



LM-79-08 Test Report

for

ABOVE ALL LIGHTING INC

1501 Industrial Way N. Toms River, NJ 08755.

V-Line Wall Pack

Model: WL100501

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ17030090q

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

Reviewed by:

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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: **WL100501**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
124.4	12558.0	100.99	0.9945
CCT (K)	CRI	BUG	Stabilization Time (Light & Power)
4793	67.4	B3-U1-G2	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

TABLE OF CONTENT

LM-79-08 Test Report.....	1
Test Summary.....	2
Sample Photo	4
TEST RESULTS	5
Spectral Power Distribution	6
Zonal Lumen Tabulation	7
Luminous Intensity Distribution Plots	9
Luminous Intensity Data.....	10
EQUIPMENT LIST	12
TEST METHODS.....	12
Seasoning of SSL Product.....	12
Goniophotometer Method	12
Photometric and Electrical Measurements.....	12
Color Characteristics Measurements	13
Color Spatial Uniformity	13

Sample Photo



Figure 1- Overview of the sample

Equipment Under Test (EUT)

Name	: V-Line Wall Pack
Model	: WL100501
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°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)	0.846	0.386
Power Factor	0.9945	0.9335
Test Power (W)	100.99	99.81
THD A%	7.47	14.70
Luminous Efficacy (lm/W)	124.4	124.6
Total Luminous Flux (lm)	12558.0	12439.0
Color Rendering Index (CRI)	67.4	
R9	-38	
Correlated Color Temperature (CCT) (K)	4793	
Chromaticity (Chroma x, Chroma y)	(0.3521, 0.3637)	
Chromaticity (Chroma u, Chroma v)	(0.2114, 0.3277)	
Chromaticity (Chroma u', Chroma v')	(0.2114, 0.4915)	
Duv	0.0033	
Average Beam Angle (°)	91.5	
Center Beam Candle Power (cd)	4100	
Spacing Criteria	0.58 (0°-180°)/ 1.37 (90°-270°)	
Zonal Lumens in the 0°-60°Zone	80.75%	
Zonal Lumens in the 60°-90°Zone	19.17%	
Zonal Lumens in the 90°-120°Zone	0.02%	
Zonal Lumens in the 120°-180°Zone	0.05%	

Special Color Rendering Indices	
R1	65
R2	71
R3	75
R4	69
R5	66
R6	61
R7	77
R8	54
R9	-38
R10	32
R11	65
R12	36
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

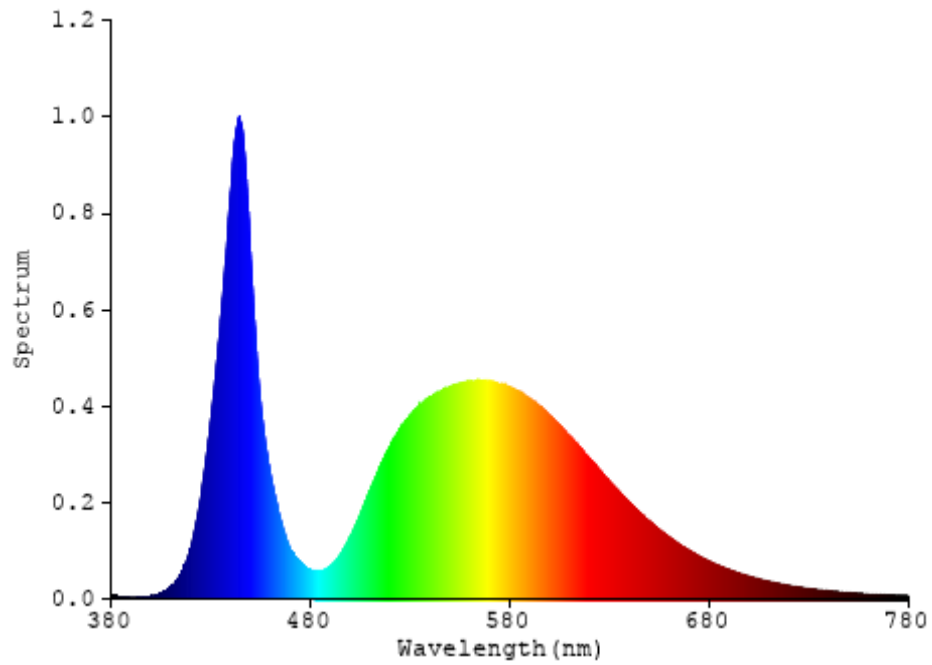


Chart 1: Spectral Power Distribution

Zonal Lumen Tabulation

$\gamma(^{\circ})$	Lumens	% Total
0- 10	346.864	2.76%
10- 20	977.03	7.78%
20- 30	1605.441	12.78%
30- 40	2144.805	17.08%
40- 50	2559.457	20.38%
50- 60	2507.565	19.97%
60- 70	1871.043	14.90%
70- 80	509.138	4.05%
80- 90	27.481	0.22%
90-100	0.487	0.00%
100-110	0.897	0.01%
110-120	1.162	0.01%
120-130	1.381	0.01%
130-140	1.615	0.01%
140-150	1.576	0.01%
150-160	1.213	0.01%
160-170	0.764	0.01%
170-180	0.266	0.00%
Total	12558.2	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	10141.16	80.75%
60- 90	2407.662	19.17%
0-90	12548.82	99.93%
90- 180	9.361	0.07%
0- 180	12558.2	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.

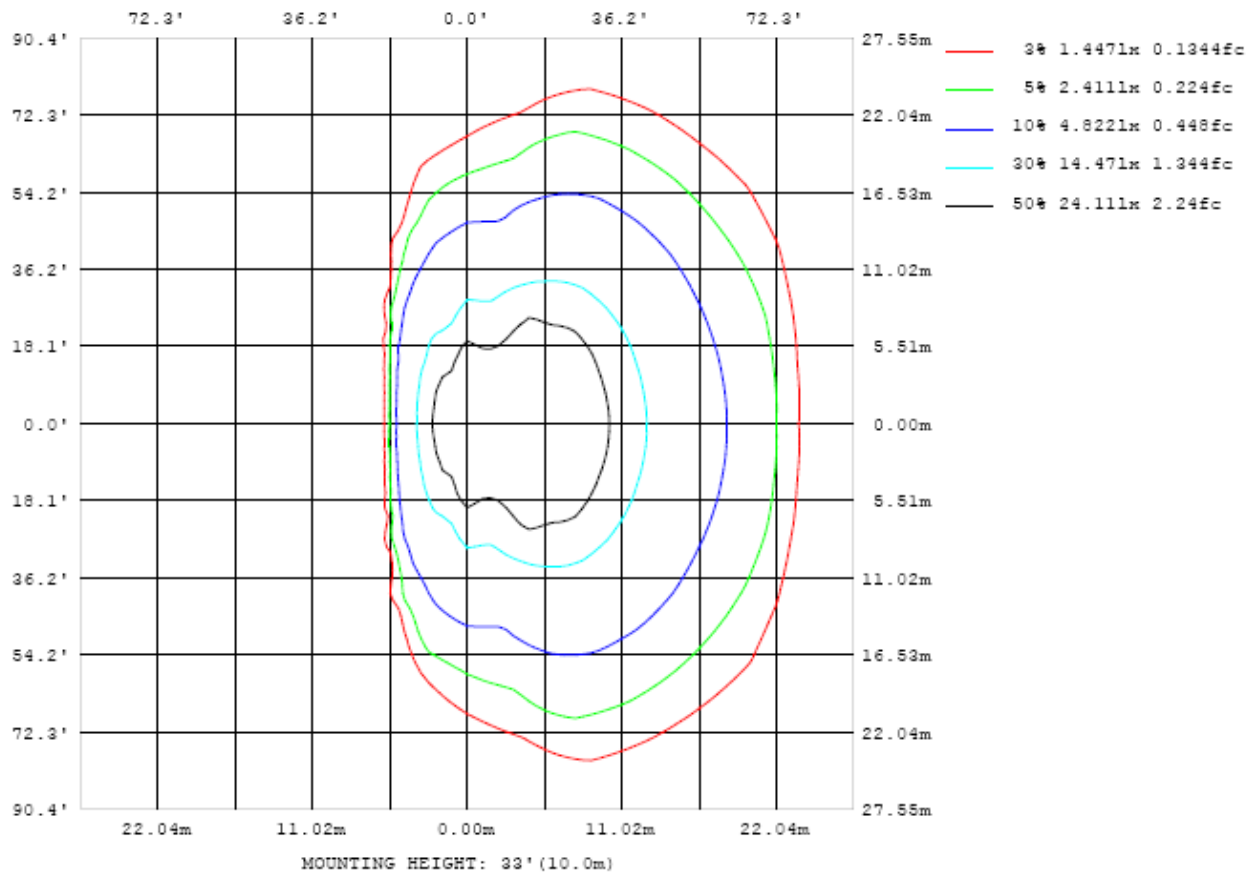


Chart 2: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots

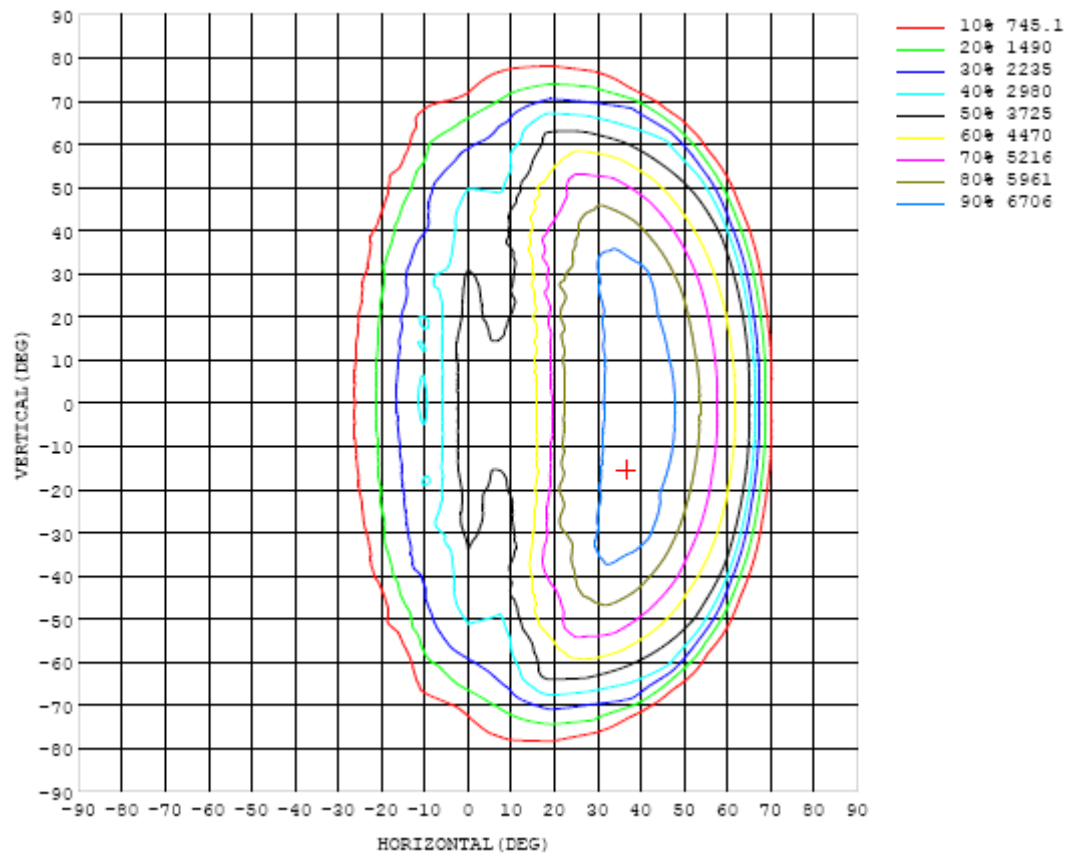


Chart 3: Isocandela Plot

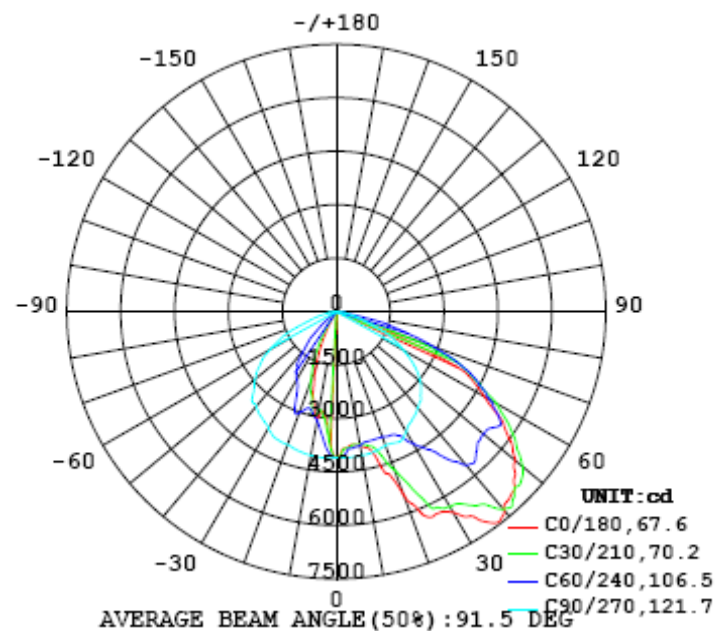


Chart 4: Polar Candela Distribution

Luminous Intensity Data

Table--1

UNIT: cd

C (DEG) y (DEG)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	4100	4100	4100	4100	4100	4100	4100	4100	4100	4100	4100	4100	4100	4100	4100	4100	4100	4100	4100
5	3813	3823	3830	3840	3844	3860	3869	4017	4094	4106	4050	3911	3714	3514	3358	3234	3156	3119	3100
10	3809	3809	3799	3791	3773	3760	3817	3851	3977	4100	3894	3456	3089	2909	2809	2860	2953	3004	3022
15	4196	4164	4054	3929	3858	3778	3744	3768	3842	4071	3683	3082	2843	2959	2874	2628	2533	2500	2502
20	5450	5328	5038	4720	4314	3890	3744	3683	3744	4000	3372	2878	3026	2644	2286	2015	1843	1729	1704
25	6349	6331	6172	5898	5200	4540	3808	3641	3651	4041	3167	2825	2609	2121	1763	1368	1126	952	927
30	6505	6492	6349	6325	6197	5330	4268	3654	3533	3900	3072	2825	2213	1730	1129	705	424	278	236
35	7191	7098	6859	6644	6243	6031	4821	3734	3424	3695	2641	2430	1909	1128	474	164	113	111	99.6
40	7268	7324	7372	7234	6653	5978	5628	4077	3360	3528	2473	2234	1401	449	133	113	113	113	111
45	7035	7013	6959	7011	7105	6244	5524	4328	3345	3319	2535	1779	820	131	127	130	127	126	126
50	6509	6465	6519	6770	6577	6501	5358	4449	2937	3051	2324	1224	162	135	142	139	132	127	125
55	5731	5745	5884	6008	6047	5918	5566	4192	2717	2655	2009	710	120	161	147	130	123	117	115
60	4758	4796	4874	5139	5213	5259	4925	3943	2663	2154	1521	126	175	157	132	121	112	103	102
65	3820	3951	4011	4067	4123	4182	4128	3788	2342	1685	1002	171	162	133	117	101	89.7	83.4	78.8
70	830	979	1366	1998	3111	3022	2868	2695	1792	960	382	213	134	96.7	92.0	71.0	55.5	50.5	47.0
75	48.1	46.5	60.9	130	494	1174	1581	1550	1179	559	63.5	121	91.0	59.1	47.5	34.0	26.9	23.6	21.4
80	2.20	2.41	3.97	6.01	15.2	48.4	252	589	508	240	27.5	58.4	35.7	23.5	17.6	16.9	16.0	15.7	14.9
85	0.15	0.15	0.15	0.15	0.15	0.15	2.26	6.39	26.6	7.45	9.10	10.5	10.4	10.5	11.0	11.3	10.8	10.5	10.3
90	0.08	0.08	0.08	0.08	0.09	0.10	0.12	0.16	0.20	0.23	0.27	0.30	0.32	0.32	0.31	0.38	0.59	0.88	1.95
95	0.07	0.07	0.07	0.08	0.09	0.11	0.15	0.21	0.29	0.35	0.41	0.47	0.53	0.54	0.66	0.52	0.46	0.44	0.74
100	0.07	0.07	0.07	0.08	0.10	0.14	0.21	0.30	0.44	0.56	0.72	0.91	1.06	1.11	1.05	0.93	0.82	0.76	1.32
105	0.07	0.07	0.08	0.09	0.13	0.18	0.27	0.41	0.61	0.73	0.90	1.06	1.14	1.19	1.18	1.13	1.06	1.02	1.90
110	0.08	0.08	0.09	0.11	0.17	0.24	0.36	0.70	0.74	0.90	1.10	1.25	1.30	1.38	1.40	1.41	1.36	1.33	2.23
115	0.09	0.09	0.10	0.15	0.21	0.31	0.45	0.76	0.85	1.05	1.32	1.51	1.59	1.69	1.71	1.72	1.69	1.67	2.59
120	0.11	0.11	0.13	0.20	0.27	0.40	0.59	0.76	0.96	1.17	1.47	1.68	1.80	1.95	2.02	2.09	2.07	2.06	2.98
125	0.14	0.14	0.19	0.28	0.36	0.52	0.71	0.82	1.11	1.37	1.70	1.96	2.08	2.28	2.37	2.50	2.51	2.52	3.31
130	0.20	0.23	0.31	0.41	0.45	0.62	0.85	1.03	1.24	1.55	1.94	2.30	2.51	2.62	2.77	2.98	3.02	3.10	3.79
135	0.33	0.38	0.48	0.59	0.61	0.77	0.97	1.21	1.40	1.80	2.12	2.46	2.69	2.97	3.24	3.38	3.50	3.61	4.17
140	0.48	0.52	0.66	0.77	0.76	0.95	1.12	1.31	1.63	1.96	2.31	2.70	2.95	3.30	3.50	3.61	3.73	3.81	4.38
145	0.63	0.72	0.88	0.92	0.92	1.04	1.22	1.42	1.82	2.11	2.44	2.83	3.11	3.34	3.55	3.67	3.82	3.75	4.50
150	0.84	0.96	1.08	1.17	1.15	1.16	1.26	1.53	1.75	2.08	2.33	2.63	2.89	3.15	3.36	3.50	3.56	3.47	4.36
155	1.11	1.23	1.32	1.50	1.37	1.27	1.37	1.62	1.81	1.98	2.23	2.52	2.75	3.01	3.22	3.31	3.24	3.13	4.03
160	1.40	1.49	1.61	1.75	1.70	1.50	1.51	1.77	1.94	1.85	2.26	2.58	2.79	2.98	3.13	3.12	3.03	2.93	3.77
165	1.68	1.76	1.92	2.02	2.04	1.80	1.79	1.99	2.02	2.05	2.39	2.76	2.90	3.01	3.05	3.01	2.92	2.80	3.23
170	1.94	2.02	2.17	2.30	2.33	2.05	1.92	2.07	2.31	2.30	2.31	2.77	2.98	3.04	3.04	2.97	2.89	2.75	2.89
175	2.23	2.38	2.49	2.63	2.73	2.60	2.40	2.52	2.60	2.52	2.69	2.89	3.13	3.18	3.23	3.22	3.15	3.04	2.84
180	2.61	2.61	2.61	2.62	2.62	2.63	2.64	2.64	2.65	2.66	2.66	2.66	2.66	2.66	2.66	2.65	2.65	2.65	2.65

Table 4: 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	4100	4100	4100	4100	4100	4100	4100	4100	4100	4100	4100	4100	4100	4100	4100	4100	4100		
5	3111	3152	3236	3359	3516	3724	3925	4035	4113	4065	3997	3887	3653	3844	3841	3834	3822		
10	3003	2957	2832	2794	2910	3103	3487	3918	4098	3945	3832	3800	3758	3775	3794	3806	3818		
15	2515	2504	2636	2942	2955	2827	3098	3711	4053	3821	3741	3737	3783	3861	3913	4044	4219		
20	1727	1879	2082	2294	2681	3015	2831	3406	3974	3723	3672	3748	3852	4359	4668	5017	5426		
25	979	1143	1405	1764	2213	2627	2767	3194	3943	3621	3639	3784	4698	5143	5755	6268	6298		
30	270	435	709	1152	1738	2183	2861	3156	3777	3532	3651	4287	5316	6241	6297	6368	6459		
35	103	105	176	515	1140	1870	2452	2648	3628	3430	3768	4817	5971	6253	6570	6811	7068		
40	113	108	113	139	513	1401	2142	2428	3475	3407	4076	5479	5970	6594	7190	7342	7249		
45	126	126	143	136	133	828	1810	2419	3291	3355	4371	5450	6161	7015	7057	6944	6949		
50	125	129	141	151	138	241	1315	2320	2960	2920	4320	5290	6340	6521	6691	6424	6417		
55	115	123	129	146	162	123	907	1926	2589	2673	4108	5399	5848	5906	5868	5792	5674		
60	104	108	115	130	160	155	211	1578	2133	2667	3861	4799	5077	5060	5010	4782	4744		
65	80.7	86.2	106	114	133	155	161	1034	1619	2309	3604	3950	4034	3975	3959	3917	3882		
70	50.2	57.4	67.9	89.0	89.5	135	209	637	928	1730	2614	2822	2911	3016	2198	1465	1068		
75	21.6	25.1	33.9	40.3	53.1	90.9	109	80.5	536	1103	1478	1562	1376	572	189	66.3	53.4		
80	15.1	15.8	17.5	17.9	23.5	35.8	49.0	26.7	227	471	559	360	47.9	28.5	14.6	4.93	1.93		
85	10.7	10.8	11.0	11.2	10.6	11.5	11.8	11.7	26.4	41.5	37.8	5.76	0.18	0.17	0.16	0.16	0.16		
90	2.41	2.40	2.70	2.19	1.96	1.81	1.42	1.04	0.42	0.22	0.14	0.12	0.11	0.11	0.10	0.10	0.10		
95	0.76	0.82	0.91	0.99	1.06	1.03	0.88	0.67	0.47	0.30	0.18	0.11	0.10	0.09	0.09	0.08	0.08		
100	1.34	1.43	1.55	1.64	1.67	1.53	1.25	0.92	0.66	0.45	0.27	0.16	0.11	0.10	0.10	0.09	0.09		
105	1.91	1.96	2.02	2.06	2.01	1.82	1.52	1.19	0.90	0.64	0.40	0.23	0.14	0.12	0.12	0.11	0.10		
110	2.25	2.31	2.38	2.38	2.28	2.07	1.77	1.46	1.14	0.82	0.56	0.33	0.20	0.14	0.13	0.12	0.11		
115	2.57	2.57	2.58	2.56	2.43	2.19	1.93	1.61	1.27	0.95	0.68	0.45	0.30	0.18	0.15	0.14	0.12		
120	2.94	2.87	2.83	2.76	2.55	2.30	2.06	1.74	1.41	1.09	0.82	0.57	0.42	0.28	0.20	0.16	0.14		
125	3.29	3.21	3.09	2.96	2.69	2.45	2.24	1.93	1.60	1.25	1.01	0.73	0.57	0.41	0.31	0.24	0.19		
130	3.78	3.61	3.50	3.27	3.02	2.79	2.55	2.25	1.91	1.50	1.24	0.98	0.80	0.62	0.49	0.39	0.32		
135	4.21	4.06	3.96	3.77	3.47	3.17	2.91	2.66	2.23	1.86	1.53	1.28	1.09	0.97	0.79	0.64	0.54		
140	4.48	4.36	4.24	4.13	3.88	3.57	3.23	2.93	2.50	2.12	1.72	1.59	1.39	1.27	1.10	0.90	0.76		
145	4.59	4.52	4.41	4.26	4.10	3.84	3.52	3.14	2.84	2.30	2.10	1.90	1.75	1.57	1.44	1.24	1.07		
150	4.44	4.46	4.36	4.27	4.10	3.84	3.59	3.22	2.83	2.49	2.37	2.09	2.04	1.93	1.83	1.67	1.46		
155	4.13	4.24	4.31	4.20	4.01	3.78	3.50	3.19	2.94	2.75	2.43	2.26	2.15	2.18	2.28	2.03	1.82		
160	3.86	3.93	4.05	4.04	3.91	3.72	3.50	3.22	2.83	2.88	2.63	2.43	2.31	2.51	2.58	2.42	2.21		
165	3.30	3.43	3.57	3.69	3.72	3.62	3.47	3.14	2.91	2.73	2.72	2.56	2.53	2.66	2.75	2.71	2.53		
170	2.92	3.08	3.26	3.38	3.46	3.44	3.37	2.99	2.86	2.82	2.81	2.67	2.57	2.88	3.01	2.94	2.78		
175	2.85	2.95	3.06	3.22	3.18	3.21	3.13	2.92	2.79	2.81	2.95	2.84	2.78	3.06	3.18	3.09	2.98		
180	2.65	2.65	2.65	2.66	2.66	2.66	2.66	2.66	2.66	2.65	2.64	2.64	2.63	2.62	2.62	2.61	2.61		

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 ($C=0^\circ/180^\circ$ 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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