

LM-79-08 Test Report

for

ABOVE ALL LIGHTING INC

1501 Industrial Way N. Toms River, NJ 08755.

MT LED Area Light

Model: MT100401-VW

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

Tel: +86-571-56680806

www.ledtestlab.com

Report No.: HZ17080006j

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

Test specifications:

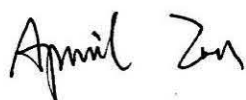
Date of Receipt : Jul. 24, 2017

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: MT100401-VW

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
104.1	12125.0	116.52	0.9945
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

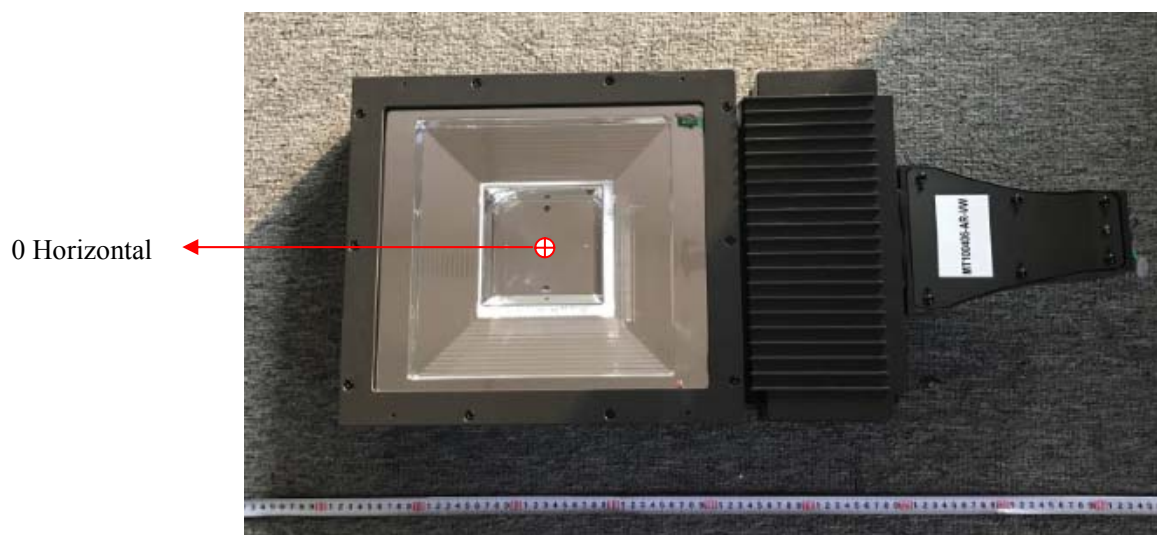


Figure 1- Overview of the sample

Equipment Under Test (EUT)

Name	: MT LED Area Light
Model	: MT100401-VW
Electrical Ratings	: 120~277V, 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)	120.0	277.0
Voltage frequency (Hz)	60	60
Test Current (A)	0.977	0.445
Power Factor	0.9945	0.9365
Test Power (W)	116.52	115.51
THD A%	6.84	11.68
Luminous Efficacy (lm/W)	104.1	105.3
Total Luminous Flux (lm)	12125.0	12156.0
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 (°)	148.9	
Center Beam Candle Power (cd)	1792	
Spacing Criteria	2.22 (0°-180°)/ 2.07 (90°-270°)	
Zonal Lumens in the 0°-60°Zone	67.78%	
Zonal Lumens in the 60°-90°Zone	32.22%	
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

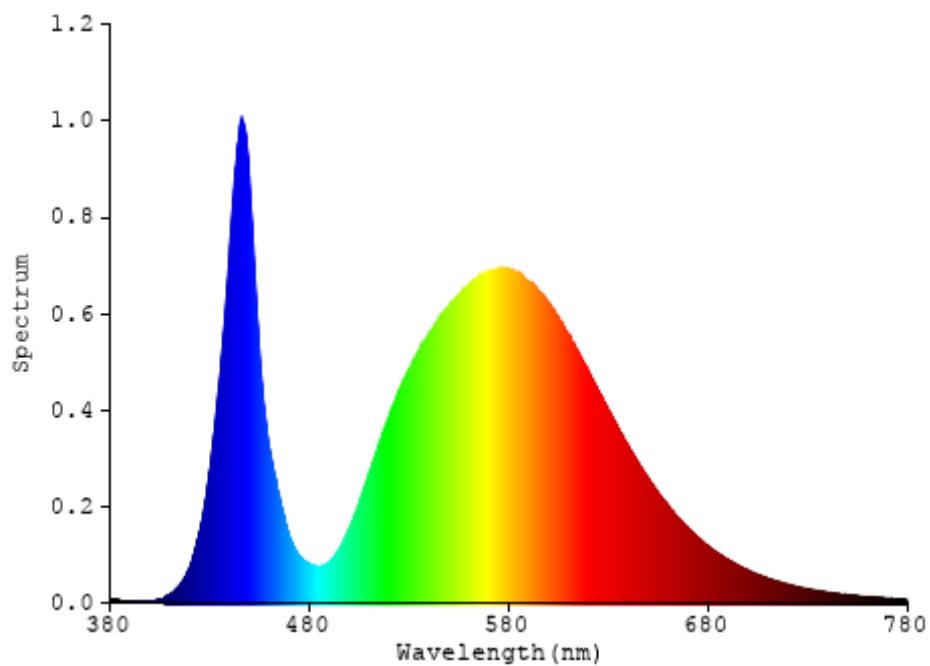


Chart 1: Spectral Power Distribution

IESNA Luminaire Flux Distribution Table

Zone	Lumens	Luminaire %
FL - Front-Low (0-30)	841.2	6.9
FM - Front-Medium (30-60)	3218.9	26.5
FH - Front-High (60-80)	1575.6	13.0
FVH - Front-Very High (80-90)	6.8	0.1
Total Forward Light	5642.5	46.5

BL - Back-Low (0-30)	853.1	7.0
BM - Back-Medium (30-60)	3305.4	27.3
BH - Back-High (60-80)	2280.5	18.8
BVH - Back-Very High (80-90)	43.6	0.4
Total Back Light	6482.6	53.5

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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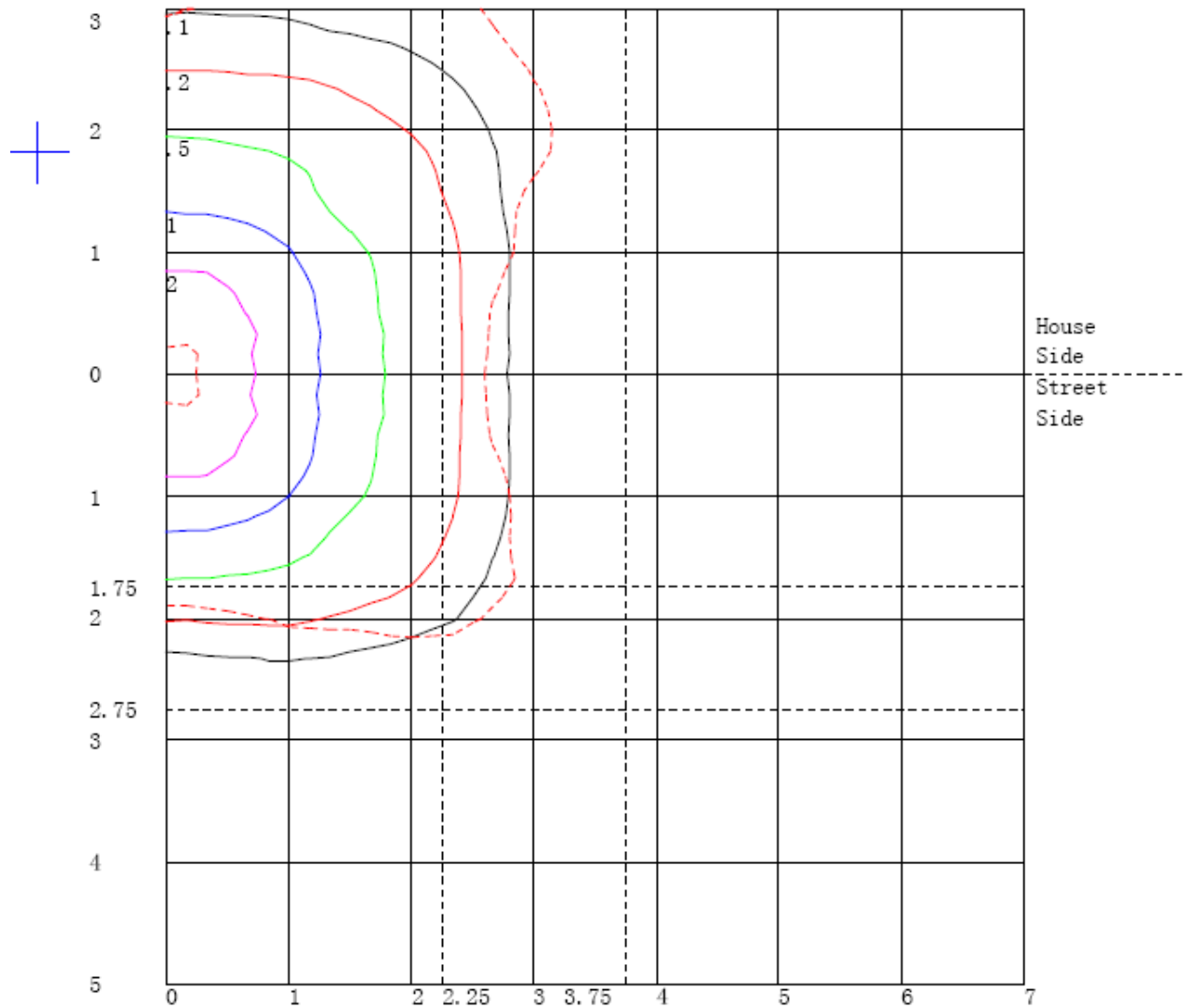
Table 3: Flux Distribution Data

Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	6482.6	0	6482.6
Street Side	5642.5	0	5642.5

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

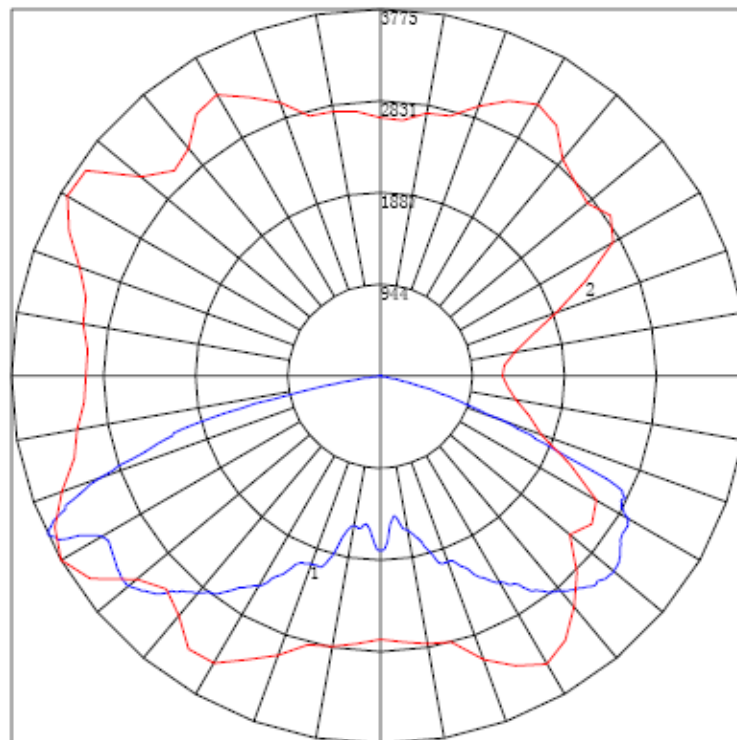


Chart 3: Maximum Plane and Cone Plots of Candela

Maximum Candela = 3774.62 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.)

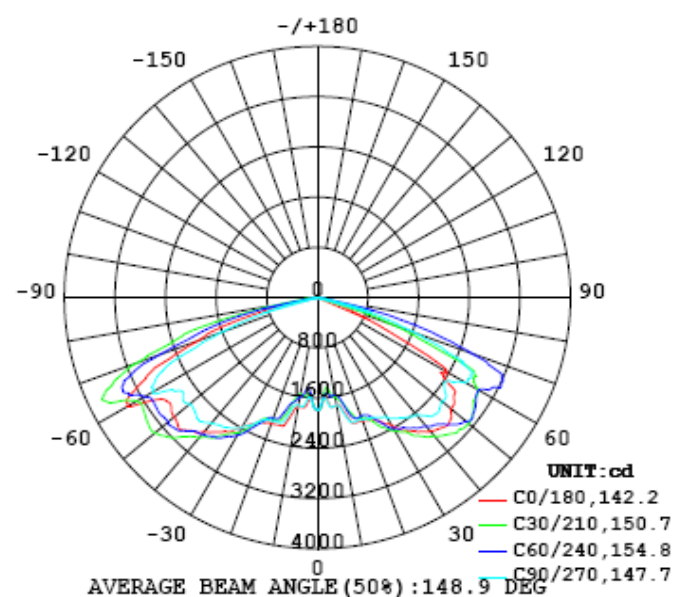


Chart 4: Polar Candela Distribution

Luminous Intensity Data

Table--1

UNIT: cd

C (DEG) y (DEG)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792
5	1613	1610	1600	1571	1533	1491	1459	1441	1442	1450	1469	1500	1537	1571	1598	1618	1629	1631	1630
10	1743	1724	1660	1590	1567	1576	1607	1668	1723	1723	1672	1613	1567	1562	1590	1663	1726	1748	1744
15	2052	1994	1866	1815	1826	1873	1836	1760	1699	1699	1749	1826	1895	1875	1827	1852	1956	2040	2052
20	2102	2004	1913	1972	2060	2030	2030	2087	2197	2207	2123	2022	2007	2019	2013	1886	1902	2048	2075
25	2152	2003	1963	2096	2079	2093	2225	2330	2348	2321	2339	2289	2124	2041	2053	2024	1907	2051	2105
30	2353	2173	2235	2270	2266	2409	2449	2406	2370	2366	2372	2384	2407	2259	2147	2155	2022	2097	2206
35	2598	2411	2574	2543	2666	2735	2690	2579	2547	2507	2491	2496	2545	2559	2378	2292	2260	2176	2342
40	2772	2638	2825	2836	2968	2921	2884	2863	2845	2804	2729	2693	2680	2682	2673	2468	2474	2293	2443
45	2888	2779	2924	3069	3089	3064	3058	3078	3070	3049	3016	2929	2855	2852	2889	2785	2672	2478	2631
50	2761	2698	2780	2991	3020	3073	3121	3169	3201	3212	3179	3154	3071	2947	2851	2798	2575	2484	2581
55	2655	2626	2641	2741	2778	2877	3007	3101	3189	3247	3206	3122	3049	2860	2652	2576	2431	2395	2442
60	2324	2314	2480	2401	2473	2654	2941	3054	3072	3028	3035	3063	2946	2845	2723	2662	2760	2650	2714
65	1142	1183	1325	1436	1766	2139	2670	2850	2732	2826	2963	3145	3206	3138	2950	2752	2664	2634	2588
70	535	557	601	748	841	1064	1302	1579	1896	2482	2675	2813	2580	2457	2235	1966	1792	1764	1628
75	201	227	277	319	343	424	531	646	719	856	1012	1310	1356	1213	1094	1007	856	769	742
80	16.8	21.8	32.1	38.0	60.9	71.4	90.4	85.9	79.2	80.8	95.6	131	151	270	237	135	115	74.6	68.5
85	0.76	0.73	0.76	0.87	0.91	0.99	0.97	0.95	2.36	2.33	2.65	3.55	3.49	5.41	4.96	5.97	5.45	5.86	6.29
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) y (DEG)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
0	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792
5	1628	1619	1593	1555	1519	1484	1462	1448	1443	1445	1459	1490	1532	1578	1619	1644	1653	1650	1639
10	1736	1674	1602	1575	1580	1624	1694	1735	1751	1713	1651	1594	1578	1585	1630	1709	1767	1772	1755
15	2012	1892	1853	1895	1937	1884	1815	1757	1731	1793	1880	1952	1975	1918	1922	1978	2096	2122	2098
20	1989	1883	1969	2041	2018	2030	2125	2240	2323	2227	2107	2066	2086	2110	1983	1953	2081	2142	2094
25	1970	1942	2076	2065	2077	2244	2371	2360	2365	2382	2371	2241	2129	2117	2120	1977	2070	2171	2088
30	2035	2123	2156	2168	2376	2422	2410	2408	2402	2398	2433	2487	2416	2274	2324	2247	2236	2377	2228
35	2140	2311	2301	2492	2568	2557	2516	2493	2523	2577	2636	2684	2766	2669	2540	2556	2420	2611	2407
40	2320	2475	2545	2698	2701	2707	2707	2757	2819	2870	2855	2887	2934	2963	2837	2845	2645	2788	2638
45	2535	2690	2885	2902	2854	2845	2930	3044	3054	3104	3077	3097	3127	3157	3124	3010	2843	2988	2846
50	2541	2606	2827	2893	2986	3081	3187	3219	3224	3236	3244	3262	3229	3172	3118	2921	2856	2956	2873
55	2426	2481	2623	2697	2900	3050	3157	3290	3394	3356	3245	3167	3040	2950	2928	2854	2844	2893	2863
60	2649	2694	2665	2760	2869	3003	3155	3333	3174	3204	3254	3207	3241	3231	3301	3441	3396	3473	3410
65	2633	2731	2779	2978	3216	3354	3219	3065	3025	3230	3632	3670	3484	3229	3060	3010	2983	2982	3025
70	1768	1809	1941	2201	2487	2687	2994	3326	3337	3179	3120	2924	2736	2494	2294	2131	2070	2009	2064
75	782	890	1060	1195	1389	1786	1970	2084	2080	2152	2145	1999	1668	1468	1307	1151	1054	1056	1096
80	86.9	130	168	284	437	529	583	624	645	597	573	554	514	405	284	246	190	191	225
85	8.69	11.0	13.7	17.6	22.8	31.6	37.0	46.5	43.3	52.6	65.9	72.4	76.7	72.0	70.9	69.5	62.9	66.6	69.1
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

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	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792
5	1628	1615	1594	1566	1531	1498	1470	1447	1440	1450	1470	1500	1532	1565	1586	1590	1593	1594	1592
10	1731	1672	1597	1562	1559	1596	1659	1710	1717	1673	1606	1570	1574	1615	1687	1741	1746	1747	1715
15	2013	1898	1861	1902	1916	1846	1763	1723	1721	1748	1810	1854	1814	1804	1879	1998	2031	2015	1913
20	1949	1942	2061	2066	2055	2065	2159	2240	2219	2098	2047	2034	2047	1956	1910	2027	2090	2052	1918
25	1953	2074	2109	2111	2182	2330	2379	2374	2378	2368	2225	2082	2095	2095	1967	2063	2177	2091	1967
30	2199	2302	2262	2362	2492	2442	2428	2420	2428	2473	2529	2462	2308	2321	2264	2243	2385	2241	2241
35	2509	2531	2625	2756	2690	2625	2590	2637	2637	2673	2725	2736	2620	2484	2476	2327	2523	2329	2473
40	2805	2796	2950	2937	2911	2919	2969	2960	2907	2864	2836	2838	2839	2680	2673	2487	2613	2473	2652
45	2994	3106	3165	3130	3156	3183	3209	3187	3139	3058	2996	2999	3001	2925	2753	2559	2702	2588	2750
50	2923	3134	3183	3271	3351	3351	3345	3348	3295	3222	3080	2969	2879	2830	2633	2553	2639	2569	2611
55	2862	2966	3040	3208	3317	3347	3408	3355	3258	3182	3093	2932	2781	2707	2570	2566	2609	2576	2602
60	3461	3286	3266	3291	3298	3313	3219	3192	3216	3187	3160	3063	2998	2977	3049	2942	3016	2958	3020
65	3105	3190	3423	3606	3745	3676	3277	3100	3258	3429	3410	3212	3003	2832	2793	2696	2656	2666	2793
70	2195	2431	2578	2803	3022	3231	3417	3442	3256	3008	2650	2355	2101	1941	1753	1654	1609	1688	1741
75	1248	1370	1487	1720	2087	2097	2056	1986	1960	1909	1604	1290	1090	958	795	705	669	704	809
80	262	297	406	507	564	548	529	500	446	434	351	319	215	107	81.2	52.3	36.7	45.0	81.3
85	72.8	71.2	71.8	76.9	54.8	44.1	34.6	28.2	24.2	21.1	19.6	15.9	14.8	11.0	8.72	7.05	3.81	1.38	1.00
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	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792	1792				
5	1586	1568	1546	1513	1483	1462	1453	1464	1486	1511	1537	1562	1582	1594	1602				
10	1653	1583	1562	1567	1615	1672	1702	1670	1606	1557	1556	1582	1649	1708	1738				
15	1807	1781	1816	1812	1752	1706	1703	1703	1765	1826	1818	1759	1803	1913	2016				
20	1925	2051	2051	2037	2044	2138	2163	2123	2040	2031	2037	2024	1903	1918	2054				
25	2094	2097	2068	2161	2334	2362	2355	2355	2301	2142	2084	2073	2045	1931	2065				
30	2324	2298	2416	2507	2454	2408	2400	2396	2439	2446	2334	2251	2277	2172	2222				
35	2470	2578	2738	2708	2655	2604	2596	2600	2622	2689	2740	2573	2539	2509	2435				
40	2670	2834	2833	2837	2857	2922	2950	2971	2915	2882	2928	2953	2777	2781	2620				
45	2913	2987	2967	2997	3079	3154	3195	3217	3184	3143	3078	3104	3014	2934	2729				
50	2832	2869	2959	3099	3218	3279	3336	3306	3286	3233	3115	3015	2967	2759	2666				
55	2700	2770	2972	3096	3159	3249	3311	3291	3177	3094	2933	2763	2693	2584	2582				
60	3017	3037	3089	3192	3156	3109	3038	3074	3087	2866	2537	2359	2357	2304	2242				
65	2781	3035	3280	3391	3310	3104	2770	2523	2636	2343	2002	1665	1466	1290	1203				
70	1950	2158	2357	2513	2625	2604	2213	1718	1339	1112	914	820	701	641	521				
75	968	1049	1135	1209	939	771	658	585	539	481	382	334	309	266	222				
80	84.4	157	143	95.5	90.5	62.6	54.8	61.6	61.2	61.3	74.9	43.2	43.7	30.6	20.9				
85	1.08	1.15	1.22	1.76	1.67	0.87	0.91	0.96	1.03	1.12	1.18	1.29	1.07	0.98	0.86				
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.

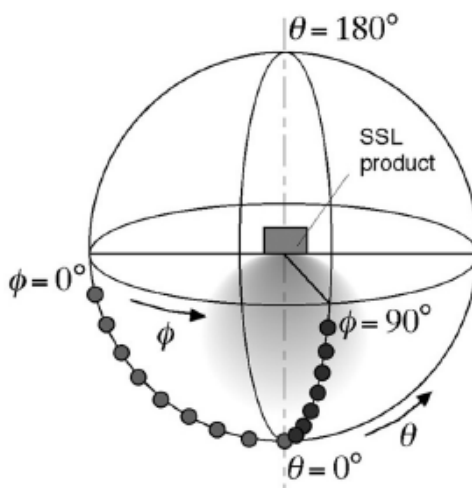
Color Characteristics Measurements

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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