

LM-79-08 Test Report

for

ABOVE ALL LIGHTING INC

1501 Industrial Way N. Toms River, NJ 08755.

MT LED Area Light

Model: MT100406-VW

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

Tel: +86-571-56680806

www.ledtestlab.com

Report No.: HZ17080006c

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

Test specifications:

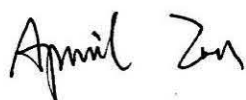
Date of Receipt : Jul. 24, 2017

Date of Test : Jul. 25, 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

Reviewed by:



Engineer: April Zou

Jul. 25, 2017

Approved by



Manager: Jim Zhang

Jul. 25, 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: MT100406-VW

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
103.4	11885.0	114.96	0.9561
CCT (K)	CRI	Stabilization Time (Light & Power)	
3889	67.6	60	
IES Classification		Longitudinal Classification	
Type III		Short	

Table 1: Executive Data Summary

Sample Photo

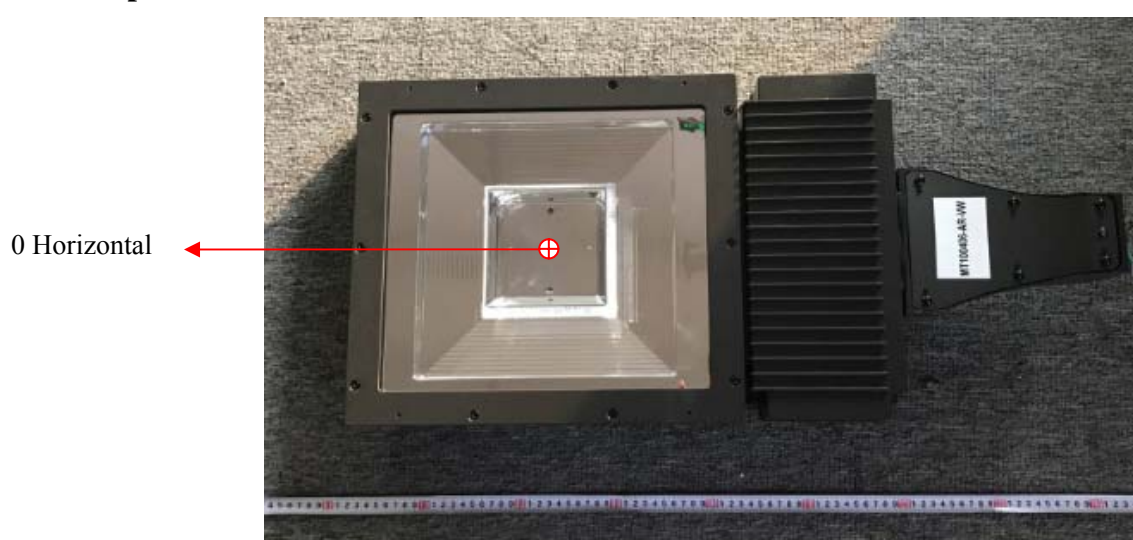


Figure 1- Overview of the sample

Equipment Under Test (EUT)

Name	: MT LED Area Light
Model	: MT100406-VW
Electrical Ratings	: 347~480V, 50/60Hz, 100W
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

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TEST RESULTS

Test ambient temperature was 24.7°C.

Sample 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 95 minutes.

Goniophotometer Method

The photometric distance is 2.47m.

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

Parameter	Result	
Test Voltage (V)	347.0	480.0
Voltage frequency (Hz)	60	60
Test Current (A)	0.347	0.274
Power Factor	0.9561	0.8879
Test Power (W)	114.96	116.78
THD A%	10.46	13.22
Luminous Efficacy (lm/W)	103.4	102.1
Total Luminous Flux (lm)	11885.0	11916.0
Color Rendering Index (CRI)	67.6	
R9	-45	
Correlated Color Temperature (CCT) (K)	3889	
Chromaticity (Chroma x, Chroma y)	(0.3893, 0.3929)	
Chromaticity (Chroma u, Chroma v)	(0.2245, 0.3399)	
Chromaticity (Chroma u', Chroma v')	(0.2245, 0.5098)	
Duv	0.0049	
Average Beam Angle (°)	149.0	
Center Beam Candle Power (cd)	1739	
Spacing Criteria	2.23 (0°-180°)/ 2.08 (90°-270°)	
Zonal Lumens in the 0°-60°Zone	67.61%	
Zonal Lumens in the 60°-90°Zone	32.39%	
Zonal Lumens in the 90°-120°Zone	0.00%	
Zonal Lumens in the 120°-180°Zone	0.00%	

Special Rendering Indices	Color
R1	63
R2	75
R3	84
R4	66
R5	63
R6	63
R7	80
R8	47
R9	-45
R10	40
R11	59
R12	34
R13	65
R14	91

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

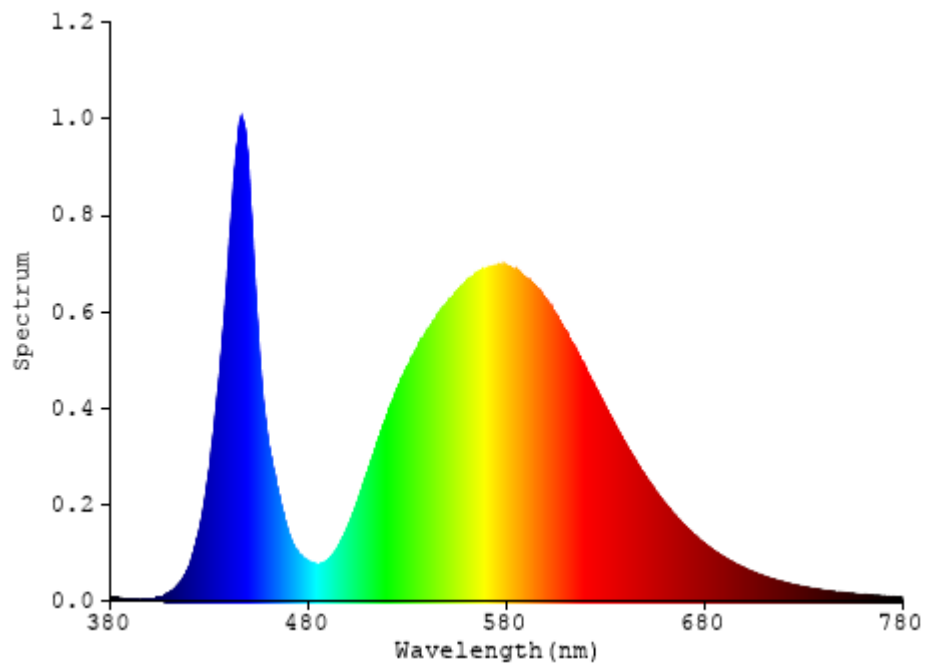


Chart 1: Spectral Power Distribution

IESNA Luminaire Flux Distribution Table

Zone	Lumens	Luminaire %
FL - Front-Low (0-30)	822.0	6.9
FM - Front-Medium (30-60)	3163.4	26.6
FH - Front-High (60-80)	1603.3	13.5
FVH - Front-Very High (80-90)	7.3	0.1
Total Forward Light	5596.0	47.1

BL - Back-Low (0-30)	830.8	7.0
BM - Back-Medium (30-60)	3219.1	27.1
BH - Back-High (60-80)	2196.4	18.5
BVH - Back-Very High (80-90)	43.2	0.4
Total Back Light	6289.5	53.0

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

BUG (Back, Up, Glare) Rating	B3-U0-G3
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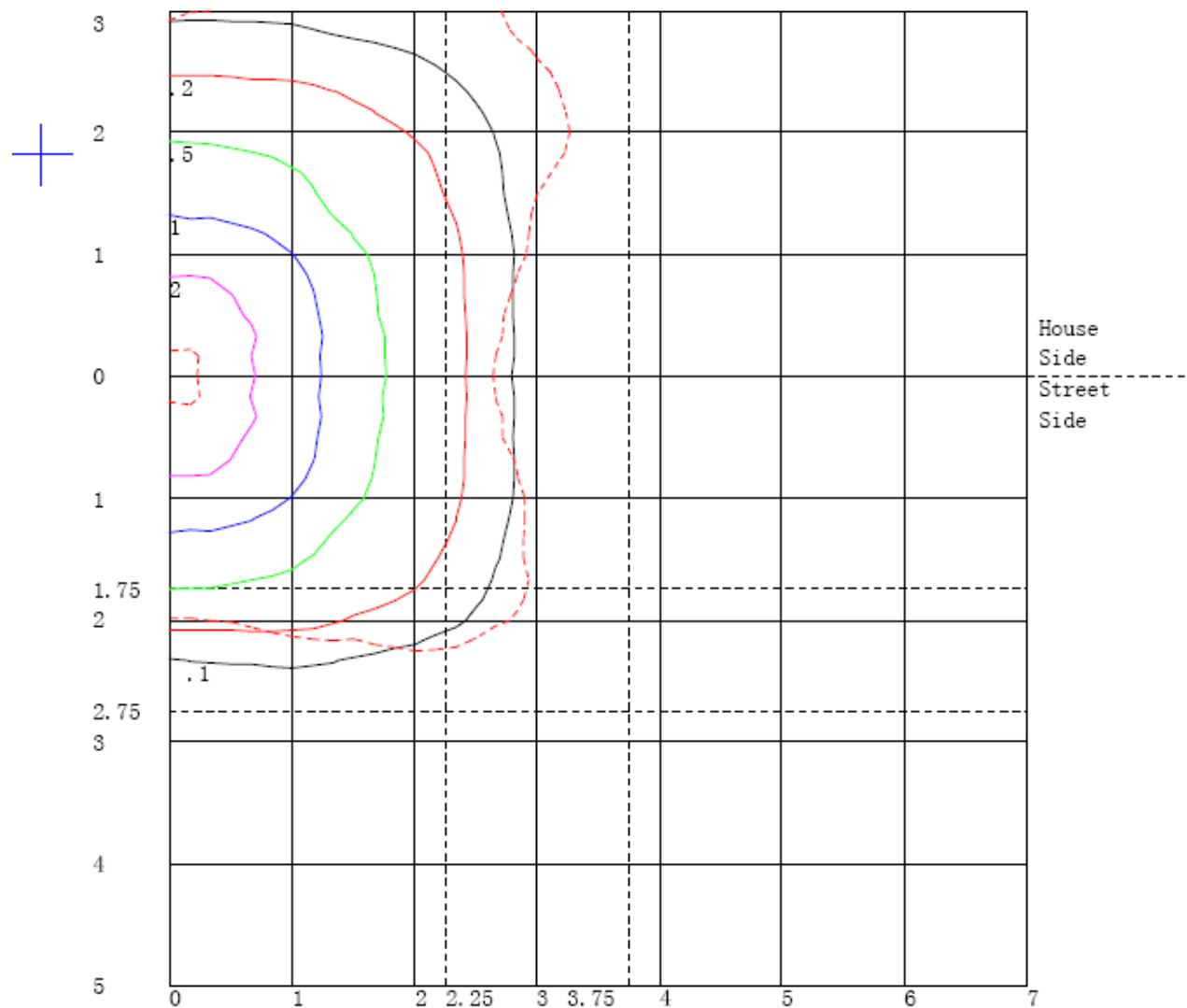
Table 3: Flux Distribution Data

Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	6289.5	0	6289.5
Street Side	5596.0	0	5596.0

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 25 Foot Mounting Height

1/2 Maximum Candela Trace Shown As Dashed Curve

(+) = Maximum Candela Point

Chart 2: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots

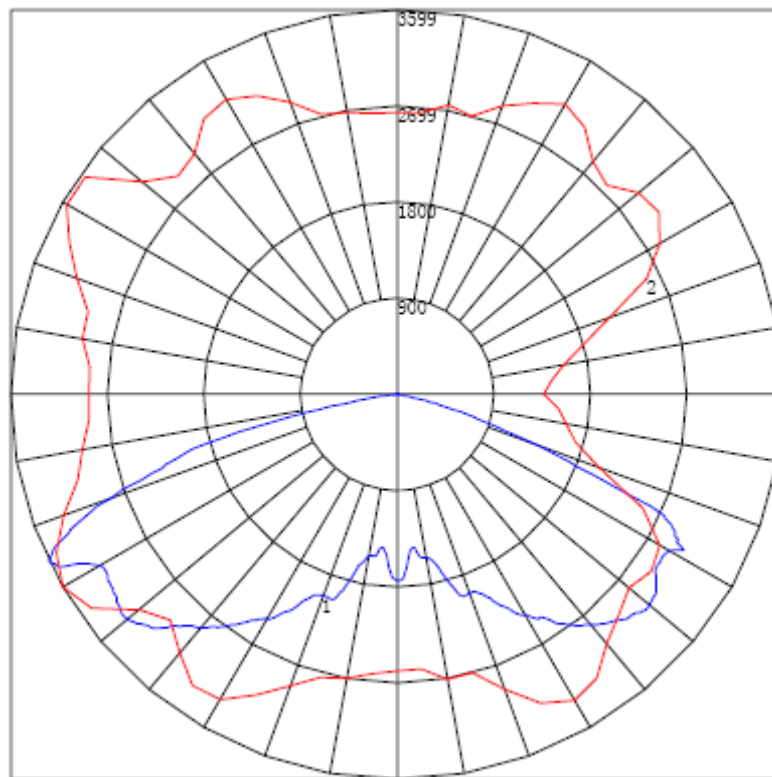


Chart 3: Maximum Plane and Cone Plots of Candela

Maximum Candela = 3599.15 Located At Horizontal Angle = 210, Vertical Angle = 64.5

1 - Vertical Plane Through Horizontal Angles (210 - 30) (Through Max. Cd.)

2 - Horizontal Cone Through Vertical Angle (64.5) (Through Max. Cd.)

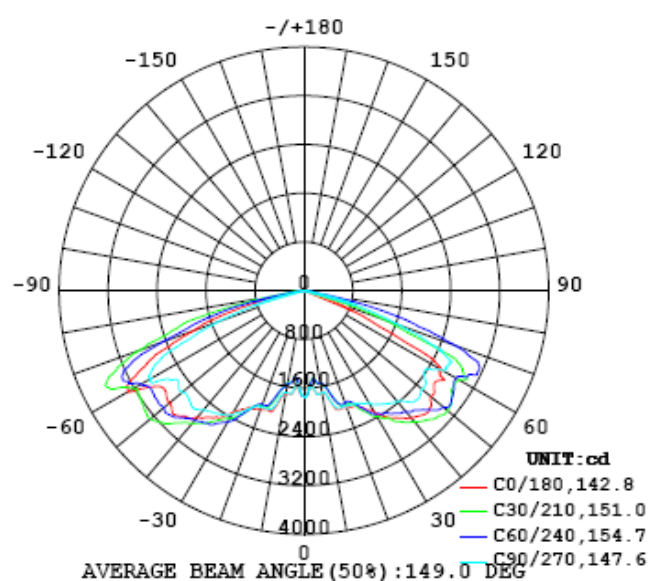


Chart 4: Polar Candela Distribution

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	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739
5	1576	1578	1574	1561	1537	1500	1463	1430	1411	1412	1424	1452	1481	1516	1543	1560	1571	1574	1571
10	1699	1694	1656	1584	1536	1533	1547	1591	1649	1677	1646	1590	1539	1525	1548	1611	1678	1703	1700
15	2008	1984	1864	1780	1766	1807	1807	1734	1664	1653	1679	1741	1808	1806	1755	1776	1877	1974	1982
20	2046	1987	1869	1892	2005	1990	1984	2007	2108	2137	2075	1978	1963	1964	1961	1842	1847	1991	2021
25	2104	1993	1901	2027	2030	2033	2137	2262	2297	2263	2284	2240	2079	1983	2002	1978	1846	1984	2045
30	2306	2153	2152	2227	2201	2323	2383	2342	2311	2298	2316	2316	2342	2192	2089	2104	1967	2017	2129
35	2547	2362	2491	2481	2571	2669	2624	2518	2484	2438	2411	2421	2471	2486	2312	2230	2192	2109	2271
40	2723	2573	2766	2755	2900	2852	2813	2788	2757	2715	2666	2618	2595	2603	2604	2393	2386	2231	2373
45	2841	2705	2878	2986	3033	2991	2979	3011	2998	2971	2942	2853	2762	2754	2804	2718	2607	2420	2560
50	2714	2615	2708	2925	2964	3013	3069	3100	3125	3123	3099	3075	2987	2886	2791	2742	2521	2436	2518
55	2619	2579	2584	2692	2725	2830	2949	3023	3112	3175	3142	3049	2977	2797	2602	2523	2380	2350	2400
60	2528	2494	2660	2622	2692	2909	2933	2978	3003	2958	2973	2991	2867	2755	2642	2565	2654	2579	2621
65	1273	1309	1420	1617	1918	2427	2757	2922	2878	2755	2870	3088	3137	3046	2877	2680	2636	2572	2569
70	568	597	650	758	956	1169	1422	1663	1995	2588	2774	2795	2626	2448	2277	1998	1753	1723	1675
75	187	212	266	312	337	423	541	670	762	913	1110	1398	1452	1258	1152	1039	894	814	770
80	19.5	21.6	42.0	40.4	63.5	73.5	94.7	89.5	87.4	92.0	105	150	193	305	263	151	129	86.9	67.2
85	0.79	0.73	0.72	0.88	1.06	1.06	1.05	2.41	2.36	2.56	3.05	3.83	4.17	6.26	5.89	6.20	7.04	5.86	7.55
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

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	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739
5	1571	1564	1550	1517	1483	1449	1427	1412	1411	1420	1450	1485	1525	1564	1587	1602	1597	1587	1579
10	1696	1643	1573	1536	1538	1577	1645	1689	1691	1633	1575	1539	1540	1559	1628	1705	1726	1717	1701
15	1954	1832	1778	1798	1845	1795	1727	1685	1683	1740	1828	1896	1881	1838	1866	1967	2062	2059	2020
20	1950	1837	1908	1985	1969	1981	2051	2167	2214	2125	2020	2010	2042	2033	1900	1914	2063	2081	2007
25	1929	1880	2019	2003	2015	2172	2311	2304	2304	2321	2284	2143	2066	2074	2039	1919	2051	2112	1989
30	1964	2043	2094	2098	2291	2346	2344	2329	2344	2332	2362	2415	2309	2210	2270	2152	2209	2309	2128
35	2079	2246	2242	2405	2495	2476	2429	2419	2449	2492	2550	2610	2682	2568	2479	2458	2378	2539	2322
40	2236	2386	2464	2624	2627	2629	2633	2670	2730	2781	2781	2807	2850	2894	2748	2779	2573	2714	2571
45	2474	2635	2802	2800	2765	2763	2840	2959	2968	3006	2987	3009	3045	3075	3025	2935	2756	2905	2799
50	2488	2555	2772	2828	2909	2987	3098	3126	3138	3157	3151	3162	3152	3096	3043	2860	2763	2859	2817
55	2372	2426	2575	2651	2832	2976	3089	3211	3299	3260	3176	3082	2960	2881	2851	2773	2749	2799	2793
60	2550	2595	2601	2645	2788	2914	3062	3109	3120	3136	3165	3116	3120	3123	3177	3309	3263	3327	3259
65	2638	2719	2701	2908	3083	3271	3174	2978	2905	3130	3563	3568	3381	3097	2949	2883	2845	2833	2854
70	1763	1769	1977	2232	2589	2729	2937	3271	3272	3122	3052	2876	2633	2399	2224	2078	1987	1919	1961
75	829	924	1081	1251	1412	1833	1980	2127	2183	2152	2164	1950	1670	1439	1274	1110	995	995	1023
80	99.3	151	205	321	461	556	595	660	661	653	592	590	556	410	296	253	197	203	219
85	9.52	11.6	14.3	17.8	28.2	29.0	42.4	40.6	47.1	56.0	68.0	74.0	78.9	73.1	69.8	69.7	61.4	65.1	66.6
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

Table 6: Luminous Intensity Data

Table--3

UNIT: cd

C (DEG) y (DEG)	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280
0	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739
5	1567	1547	1520	1484	1448	1417	1394	1388	1395	1409	1434	1469	1505	1538	1556	1566	1569	1569	1563
10	1658	1588	1531	1517	1537	1592	1652	1678	1666	1611	1549	1526	1540	1585	1651	1700	1706	1701	1667
15	1911	1835	1831	1883	1860	1786	1713	1682	1694	1739	1805	1842	1796	1794	1869	1987	2008	1990	1891
20	1875	1925	2028	2014	2007	2029	2148	2215	2164	2040	1989	1984	1995	1891	1862	1990	2042	1995	1869
25	1911	2050	2062	2069	2167	2304	2307	2303	2312	2303	2166	2036	2046	2054	1939	2053	2148	2056	1958
30	2178	2236	2210	2344	2431	2381	2365	2371	2384	2435	2483	2417	2266	2281	2220	2221	2356	2203	2226
35	2474	2473	2596	2678	2628	2569	2545	2593	2590	2635	2682	2675	2549	2420	2402	2291	2468	2281	2427
40	2742	2750	2873	2870	2845	2866	2928	2910	2844	2799	2786	2786	2786	2641	2630	2446	2557	2435	2629
45	2925	3047	3079	3071	3087	3118	3145	3113	3065	2997	2942	2932	2914	2809	2658	2477	2615	2520	2672
50	2854	3055	3104	3206	3272	3263	3255	3260	3204	3119	2992	2880	2799	2735	2566	2487	2592	2521	2549
55	2804	2892	2977	3134	3231	3245	3298	3247	3169	3087	2987	2834	2682	2629	2515	2528	2549	2543	2554
60	3325	3148	3173	3194	3206	3218	3108	3085	3118	3089	3080	2982	2949	2868	2949	2812	2869	2853	2945
65	2938	3028	3245	3442	3552	3528	3163	3001	3173	3324	3276	3097	2836	2712	2641	2581	2526	2575	2647
70	2089	2295	2446	2638	2838	3078	3247	3256	3111	2816	2452	2200	1969	1749	1608	1538	1483	1528	1597
75	1169	1298	1389	1609	1964	1954	1876	1850	1799	1742	1460	1150	972	835	680	605	554	590	683
80	260	292	394	480	513	501	458	424	397	381	308	275	170	96.0	77.9	47.2	33.0	43.1	72.2
85	69.8	68.7	69.8	68.7	51.6	38.1	30.4	25.2	21.7	18.5	15.5	14.6	10.5	10.00	8.08	6.28	3.66	1.50	1.05
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

Table 7: Luminous Intensity Data

Table--4

UNIT: cd

C (DEG) y (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
0	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739	1739				
5	1549	1529	1497	1462	1433	1406	1394	1397	1413	1439	1467	1499	1529	1551	1563				
10	1601	1538	1521	1532	1582	1643	1681	1664	1612	1542	1516	1524	1569	1638	1689				
15	1801	1792	1838	1816	1745	1683	1664	1669	1730	1794	1820	1764	1761	1845	1960				
20	1898	2011	2000	1988	2006	2110	2173	2122	2017	1990	1982	1996	1895	1851	1969				
25	2078	2058	2024	2126	2285	2309	2296	2299	2275	2137	2027	2017	2025	1890	1984				
30	2288	2249	2393	2475	2411	2364	2342	2332	2382	2394	2325	2207	2225	2166	2145				
35	2425	2552	2673	2659	2612	2560	2555	2553	2562	2628	2698	2558	2483	2479	2358				
40	2642	2781	2760	2777	2809	2858	2902	2924	2869	2828	2869	2904	2742	2742	2570				
45	2843	2907	2906	2941	3021	3092	3123	3143	3130	3110	3037	3060	3001	2880	2704				
50	2739	2786	2889	3032	3141	3218	3283	3268	3235	3185	3083	2963	2908	2709	2635				
55	2626	2688	2889	3029	3102	3178	3240	3225	3119	3031	2887	2740	2670	2562	2571				
60	2902	3028	3076	3177	3098	3013	2959	2983	3080	3042	2922	2758	2553	2583	2481				
65	2721	2897	3173	3240	3210	3093	2926	2842	2840	2740	2321	1865	1618	1476	1376				
70	1748	1971	2184	2318	2729	2696	2422	1879	1519	1306	1072	880	709	597	516				
75	830	919	1080	1240	991	787	663	620	575	497	387	315	285	253	206				
80	88.4	164	179	77.3	80.4	60.5	40.0	55.3	63.6	62.1	61.8	40.2	41.1	32.6	26.8				
85	1.10	1.15	1.10	1.81	1.83	0.92	0.96	1.06	1.03	1.13	1.18	1.06	1.06	1.01	0.92				
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				

Table 8: Luminous Intensity Data

EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Goniophotometer system	GO-R5000	HZTE011-01	Jul. 26, 2016	Jul. 25, 2017
Digital Power Meter	PF2010A	HZTE028-01	Jul. 26, 2016	Jul. 25, 2017
AC Power Supply	DPS1060	HZTE001-06	Dec. 25, 2016	Dec. 24, 2017
DC Power Supply	WY12010	HZTE004-03	Dec. 25, 2016	Dec. 24, 2017
Temperature Meter	TES1310	HZTE017-01	Aug. 08, 2016	Aug. 07, 2017
Standard Source	D908	HZTE012-01	Jul. 28, 2016	Jul. 27, 2017
Standard source	SCL-1400	HZTE012-02	Jul. 28, 2016	Jul. 27, 2017

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 expanded uncertainty is 2.3% with a coverage factor $k=2$.

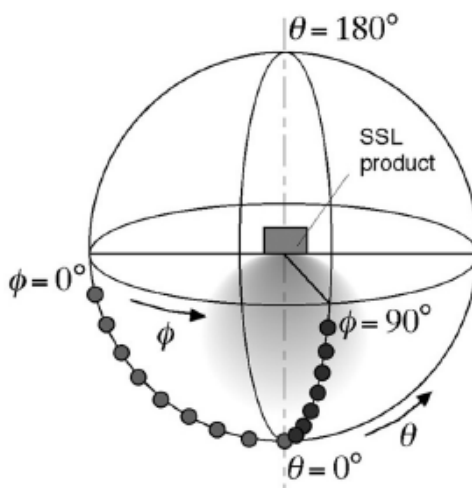
Color Characteristics Measurements

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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