NVLAP LAB CODE 200960-0

LM-79-08 Test Report

for

ABBlighting, Inc.

1501 Industrial Way N. Toms River, NJ 08755

Model T Led Light

Model: MT100501-VW

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

No.1805, DongLiu road, BinJiang District, Hangzhou, China

Tel: +86-571-56680806

www.ledtestlab.com

Report No.: HZ16050033a

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

Reviewed by:

Engineer: April Zou

May 23, 2016

Approved by:

Manager: Jim Zhang

May 23, 2016

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: **MT100501-VW**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
120.5	12429.0	103.13	0.9936

CCT (K)	CRI	Stabilization Time (Light & Power)
5067	68.1	60

Table 1: Executive Data Summary

Test specifications:

Date of Receipt	: May 18, 2016
Date of Test	: May 18, 2016
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

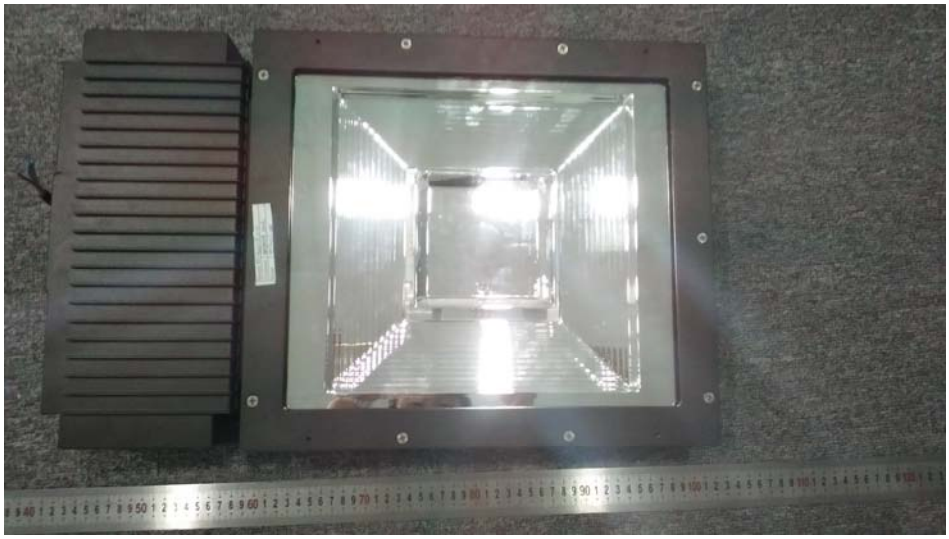


Figure 1- Overview of the sample

Equipment Under Test (EUT)	
Name	: Model T Led Light
Model	: MT100501-VW
Electrical Ratings	: 100~277Vac, 50/60Hz, 100W
Product Description	: 5000K, Aluminum Enclosure, Black Coating, Silver reflector Manufacturer of light source: Samsung Model of light source: 351B Quantity of LED light source: 48 (12S4P)
Manufacturer	: ABB Lighting (shanghai) Co., Ltd.
Address	: Room 1012, North Minch Fortune 108 Plaza,# 1839 Qixin road, Shanghai

TEST RESULTS

Test ambient temperature was 24.2℃.

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 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	100.0	277.0
Voltage frequency (Hz)	60	60	60
Test Current (A)	0.865	1.042	0.401
Power Factor	0.9936	0.9957	0.9220
Test Power (W)	103.13	103.73	102.52
THD A%	7.80	7.35	15.51
Luminous Efficacy (lm/W)	120.5	120.1	121.5
Total Luminous Flux (lm)	12429.0	12458.0	12458.0
Color Rendering Index (CRI)	68.1		
R9	-38.1		
Correlated Color Temperature (CCT) (K)	5067		
Chromaticity (Chroma x, Chroma y)	(0.3436, 0.3545)		
Chromaticity (Chroma u, Chroma v)	(0.2093, 0.3239)		
Chromaticity (Chroma u', Chroma v')	(0.2093, 0.4859)		
Duv	0.0021		
Average Beam Angle (°)	151.9		
Center Beam Candle Power (cd)	1703		
Spacing Criteria	2.00 (0°-180°)/ 2.08 (90°-270°)		
Zonal Lumens in the 0°-60°Zone	65.89%		
Zonal Lumens in the 60°-90°Zone	34.11%		
Zonal Lumens in the 90°-120°Zone	0.00%		
Zonal Lumens in the 120°-180°Zone	0.00%		

Special Color Rendering Indices	
R1	66.3
R2	72.6
R3	76.2
R4	69.4
R5	66.7
R6	61.7
R7	77.3
R8	54.7
R9	-38.1
R10	34
R11	66
R12	36
R13	66.4
R14	86.4

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

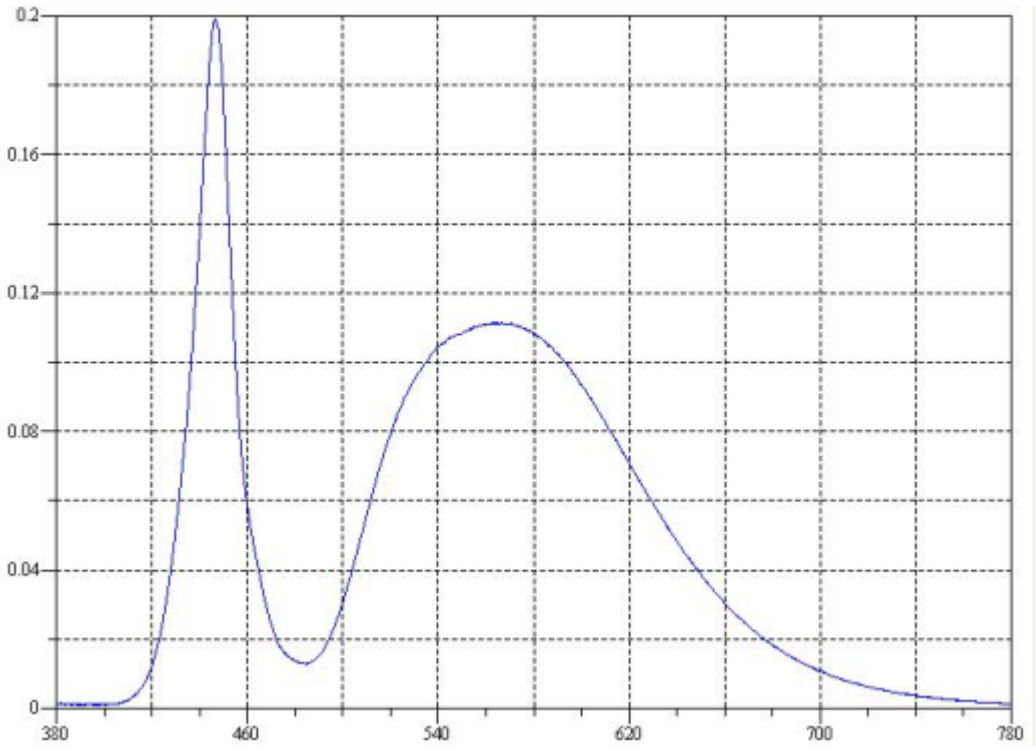


Chart 1: Spectral Power Distribution

Zonal Lumen Tabulation

γ(°)	Lumens	% Total
0- 10	152.696	1.23%
10- 20	523.713	4.21%
20- 30	1003.897	8.08%
30- 40	1611.048	12.96%
40- 50	2261.35	18.19%
50- 60	2636.305	21.21%
60- 70	2879.433	23.17%
70- 80	1317.246	10.60%
80- 90	43.374	0.35%
90-100	0	0.00%
100-110	0	0.00%
110-120	0	0.00%
120-130	0	0.00%
130-140	0	0.00%
140-150	0	0.00%
150-160	0	0.00%
160-170	0	0.00%
170-180	0	0.00%
Total	12429.1	100%

γ(°)	Lumens	% Total
0- 60	8189.009	65.89%
60- 90	4240.053	34.11%
0-90	12429.062	100.00%
90- 180	0	0.00%
0- 180	12429.1	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.

Illuminance Plots

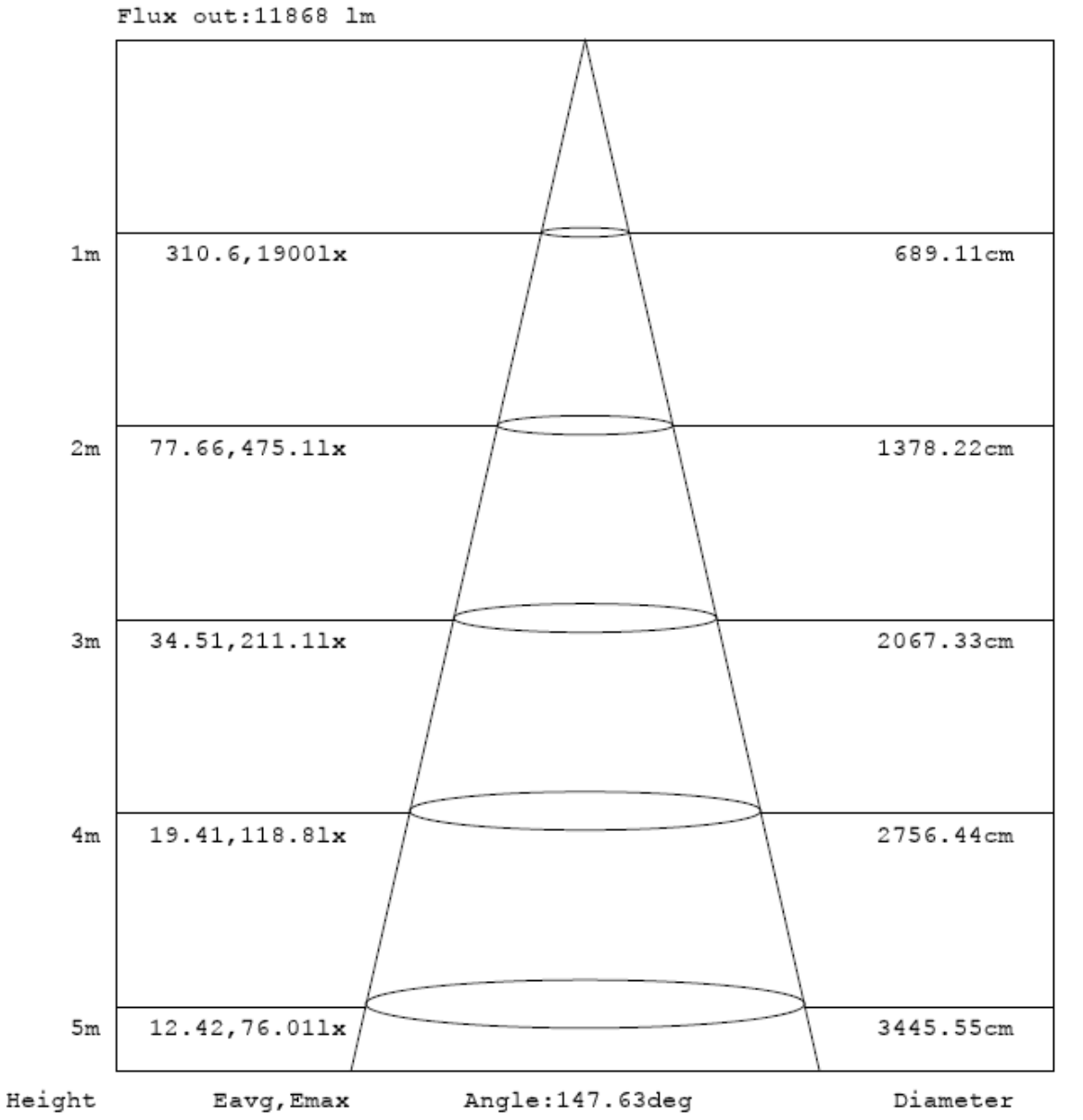


Chart 2: Beam Angle

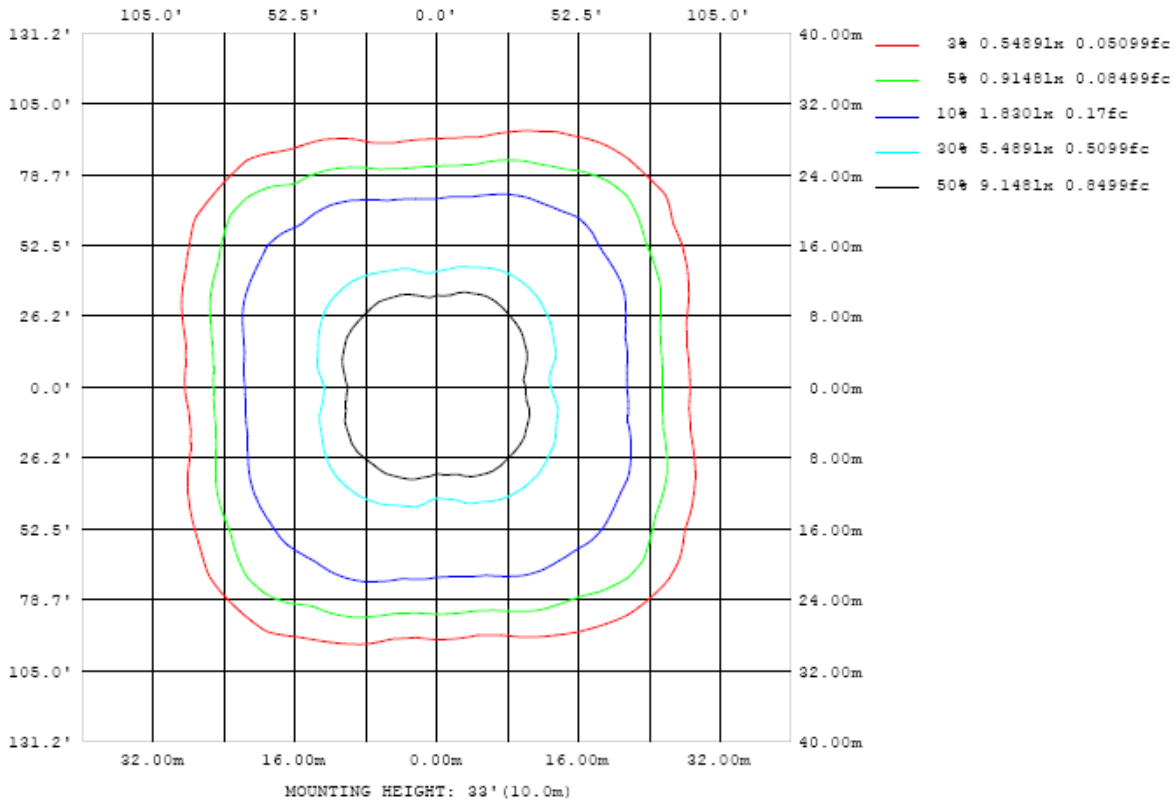


Chart 3: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots

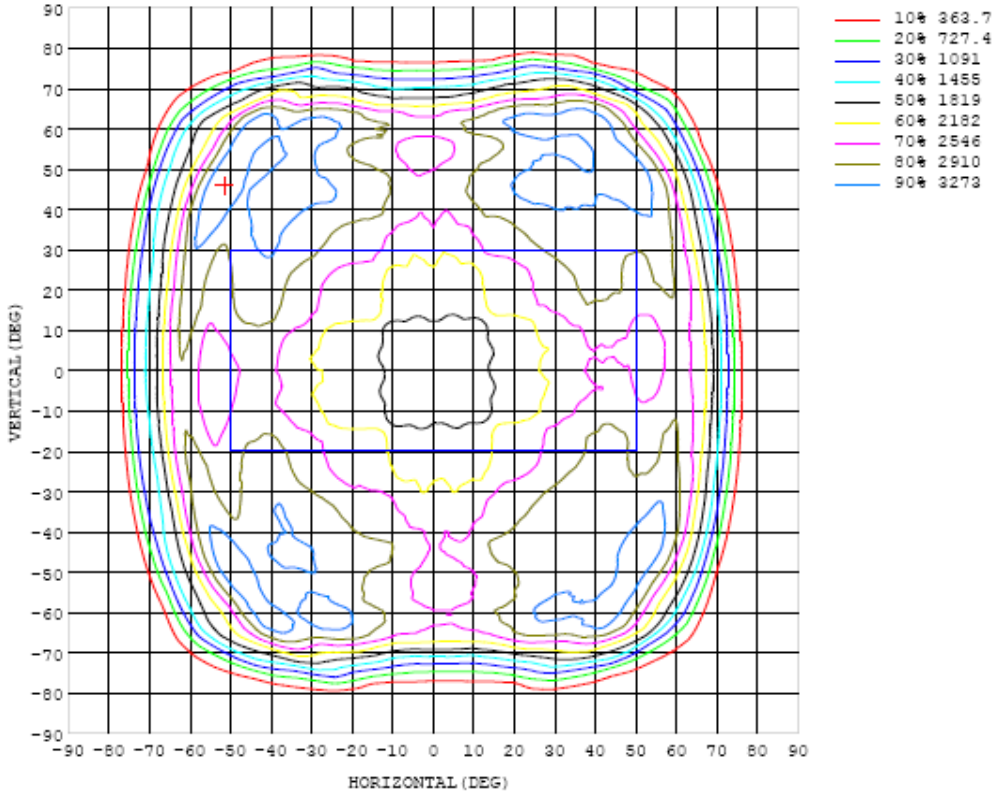


Chart 4: Isocandela Plot

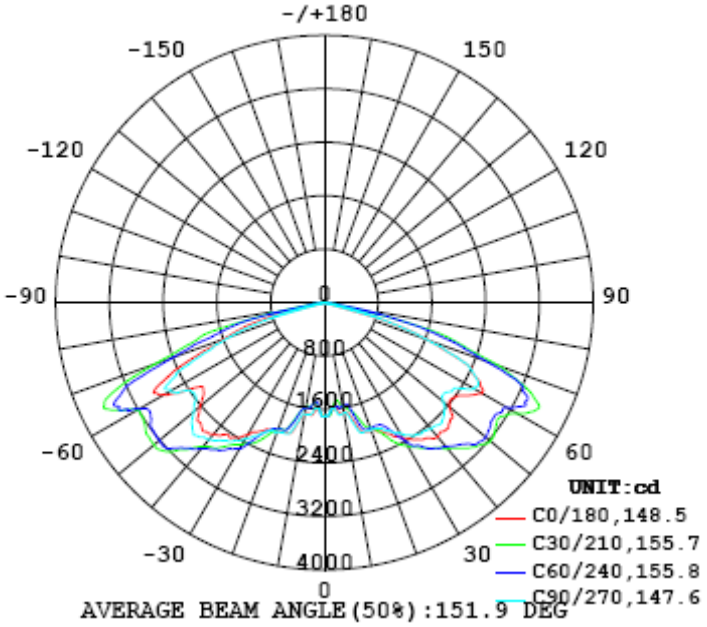


Chart 5: Polar Candela Distribution

Luminous Intensity Data

Table--1 UNIT: cd

γ (DEG) \ C (DEG)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703
5	1591	1587	1586	1592	1589	1569	1541	1518	1512	1523	1542	1564	1580	1585	1584	1581	1582	1583	1587
10	1668	1670	1649	1597	1567	1562	1573	1610	1638	1612	1572	1564	1565	1583	1631	1676	1673	1672	1676
15	1945	1904	1812	1744	1735	1755	1712	1661	1648	1654	1703	1769	1788	1770	1821	1897	1988	1994	1997
20	2038	1980	1902	1941	2016	1986	1992	2055	2108	2093	2025	1994	1995	2007	1919	1919	2004	2035	2028
25	2153	2049	2021	2101	2055	2092	2227	2330	2336	2326	2298	2150	2025	2030	2058	1962	2013	2126	2104
30	2347	2233	2287	2278	2300	2468	2476	2428	2392	2366	2395	2435	2381	2223	2246	2224	2153	2303	2256
35	2509	2393	2505	2479	2663	2697	2654	2616	2604	2598	2619	2606	2663	2615	2427	2448	2335	2497	2408
40	2627	2531	2648	2777	2884	2848	2857	2858	2897	2914	2875	2845	2815	2804	2672	2546	2448	2557	2474
45	2618	2637	2727	2987	2996	2997	3069	3106	3122	3112	3082	3033	2990	2970	2938	2652	2585	2564	2479
50	2436	2553	2709	2920	3007	3107	3225	3203	3190	3204	3237	3224	3130	2972	2856	2630	2477	2368	2307
55	2433	2568	2788	2814	2908	3082	3132	3198	3266	3261	3218	3138	3052	2878	2733	2684	2468	2358	2316
60	2716	2845	2995	3010	3175	3265	3330	3252	3121	3106	3211	3265	3146	3035	2902	2844	2718	2574	2572
65	2423	2511	2580	2865	3153	3457	3476	3417	3318	3261	3312	3355	3337	3071	2867	2590	2512	2417	2429
70	1655	1659	1775	2060	2359	2573	2764	2987	3244	3393	3148	2757	2549	2375	2122	1791	1635	1641	1636
75	563	609	692	871	1153	1414	1745	2011	1957	1948	1924	1750	1549	1234	963	804	700	671	654
80	42.9	52.2	39.1	62.3	178	281	284	276	333	323	404	432	455	348	145	96.8	86.6	81.2	83.2
85	4.98	4.79	5.64	5.64	7.23	8.71	9.27	8.08	11.9	10.5	8.61	12.5	11.6	13.1	13.1	8.20	7.83	7.62	8.07
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 4: Luminous Intensity Data

Table--2 UNIT: cd

γ (DEG) \ C (DEG)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
0	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703
5	1587	1570	1539	1509	1490	1485	1487	1491	1498	1516	1544	1574	1596	1604	1605	1608	1611	1613	1613
10	1643	1585	1573	1576	1587	1636	1678	1689	1652	1594	1560	1558	1568	1601	1659	1687	1684	1685	1680
15	1903	1859	1836	1872	1840	1768	1706	1669	1709	1783	1860	1899	1880	1883	1923	2002	2034	2025	1969
20	1927	1931	2034	2012	1990	2042	2148	2250	2191	2076	2011	2006	2020	1946	1910	1989	2054	2056	1942
25	1996	2076	2063	2048	2138	2306	2329	2329	2338	2346	2231	2077	2041	2065	1972	1977	2101	2109	1968
30	2158	2264	2230	2335	2481	2459	2422	2391	2378	2389	2433	2426	2249	2211	2230	2161	2305	2287	2153
35	2403	2458	2508	2701	2674	2627	2571	2561	2546	2561	2622	2671	2660	2477	2482	2362	2514	2468	2403
40	2582	2576	2783	2825	2813	2805	2822	2855	2858	2834	2828	2829	2881	2796	2674	2563	2649	2569	2620
45	2649	2730	2943	2973	2950	2992	3034	3062	3071	3085	3099	3102	3105	3087	2803	2727	2686	2596	2747
50	2494	2747	2853	2941	3065	3188	3195	3201	3247	3276	3286	3143	3060	2984	2806	2631	2493	2418	2601
55	2497	2706	2734	2859	3034	3141	3262	3310	3306	3274	3226	3117	2873	2728	2645	2417	2242	2208	2397
60	2712	2870	2899	3018	3128	3274	3269	3215	3194	3184	3148	3108	3062	2980	2986	2863	2725	2751	2880
65	2562	2596	2872	3094	3389	3428	3350	3207	3185	3343	3469	3460	3246	2985	2694	2616	2512	2513	2615
70	1600	1731	2068	2334	2570	2675	3042	3336	3367	3066	2663	2506	2270	1960	1703	1562	1541	1584	1577
75	702	802	954	1232	1512	1765	1891	1872	1902	1944	1904	1729	1398	1091	886	803	780	836	868
80	87.9	87.6	135	288	439	447	450	476	422	447	443	411	308	125	76.4	73.2	58.2	68.8	79.4
85	8.42	8.95	14.4	16.7	22.1	18.1	18.2	22.3	25.0	23.8	32.1	23.6	17.8	15.7	11.7	10.5	9.99	9.87	10.1
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 5: 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	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703
5	1612	1601	1573	1539	1503	1482	1474	1473	1473	1476	1484	1506	1539	1572	1591	1596	1594	1598	1597
10	1631	1571	1552	1555	1577	1625	1668	1684	1679	1641	1600	1588	1585	1594	1651	1689	1692	1696	1689
15	1901	1873	1910	1917	1865	1793	1717	1691	1746	1811	1889	1922	1888	1894	1931	2019	2028	2021	1942
20	1902	1980	2014	2008	2018	2114	2244	2277	2174	2052	2014	2023	2040	1941	1940	2039	2063	2027	1931
25	1998	2052	2049	2120	2273	2347	2350	2339	2355	2315	2155	2057	2061	2084	2014	2102	2153	2051	1985
30	2254	2215	2285	2446	2457	2407	2396	2384	2416	2471	2528	2374	2282	2324	2200	2275	2354	2192	2248
35	2476	2510	2711	2709	2635	2577	2577	2581	2607	2666	2702	2718	2527	2475	2434	2423	2527	2354	2504
40	2657	2841	2873	2826	2814	2856	2907	2887	2846	2811	2856	2901	2877	2683	2684	2559	2678	2545	2668
45	2834	3067	3129	3108	3136	3136	3101	3098	3128	3100	3078	3100	3099	2900	2811	2645	2765	2742	2837
50	2840	3002	3079	3213	3313	3307	3314	3299	3297	3344	3203	3102	3011	2902	2643	2458	2543	2634	2770
55	2652	2710	2880	3114	3258	3389	3440	3431	3389	3250	3159	2932	2774	2724	2483	2299	2366	2485	2701
60	3028	3018	3075	3122	3211	3279	3283	3316	3316	3305	3192	3143	2933	2979	2824	2652	2643	2790	2959
65	2661	2951	3249	3560	3611	3474	3245	3200	3380	3517	3408	3118	2933	2589	2514	2366	2344	2531	2569
70	1716	1952	2213	2478	2671	3081	3386	3428	3009	2497	2390	2203	1900	1614	1488	1496	1499	1560	1666
75	965	1172	1368	1662	1859	1798	1746	1869	1819	1712	1477	1152	959	740	670	650	645	676	763
80	70.5	123	294	394	396	396	341	423	451	370	332	272	93.0	45.2	42.3	38.9	37.6	44.4	49.3
85	10.6	17.0	20.5	20.6	20.2	17.6	22.0	17.1	14.4	13.1	17.4	19.6	14.3	8.11	7.35	6.93	6.96	7.09	7.64
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 6: 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	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703	1703				
5	1595	1591	1580	1559	1530	1505	1490	1485	1495	1524	1559	1586	1600	1598	1595				
10	1645	1596	1590	1583	1577	1606	1653	1653	1609	1577	1565	1565	1614	1671	1680				
15	1872	1833	1830	1841	1772	1692	1661	1683	1730	1776	1776	1754	1789	1874	1952				
20	1931	2037	2028	1999	2046	2133	2165	2128	2032	2002	2028	1994	1904	1934	2038				
25	2082	2056	2051	2177	2341	2342	2359	2343	2291	2165	2081	2111	2071	2037	2145				
30	2283	2252	2401	2469	2420	2387	2425	2445	2491	2531	2380	2278	2313	2241	2320				
35	2482	2619	2704	2658	2658	2628	2635	2641	2691	2722	2742	2562	2505	2434	2445				
40	2769	2910	2866	2885	2892	2933	2946	2906	2871	2870	2895	2862	2660	2622	2533				
45	3092	3089	3108	3186	3171	3159	3163	3154	3119	3021	3002	2968	2778	2661	2498				
50	2993	3138	3244	3367	3357	3313	3268	3245	3233	3124	3007	2944	2802	2534	2353				
55	2790	2947	3168	3269	3353	3369	3351	3312	3183	3111	2957	2843	2797	2554	2378				
60	2933	3082	3124	3195	3233	3243	3224	3344	3372	3303	3168	3061	3014	2877	2724				
65	2903	3130	3419	3521	3416	3277	3333	3476	3580	3458	3173	2911	2630	2562	2438				
70	1923	2227	2345	2654	3081	3356	3323	3106	2735	2618	2397	2094	1827	1667	1668				
75	921	1204	1516	1733	1906	1904	1849	1859	1698	1506	1185	930	721	610	568				
80	83.0	254	368	351	439	311	274	344	294	311	212	67.6	32.1	35.7	31.5				
85	13.6	19.8	17.3	17.8	9.16	11.6	14.2	10.6	10.4	8.80	9.23	5.56	4.59	4.24	4.08				
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
135	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
155	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
165	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				

Table 7: Luminous Intensity Data

EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Goniophotometer system	GO-R5000	HZTE011-01	Jul. 17, 2015	Jul. 16, 2016
Digital Power Meter	PF2010A	HZTE028-01	Jul. 17, 2015	Jul. 16, 2016
AC Power Supply	PCR 500L	HZTE001-08	Jul. 17, 2015	Jul. 16, 2016
DC Power Supply	WY12010	HZTE004-03	Jul. 17, 2015	Jul. 16, 2016
Temperature Meter	TES1310	HZTE017-01	Jul. 17, 2015	Jul. 16, 2016
Standard Source	D908	HZTE012-01	Jul. 23, 2015	Jul. 22, 2016
Standard source	SCL-1400	HZTE012-02	Oct. 21, 2015	Oct. 20, 2016

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

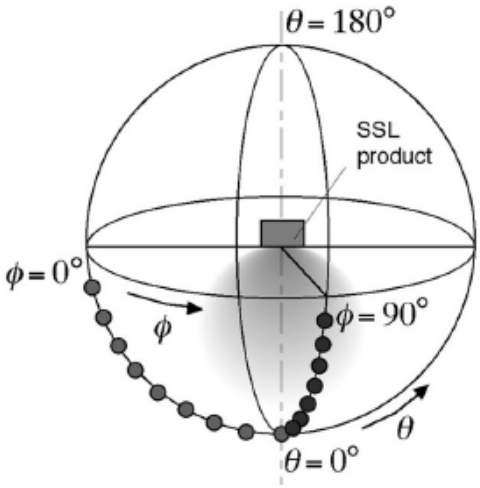
An EVERFINE Type C Model GO-R5000 Goniophotometer was used to measure the intensity at each angle of distribution for each sample. The photometric distance is 2.475m for near-field measurement or 30m for far-field measurement. Bandwidth of spectroradiometer is 380nm-780nm.
Ambient temperature was measured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