



LM-79-08 Test Report

for

ABB Lighting, Inc.

1501 Industrial Way N. Toms River, NJ 08755

80W Area Light

Model: ABRW80LED50III

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

Tel: +86-571-56680806

www.ledtestlab.com

Report No.: HZ14090017a

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

Test specifications:

Date of Receipt : Sep. 16, 2014

Date of Test : Sep. 19, 2014

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

Reviewed by:

April Zou

Engineer: April Zou
Nov. 05, 2014

Approved by



Jim Zhang

Manager: Jim Zhang
Nov. 05, 2014

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: ABRW80LED50III

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
100.5	7818.3	77.82	0.9910
CCT (K)	CRI	Stabilization Time (Light & Power)	
4949	82.7	60	
IES Classification		Longitudinal Classification	
Type II		Very Short	

Table 1: Executive Data Summary

Sample Photo

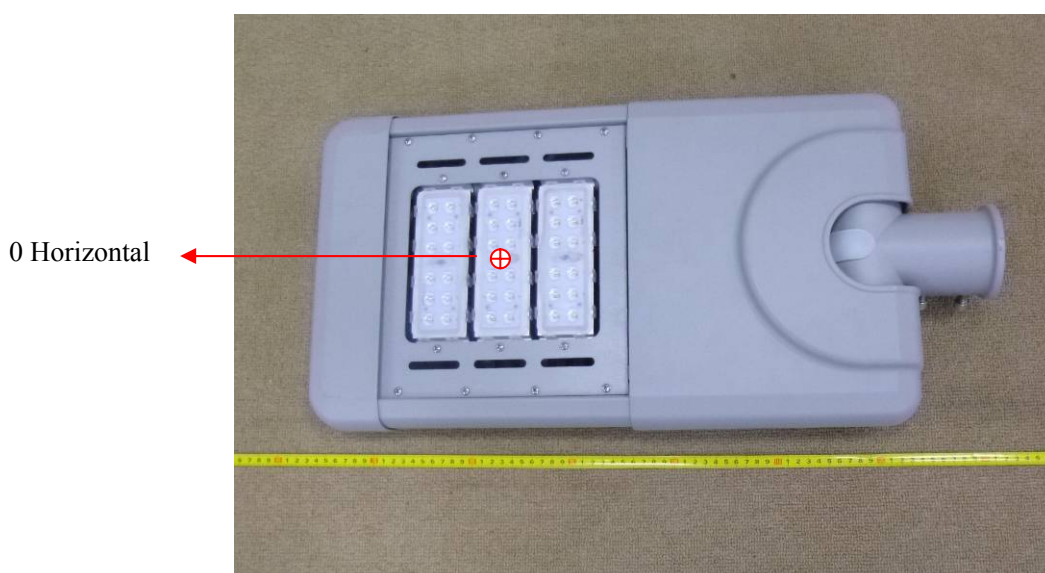


Figure 1- Overview of the sample

Equipment Under Test (EUT)

Name	: 80W Area Light
Model	: ABRW80LED50III
Electrical Ratings	: 100-277V ac, 50/60Hz, 80W
Product Description	: 5000K, Outdoor Pole/Arm-Mounted Area and Roadway Luminaires Manufacturer of light source: Philips Model of light source: Luxeon T Quantity of light source: 36pcs
Manufacturer	: ABB Lighting (Shanghai) Co., Ltd.
Address	: Room 1012, North Minch Fortune 108 Plaza,# 1839 Qixin road, Shanghai

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TEST RESULTS

Test ambient temperature was 25.0°C.

Sample 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 95 minutes.

Goniophotometer Method

The photometric distance is 2.475m.

Luminous data was taken at 0.5°vertical intervals and 5°horizontal intervals.

Parameter	Result			Special Color Rendering Indices	
Test Voltage (V)	120.0	100.0	277.0	R1	84
Voltage frequency (Hz)	60	60	60	R2	85
Test Current (A)	0.654	0.793	0.293	R3	84
Power Factor	0.9910	0.9909	0.9531	R4	84
Test Power (W)	77.82	78.60	77.37	R5	85
Off-State Power (W)	0	0	0	R6	79
THD A%	8.88	9.15	13.97	R7	86
Luminous Efficacy (lm/W)	100.5	101.3	102.5	R8	75
Total Luminous Flux (lm)	7818.3	7962.2	7930.4	R9	26
Color Rendering Index (CRI)	82.7			R10	63
R9	26			R11	85
Correlated Color Temperature (CCT) (K)	4949			R12	64
Chromaticity (Chroma x, Chroma y)	(0.3474, 0.3613)			R13	83
Chromaticity (Chroma u, Chroma v)	(0.2092, 0.3265)			R14	91
Chromaticity (Chroma u', Chroma v')	(0.2092, 0.4897)				
Duv	0.0040				
Beam Angle (°)	80.5° (0-180°)/ 147.6° (90°-270°)				
Center Beam Candle Power (cd)	2278				
Zonal Lumens in the 0°-60°Zone	78.53%				
Zonal Lumens in the 60°-90°Zone	21.47%				
Zonal Lumens in the 90°-120°Zone	0.00%				
Zonal Lumens in the 120°-180°Zone	0.00%				

Table 2: Test data per Goniophotometer Method

Spectral Power Distribution

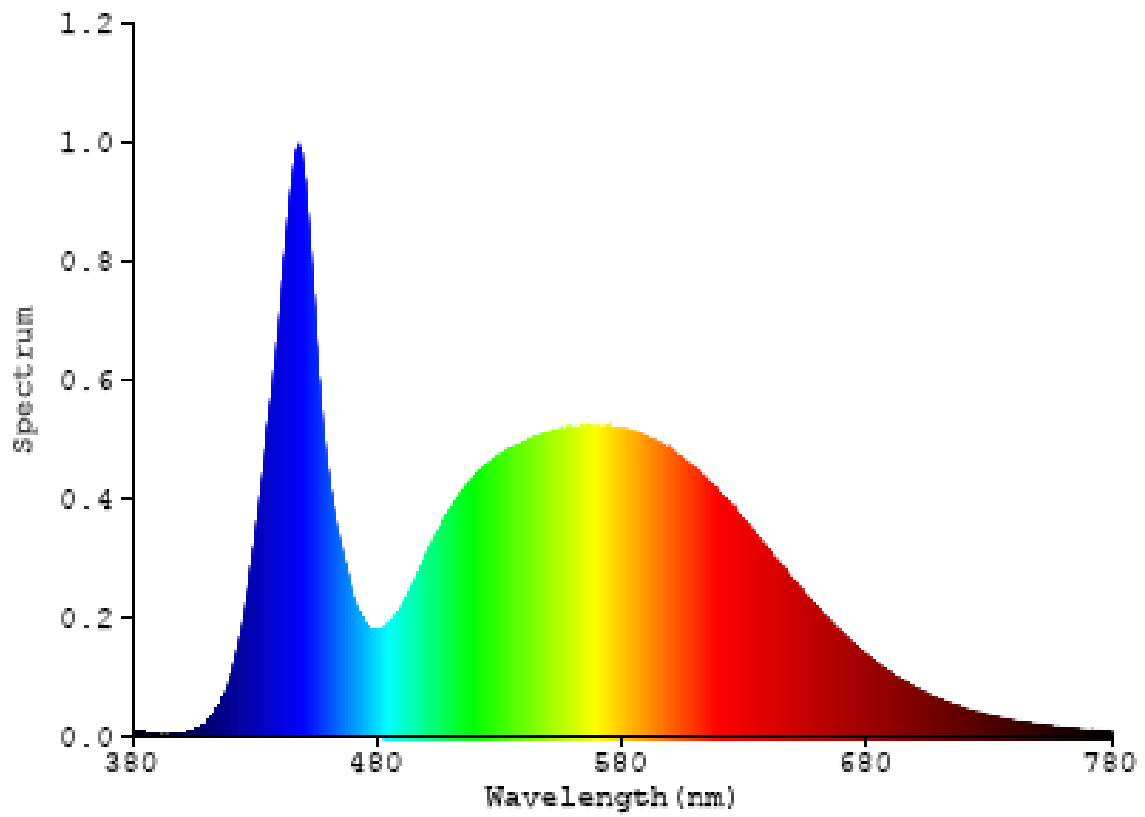


Chart 1: Spectral Power Distribution

IESNA Luminaire Flux Distribution Table

Zone	Lumens	Luminaire %
FL - Front-Low (0-30)	1023.6	13.1
FM - Front-Medium (30-60)	2888.3	36.9
FH - Front-High (60-80)	1174.7	15.0
FVH - Front-Very High (80-90)	18.5	0.2
Total Forward Light	5105.1	65.2

BL - Back-Low (0-30)	782.3	10.0
BM - Back-Medium (30-60)	1445.3	18.5
BH - Back-High (60-80)	472.1	6.0
BVH - Back-Very High (80-90)	13.6	0.2
Total Back Light	2713.3	34.7

UL - Uplight-Low (90-100)	0	0
UH - Uplight-High (100-180)	0	0
Total Up Light	0	0

BUG (Back, Up, Glare) Rating	B2-U0-G1
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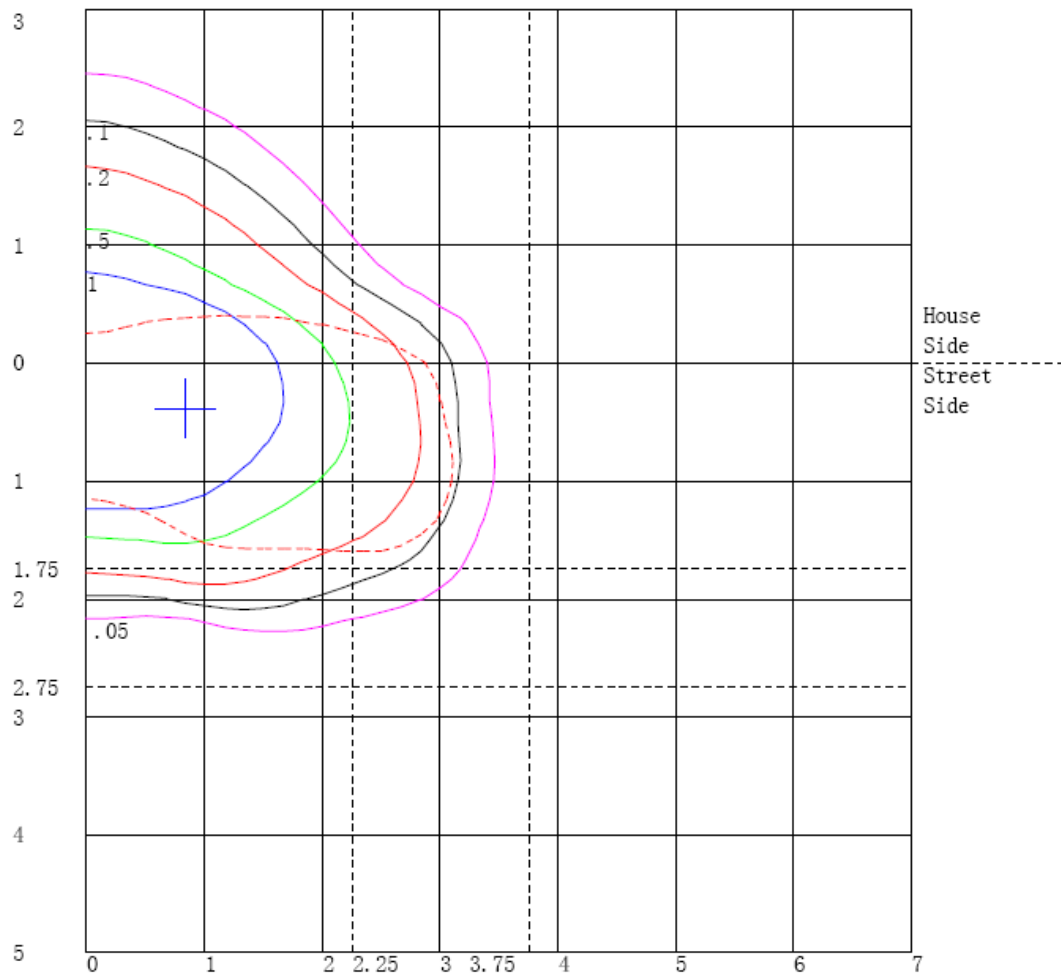
Table 3: Flux Distribution Data

Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	2713.3	0	2713.3
Street Side	5105.1	0	5105.1

Table 4: Flux Distribution Table

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

Isoilluminance Plots of Horizontal Illuminance



Distance In Units Of Mounting Height

Values Based On 20 Foot Mounting Height

1/2 Maximum Candela Trace Shown As Dashed Curve

(+) = Maximum Candela Point

Chart 2: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots

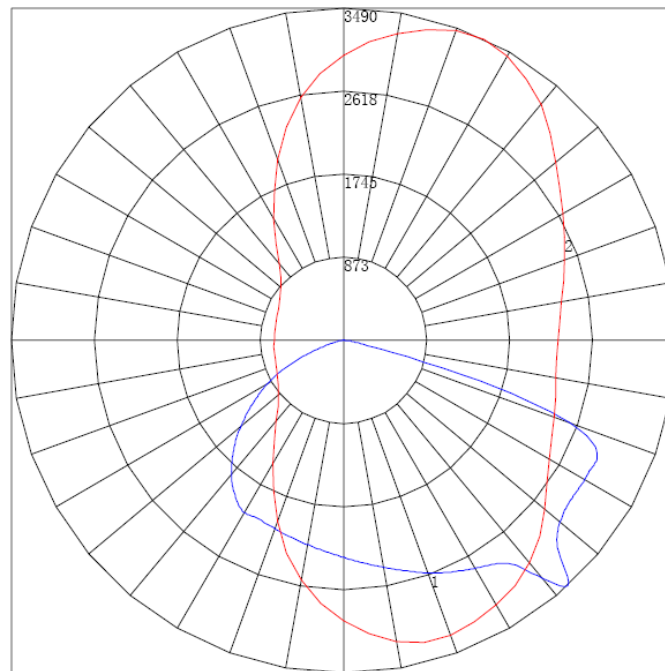


Chart 3: Maximum Plane and Cone Plots of Candela

Maximum Candela = 3490.22 Located At Horizontal Angle = 65, Vertical Angle = 42.5

1 - Vertical Plane Through Horizontal Angles (65 - 245) (Through Max. Cd.)

2 - Horizontal Cone Through Vertical Angle (42.5) (Through Max. Cd.)

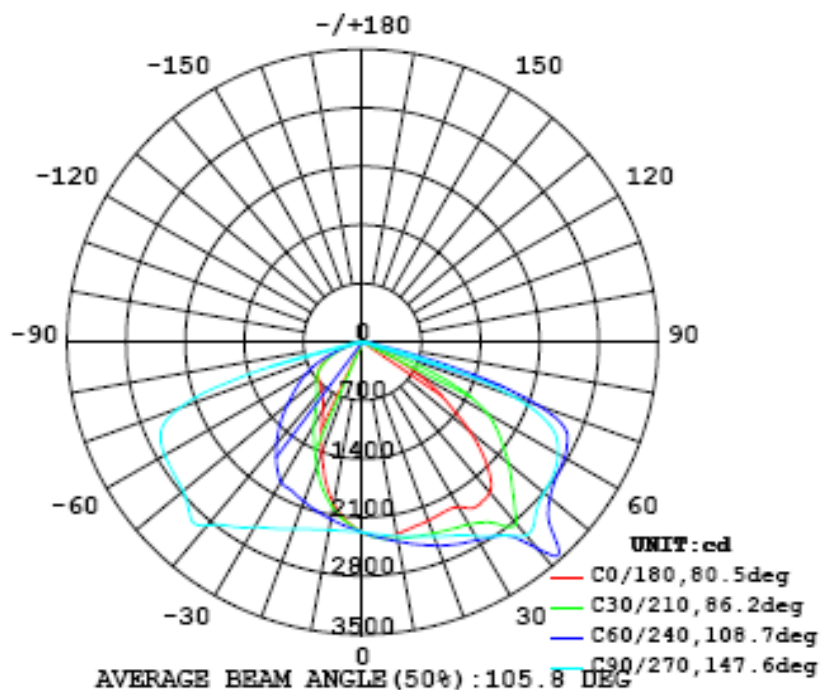


Chart 4: Polar Candela Distribution

Luminous Intensity Data

Table--1

UNIT: cd

C (DEG) γ (DEG)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278
5	2344	2347	2349	2352	2353	2354	2355	2356	2356	2355	2353	2351	2349	2345	2340	2335	2329	2321	2312
10	2335	2344	2351	2360	2370	2381	2392	2402	2411	2418	2421	2423	2423	2420	2412	2403	2391	2376	2358
15	2296	2311	2326	2344	2364	2386	2409	2433	2455	2474	2491	2502	2507	2504	2496	2482	2464	2440	2411
20	2274	2295	2318	2345	2375	2406	2438	2469	2501	2529	2554	2576	2593	2598	2592	2577	2552	2519	2477
25	2253	2279	2309	2348	2390	2432	2473	2510	2548	2583	2614	2643	2667	2682	2686	2677	2650	2609	2555
30	2280	2306	2336	2375	2423	2474	2522	2565	2603	2637	2667	2701	2735	2763	2778	2779	2760	2727	2680
35	2390	2415	2448	2490	2539	2589	2636	2678	2711	2738	2764	2790	2825	2858	2890	2919	2929	2900	2830
40	2346	2383	2440	2520	2614	2721	2838	2951	3052	3130	3179	3204	3226	3262	3298	3293	3238	3149	3018
45	2090	2111	2154	2219	2301	2403	2519	2627	2727	2839	2959	3069	3163	3232	3254	3218	3135	3032	2904
50	1665	1695	1763	1857	1967	2104	2258	2410	2552	2659	2741	2824	2900	2972	3034	3049	3008	2928	2809
55	1180	1213	1298	1426	1594	1799	1993	2158	2320	2478	2604	2703	2807	2918	3019	3062	3020	2921	2763
60	739	767	855	991	1181	1438	1709	1918	2063	2218	2412	2599	2765	2927	3070	3124	3055	2898	2675
65	286	286	299	340	491	788	1129	1416	1642	1838	2083	2390	2681	2941	3155	3216	3080	2821	2496
70	164	168	164	143	126	144	273	539	811	1062	1366	1794	2218	2522	2706	2683	2457	2178	1897
75	110	116	117	103	91.7	98.5	108	117	147	233	426	722	901	882	862	817	687	597	527
80	60.5	59.2	59.5	58.3	56.5	60.9	67.3	70.4	71.6	79.8	97.9	118	139	173	175	125	93.2	82.8	83.6
85	3.51	4.84	4.69	5.01	6.14	5.15	4.38	8.30	9.81	9.48	12.6	22.0	32.9	35.6	27.6	18.3	12.5	9.14	11.2
90	0.06	0.05	0.05	0.05	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06

Table 5: Luminous Intensity Data

Table--2

UNIT: cd

C (DEG) γ (DEG)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
0	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278
5	2303	2293	2282	2270	2259	2247	2235	2223	2212	2201	2191	2182	2174	2167	2161	2156	2153	2151	2149
10	2336	2314	2288	2261	2234	2206	2177	2148	2120	2093	2067	2044	2024	2005	1990	1978	1971	1965	1963
15	2376	2339	2297	2254	2208	2159	2107	2054	2001	1949	1900	1854	1814	1778	1749	1729	1716	1708	1707
20	2429	2377	2318	2253	2180	2100	2016	1928	1840	1755	1676	1606	1547	1498	1460	1432	1415	1409	1413
25	2493	2427	2352	2265	2163	2047	1921	1793	1672	1558	1458	1373	1303	1245	1201	1172	1155	1150	1156
30	2617	2535	2431	2302	2146	1971	1793	1623	1469	1335	1224	1136	1067	1016	980	958	946	944	951
35	2727	2600	2441	2243	2013	1781	1571	1384	1223	1092	996	931	887	858	839	828	823	823	829
40	2850	2646	2395	2109	1829	1577	1349	1156	1014	918	856	815	788	770	760	754	752	752	756
45	2734	2515	2234	1919	1621	1351	1127	971	874	813	774	748	730	720	715	713	713	713	714
50	2642	2399	2061	1704	1383	1124	949	845	782	739	711	695	682	676	676	680	682	682	683
55	2552	2240	1826	1437	1131	931	817	748	701	670	646	629	618	615	620	631	640	643	645
60	2389	1981	1496	1111	872	747	673	624	588	562	544	531	523	520	528	545	560	567	570
65	2074	1525	1010	713	581	514	470	441	421	409	402	398	397	400	411	433	448	453	460
70	1436	822	443	327	286	264	252	247	246	248	251	255	261	267	277	291	298	302	313
75	373	179	121	110	108	110	114	118	121	123	128	134	140	146	139	120	115	118	123
80	80.8	69.3	55.9	50.8	49.5	50.8	53.0	54.9	56.8	57.8	58.4	62.7	62.9	55.5	52.4	53.6	53.3	53.1	55.0
85	17.0	19.5	19.1	19.2	18.7	17.5	17.7	17.2	17.3	17.8	17.5	17.0	15.5	14.5	14.6	14.8	15.2	16.7	18.5
90	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.08

Table 6: Luminous Intensity Data

Table--3

UNIT: cd

γ (DEG) \ C (DEG)	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280
0	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278
5	2150	2152	2155	2159	2165	2171	2179	2186	2195	2204	2214	2223	2233	2243	2253	2262	2270	2279	2287
10	1966	1974	1985	1999	2016	2036	2058	2081	2105	2130	2154	2178	2202	2225	2246	2266	2284	2300	2315
15	1717	1734	1757	1787	1822	1861	1904	1949	1997	2047	2096	2141	2183	2223	2258	2290	2320	2346	2366
20	1426	1450	1485	1529	1583	1648	1721	1800	1878	1955	2031	2106	2175	2238	2293	2341	2383	2420	2448
25	1170	1196	1233	1283	1347	1425	1517	1620	1735	1855	1971	2078	2178	2266	2343	2408	2464	2510	2545
30	966	993	1032	1085	1154	1241	1346	1469	1612	1770	1933	2088	2225	2340	2429	2498	2558	2611	2651
35	838	854	879	913	962	1032	1129	1252	1400	1577	1779	1988	2188	2363	2500	2608	2695	2754	2781
40	762	772	787	810	843	887	953	1053	1195	1371	1583	1833	2102	2355	2567	2734	2863	2957	3008
45	717	722	732	747	769	798	839	903	1007	1166	1377	1635	1932	2233	2499	2719	2899	3045	3164
50	684	685	688	696	708	727	755	796	863	977	1159	1409	1723	2067	2370	2602	2776	2903	2983
55	641	635	634	638	645	657	675	705	752	826	958	1173	1479	1859	2236	2527	2737	2881	2960
60	561	550	547	549	553	561	576	601	640	696	782	934	1198	1592	2045	2425	2707	2910	3027
65	451	435	430	429	429	430	437	453	480	520	576	664	841	1193	1710	2233	2641	2952	3163
70	310	298	295	292	289	287	287	289	296	310	334	374	450	659	1143	1790	2306	2671	2976
75	137	159	166	163	160	157	156	157	159	161	164	170	185	226	444	842	1076	1177	1376
80	55.0	58.0	67.0	76.8	78.4	75.7	74.3	74.2	74.8	74.6	73.5	73.4	74.1	79.7	93.6	109	135	180	232
85	18.9	19.9	21.1	22.9	24.9	26.0	26.2	24.9	24.4	25.9	28.4	31.0	33.1	34.1	37.2	37.2	31.6	29.2	35.0
90	0.08	0.09	0.09	0.10	0.11	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.10	0.09

Table 7: Luminous Intensity Data

Table--4

UNIT: cd

γ (DEG) \ C (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
0	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278	2278				
5	2294	2300	2305	2311	2316	2319	2322	2325	2327	2329	2332	2334	2336	2338	2341				
10	2325	2333	2339	2342	2343	2342	2338	2334	2331	2328	2325	2323	2323	2325	2329				
15	2380	2387	2388	2382	2372	2360	2346	2330	2316	2305	2295	2287	2282	2281	2285				
20	2462	2466	2460	2447	2429	2406	2382	2357	2333	2312	2294	2281	2269	2262	2262				
25	2562	2564	2553	2535	2510	2480	2445	2408	2372	2337	2303	2276	2258	2245	2241				
30	2667	2662	2640	2609	2577	2546	2514	2472	2422	2378	2339	2305	2283	2272	2268				
35	2777	2751	2719	2685	2657	2631	2606	2588	2564	2527	2492	2457	2423	2399	2386				
40	2998	2951	2920	2916	2926	2936	2912	2844	2756	2653	2542	2450	2382	2343	2334				
45	3245	3269	3226	3140	3029	2882	2714	2577	2484	2405	2317	2237	2170	2119	2094				
50	3006	2972	2908	2830	2724	2597	2486	2392	2257	2098	1963	1865	1784	1713	1673				
55	2969	2897	2783	2665	2540	2425	2302	2141	1967	1793	1613	1447	1317	1229	1186				
60	3042	2936	2759	2571	2385	2210	2045	1913	1757	1513	1250	1053	917	810	751				
65	3219	3072	2798	2510	2213	1953	1800	1626	1361	1031	664	426	357	320	297				
70	3130	3001	2678	2264	1789	1410	1170	904	549	273	164	135	157	168	166				
75	1588	1614	1516	1318	910	523	304	185	122	111	100	98.1	112	123	117				
80	280	283	247	221	175	110	91.6	82.5	80.6	74.8	65.7	59.8	59.4	61.8	61.6				
85	47.2	66.8	77.0	64.7	45.4	32.6	28.4	27.9	23.0	17.4	11.7	7.78	5.44	3.85	3.02				
90	0.09	0.09	0.08	0.08	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06				

Table 8: Luminous Intensity Data

EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Goniophotometer system	GO-R5000	HZTE011-01	Sep. 18, 2014	Sep. 17, 2015
Digital Power Meter	PF2010A	HZTE028-01	Sep. 18, 2014	Sep. 17, 2015
AC Power Supply	PCR 500L	HZTE001-08	Sep. 18, 2014	Sep. 17, 2015
DC Power Supply	WY12010	HZTE004-03	Sep. 18, 2014	Sep. 17, 2015
Temperature Meter	TES1310	HZTE017-01	Sep. 18, 2014	Sep. 17, 2015
Standard Source	D908	HZTE012-01	Sep. 18, 2014	Sep. 17, 2015

Table 9: 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 1.8% with a coverage factor k=2.

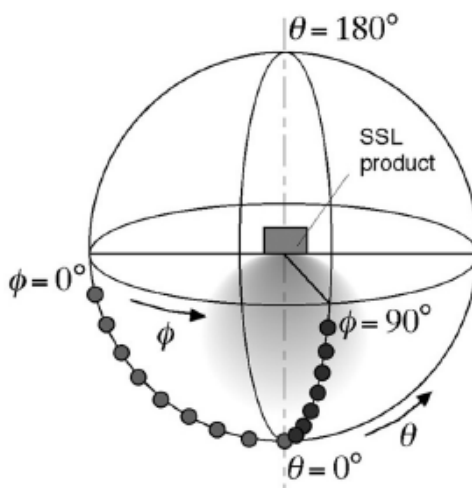
Color Characteristics Measurements

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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