

LM-79-08 Test Report

for

ABOVE ALL LIGHTING INC

1501 Industrial Way N. Toms River, NJ 08755.

MT LED Area Light

Model: MT100506-III

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

Tel: +86-571-56680806

www.ledtestlab.com

Report No.: HZ17080006d

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

Test specifications:

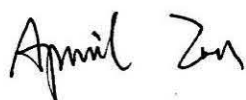
Date of Receipt : Jul. 24, 2017

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: MT100506-III

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
110.0	12664.0	115.13	0.9732
CCT (K)	CRI	Stabilization Time (Light & Power)	
5240	69.2	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	: MT100506-III
Electrical Ratings	: 347~480V, 50/60Hz, 100W
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

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TEST RESULTS

Test ambient temperature was 24.4°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)	0.341	0.261
Power Factor	0.9732	0.9307
Test Power (W)	115.13	116.68
THD A%	9.48	14.17
Luminous Efficacy (lm/W)	110.0	108.3
Total Luminous Flux (lm)	12664.0	12632.0
Color Rendering Index (CRI)	69.2	
R9	-30	
Correlated Color Temperature (CCT) (K)	5240	
Chromaticity (Chroma x, Chroma y)	(0.3386, 0.3449)	
Chromaticity (Chroma u, Chroma v)	(0.2096, 0.3203)	
Chromaticity (Chroma u', Chroma v')	(0.2096, 0.4804)	
Duv	-0.0007	
Average Beam Angle (°)	93.8	
Center Beam Candle Power (cd)	3343	
Spacing Criteria	0.72 (0°-180°)/ 1.67 (90°-270°)	
Zonal Lumens in the 0°-60°Zone	70.79%	
Zonal Lumens in the 60°-90°Zone	29.21%	
Zonal Lumens in the 90°-120°Zone	0.00%	
Zonal Lumens in the 120°-180°Zone	0.00%	

Special Rendering Indices	Color
R1	68
R2	73
R3	75
R4	71
R5	69
R6	63
R7	78
R8	58
R9	-30
R10	34
R11	68
R12	39
R13	68
R14	85

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

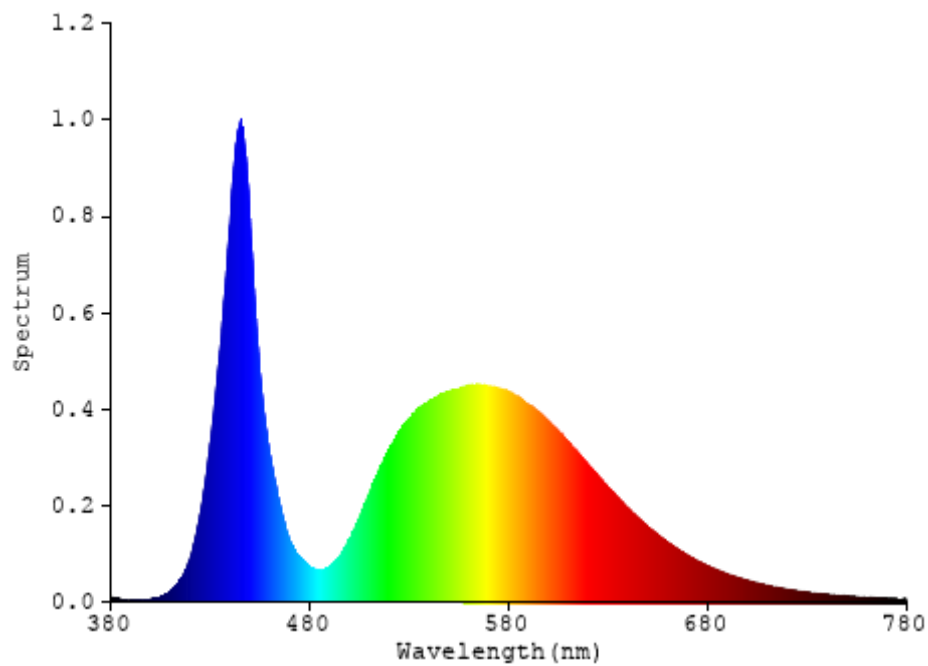


Chart 1: Spectral Power Distribution

IESNA Luminaire Flux Distribution Table

Zone	Lumens	Luminaire %
FL - Front-Low (0-30)	1553.1	12.3
FM - Front-Medium (30-60)	5124.0	40.5
FH - Front-High (60-80)	3104.7	24.5
FVH - Front-Very High (80-90)	48.2	0.4
Total Forward Light	9830.0	77.7

BL - Back-Low (0-30)	985.9	7.8
BM - Back-Medium (30-60)	1301.9	10.3
BH - Back-High (60-80)	527.1	4.2
BVH - Back-Very High (80-90)	19.2	0.2
Total Back Light	2834.1	22.5

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

BUG (Back, Up, Glare) Rating	B2-U0-G2
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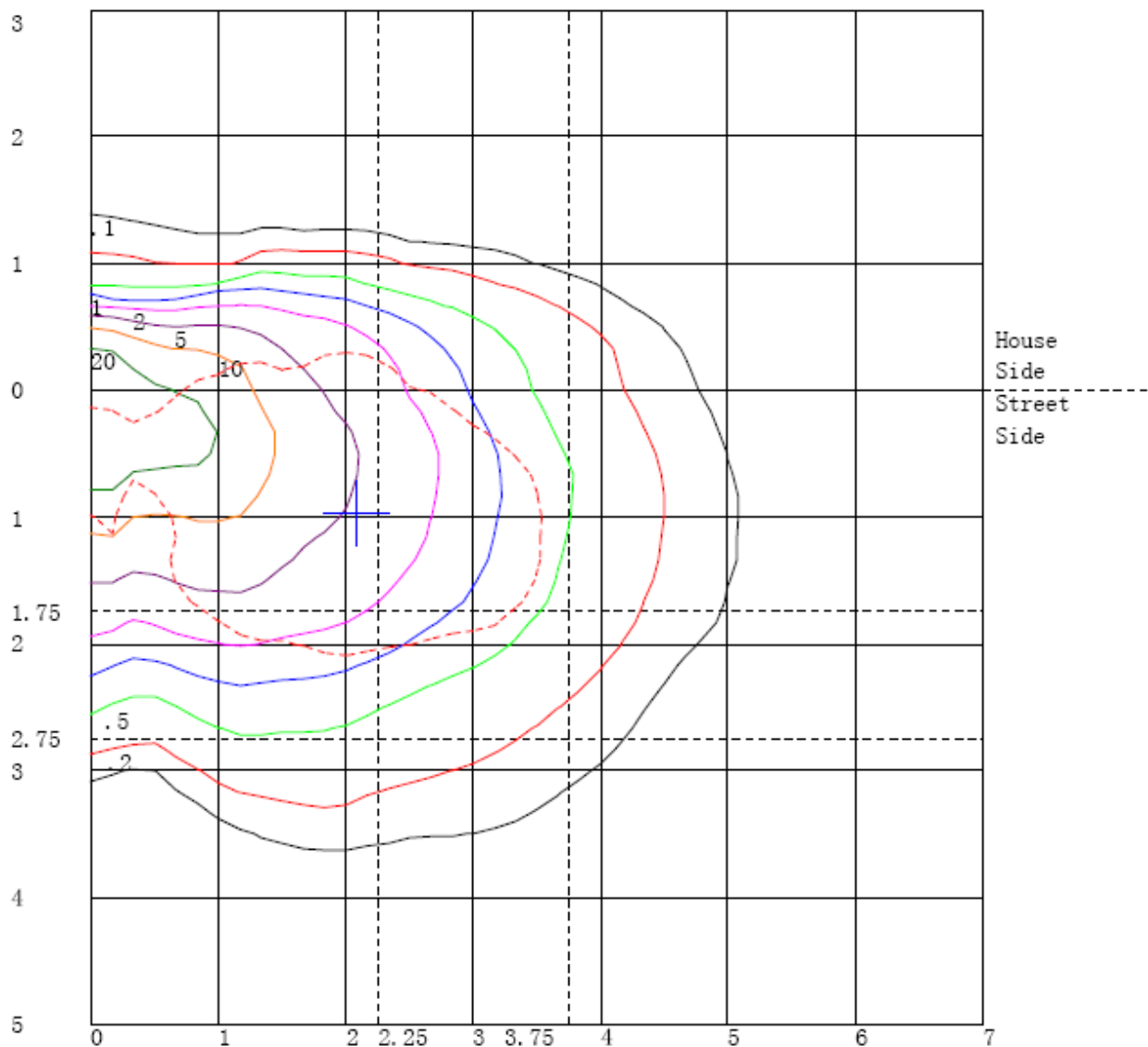
Table 3: Flux Distribution Data

Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	2834.1	0	2834.1
Street Side	9830.0	0	9830.0

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 10 Foot Mounting Height
1/2 Maximum Candela Trace Shown As Dashed Curve
(+) = Maximum Candela Point

Chart 2: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots

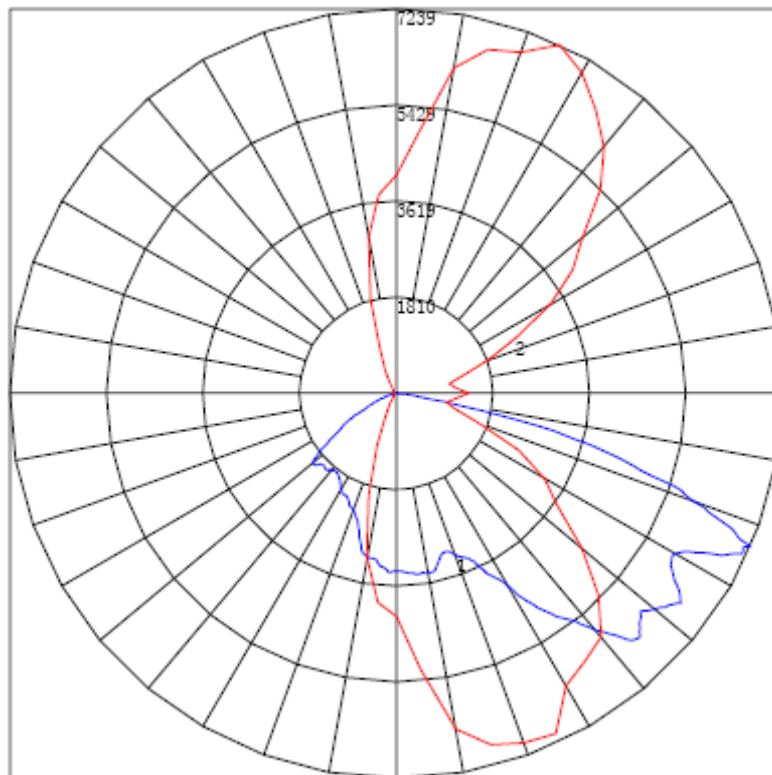


Chart 3: Maximum Plane and Cone Plots of Candela

Maximum Candela = 7238.83 Located At Horizontal Angle = 65, Vertical Angle = 66.5

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

2 - Horizontal Cone Through Vertical Angle (66.5) (Through Max. Cd.)

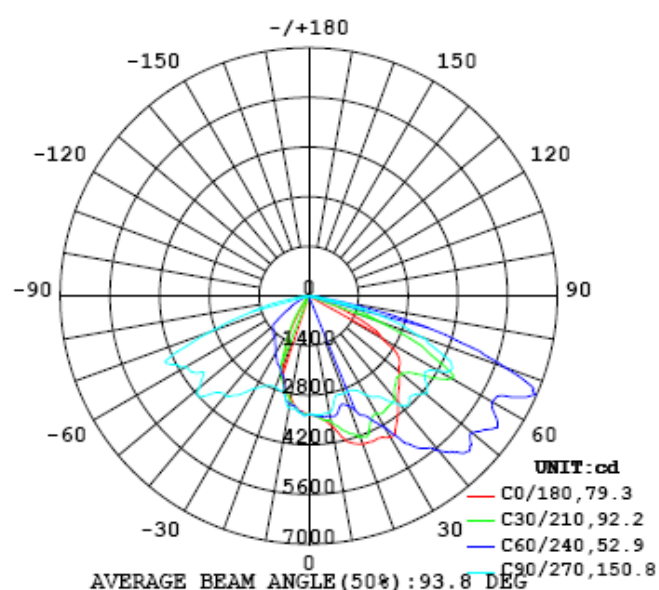


Chart 4: Polar Candela Distribution

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	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343
5	3444	3438	3437	3438	3448	3448	3452	3459	3457	3439	3428	3414	3400	3390	3389	3388	3382	3374	3368
10	3716	3706	3719	3731	3724	3647	3602	3578	3560	3520	3491	3463	3443	3429	3407	3381	3364	3347	3338
15	4251	4228	4252	4182	4081	4014	3944	3918	3796	3676	3578	3430	3300	3206	3105	3043	2974	2939	2927
20	4434	4378	4408	4364	4297	4290	4216	4026	3831	3671	3563	3467	3303	3225	3149	3085	3020	2946	2922
25	4467	4474	4503	4448	4442	4314	4060	3905	3926	3941	3883	3850	3721	3531	3364	3212	3105	2993	2930
30	4595	4564	4657	4665	4589	4051	3825	3904	4036	4203	4331	4368	4282	4194	3992	3746	3549	3328	3220
35	4333	4521	4518	4457	3999	3741	3855	3973	4168	4359	4723	5052	5190	5069	4777	4315	3931	3630	3463
40	3920	4319	4049	3914	3412	3521	3770	3997	4193	4643	5136	5387	5700	5822	5576	5158	4629	4263	4030
45	3601	4152	3683	3234	3106	3245	3478	3856	4306	4691	5307	5873	6238	6469	6289	5632	4844	4340	4032
50	3326	3853	3400	2844	2978	3186	3430	3817	4497	5079	5600	5849	6005	6319	6356	5950	5245	4644	4281
55	3112	3361	2987	2840	3174	3478	3890	4490	4957	5369	5840	6223	6490	6469	6137	5908	5176	4375	3984
60	2390	2312	1956	2321	2968	3826	4656	5169	5804	6372	6377	6060	5975	6051	6190	6146	5400	4708	4231
65	1668	1430	1272	1546	2152	2835	3667	4628	5353	5611	5960	6350	6751	7156	7064	6946	6379	5156	4427
70	693	587	586	950	1382	1874	2102	2546	3364	4288	5124	5578	5861	5931	5649	5574	5144	4091	3295
75	52.1	59.1	73.6	215	565	904	1274	1423	1649	1956	2240	2965	3506	3757	3640	3486	3248	2584	2023
80	11.2	12.7	15.3	29.5	77.2	94.3	146	218	401	510	612	713	869	889	1069	1050	1012	825	633
85	0.42	0.40	0.42	0.46	0.53	0.67	2.03	3.41	6.42	13.2	39.5	50.4	56.5	63.4	66.1	78.0	45.8	36.7	37.0
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	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343
5	3376	3382	3373	3351	3326	3301	3285	3278	3276	3276	3268	3251	3242	3237	3232	3228	3229	3235	3238
10	3342	3316	3282	3264	3272	3249	3209	3188	3171	3141	3106	3063	3015	3001	2961	2949	2944	2941	2942
15	2907	2850	2875	2861	2880	2880	2867	2893	2888	2847	2826	2801	2796	2747	2707	2651	2633	2631	2644
20	2817	2803	2690	2641	2475	2400	2320	2290	2278	2337	2401	2384	2291	2250	2215	2164	2104	2101	2138
25	2793	2725	2623	2414	2292	2224	2074	1938	1809	1690	1648	1700	1693	1596	1561	1504	1442	1452	1502
30	3050	2863	2569	2376	2179	1976	1775	1578	1413	1255	1126	1004	969	899	807	789	740	739	784
35	3246	2923	2571	2310	2017	1740	1470	1235	1005	791	600	444	333	248	192	176	186	209	218
40	3650	3258	2847	2414	1965	1542	1209	878	578	347	180	122	114	109	102	102	106	101	98.5
45	3756	3446	3086	2584	2003	1496	969	527	231	138	111	98.2	88.2	80.3	74.5	71.7	71.6	69.6	71.4
50	4002	3750	3242	2536	1896	1170	608	268	147	99.8	81.6	67.6	59.7	55.9	54.7	55.2	55.8	56.2	54.2
55	3749	3539	3044	2257	1444	817	369	164	93.9	73.1	61.2	53.6	49.2	48.8	48.8	48.0	47.8	49.1	46.7
60	3898	3354	2486	1572	878	474	243	125	81.0	66.8	54.8	48.5	45.8	44.3	43.0	42.0	40.6	40.2	41.5
65	4121	3267	2151	1154	557	256	128	90.6	75.1	64.5	57.4	50.8	44.9	41.1	38.9	37.6	37.4	38.5	40.5
70	2948	2207	1170	516	257	133	90.8	88.0	75.2	63.1	49.8	44.1	41.0	38.4	36.9	36.3	36.8	38.9	39.9
75	1816	1170	538	270	121	70.7	82.3	76.3	68.0	53.4	46.0	42.4	40.7	37.9	36.9	36.4	37.4	38.5	39.9
80	573	247	122	69.1	53.0	54.6	56.3	54.6	49.2	45.8	44.5	41.4	38.8	37.2	36.0	36.4	37.0	37.9	37.7
85	36.6	50.8	24.5	24.2	26.1	27.9	28.5	30.8	34.2	34.0	35.1	35.1	34.4	33.5	33.4	33.8	33.5	34.0	32.9
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	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343
5	3246	3258	3287	3297	3282	3253	3233	3233	3246	3259	3261	3271	3280	3282	3287	3291	3298	3309	3319
10	2977	2985	2963	2990	3010	2992	2970	3009	3035	3055	3085	3121	3142	3145	3155	3177	3205	3221	3223
15	2690	2690	2707	2660	2688	2690	2705	2744	2715	2666	2671	2690	2679	2708	2737	2732	2794	2804	2832
20	2173	2201	2174	2235	2288	2251	2171	2102	2159	2191	2286	2335	2480	2542	2625	2639	2741	2779	2834
25	1514	1482	1537	1586	1566	1555	1641	1753	1858	1969	2095	2165	2310	2487	2576	2696	2795	2863	2948
30	790	813	887	905	968	1078	1213	1363	1538	1698	1871	2060	2198	2422	2707	2879	3013	3134	3329
35	222	249	286	346	444	594	779	963	1170	1409	1648	1890	2173	2479	2877	3165	3394	3625	3928
40	99.5	104	110	113	132	225	353	586	892	1166	1506	1885	2299	2681	3154	3461	3659	3902	4324
45	74.9	81.5	82.0	85.5	97.2	116	151	297	542	970	1405	1915	2472	3013	3382	3648	3906	4210	4686
50	54.9	54.3	55.9	59.0	65.8	79.5	106	163	326	681	1329	2030	2753	3327	3583	3745	4026	4379	4985
55	47.7	48.0	48.1	47.7	49.7	55.5	66.2	92.1	204	434	872	1451	2113	2827	3307	3484	3775	4195	4921
60	44.2	45.3	45.2	45.4	47.7	53.2	58.2	68.8	112	239	539	1064	1816	2731	3454	3765	4004	4390	5107
65	42.1	43.4	45.7	47.5	51.1	52.9	54.8	59.4	72.6	133	266	560	1182	2182	3339	4149	4446	5214	6408
70	42.0	42.7	43.5	44.8	46.7	50.0	54.4	61.5	76.5	87.1	155	304	622	1250	2174	2711	2960	3736	4448
75	40.2	40.6	41.7	43.3	44.4	45.2	48.9	57.4	71.1	77.9	75.1	124	216	418	896	1429	1567	1970	2487
80	37.8	38.3	39.4	39.9	40.7	42.5	43.7	46.2	51.5	56.0	52.8	44.6	55.9	110	273	497	575	770	936
85	33.4	34.5	35.3	35.4	29.7	26.3	25.4	25.0	21.1	20.0	16.9	12.8	11.9	8.08	6.32	4.90	3.10	0.98	0.68
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	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343	3343				
5	3326	3333	3340	3354	3362	3365	3365	3379	3409	3445	3476	3494	3489	3475	3463				
10	3231	3249	3275	3298	3328	3345	3359	3365	3423	3510	3572	3611	3680	3751	3743				
15	2878	2946	3041	3139	3263	3391	3507	3610	3719	3788	3823	3924	4065	4179	4268				
20	2896	2988	3054	3158	3275	3447	3548	3682	3870	4027	4100	4126	4191	4310	4443				
25	3076	3181	3301	3564	3709	3760	3758	3757	3746	3887	4186	4314	4302	4429	4517				
30	3550	3805	4153	4288	4299	4219	4051	3855	3755	3659	3816	4304	4376	4406	4631				
35	4269	4716	4891	4986	4844	4517	4179	3955	3795	3690	3614	3858	4286	4290	4595				
40	4887	5391	5698	5540	5310	4817	4319	4017	3751	3525	3333	3248	3757	3876	4282				
45	5362	5872	5941	5723	5437	4930	4481	3997	3619	3245	3061	2966	3115	3551	4059				
50	5873	6345	6271	5993	5672	5100	4639	4048	3501	3128	2957	2826	2690	3236	3700				
55	5403	5446	5727	5769	5894	5838	5451	4649	4062	3506	3264	2978	2706	2877	3293				
60	5843	6057	6106	5952	5684	5539	5666	5746	5276	4332	3549	2841	2271	1955	2308				
65	6589	6776	6584	6202	6065	6152	5646	4871	4209	3839	2784	1988	1442	1170	1428				
70	4958	5311	5654	5790	5799	4931	3932	3148	2643	2085	1785	1387	737	491	537				
75	2679	2854	2981	2599	2237	2048	1853	1648	1428	1197	871	483	274	54.4	34.1				
80	1024	970	776	681	601	377	303	226	195	153	90.9	55.3	22.8	10.9	10.9				
85	0.65	0.72	19.3	16.1	20.0	11.1	1.62	1.03	0.72	0.76	0.83	0.91	1.07	0.74	0.48				
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 $k=2$.

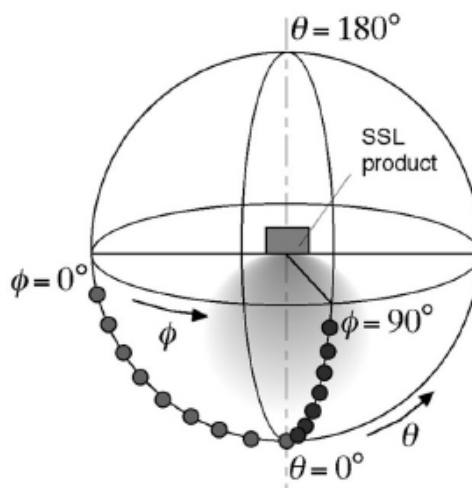
Color Characteristics Measurements

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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