LM-79-08 Test Report

for

ABOVE ALL LIGHTING INC

1501 Industrial Way N. Toms River, NJ 08755.

V-Line Flood Light

Model: FL100501

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ17030090t

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

Reviewed by:

Engineer: April Zou

Apr. 13, 2017

Approved by:

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: **FL100501**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
118.9	12014.0	101.01	0.9948
CCT (K)	**CRI**	**BUG**	**Stabilization Time (Light & Power)**
4804	67.2	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	: FL100501
Electrical Ratings	: 120~277Vac, 50/60Hz
Product Description	: 5000K 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℃.

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)	0.846	0.386
Power Factor	0.9948	0.9343
Test Power (W)	101.01	99.81
THD A%	7.23	14.34
Luminous Efficacy (lm/W)	118.9	119.9
Total Luminous Flux (lm)	12014.0	11962.0
Color Rendering Index (CRI)	67.2	
R9	-38	
Correlated Color Temperature (CCT) (K)	4804	
Chromaticity (Chroma x, Chroma y)	(0.3517, 0.3631)	
Chromaticity (Chroma u, Chroma v)	(0.2114, 0.3274)	
Chromaticity (Chroma u', Chroma v')	(0.2114, 0.4911)	
Duv	0.0031	
Average Beam Angle (°)	85.6	
Center Beam Candle Power (cd)	6286	
Spacing Criteria	0.63 (0°-180°)/ 1.47 (90°-270°)	
Zonal Lumens in the 0°-60°Zone	93.96%	
Zonal Lumens in the 60°-90°Zone	5.94%	
Zonal Lumens in the 90°-120°Zone	0.02%	
Zonal Lumens in the 120°-180°Zone	0.07%	

Special Color Rendering Indices	
R1	65
R2	71
R3	75
R4	69
R5	66
R6	60
R7	77
R8	54
R9	-38
R10	31
R11	65
R12	35
R13	65
R14	86

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

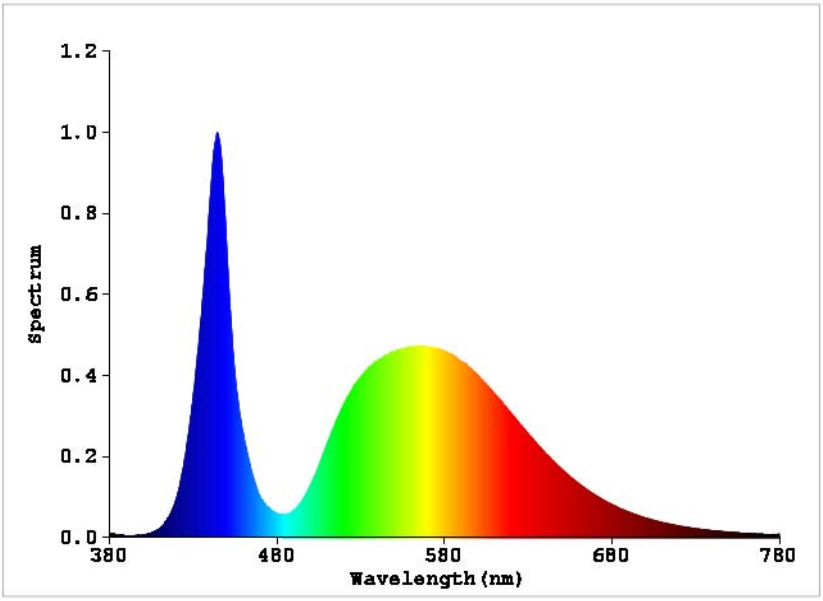


Chart 1: Spectral Power Distribution

Zonal Lumen Tabulation

γ(°)	Lumens	% Total
0- 10	588.638	4.90%
10- 20	1660.175	13.82%
20- 30	2364.87	19.68%
30- 40	2613.635	21.76%
40- 50	2459.881	20.48%
50- 60	1601.479	13.33%
60- 70	629.15	5.24%
70- 80	81.824	0.68%
80- 90	2.666	0.02%
90-100	0.229	0.00%
100-110	1.26	0.01%
110-120	1.509	0.01%
120-130	1.52	0.01%
130-140	1.865	0.02%
140-150	1.996	0.02%
150-160	1.69	0.01%
160-170	1.145	0.01%
170-180	0.39	0.00%
Total	12013.9	100%

γ(°)	Lumens	% Total
0- 60	11288.68	93.96%
60- 90	713.64	5.94%
0-90	12002.32	99.90%
90- 180	11.604	0.10%
0- 180	12013.9	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.

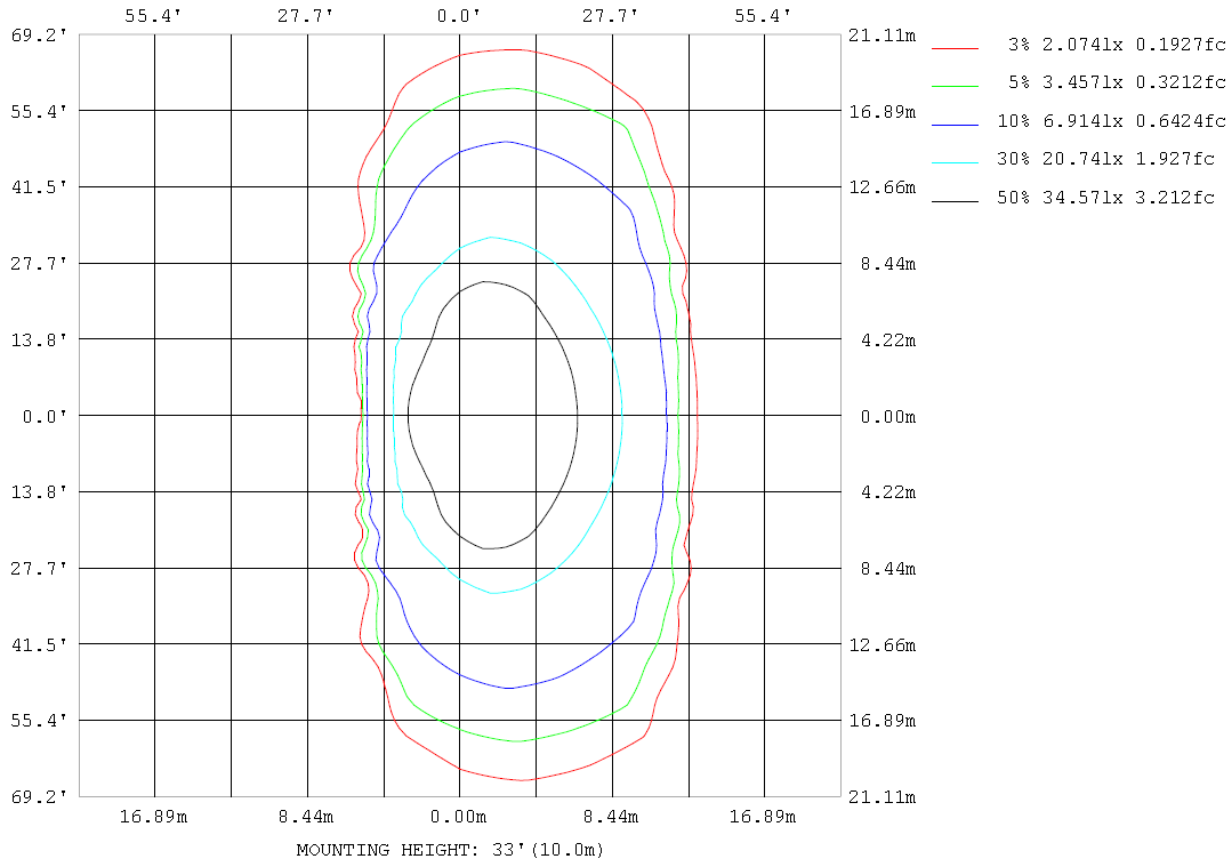


Chart 2: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots

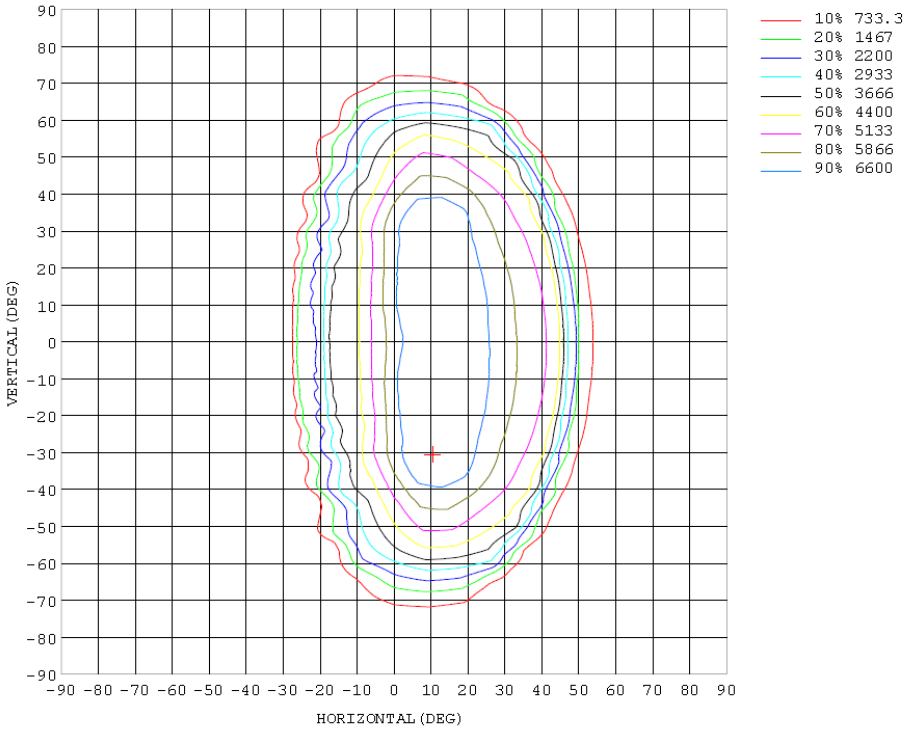


Chart 3: Isocandela Plot

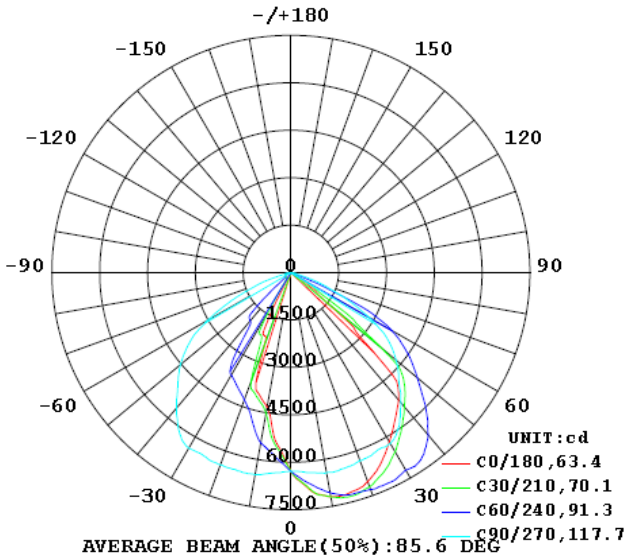


Chart 4: Polar Candela Distribution

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	6286	6286	6286	6286	6286	6286	6286	6286	6286	6286	6286	6286	6286	6286	6286	6286	6286	6286	6286
5	6897	6904	6896	6864	6819	6759	6693	6619	6481	6347	6172	5979	5809	5652	5540	5473	5424	5388	5383
10	7190	7201	7202	7195	7174	7159	7060	6921	6747	6423	6049	5655	5377	5028	4685	4479	4393	4340	4330
15	7200	7241	7268	7315	7322	7300	7260	7114	6825	6410	5836	5328	4670	4328	4170	4084	4011	3966	3954
20	7035	7078	7148	7206	7218	7287	7288	7260	6879	6331	5582	4776	4219	4017	3880	3607	2922	2531	2425
25	6667	6711	6801	6931	7058	7173	7323	7236	6927	6264	5399	4323	3963	3709	2496	2179	2181	2116	2032
30	6173	6227	6353	6541	6752	6963	7211	7325	7052	6238	5249	4104	3682	2180	2101	1246	427	252	231
35	5692	5748	5862	6050	6301	6671	7158	7209	6903	5920	4714	3806	2462	1978	436	268	246	221	211
40	5258	5300	5383	5536	5772	6236	6698	6745	6433	5369	4079	3527	1909	376	229	236	216	201	197
45	4258	4566	4837	5041	5248	5641	5973	6112	5880	4787	3550	2361	991	213	218	221	211	197	193
50	1358	1927	2633	3710	4674	4933	5184	5516	5328	4305	3159	1722	217	215	221	227	220	206	203
55	423	516	878	1061	2620	4239	4488	4743	4603	3724	2739	1077	206	218	221	232	200	186	182
60	112	116	120	191	814	2220	3638	3652	3507	2806	2020	174	202	221	207	199	188	178	176
65	45.7	55.6	80.1	106	95.5	431	1857	2282	2212	1780	792	142	186	197	199	151	113	79.8	74.6
70	9.37	10.1	10.7	9.77	40.8	76.9	186	1012	1084	943	319	119	147	156	80.4	28.3	7.25	6.65	5.98
75	7.27	7.37	7.72	7.39	7.26	8.27	23.2	88.6	249	200	21.2	56.8	77.5	17.1	5.03	4.59	4.52	4.41	4.44
80	1.30	1.32	1.34	1.39	4.33	6.22	5.47	5.32	5.71	7.32	6.51	6.82	4.73	3.46	2.93	3.05	3.11	3.10	3.14
85	0.96	0.97	0.98	0.96	0.99	1.36	1.92	1.45	2.38	15.3	7.89	2.45	2.05	2.34	2.19	2.50	2.61	2.58	2.64
90	0.08	0.10	0.11	0.10	0.11	0.17	0.24	0.20	0.29	6.89	1.79	0.75	0.34	0.33	0.18	0.15	0.14	0.13	0.11
95	0.05	0.06	0.06	0.06	0.07	0.10	0.13	0.16	0.19	0.22	0.25	0.26	0.23	0.19	0.12	0.07	0.05	0.04	0.05
100	0.06	0.06	0.07	0.07	0.10	0.15	0.23	0.36	0.29	0.33	0.37	0.42	0.40	0.32	0.25	0.16	0.09	0.07	0.09
105	0.07	0.07	0.08	0.09	0.16	0.35	0.69	1.82	3.09	7.74	6.27	1.14	0.95	0.51	0.41	0.30	0.19	0.14	0.22
110	0.09	0.10	0.11	0.17	0.34	0.52	0.83	1.49	4.75	13.8	6.52	2.13	0.91	0.68	0.56	0.46	0.34	0.27	0.46
115	0.12	0.14	0.17	0.26	0.39	0.60	0.85	1.23	4.33	4.61	3.07	1.96	1.21	0.90	0.73	0.62	0.50	0.45	0.83
120	0.12	0.17	0.21	0.32	0.45	0.69	0.96	1.21	1.65	2.35	2.42	1.94	1.49	1.16	0.98	0.89	0.76	0.72	1.26
125	0.22	0.23	0.30	0.41	0.56	0.83	1.12	1.31	1.73	2.24	2.32	2.03	1.69	1.46	1.28	1.22	1.13	1.09	1.82
130	0.34	0.38	0.45	0.58	0.68	0.95	1.34	1.59	1.82	2.23	2.32	2.22	2.06	1.78	1.64	1.61	1.54	1.52	2.44
135	0.52	0.58	0.69	0.84	0.92	1.20	1.54	1.94	2.07	2.47	2.59	2.57	2.45	2.32	2.21	2.09	2.07	2.07	3.05
140	0.77	0.82	0.97	1.11	1.20	1.53	1.80	2.10	2.32	2.60	2.79	2.92	2.89	2.89	2.74	2.58	2.54	2.56	3.88
145	1.06	1.14	1.29	1.33	1.46	1.72	1.99	2.23	2.58	2.82	3.05	3.25	3.28	3.25	3.16	3.03	3.06	2.93	4.52
150	1.43	1.53	1.65	1.72	1.74	1.83	2.08	2.31	2.49	2.78	2.99	3.17	3.26	3.36	3.40	3.40	3.44	3.35	5.02
155	1.94	1.99	2.06	2.19	2.04	2.04	2.17	2.34	2.50	2.65	2.82	3.04	3.19	3.40	3.56	3.68	3.67	3.62	5.12
160	2.85	2.50	2.53	2.58	2.46	2.29	2.33	2.47	2.57	2.49	2.84	3.09	3.25	3.49	3.71	3.81	3.85	3.84	5.36
165	3.73	3.13	2.97	2.95	2.84	2.61	2.62	2.68	2.67	2.69	2.96	3.26	3.38	3.57	3.74	3.84	3.96	3.93	5.06
170	3.25	3.33	3.35	3.32	3.14	2.85	2.81	2.89	3.09	3.11	3.15	3.48	3.64	3.76	3.88	3.99	4.08	4.05	4.75
175	4.41	4.00	3.73	3.74	3.62	3.47	3.46	3.48	3.45	3.42	3.63	3.81	3.94	4.03	4.15	4.29	4.41	4.52	4.72
180	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	4.22

Table 4: 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	6286	6286	6286	6286	6286	6286	6286	6286	6286	6286	6286	6286	6286	6286	6286	6286	6286		
5	5400	5439	5497	5578	5688	5829	6003	6176	6359	6502	6610	6686	6750	6799	6836	6873	6894		
10	4349	4398	4513	4750	5097	5467	5783	6135	6492	6784	6916	7047	7127	7152	7171	7190	7189		
15	3973	4016	4092	4185	4363	4782	5446	5953	6491	6888	7138	7223	7275	7294	7268	7235	7200		
20	2569	3018	3661	3903	4031	4283	4919	5722	6470	6957	7233	7265	7245	7190	7160	7106	7051		
25	2147	2190	2211	2675	3798	3982	4449	5547	6415	7026	7257	7232	7134	7008	6880	6759	6668		
30	244	402	1355	2150	2381	3748	4191	5404	6409	7158	7245	7135	6887	6661	6464	6301	6183		
35	230	251	271	561	2078	2828	3901	4917	6121	6974	7167	7062	6535	6199	5967	5813	5698		
40	202	219	230	222	536	1995	3551	4273	5598	6482	6683	6617	6056	5659	5459	5332	5257		
45	200	212	220	204	240	1529	2941	3678	5023	5907	6040	5869	5469	5151	4962	4798	4420		
50	211	223	222	217	201	249	1792	3266	4530	5357	5359	5011	4835	4587	3257	2554	1831		
55	188	206	228	217	207	216	1496	2802	3902	4638	4592	4340	4159	2532	1054	776	466		
60	180	190	201	214	214	190	222	2129	3028	3571	3572	3586	1978	746	180	116	113		
65	90.3	130	175	199	198	173	135	1378	1965	2226	2226	1613	431	102	108	79.3	52.1		
70	6.81	17.7	42.9	125	163	147	100	439	1072	1154	1068	178	75.4	42.4	17.7	10.7	9.70		
75	4.49	4.58	4.61	5.24	39.1	98.9	51.1	57.6	262	266	70.2	26.7	10.5	7.49	6.99	7.32	7.20		
80	3.16	3.09	2.95	3.10	3.18	3.84	6.48	5.15	19.8	22.1	8.70	6.31	5.17	4.22	1.66	1.52	1.39		
85	2.65	2.57	2.40	2.18	1.80	1.58	1.73	2.10	3.33	4.94	2.96	1.88	1.38	1.22	1.16	1.13	1.06		
90	0.13	0.16	0.18	0.20	0.29	0.42	0.59	0.67	1.07	1.74	1.03	0.62	0.41	0.27	0.21	0.18	0.15		
95	0.05	0.06	0.09	0.18	0.32	0.45	0.53	0.52	0.44	0.31	0.18	0.10	0.09	0.08	0.07	0.07	0.07		
100	0.10	0.14	0.25	0.44	0.64	0.84	0.92	0.87	0.72	0.53	0.33	0.18	0.11	0.11	0.10	0.09	0.08		
105	0.25	0.36	0.56	0.82	1.10	1.62	2.95	2.57	4.82	3.18	1.17	0.33	0.16	0.14	0.12	0.11	0.10		
110	0.53	0.68	0.93	1.28	1.71	2.05	3.58	2.57	5.56	4.82	1.88	0.73	0.26	0.16	0.14	0.13	0.12		
115	0.92	1.07	1.32	1.68	2.06	2.31	2.97	2.73	5.80	5.90	2.18	1.02	0.46	0.22	0.17	0.16	0.15		
120	1.39	1.55	1.79	2.06	2.29	2.52	3.16	2.87	4.93	4.92	2.43	1.25	0.73	0.41	0.26	0.19	0.17		
125	1.95	2.09	2.24	2.45	2.65	2.88	3.38	3.23	4.46	4.76	2.81	1.60	1.06	0.69	0.49	0.38	0.33		
130	2.57	2.65	2.80	2.95	3.17	3.40	3.73	3.70	4.29	4.73	3.45	2.20	1.54	1.11	0.80	0.65	0.59		
135	3.28	3.35	3.52	3.73	3.88	4.01	4.16	4.12	4.50	5.23	3.79	2.92	2.27	1.61	1.25	1.05	0.89		
140	4.07	4.08	4.19	4.43	4.54	4.58	4.55	4.48	4.55	5.29	4.16	3.26	2.66	2.11	1.72	1.44	1.12		
145	4.66	4.77	4.81	4.91	4.99	4.99	4.85	4.63	4.61	5.03	4.60	3.86	3.25	2.65	2.26	1.97	1.57		
150	5.05	5.25	5.21	5.21	5.16	5.06	4.89	4.64	4.43	4.65	4.63	4.24	3.74	3.26	2.93	2.68	2.17		
155	5.29	5.48	5.52	5.36	5.18	4.97	4.71	4.59	4.48	4.67	4.70	4.58	4.18	3.86	3.80	3.39	2.71		
160	5.49	5.40	5.57	5.48	5.23	4.97	4.75	4.56	4.34	4.59	4.95	5.01	4.78	4.87	4.69	4.24	3.39		
165	5.40	5.16	5.18	5.35	5.29	5.08	4.89	4.63	4.54	4.51	4.79	5.11	5.27	5.66	5.55	4.07	4.05		
170	5.09	5.12	4.92	4.77	4.86	4.97	4.96	4.75	4.70	4.81	4.90	4.98	4.99	4.68	4.32	4.46	4.16		
175	4.84	4.92	5.03	4.86	4.48	4.28	4.20	4.05	3.84	3.86	4.01	3.99	4.06	4.64	5.25	5.44	4.93		
180	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		

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

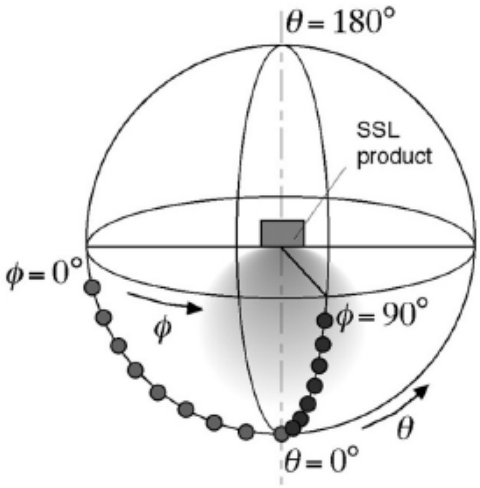
An EVERFINE Type C Model GO-R5000 Goniophotometer was used to measure the intensity at each angle of distribution for each sample. The photometric distance is 2.475m for near-field measurement or 30m for far-field measurement. Bandwidth of spectroradiometer is 380nm-780nm.
Ambient temperature was measured 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 expended 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°/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 ***

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