



## Photometric Test Report

### Relevant Standards

IES LM-79-2008

### Prepared For

#### Maxlite Inc.

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### Test Laboratory: UL-CCIC Company Limited

Test Laboratory Address: 2, Chengwan Road, Suzhou Industrial Park, Suzhou 21522 China

### Catalog Number

HL-LI4880UP-D1

### Project Number

4788933278

### Report Number

4788933278-2

### Test Date

2/8/2018-2/26/2018

### Issue Date

4/16/2019

### Revision Date

N/A

### Prepared By

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### Approved By

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The results contained in this report pertain only to the tested sample.

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### 1.0 Test List

Test Item	Test	Test Date	Model Number	Tests Conducted By
1	Integrating Sphere Test	2/8/2018	HL-LI4880UP-D1	Elvis Wu
2	Goniophotometer Test	2/8/2018	HL-LI4880UP-D1	Elvis Wu

### Remark (if any)

1. UL test equipment information is recorded on Meter Use in UL's Aurora database.



## 2.0 Production Description

**Luminaire Description:** Outdoor Pole/Arm-Mounted Area and Roadway Luminaires

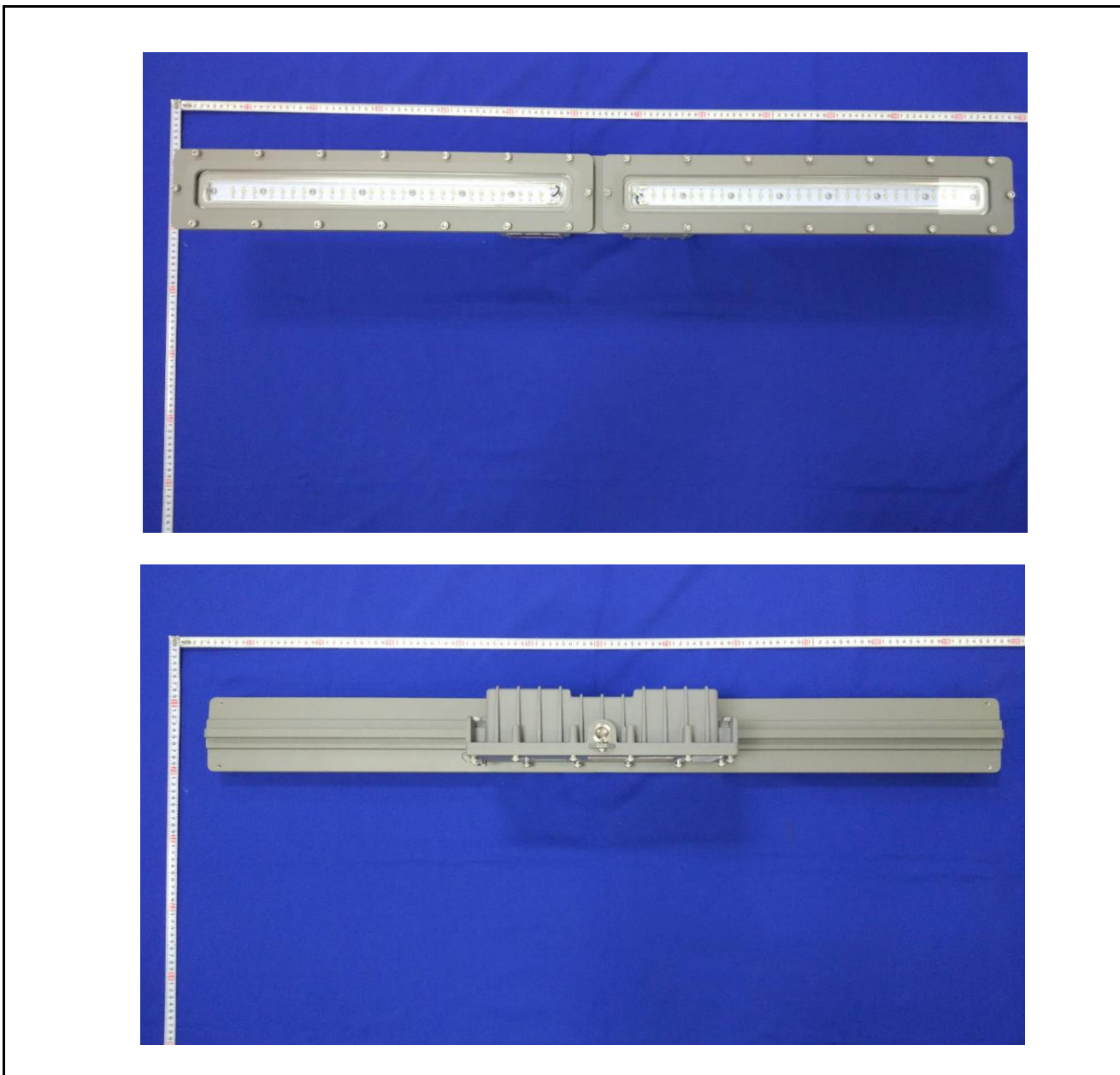
**Model Number:** HL-LI4880UP-D1

**Rated Voltage:** 120-277V AC

**Frequency:** 60Hz

**LED Package:** GW CSSRM2.PM

### Photos of Luminaire Characteristics





### 3.0 LM-79 Measurement and Test Results

<b>Model No.</b>	HL-LI4880UP-D1	<b>Sample ID.</b>	1407665
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45

#### Test Method

1. The sample was tested according to the IES LM-79-2008.

2. Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ . The reference standard lamp is rated current 2.6A omni-directional Incandescent lamp and was calibrated by china seprei laboratory.

3. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%. Photometric measurement conditions was using  $4\pi$  geometry. The self-absorption factor is applied in the final test result. The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

#### Integrating Sphere Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
25.1	120.08	60	0.6769	80.55	0.9911

#### Test Results

CCT (K)	CRI (Ra)	Duv	Luminous Flux (lm)	Luminous Efficacy (lm/W)
4864	73.24	-0.0034	9254.03	114.89

Spectral Result			
Luminous Flux $\Phi(v)$	9254.03 (lm)	Chrom x	0.3481
Chrom y	0.3473	Chrom u	0.2152
Chrom v	0.3220	Duv	-0.0034
Chrom u'	0.2152	Chrom v'	0.4830
CCT	4864.0 (K)	Luminous Efficacy $\eta$	114.89 (lm/W)
Ra	73.24	R1	72.6
R2	77.3	R3	80.2
R4	74.9	R5	73.1
R6	69.0	R7	79.4
R8	59.4	R9	-19.6
R10	45.7	R11	73.9
R12	48.2	R13	72.5
R14	88.7	R15	67.3
Rf	69.0	Rg	97.5



#### 4.0 LM-79 Measurement and Test Results

<b>Model No.</b>	HL-LI4880UP-D1	<b>Sample ID.</b>	1407665
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45

#### Test Method

- 1.The sample was tested according to the IES LM-79-2008.
- 2.Photometric paramters were measured using a type C goniophotometer and software.
- 3.The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample.The reference standard lamp is rated current 3.865A omni-directional Incandescent lamp and was calibrated by china seprei laboratory.
- 4.The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5° vertical intervals and 22.5° horizontal intervals..Photometric distance was more than five times of the largest dimension of the test SSL product.

#### Goniophotometer Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
24.3	119.98	60	0.6801	80.83	0.9909

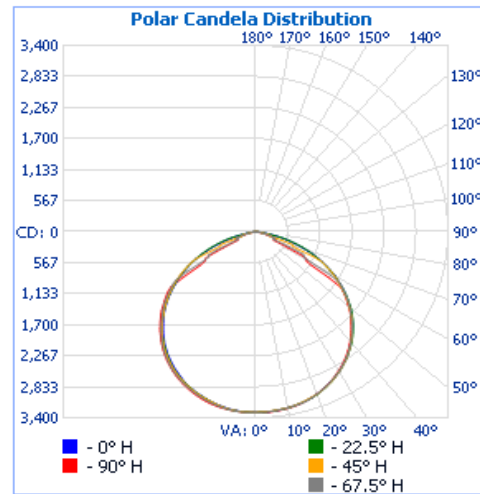
#### Test Result

Flux (lm)	Zonal Lumen Requirement (0°-90°)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)
		Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
9160	100.0%	141.7	155	112.2	116.5	113.32
<b>Zonal Lumen Requirement (80°-90°)</b>						
0.4%						

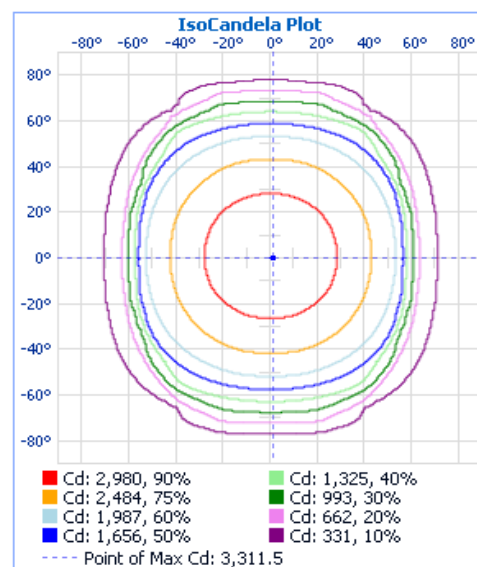


## 5.2 Goniophotometer Test (Cont'd)

### Light Distribution Curve



### IsoCandela Plot





## 5.2 Goniophotometer Test (Cont'd)

### Zonal Lumen Summary

#### Zonal Lumen Summary

Zone	Lumens	% Luminaire
0-30	2,626.6	28.7%
0-40	4,362.2	47.6%
0-60	7,828.7	85.5%
60-90	1,331.3	14.5%
70-100	383.6	4.2%
90-120	0	0%
0-90	9,160.0	100%
90-180	0	0%
0-180	9,160.0	100%

### Lumens Per Zone

#### Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-5	78.8	0.9%	90-95	0	0%
5-10	234.6	2.6%	95-100	0	0%
10-15	384.3	4.2%	100-105	0	0%
15-20	523.9	5.7%	105-110	0	0%
20-25	649.2	7.1%	110-115	0	0%
25-30	755.9	8.3%	115-120	0	0%
30-35	839.6	9.2%	120-125	0	0%
35-40	895.9	9.8%	125-130	0	0%
40-45	920.7	10.1%	130-135	0	0%
45-50	913.1	10.0%	135-140	0	0%
50-55	869.7	9.5%	140-145	0	0%
55-60	763.0	8.3%	145-150	0	0%
60-65	577.4	6.3%	150-155	0	0%
65-70	370.4	4.0%	155-160	0	0%
70-75	235.0	2.6%	160-165	0	0%
75-80	116.0	1.3%	165-170	0	0%
80-85	28.7	0.3%	170-175	0	0%
85-90	3.9	0.0%	175-180	0	0%



5.2 Goniophotometer Test (Cont'd)

Intensity Data(cd)

	0	22.5	45	67.5	90	113	135	158	180	203	225	247.5	270	292.5	315	338	360
0	3301	3301	3301	3301	3301	3301	3301	3301	3301	3301	3301	3301	3301	3301	3301	3301	3301
1	3296	3298	3294	3302	3312	3305	3296	3300	3295	3300	3296	3305	3312	3302	3294	3298	3296
2	3296	3297	3292	3300	3309	3305	3297	3300	3294	3300	3297	3305	3309	3300	3292	3297	3296
3	3293	3295	3290	3298	3306	3304	3297	3297	3293	3297	3297	3304	3306	3298	3290	3295	3293
4	3293	3293	3288	3294	3302	3302	3295	3295	3292	3295	3295	3302	3302	3294	3288	3293	3293
5	3290	3289	3285	3290	3298	3300	3293	3291	3291	3291	3293	3300	3298	3290	3285	3289	3290
6	3286	3284	3281	3286	3294	3296	3290	3289	3284	3289	3290	3296	3294	3286	3281	3284	3286
7	3282	3280	3277	3282	3290	3291	3285	3284	3280	3284	3285	3291	3290	3282	3277	3280	3282
8	3276	3276	3272	3278	3285	3284	3277	3278	3272	3278	3277	3284	3285	3278	3272	3276	3276
9	3271	3271	3269	3273	3279	3276	3268	3269	3263	3269	3268	3276	3279	3273	3269	3271	3271
10	3264	3266	3264	3268	3273	3268	3257	3259	3251	3259	3257	3268	3273	3268	3264	3266	3264
11	3259	3260	3258	3262	3268	3257	3246	3247	3241	3247	3246	3257	3268	3262	3258	3260	3259
12	3249	3251	3250	3256	3260	3248	3233	3235	3229	3235	3233	3248	3260	3256	3250	3251	3249
13	3243	3242	3240	3248	3251	3237	3219	3221	3218	3221	3219	3237	3251	3248	3240	3242	3243
14	3235	3233	3230	3239	3241	3226	3206	3207	3206	3207	3206	3226	3241	3239	3230	3233	3235
15	3227	3224	3220	3229	3229	3212	3193	3193	3192	3193	3193	3212	3229	3229	3220	3224	3227
16	3216	3214	3208	3219	3216	3200	3180	3178	3175	3178	3180	3200	3216	3219	3208	3214	3216
17	3204	3201	3196	3206	3202	3186	3167	3163	3158	3163	3167	3186	3202	3206	3196	3201	3204
18	3190	3190	3185	3191	3187	3170	3152	3148	3141	3148	3152	3170	3187	3191	3185	3190	3190
19	3176	3177	3171	3176	3172	3154	3137	3131	3128	3131	3137	3154	3172	3176	3171	3177	3176
20	3156	3163	3157	3157	3155	3137	3118	3114	3113	3114	3118	3137	3155	3157	3157	3163	3156
25	3062	3070	3070	3065	3057	3045	3021	3016	3007	3016	3021	3045	3057	3065	3070	3070	3062
30	2952	2951	2950	2946	2932	2926	2900	2892	2873	2892	2900	2926	2932	2946	2950	2951	2952
35	2800	2805	2802	2801	2783	2770	2746	2734	2721	2734	2746	2770	2783	2801	2802	2805	2800
40	2622	2637	2620	2620	2600	2583	2559	2551	2527	2551	2559	2583	2600	2620	2620	2637	2622
45	2424	2432	2409	2407	2388	2360	2335	2334	2313	2334	2335	2360	2388	2407	2409	2432	2424
50	2184	2200	2167	2172	2152	2126	2081	2083	2068	2083	2081	2126	2152	2172	2167	2200	2184
55	1914	1917	1889	1894	1885	1845	1800	1796	1786	1796	1800	1845	1885	1894	1889	1917	1914
60	1619	1608	1603	1205	1032	1063	1514	1494	1482	1494	1514	1063	1032	1205	1603	1608	1619
65	1287	1278	1281	663	353	477	1155	1160	1158	1160	1155	477	353	663	1281	1278	1287
70	911	940	687	361	361	354	488	829	789	829	488	354	361	361	687	940	911
75	569	597	270	214	191	196	247	485	442	485	247	196	191	214	270	597	569
80	218	225	112	56	42	44	85	114	149	114	85	44	42	56	112	225	218
85	48	41	13	9	8	8	9	15	18	15	9	8	8	9	13	41	48
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0





## 6.0 THD and PF Test

### Test Method

1. The samples were tested according to the ANSI C82.77-2002.
2. The ambient temperature condition was maintained at  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ . The sample measurement was made using a digital power meter and power supply. The sample was operated at rated voltage and stabilized before measurement. The total harmonic distortion were calculated from the digital power meter.

### Test Results

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD
24.3	277.05	60	0.3051	79.3	0.9381	13.21%



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