	4398
15	6911	6944	7003	7061	7116	7119	7097	6985	6856	6433	5968	5469	4766	4389	4210	4140	4064	4040	4019
20	6672	6706	6766	6795	6836	6929	7049	7078	6842	6412	5778	4899	4250	4046	3915	3866	3338	2825	2659
25	6314	6331	6410	6509	6603	6724	6931	7030	6857	6362	5612	4460	3991	3779	2868	2189	2168	2158	2114
30	5827	5860	5966	6089	6270	6475	6771	6955	6882	6272	5379	4128	3684	2379	2093	1694	540	321	245
35	5379	5414	5494	5605	5808	6110	6551	6659	6616	5938	4796	3821	2948	1972	533	261	253	233	221
40	4934	4953	4996	5088	5269	5602	6017	6113	6056	5362	4050	3428	1896	643	216	230	218	207	205
45	3976	4160	4490	4576	4735	5008	5281	5467	5482	4755	3466	2902	1581	211	212	214	209	200	196
50	2262	2349	2490	2928	4200	4344	4511	4826	4857	4202	3017	1627	224	205	210	219	225	219	214
55	573	581	743	997	2271	3725	3846	4063	4090	3530	2558	1399	193	202	209	228	203	190	186
60	109	112	112	133	580	1855	3046	3048	3035	2583	1871	176	176	200	196	196	189	182	181
65	58.7	63.6	77.7	93.5	89.7	286	1176	1860	1867	1627	1072	129	155	172	187	154	117	81.8	72.5
70	10.0	10.2	10.9	10.5	30.7	63.2	108	839	929	840	361	95.4	126	138	83.0	24.5	5.44	4.66	3.93
75	8.51	8.22	8.01	7.22	7.32	8.78	19.6	37.5	198	188	33.0	45.1	65.6	16.9	3.57	3.00	2.94	2.82	2.74
80	1.35	1.34	1.36	1.44	3.44	5.25	5.04	7.31	10.4	10.1	6.68	5.60	3.47	2.27	1.69	1.58	1.56	1.53	1.48
85	0.96	0.93	0.91	0.88	0.84	0.89	1.03	1.79	3.32	3.30	2.22	1.32	1.03	0.98	1.00	1.07	1.13	1.13	1.10
90	0.07	0.06	0.06	0.06	0.07	0.08	0.10	0.13	0.16	0.32	0.22	0.22	0.15	0.11	0.07	0.06	0.06	0.07	0.05
95	0.05	0.05	0.06	0.07	0.09	0.11	0.15	0.19	0.22	0.27	0.29	0.39	0.27	0.22	0.15	0.09	0.07	0.06	0.05
100	0.06	0.06	0.07	0.09	0.12	0.18	0.29	0.33	0.40	0.43	0.46	0.51	0.44	0.36	0.28	0.19	0.12	0.09	0.10
105	0.07	0.07	0.09	0.10	0.18	0.36	0.83	2.57	11.8	19.9	7.99	4.50	1.14	0.65	0.46	0.34	0.23	0.16	0.24
110	0.08	0.10	0.12	0.18	0.37	0.66	1.90	8.11	17.9	18.9	12.1	5.58	3.22	1.00	0.70	0.51	0.38	0.30	0.48
115	0.10	0.13	0.16	0.27	0.48	1.03	3.78	14.8	30.3	23.6	18.3	4.43	3.92	1.82	0.89	0.69	0.54	0.48	0.80
120	0.12	0.16	0.21	0.35	0.57	1.22	3.83	17.6	21.0	21.6	16.8	4.09	2.62	1.80	1.13	0.96	0.81	0.75	1.19
125	0.18	0.24	0.31	0.46	0.68	1.25	6.00	13.4	9.97	9.50	9.38	3.99	2.40	1.76	1.37	1.27	1.16	1.10	1.67
130	0.28	0.38	0.49	0.64	0.80	1.33	3.46	5.42	5.97	5.95	4.62	3.20	2.36	1.94	1.71	1.64	1.55	1.52	2.26
135	0.49	0.60	0.74	0.90	1.01	1.37	2.05	2.74	3.04	3.49	3.25	2.92	2.64	2.42	2.26	2.11	2.06	2.05	2.94
140	0.70	0.82	1.02	1.18	1.28	1.66	2.01	2.38	2.69	2.91	3.04	3.13	3.01	2.93	2.75	2.57	2.51	2.53	3.63
145	0.97	1.13	1.33	1.40	1.53	1.78	2.11	2.38	2.73	2.98	3.14	3.29	3.27	3.21	3.11	2.98	3.00	2.89	4.27
150	1.31	1.52	1.68	1.79	1.82	1.91	2.16	2.38	2.56	2.82	2.98	3.14	3.22	3.30	3.33	3.32	3.33	3.29	4.78
155	1.75	1.96	2.06	2.25	2.12	2.11	2.25	2.39	2.55	2.65	2.83	3.04	3.17	3.35	3.49	3.58	3.53	3.53	5.04
160	2.25	2.40	2.53	2.60	2.53	2.36	2.37	2.51	2.60	2.51	2.86	3.09	3.24	3.44	3.62	3.68	3.71	3.75	5.13
165	2.75	2.88	2.96	2.97	2.90	2.67	2.68	2.76	2.74	2.77	3.03	3.31	3.41	3.56	3.68	3.76	3.86	3.87	4.84
170	3.17	3.26	3.28	3.29	3.17	2.86	2.81	2.87	3.09	3.11	3.11	3.45	3.57	3.69	3.79	3.87	3.95	3.99	4.55
175	3.67	3.77	3.72	3.71	3.68	3.48	3.45	3.51	3.48	3.43	3.61	3.82	3.92	3.97	4.10	4.24	4.33	4.34	4.28
180	3.53	3.53	3.53	3.53	3.53	3.52	3.52	3.52	3.52	3.52	3.52	3.52	3.52	3.52	3.52	3.52	3.52	3.52	3.52

Table 4: Luminous Intensity Data

Table--2

UNIT: cd

C (DEG) γ (DEG)	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350		
0	6305	6305	6305	6305	6305	6305	6305	6305	6305	6305	6305	6305	6305	6305	6305	6305	6305		
5	5470	5498	5550	5642	5767	5894	6029	6178	6347	6493	6604	6694	6744	6756	6766	6782	6799		
10	4413	4476	4595	4775	5113	5471	5828	6123	6405	6723	6863	6914	7024	7063	7064	7064	7061		
15	4029	4064	4136	4203	4364	4730	5421	5952	6387	6847	6937	7078	7091	7090	7024	6975	6931		
20	2826	3322	3880	3904	4042	4230	4803	5667	6313	6809	7040	7016	6929	6855	6791	6739	6688		
25	2143	2179	2200	2802	3810	3986	4395	5549	6323	6852	7029	6918	6715	6605	6505	6414	6332		
30	262	372	1539	2121	2315	3718	4111	5290	6211	6812	6923	6778	6491	6280	6099	5958	5862		
35	231	250	266	530	2012	2836	3825	4739	5947	6659	6728	6611	6155	5831	5616	5497	5405		
40	207	216	235	224	442	1925	3487	4115	5426	6198	6222	6124	5703	5316	5133	5023	4948		
45	199	207	215	216	215	1367	2825	3530	4838	5621	5651	5441	5156	4797	4653	4539	4282		
50	218	225	221	213	207	235	1697	3128	4305	5083	5018	4690	4488	4267	3474	2540	2406		
55	190	202	232	212	206	202	1400	2741	3699	4386	4361	4066	3856	2438	1655	753	669		
60	183	189	198	199	209	190	192	2164	2867	3427	3471	3374	2060	707	388	112	107		
65	91.6	133	167	191	183	172	145	1141	1880	2243	2287	2034	483	93.8	89.2	80.6	71.8		
70	4.46	10.7	35.4	111	153	141	119	479	1082	1219	1155	345	69.4	59.0	30.9	11.3	10.8		
75	2.71	2.68	2.85	3.40	28.6	97.6	61.3	35.0	317	394	218	34.8	27.7	8.61	7.59	7.27	7.96		
80	1.46	1.42	1.37	1.63	2.09	3.32	9.23	6.26	21.1	45.8	10.4	6.91	5.97	6.78	3.83	1.59	1.51		
85	1.07	1.01	0.94	0.88	0.85	1.01	1.53	2.06	3.69	3.22	2.08	1.46	1.08	1.09	1.10	1.11	1.08		
90	0.07	0.09	0.10	0.13	0.22	0.34	0.54	0.56	0.80	0.59	0.41	0.29	0.26	0.23	0.21	0.20	0.17		
95	0.05	0.06	0.08	0.15	0.25	0.36	0.44	0.47	0.40	0.29	0.18	0.11	0.09	0.09	0.08	0.07	0.07		
100	0.10	0.13	0.21	0.36	0.52	0.68	0.76	0.76	0.65	0.48	0.31	0.19	0.11	0.10	0.10	0.09	0.08		
105	0.26	0.32	0.47	0.67	0.87	1.17	5.91	8.91	15.3	5.75	1.36	0.51	0.18	0.14	0.12	0.12	0.11		
110	0.50	0.61	0.78	0.98	1.23	2.94	4.49	9.53	26.8	9.30	1.92	0.91	0.37	0.20	0.15	0.14	0.13		
115	0.82	0.92	1.09	1.32	1.57	2.42	3.89	11.7	17.3	15.0	2.39	1.31	0.57	0.33	0.22	0.19	0.17		
120	1.21	1.31	1.48	1.67	1.87	2.29	4.05	16.8	14.2	7.24	2.27	1.22	0.87	0.48	0.32	0.25	0.22		
125	1.69	1.77	1.88	2.04	2.22	2.54	3.69	10.0	9.43	3.84	2.31	1.44	1.00	0.68	0.49	0.39	0.35		
130	2.25	2.30	2.42	2.53	2.74	3.00	5.14	7.11	6.64	3.52	2.41	1.69	1.31	0.98	0.77	0.61	0.57		
135	2.94	2.97	3.10	3.27	3.42	3.60	4.75	5.44	5.05	3.77	2.67	2.13	1.78	1.51	1.19	0.99	0.90		
140	3.67	3.66	3.76	3.98	4.10	4.18	4.27	4.24	4.05	3.47	2.92	2.62	2.32	1.99	1.66	1.40	1.20		
145	4.30	4.33	4.36	4.46	4.59	4.62	4.50	4.24	4.04	3.61	3.35	3.09	2.89	2.48	2.17	1.93	1.66		
150	4.75	4.81	4.76	4.78	4.77	4.71	4.56	4.29	3.94	3.74	3.67	3.38	3.24	2.98	2.76	2.56	2.28		
155	5.03	5.07	5.07	4.93	4.77	4.63	4.39	4.18	4.00	3.92	3.68	3.61	3.46	3.36	3.40	3.13	2.82		
160	5.19	5.15	5.14	5.02	4.79	4.60	4.38	4.17	3.86	3.90	3.81	3.76	3.67	3.81	3.82	3.70	3.48		
165	4.91	4.97	4.93	4.89	4.80	4.64	4.44	4.16	3.97	3.79	3.81	3.83	3.81	3.89	4.01	4.07	3.99		
170	4.60	4.73	4.74	4.68	4.61	4.52	4.40	4.12	4.00	3.95	3.92	3.86	3.79	4.00	4.21	4.29	4.28		
175	4.30	4.44	4.43	4.43	4.26	4.22	4.13	3.99	3.87	3.83	3.98	3.94	3.91	4.12	4.34	4.42	4.48		
180	3.52	3.52	3.52	3.52	3.52	3.52	3.52	3.52	3.52	3.52	3.52	3.52	3.52	3.53	3.53	3.53	3.53		

Table 5: Luminous Intensity Data

EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Goniophotometer system	GO-R5000	HZTE011-01	Jul. 27, 2016	Jul. 26, 2017
Digital Power Meter	PF2010A	HZTE028-01	Jul. 27, 2016	Jul. 26, 2017
AC Power Supply	PCR 500L	HZTE001-08	Jul. 27, 2016	Jul. 26, 2017
DC Power Supply	WY12010	HZTE004-03	Jul. 27, 2016	Jul. 26, 2017
Temperature Meter	TES1310	HZTE017-01	Jul. 27, 2016	Jul. 26, 2017
Standard Source	D908	HZTE012-01	Jul. 27, 2016	Jul. 26, 2017
Standard source	SCL-1400	HZTE012-02	Jul. 27, 2016	Jul. 26, 2017

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.

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 1.94% with a coverage factor k=2.

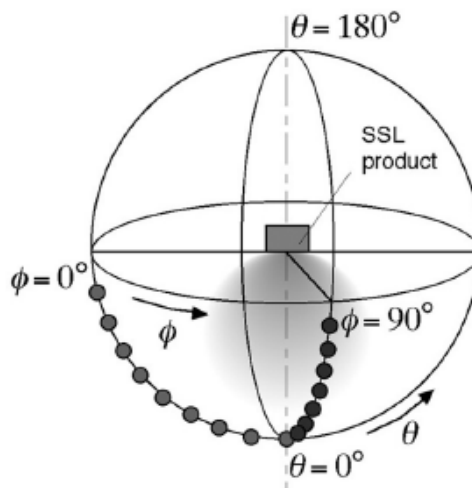
Color Characteristics Measurements

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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