



## Photometric Test Report

### Relevant Standards

IES LM-79-2008

### Prepared For

**P.Q.L., Inc.**

**2285 Ward Avenue**

**Simi Valley, CA 93065**

### Test Laboratory & Address:

**UL-CCIC Company Limited location**

**2, Chengwan Road, Suzhou Industrial Park, Suzhou 21522 China**

### Catalog Number

**55256**

### Project Number

**4787945842**

### Report Number

**4787945842\_2**

### Test Date

**4/24/2017-4/25/2017**

### Issue Date

**4/28/2017**

Prepared By

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Approved By

*Duff Yang*

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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 for the Lower CCT	4/24/2017	55256	Elvis Wu
2	Goniophotometer Test	4/25/2017	55256	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:** Direct Linear Ambient Luminaires

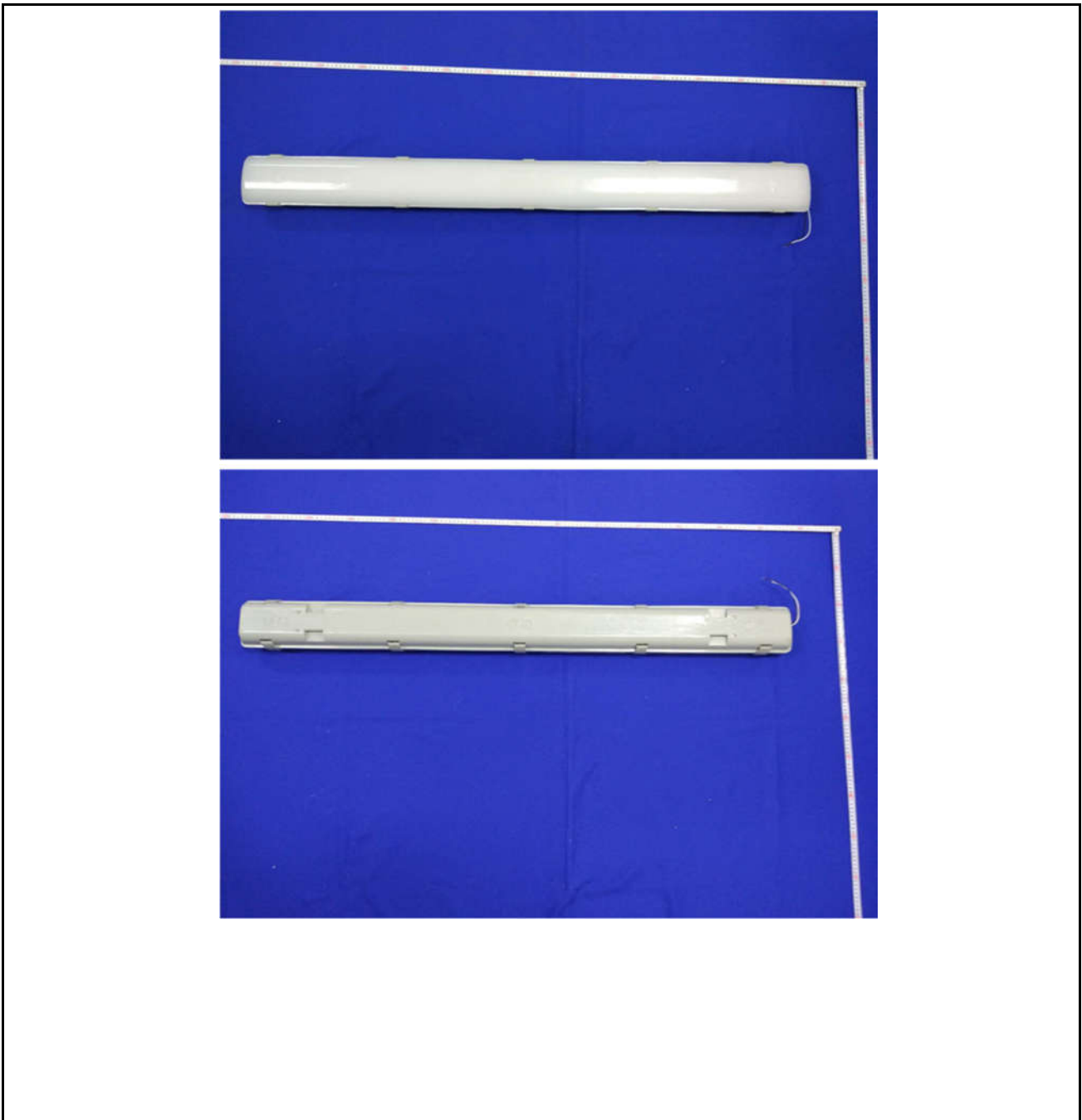
**Model Number:** 55256

**Rated Voltage:** 120-277V

**Frequency:** 50/60Hz

**LED Package:** STWxA2PD-xx

### Photos of Luminaire Characteristics





### 3.0 LM-79 Measurement and Test Results

#### 3.1 Integrating Sphere Test for the lower CCT

Model No.	55256		Sample ID.	916461-002	
Driver No.	N/A	Operate time (Min.)	80	Stabilization time (Min.)	70

#### Test Method

1.The sample was tested according to the IES LM-79-2008.  
 2.Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25° C ± 1° 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 4π 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.

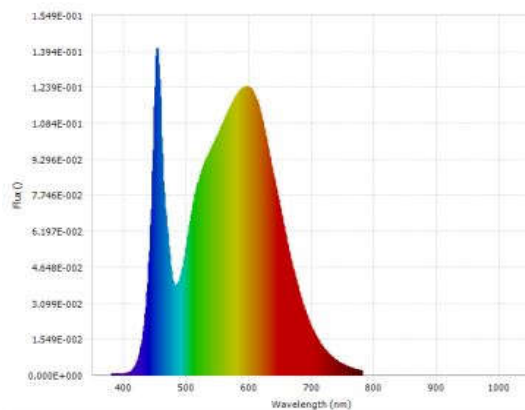
#### Integrating Sphere Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD
25.1	120.01	60	0.5348	63.616	0.9911	10.70%

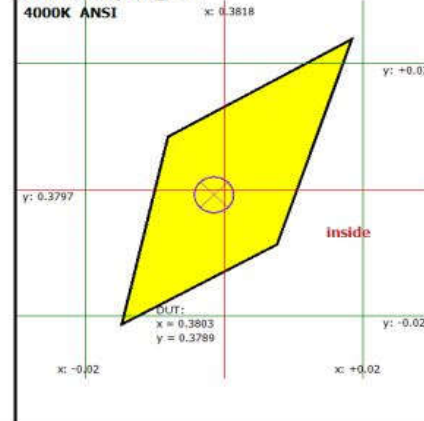
#### Test Results

Orientation	CCT (K)	CRI (Ra)	Duv	Luminous Flux (lm)	Luminous Efficacy (lm/W)	Luminous Efficacy (lm/ft)
Horizontal	4018	83.8	0.0011	7376.4	115.95	N/A

Spectral Flux Graph



Chromaticity Diagram



Spectral Result

Luminous Flux Φ(v)	7376.44 (lm)	Chrom x	0.3803
Chrom y	0.3789	Chrom u	0.2241
Chrom v	0.3350	Duv	0.0011
Chrom u'	0.2241	Chrom v'	0.5025
CCT	4018.0 (K)	Luminous Efficacy η	115.95 (lm/W)
Ra	83.83	R1	82.3
R2	89.6	R3	94.4
R4	82.4	R5	81.8
R6	84.9	R7	87.6
R8	67.7	R9	16.4
R10	74.5	R11	80.7
R12	60.5	R13	84.1
R14	96.9	R15	77.1
Rf	83	Rg	95



### 3.0 LM-79 Measurement and Test Results

#### 3.2 Goniophotometer Test

<b>Model No.</b>	55256		<b>Sample ID.</b>	916461-002	
<b>Driver No.</b>	N/A	<b>Opreate time (Min.)</b>	80	<b>Stabilization time (Min.)</b>	70

#### 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
25.1	119.99	60	0.53349	63.61	0.9937

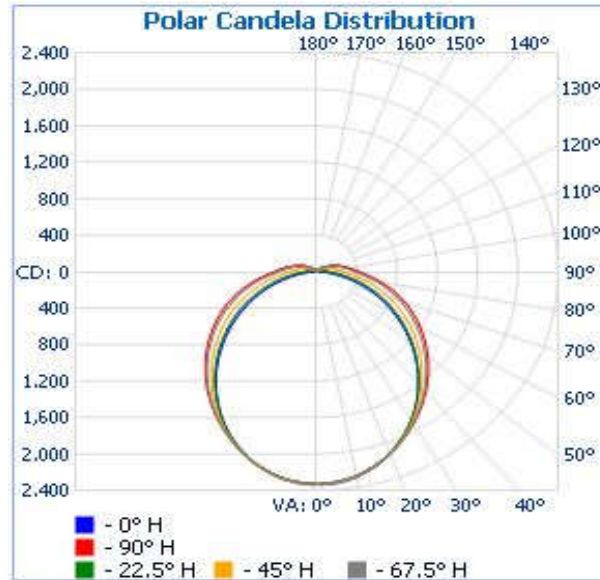
#### Test Result

Orientation	Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)
		Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
Horizontal	7407.50	159.2	157.8	120.3	102.8	116.5

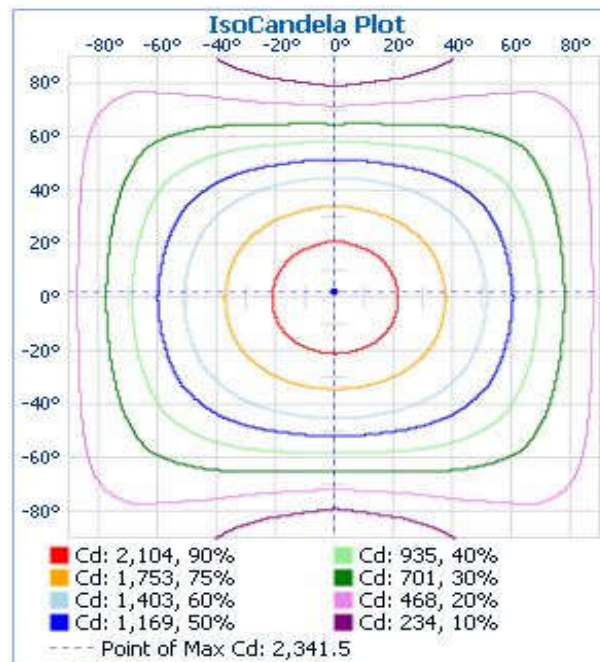


### 3.2 Goniophotometer Test (Cont'd)

#### IsoCandela Plot



#### Polar Candela Distribution







### 3.2 Goniophotometer Test (Cont'd)

#### Zonal Lumen Summary

##### Zonal Lumen Summary

Zone	Lumens	% Luminaire
0-30	1,774.3	24%
0-40	2,879.2	38.9%
0-60	5,072.1	68.5%
60-90	1,838.7	24.8%
70-100	1,193.1	16.1%
90-120	432.2	5.8%
0-90	6,910.8	93.3%
90-180	496.2	6.7%
0-180	7,407.0	100%

#### Lumens Per Zone

##### Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-5	55.6	0.8%	90-95	120.6	1.6%
5-10	164.5	2.2%	95-100	97.5	1.3%
10-15	266.4	3.6%	100-105	77.5	1%
15-20	357.5	4.8%	105-110	59.7	0.8%
20-25	434.6	5.9%	110-115	44.6	0.6%
25-30	495.7	6.7%	115-120	32.3	0.4%
30-35	539.4	7.3%	120-125	22.5	0.3%
35-40	565.6	7.6%	125-130	15.2	0.2%
40-45	574.4	7.8%	130-135	9.8	0.1%
45-50	566.7	7.7%	135-140	5.8	0.1%
50-55	543.9	7.3%	140-145	3.3	0%
55-60	507.8	6.9%	145-150	2.0	0%
60-65	460.2	6.2%	150-155	1.5	0%
65-70	403.5	5.4%	155-160	1.3	0%
70-75	340.1	4.6%	160-165	1.0	0%
75-80	273.2	3.7%	165-170	0.8	0%
80-85	207.9	2.8%	170-175	0.5	0%
85-90	153.8	2.1%	175-180	0.2	0%



**3.2 Goniophotometer Test (Cont'd)**  
**Intensity Data(cd)**

	0	22.5	45	67.5	90	113	135	158	180	203	225	247.5	270	293	315	338	360
0	2333	2333	2333	2333	2333	2333	2333	2333	2333	2333	2333	2333	2333	2333	2333	2333	2333
1	2342	2327	2338	2330	2326	2331	2336	2327	2341	2327	2336	2331	2326	2330	2338	2327	2342
2	2338	2325	2335	2327	2325	2330	2335	2325	2337	2325	2335	2330	2325	2327	2335	2325	2338
3	2338	2323	2333	2325	2322	2328	2333	2323	2335	2323	2333	2328	2322	2325	2333	2323	2338
4	2333	2318	2329	2323	2318	2324	2330	2319	2332	2319	2330	2324	2318	2323	2329	2318	2333
5	2329	2314	2325	2317	2314	2320	2325	2315	2327	2315	2325	2320	2314	2317	2325	2314	2329
6	2324	2308	2317	2310	2307	2311	2318	2309	2320	2309	2318	2311	2307	2310	2317	2308	2324
7	2316	2300	2309	2304	2300	2305	2310	2302	2312	2302	2310	2305	2300	2304	2309	2300	2316
8	2307	2292	2303	2296	2292	2296	2303	2292	2305	2292	2303	2296	2292	2296	2303	2292	2307
9	2299	2284	2294	2286	2283	2290	2293	2285	2297	2285	2293	2290	2283	2286	2294	2284	2299
10	2290	2272	2283	2276	2275	2280	2284	2273	2287	2273	2284	2280	2275	2276	2283	2272	2290
11	2277	2261	2272	2266	2263	2269	2273	2262	2272	2262	2273	2269	2263	2266	2272	2261	2277
12	2264	2249	2260	2253	2251	2255	2261	2250	2258	2250	2261	2255	2251	2253	2260	2249	2264
13	2251	2234	2245	2241	2236	2243	2248	2238	2245	2238	2248	2243	2236	2241	2245	2234	2251
14	2237	2220	2231	2226	2224	2229	2234	2223	2232	2223	2234	2229	2224	2226	2231	2220	2237
15	2222	2206	2216	2212	2210	2215	2219	2208	2216	2208	2219	2215	2210	2212	2216	2206	2222
16	2205	2189	2201	2196	2196	2200	2203	2191	2197	2191	2203	2200	2196	2196	2201	2189	2205
17	2187	2173	2183	2182	2180	2184	2186	2173	2180	2173	2186	2184	2180	2182	2183	2173	2187
18	2169	2154	2165	2163	2164	2168	2169	2157	2163	2157	2169	2168	2164	2163	2165	2154	2169
19	2150	2136	2147	2146	2146	2149	2151	2138	2142	2138	2151	2149	2146	2146	2147	2136	2150
20	2130	2116	2129	2128	2128	2131	2132	2117	2122	2117	2132	2131	2128	2128	2129	2116	2130
25	2017	2004	2021	2026	2030	2031	2024	2006	2006	2006	2024	2031	2030	2026	2021	2004	2017
30	1883	1874	1898	1913	1923	1919	1901	1878	1872	1878	1901	1919	1923	1913	1898	1874	1883
35	1734	1731	1763	1796	1812	1802	1768	1734	1720	1734	1768	1802	1812	1796	1763	1731	1734
40	1570	1576	1621	1669	1693	1676	1626	1579	1559	1579	1626	1676	1693	1669	1621	1576	1570
45	1400	1413	1474	1538	1568	1545	1480	1417	1388	1417	1480	1545	1568	1538	1474	1413	1400
50	1223	1247	1325	1404	1439	1409	1329	1251	1214	1251	1329	1409	1439	1404	1325	1247	1223
55	1047	1080	1174	1267	1309	1272	1179	1084	1039	1084	1179	1272	1309	1267	1174	1080	1047
60	870	912	1023	1131	1177	1134	1028	915	858	915	1028	1134	1177	1131	1023	912	870
65	698	750	873	993	1044	995	877	751	684	751	877	995	1044	993	873	750	698
70	526	590	728	857	911	859	731	591	512	591	731	859	911	857	728	590	526
75	359	438	590	723	774	724	590	440	347	440	590	724	774	723	590	438	359
80	208	303	461	592	642	593	462	302	197	302	462	593	642	592	461	303	208
85	86	187	343	470	515	470	343	186	78	186	343	470	515	470	343	187	86
90	24	115	260	377	419	378	261	117	26	117	261	378	419	377	260	115	24
95	22	83	209	313	350	313	211	85	23	85	211	313	350	313	209	83	22
100	19	60	169	259	292	259	170	62	20	62	170	259	292	259	169	60	19
105	16	42	133	212	242	212	132	42	18	42	132	212	242	212	133	42	16
110	14	29	103	171	196	166	94	27	15	27	94	166	196	171	103	29	14
115	12	19	78	135	156	131	65	17	12	17	65	131	156	135	78	19	12
120	10	12	57	104	118	94	45	12	10	12	45	94	118	104	57	12	10
125	8	8	39	77	92	65	29	9	9	9	29	65	92	77	39	8	8
130	7	7	25	56	68	44	19	7	8	7	19	44	68	56	25	7	7
135	7	7	14	37	46	28	11	6	7	6	11	28	46	37	14	7	7
140	6	6	7	21	29	17	6	6	6	6	6	17	29	21	7	6	6
145	6	6	6	11	15	8	6	6	6	6	6	8	15	11	6	6	6
150	6	6	6	6	7	5	6	6	6	6	6	5	7	6	6	6	6
155	6	6	6	6	6	5	6	6	6	6	6	5	6	6	6	6	6
160	7	7	6	6	6	5	6	6	7	6	6	5	6	6	6	7	7
165	7	7	7	6	6	6	6	7	7	7	6	6	6	6	7	7	7
170	8	8	8	8	6	6	7	7	8	7	7	6	6	8	8	8	8
175	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
180	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8





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