

# IES LM-79-08

## MEASUREMENT AND TEST REPORT

For

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

2285 Ward Avenue / Simi Valley, CA 93065

**Test Model: 83595**

<b>Report Type:</b>	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution, THD, Power Factor
<b>Test Engineer:</b>	Daniel Duan <i>Daniel Duan</i>
<b>Report Number:</b>	RSZ160620502-10
<b>Test Date:</b>	2016-06-22 to 2016-06-23
<b>Report Date:</b>	2016-06-27
<b>Reviewed By:</b>	Jeanne Han/Safety Manager <i>Jeanne Han</i>
<b>Prepared By:</b>	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008
<b>Test Facility:</b>	Test facility was located at Pu Long Cun 69, Puxinghu Industrial Area, Tangxia Town, Dongguan, Guangdong, P.R.China.
<b>Accreditation:</b>	The NVLAP Lab Code is 200707-0.

**STATEMENT:** This test may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Shenzhen). The test data was only valid for the test sample(s). This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Federal Government. This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

## 1. Product Description

### General Information:

One sample was received on 2016-06-20 and used for testing.

Model Tested: 83595  
 Manufacturer: P.Q.L., Inc.  
 Brand Name: Superior Life®  
 Product Designation: Outdoor Pole/Arm-Mounted Area and Roadway Luminair  
 Architectural Flood and Spot Luminaires  
 Burning Time Before Test: 0hour(For New Products)

### Rated Values:

Rated Voltage/Frequency: AC200-480V  
 Rated Power: 100 W  
 Nominal CCT: 5000K  
 Nominal Lumen Output: 12500 lm

## 2. Standards Used

IES LM-79-08: Approved Method: Electrical & Photometric Measurement of Solid-state Lighting Products  
 ANSI C82.77-2002: Harmonic Emission Limits – Related Power Quality Requirements for Lighting  
 IES TM-30-15: IES Method for Evaluating Light Source Color Rendition (This method is not in NVLAP accreditation scope)

## 3. Description of Test Equipment

Device	Manufacture	Model No	Serial No	Test Range	Calibration date	Calibration due date
2.0m integrating sphere	EVERFINE	R98	11010018	R98	2015-11-09	2016-11-08
High accuracy array spectroradiometer	EVERFINE	HAAS-2000	1012016T	380-780nm	2016-03-10	2017-03-09
DC Power Supply	EVERFINE	WY305-V1	1101047	30V/5A	2015-07-27	2016-07-26
Thermal Meter	Anymetre	JR900A	N/A	25°C	2016-01-12	2017-01-11
Standard Light Source	SENSING	N/A	LSD090808	N/A	2015-09-25	2016-09-24
AC Power Supply	EVERFINE	DPS1010-YF	1011001T	30V/5A	2016-03-04	2017-03-03
AC Power Supply	EVERFINE	VPS1030 PWM	1012017	0-150V, 0-300V	2016-03-04	2017-03-03
DC Power Supply	EVERFINE	WY12010	1009009	30V/5A	2016-03-04	2017-03-03
Power Meter	YOKOGAWA	WT-210	91KB35700	15/30/60/150/ 300/600 V	2016-03-04	2017-03-03
Goniophotometer	EVERFINE	GO-R5000	YG108492N10 120001	1600mm, 3000W/10A	2016-03-10	2017-03-09
Wireless Remote Sensor	N/A	433MHz	N/A	0°C~50°C; -20°C~60°C	2016-03-21	2017-03-20
Standard Light Source	EVERFINE	D908	1012003	N/A	2015-09-08	2016-09-07
Variable-Voltage Transformer	CHKO	TDGC2G-3	201102	0-600v	N/A	N/A

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Shenzhen) attested that all calibration has been performed using suitable standards traceable to National Primary Standards and International System of Units (SI).

## 4. Test Method

Product was tested with no seasoning. All stabilization and measurements were made in compliance with IES LM-79-08. The product was operated at rated voltage or at voltage required by manufacturer. The ambient temperature of the sample was maintained at  $25^{\circ}\text{C}\pm 1^{\circ}\text{C}$  during measurement. And relative humidity is less than 65%.

### Integrating Sphere System

The system includes AC power source, digital power meter, DC power supply, Spectroradiometer, and integrating sphere. The integrating sphere system is calibrated by standard spectrum light source before measurement.

$4\pi$  geometry was used during measurement. The product was operated in its intended orientation in application and was recorded in this report.

The uncertainty of the light output (luminous flux) measurements is  $U=2.1\%$  ( $K=2$ ), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is  $U=32\text{K}$  ( $K=2$ ), at the 95% confidence level. The uncertainty of the CRI is  $U=2.1$  ( $K=2$ ), at the 95% confidence level.

The uncertainty of power meter AC current  $U=0.19\%$  of rdg, AC Voltage  $U=0.15\%$  of rdg, Power  $U=0.20\%$  ( $K=2$ ), at the 95% confidence level.

### Goniophotometer System

The goniophotometer system is calibrated by standard light source before measurement.

Type C goniophotometer was used for measuring total luminous flux, luminous intensity distribution, and color spatial uniformity. The product was operated in its intended orientation in application and was recorded in this report. The vertical angle ( $\gamma$ ) test intervals were set no more than 1 degree while data for 5 degree intervals is reported. The horizontal angle (C plane) test intervals were set no more than 22.5 degree.

The uncertainty of the luminous intensity is  $U=1.6\%$  ( $K=2$ ), at the 95% confidence level.

### Additional Test

The Additional Test item may not be covered by IESNA LM-79-2008. Additional test including power factor, off-state power and THD, was measured by Digital Power Meter after stabilized at  $25^{\circ}\text{C}\pm 1^{\circ}\text{C}$ . Test voltage for THD and power factor test would be equal to rated voltage or, in case of a voltage range, maximum value of that range.

The uncertainty of power meter AC current  $U=0.19\%$  of rdg, AC Voltage  $U=0.15\%$  of rdg, Power  $U=0.20\%$  ( $K=2$ ), at the 95% confidence level.

### Fidelity Index and Gamut Index Calculation

The  $R_f$ ,  $R_g$  was calculated according to IES TM-30-15 by using calculation tools. The calculation was based on the measured SPD from 380nm to 780nm with 1nm intervals. All the colors in this report is for reference only.

## 5. Test Result

### [Integrating Sphere System]

Total operating time for integrating sphere test: **1.0 hour**

Test orientation: **Downward**

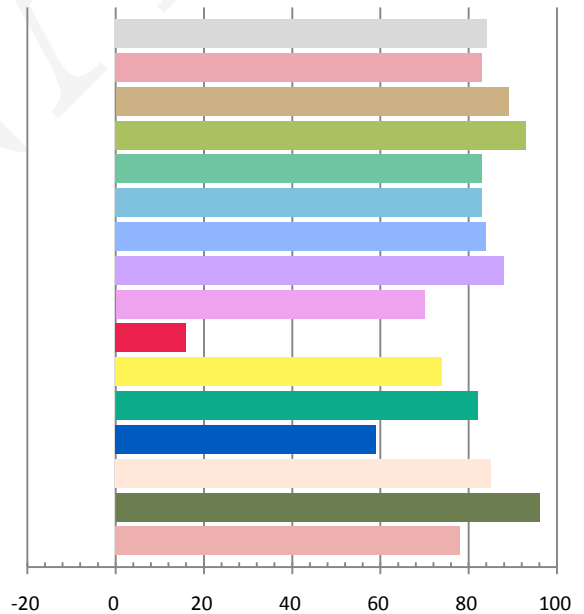
### Photometric and Electrical Measurement Result

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
480.0	60	0.2236	99.98	0.9316	11157	111.59

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
34.900	4823	0.00100	0.3505	0.3579	0.2126	0.4885

### Color Rendering Index

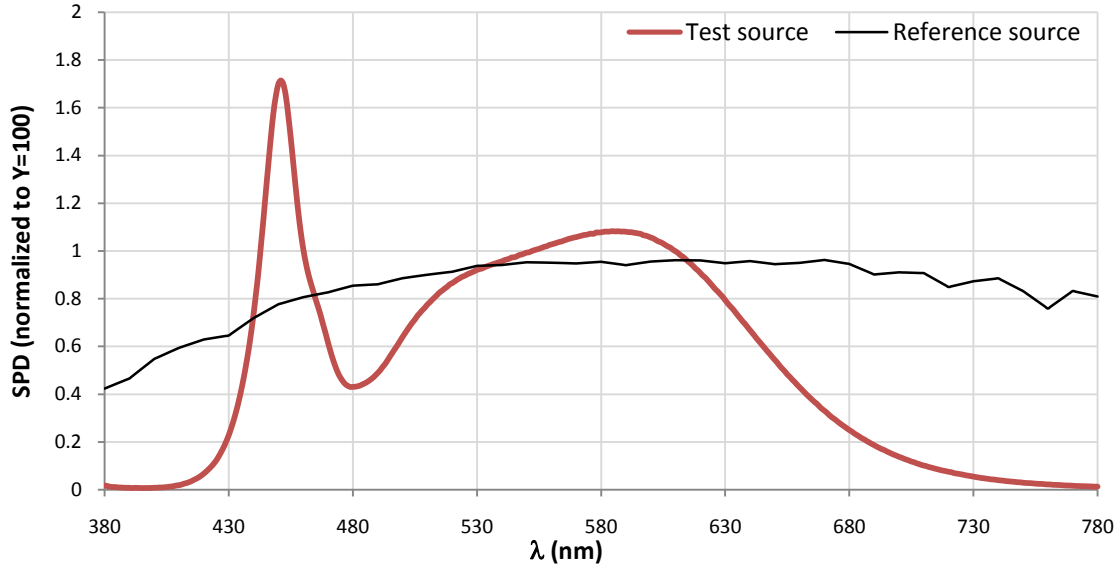
Ra			
84.2			
R1	R2	R3	R4
83	89	93	83
R5	R6	R7	R8
83	84	88	70
R9	R10	R11	R12
16	74	82	59
R13	R14	R15	
85	96	78	



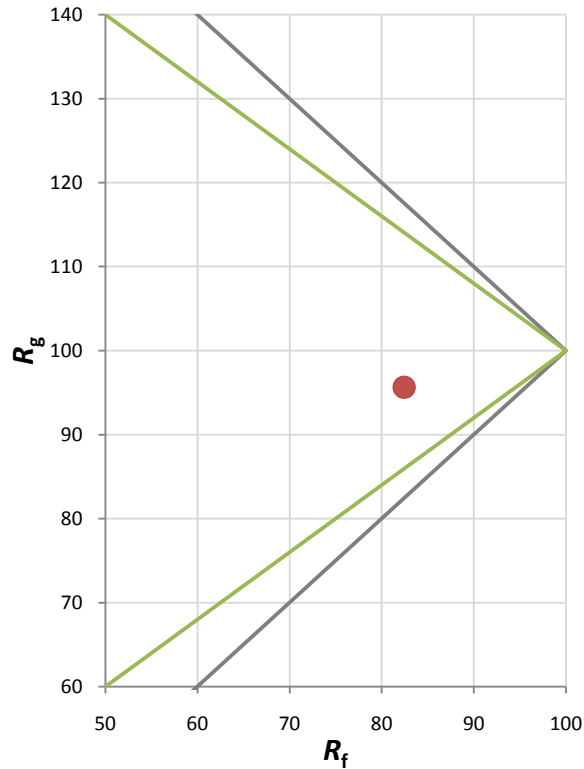
Fidelity Index and Gamut Index

Fidelity Index $R_f$	82
Gamut Index $R_g$	96

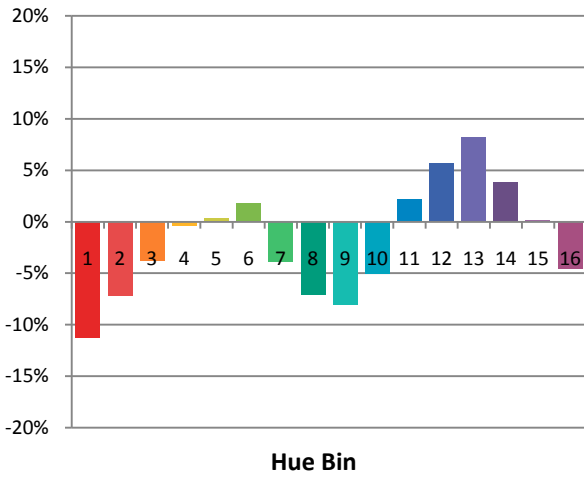
Spectral Power Distribution Comparison



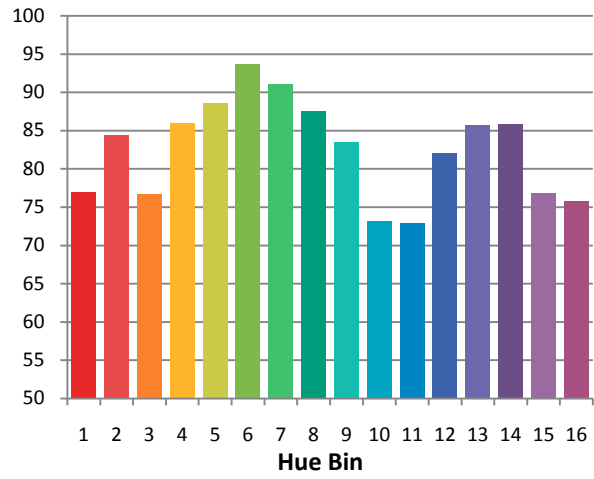
Plot of  $R_g$  versus  $R_f$



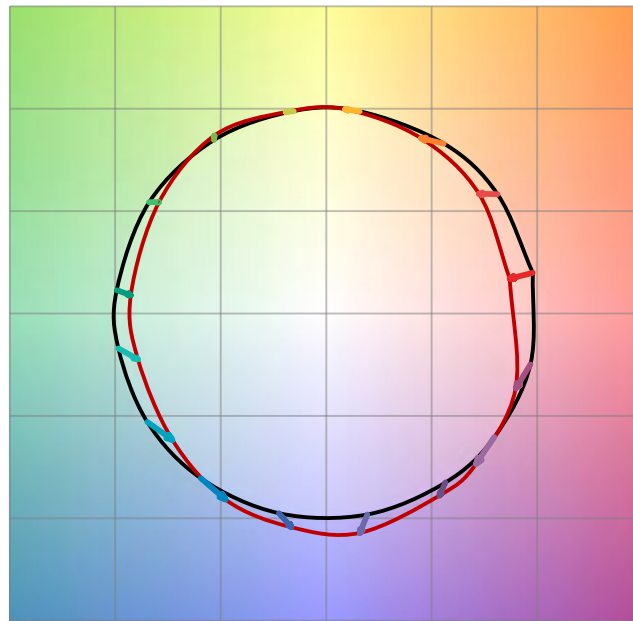
Chroma Shift by Hue



$R_f$  by Hue

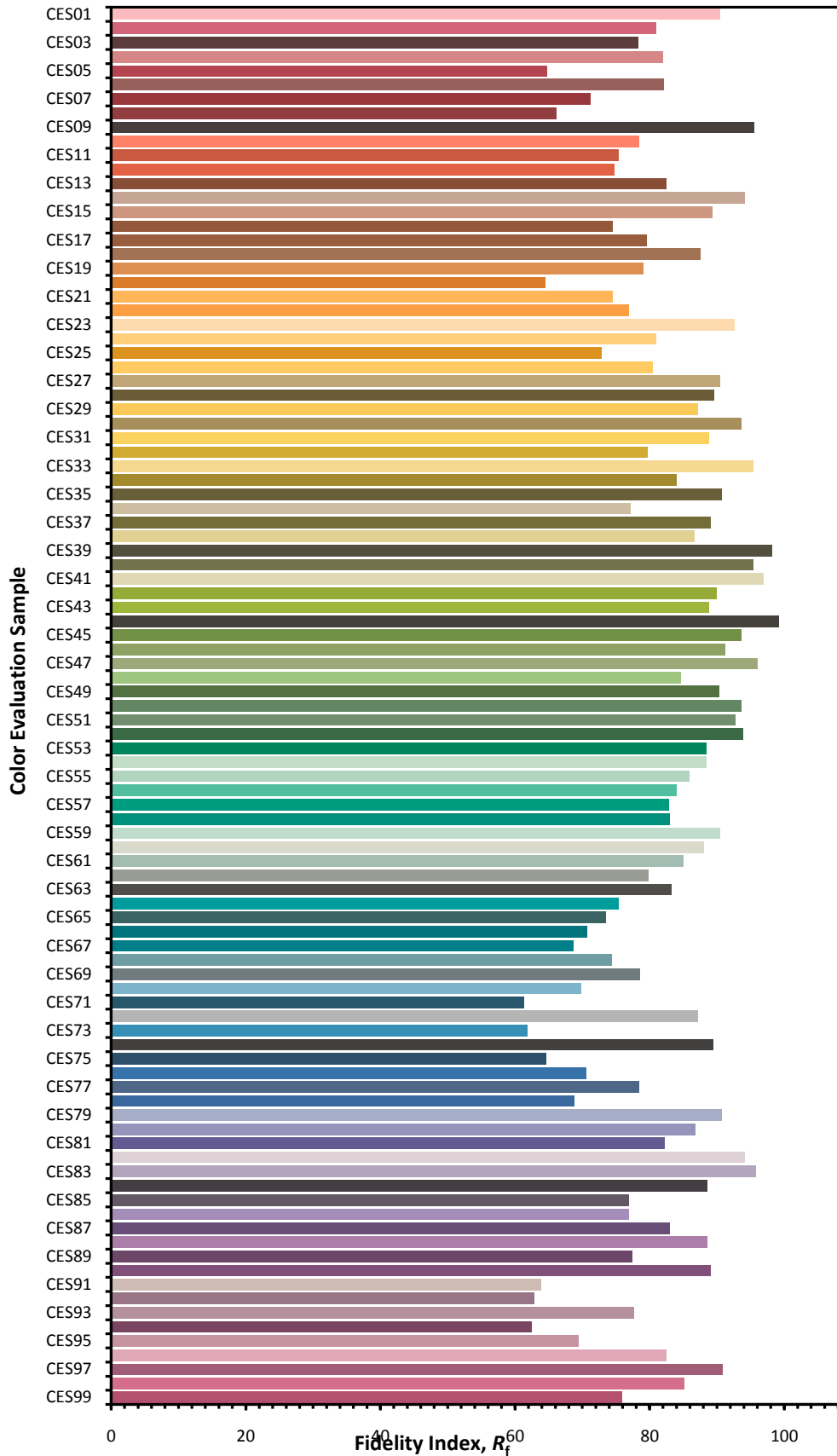


Color Vector Graphic

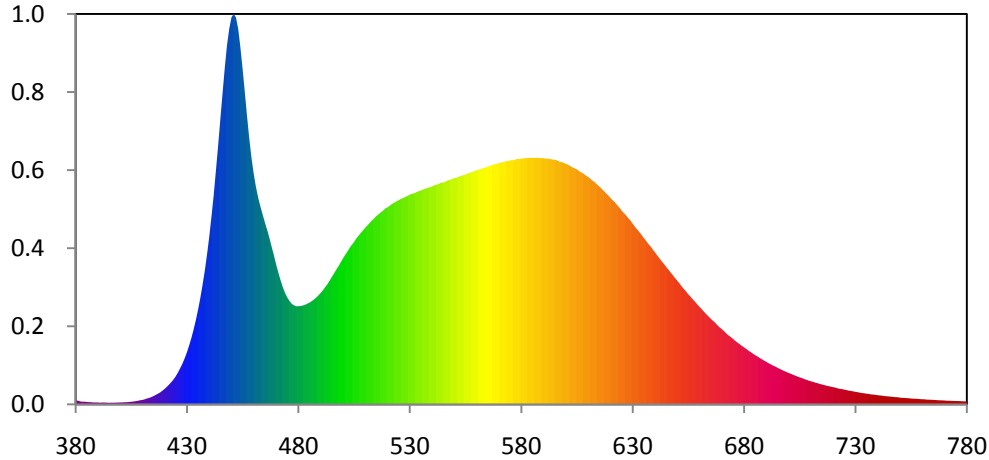


— Reference Illuminat    — Test Source

**Color Fidelity by CES Sample**



### Relative Spectral Power Distribution

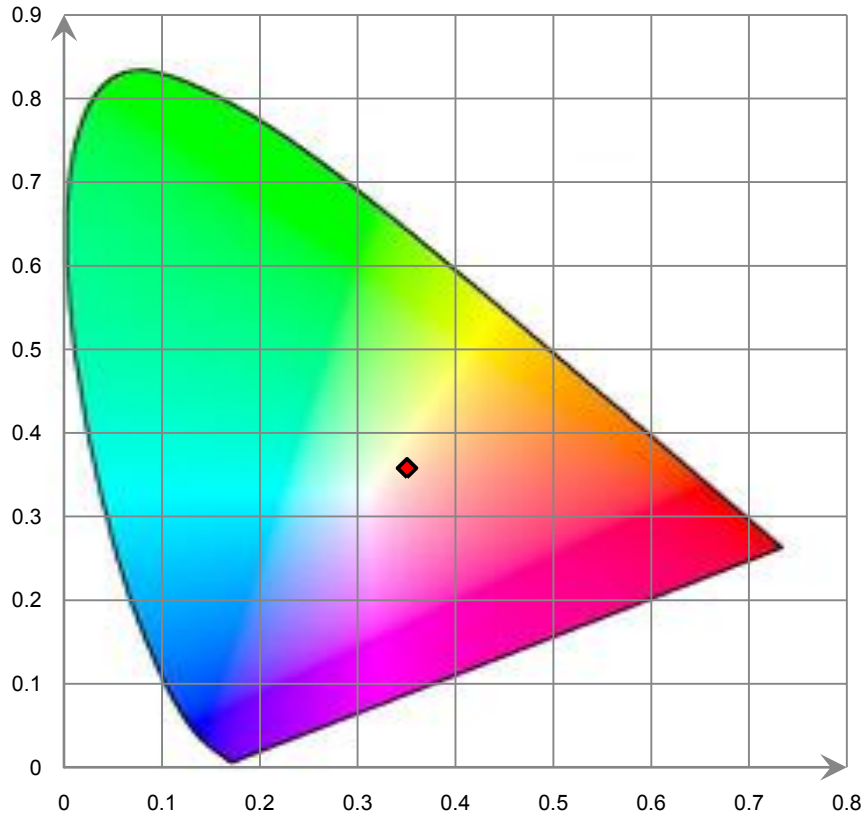


nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	2.938E+00	421	1.264E+01	462	1.481E+02	503	1.121E+02	544	1.590E+02
381	2.621E+00	422	1.422E+01	463	1.418E+02	504	1.144E+02	545	1.591E+02
382	2.179E+00	423	1.596E+01	464	1.361E+02	505	1.165E+02	546	1.597E+02
383	1.907E+00	424	1.792E+01	465	1.304E+02	506	1.190E+02	547	1.606E+02
384	1.934E+00	425	2.020E+01	466	1.251E+02	507	1.209E+02	548	1.610E+02
385	1.747E+00	426	2.293E+01	467	1.195E+02	508	1.229E+02	549	1.616E+02
386	1.585E+00	427	2.601E+01	468	1.132E+02	509	1.246E+02	550	1.623E+02
387	1.537E+00	428	2.927E+01	469	1.072E+02	510	1.267E+02	551	1.625E+02
388	1.409E+00	429	3.309E+01	470	1.007E+02	511	1.283E+02	552	1.633E+02
389	1.393E+00	430	3.732E+01	471	9.472E+01	512	1.301E+02	553	1.639E+02
390	1.371E+00	431	4.230E+01	472	8.914E+01	513	1.317E+02	554	1.644E+02
391	1.193E+00	432	4.763E+01	473	8.428E+01	514	1.334E+02	555	1.649E+02
392	1.334E+00	433	5.370E+01	474	8.004E+01	515	1.351E+02	556	1.655E+02
393	1.298E+00	434	6.041E+01	475	7.676E+01	516	1.363E+02	557	1.662E+02
394	1.262E+00	435	6.791E+01	476	7.425E+01	517	1.377E+02	558	1.666E+02
395	1.156E+00	436	7.625E+01	477	7.224E+01	518	1.389E+02	559	1.674E+02
396	1.237E+00	437	8.555E+01	478	7.112E+01	519	1.405E+02	560	1.679E+02
397	1.194E+00	438	9.564E+01	479	7.036E+01	520	1.414E+02	561	1.684E+02
398	1.260E+00	439	1.072E+02	480	7.046E+01	521	1.425E+02	562	1.689E+02
399	1.283E+00	440	1.200E+02	481	7.053E+01	522	1.437E+02	563	1.695E+02
400	1.404E+00	441	1.344E+02	482	7.091E+01	523	1.447E+02	564	1.699E+02
401	1.396E+00	442	1.498E+02	483	7.141E+01	524	1.457E+02	565	1.705E+02
402	1.573E+00	443	1.676E+02	484	7.221E+01	525	1.464E+02	566	1.711E+02
403	1.582E+00	444	1.854E+02	485	7.302E+01	526	1.473E+02	567	1.717E+02
404	1.721E+00	445	2.047E+02	486	7.403E+01	527	1.481E+02	568	1.721E+02
405	1.871E+00	446	2.233E+02	487	7.522E+01	528	1.488E+02	569	1.726E+02
406	2.075E+00	447	2.416E+02	488	7.655E+01	529	1.496E+02	570	1.729E+02
407	2.304E+00	448	2.578E+02	489	7.815E+01	530	1.504E+02	571	1.734E+02
408	2.586E+00	449	2.695E+02	490	7.990E+01	531	1.510E+02	572	1.738E+02
409	2.969E+00	450	2.776E+02	491	8.174E+01	532	1.514E+02	573	1.743E+02
410	3.163E+00	451	2.801E+02	492	8.403E+01	533	1.522E+02	574	1.745E+02
411	3.577E+00	452	2.776E+02	493	8.608E+01	534	1.529E+02	575	1.749E+02
412	4.210E+00	453	2.695E+02	494	8.868E+01	535	1.535E+02	576	1.753E+02
413	4.627E+00	454	2.560E+02	495	9.134E+01	536	1.541E+02	577	1.751E+02
414	5.220E+00	455	2.405E+02	496	9.391E+01	537	1.547E+02	578	1.761E+02
415	5.930E+00	456	2.236E+02	497	9.653E+01	538	1.552E+02	579	1.760E+02
416	6.837E+00	457	2.065E+02	498	9.905E+01	539	1.558E+02	580	1.762E+02
417	7.637E+00	458	1.905E+02	499	1.018E+02	540	1.563E+02	581	1.765E+02
418	8.599E+00	459	1.766E+02	500	1.045E+02	541	1.571E+02	582	1.767E+02
419	9.827E+00	460	1.652E+02	501	1.071E+02	542	1.576E+02	583	1.766E+02
420	1.111E+01	461	1.558E+02	502	1.096E+02	543	1.581E+02	584	1.769E+02

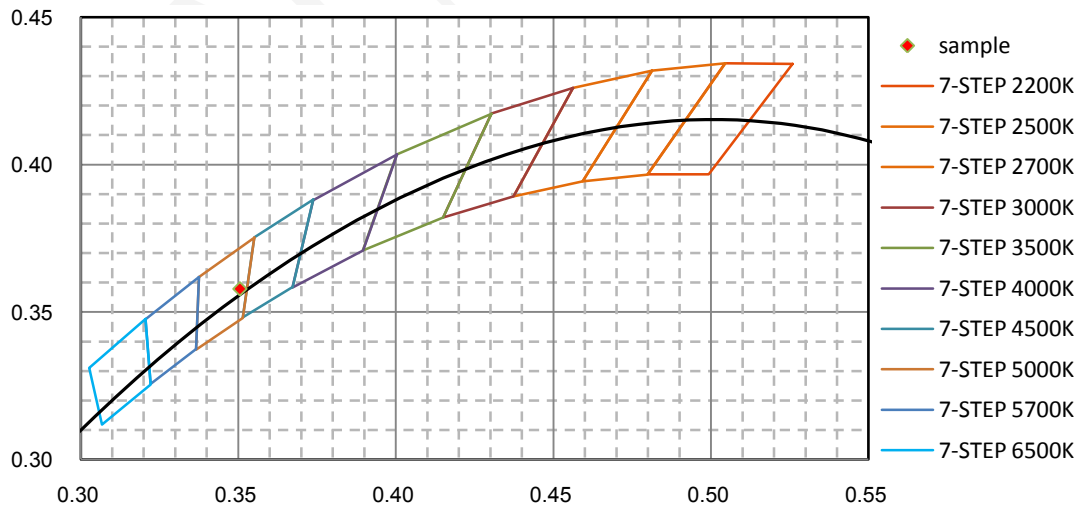


nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.769E+02	626	1.373E+02	667	5.871E+01	708	1.766E+01	749	5.116E+00
586	1.768E+02	627	1.357E+02	668	5.695E+01	709	1.704E+01	750	4.846E+00
587	1.769E+02	628	1.338E+02	669	5.535E+01	710	1.659E+01	751	4.684E+00
588	1.767E+02	629	1.320E+02	670	5.411E+01	711	1.618E+01	752	4.616E+00
589	1.767E+02	630	1.298E+02	671	5.264E+01	712	1.561E+01	753	4.531E+00
590	1.766E+02	631	1.276E+02	672	5.102E+01	713	1.520E+01	754	4.386E+00
591	1.763E+02	632	1.256E+02	673	4.960E+01	714	1.473E+01	755	4.225E+00
592	1.763E+02	633	1.238E+02	674	4.843E+01	715	1.427E+01	756	4.094E+00
593	1.760E+02	634	1.217E+02	675	4.710E+01	716	1.385E+01	757	4.042E+00
594	1.757E+02	635	1.195E+02	676	4.571E+01	717	1.340E+01	758	3.947E+00
595	1.754E+02	636	1.174E+02	677	4.446E+01	718	1.305E+01	759	3.768E+00
596	1.751E+02	637	1.153E+02	678	4.328E+01	719	1.272E+01	760	3.678E+00
597	1.742E+02	638	1.135E+02	679	4.207E+01	720	1.232E+01	761	3.629E+00
598	1.739E+02	639	1.113E+02	680	4.088E+01	721	1.208E+01	762	3.422E+00
599	1.733E+02	640	1.092E+02	681	3.985E+01	722	1.152E+01	763	3.377E+00
600	1.726E+02	641	1.071E+02	682	3.858E+01	723	1.117E+01	764	3.283E+00
601	1.720E+02	642	1.050E+02	683	3.753E+01	724	1.094E+01	765	3.259E+00
602	1.710E+02	643	1.028E+02	684	3.645E+01	725	1.061E+01	766	3.099E+00
603	1.700E+02	644	1.009E+02	685	3.534E+01	726	1.028E+01	767	2.993E+00
604	1.694E+02	645	9.883E+01	686	3.447E+01	727	9.891E+00	768	2.911E+00
605	1.685E+02	646	9.686E+01	687	3.337E+01	728	9.642E+00	769	2.895E+00
606	1.674E+02	647	9.478E+01	688	3.243E+01	729	9.318E+00	770	2.774E+00
607	1.664E+02	648	9.286E+01	689	3.142E+01	730	9.035E+00	771	2.659E+00
608	1.656E+02	649	9.075E+01	690	3.055E+01	731	8.698E+00	772	2.602E+00
609	1.642E+02	650	8.886E+01	691	2.959E+01	732	8.449E+00	773	2.550E+00
610	1.632E+02	651	8.695E+01	692	2.875E+01	733	8.112E+00	774	2.475E+00
611	1.620E+02	652	8.477E+01	693	2.786E+01	734	7.940E+00	775	2.444E+00
612	1.605E+02	653	8.282E+01	694	2.724E+01	735	7.686E+00	776	2.370E+00
613	1.594E+02	654	8.106E+01	695	2.633E+01	736	7.467E+00	777	2.344E+00
614	1.579E+02	655	7.897E+01	696	2.553E+01	737	7.177E+00	778	2.222E+00
615	1.563E+02	656	7.732E+01	697	2.474E+01	738	7.064E+00	779	2.168E+00
616	1.549E+02	657	7.540E+01	698	2.398E+01	739	6.841E+00	780	2.172E+00
617	1.533E+02	658	7.373E+01	699	2.332E+01	740	6.586E+00		
618	1.515E+02	659	7.184E+01	700	2.258E+01	741	6.407E+00		
619	1.501E+02	660	7.007E+01	701	2.198E+01	742	6.252E+00		
620	1.483E+02	661	6.839E+01	702	2.125E+01	743	5.979E+00		
621	1.465E+02	662	6.660E+01	703	2.065E+01	744	5.821E+00		
622	1.451E+02	663	6.486E+01	704	2.004E+01	745	5.680E+00		
623	1.432E+02	664	6.326E+01	705	1.934E+01	746	5.532E+00		
624	1.413E+02	665	6.163E+01	706	1.890E+01	747	5.328E+00		
625	1.393E+02	666	6.010E+01	707	1.821E+01	748	5.170E+00		

CIE 1931 x y Chromaticity Diagram



7-Step Chromaticity Quadrangles



**[Goniophotometer System]**

Total operating time for luminous intensity distribution: **1.0 hour**

Test orientation: **Downward**

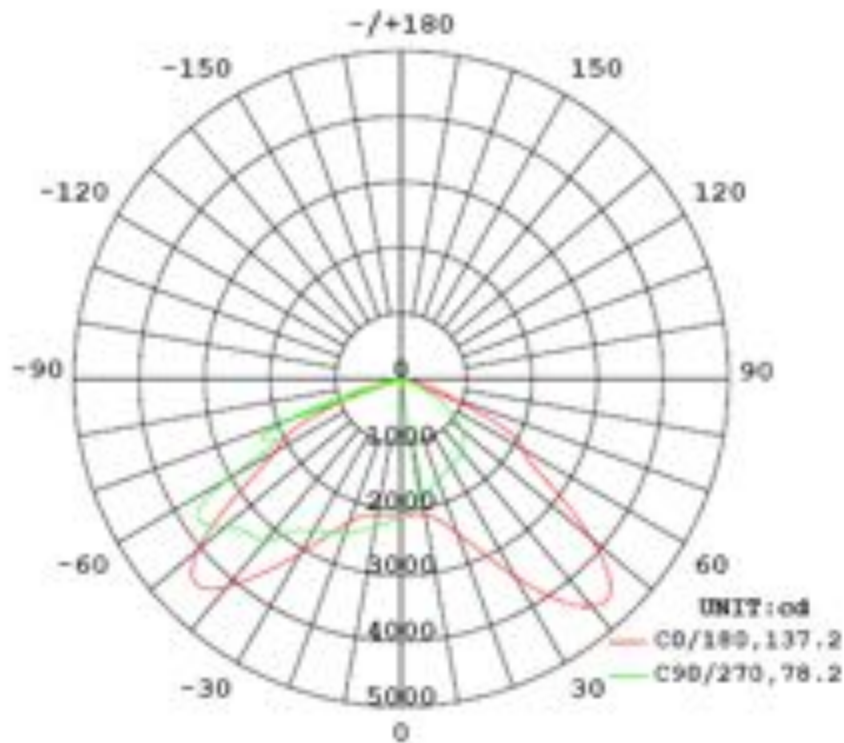
**Electrical Measurement**

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
480.0	60	0.2225	100.1	0.9372

**Photometric Measurement**

Luminous Flux (lm)	Efficacy (lm/W)	I <sub>max</sub> (cd)	S/MH (C0/180)	S/MH (C90/270)
11177.3	111.66	5147.0	2.01	1.10

**Luminous Intensity Distribution**



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I <sub>max</sub> ):	137.2	53.9	78.2	51.6	80.2
Field Angle (10% I <sub>max</sub> ):	159.4	151.5	142.2	151.2	151.1

Luminous Intensity (cd) Distribution Data

C \ y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	2083	2083	2083	2083	2083	2083	2083	2083
5.0°	2098	2139	2170	2186	2187	2177	2156	2120
10.0°	2110	2206	2264	2289	2290	2284	2269	2216
15.0°	2164	2327	2390	2400	2395	2413	2441	2414
20.0°	2328	2544	2566	2523	2501	2561	2681	2744
25.0°	2630	2875	2798	2652	2594	2724	2988	3186
30.0°	3062	3316	3112	2792	2679	2904	3405	3756
35.0°	3584	3900	3549	2993	2831	3166	3945	4429
40.0°	4136	4471	4114	3458	3236	3674	4526	4984
45.0°	4430	4824	4466	3602	3314	3792	4807	5140
50.0°	4048	4889	4514	3747	3511	3946	4888	4745
55.0°	3043	4217	4722	4102	3773	4231	4979	3717
60.0°	2233	2960	4756	4041	3078	4020	4506	2557
65.0°	1782	2198	3818	2618	2188	2622	3243	2131
70.0°	921	1643	2281	2585	1816	2501	1892	1463
75.0°	505	836	1493	1227	656	1089	1558	664
80.0°	217	283	1099	440	225	366	987	201
85.0°	47	54	353	143	78	123	234	48
90.0°	1	0	1	0	0	16	0	0
95.0°	1	1	0	0	0	0	0	1
100.0°	1	1	1	0	0	0	1	1
105.0°	1	1	1	1	1	1	1	1
110.0°	1	1	1	1	1	1	1	1
115.0°	2	1	1	1	1	1	1	1
120.0°	2	1	1	1	1	1	1	1
125.0°	2	1	1	1	1	1	1	1
130.0°	2	2	1	1	1	1	1	2
135.0°	2	2	1	1	1	1	1	2
140.0°	2	2	2	2	1	2	2	2
145.0°	2	2	2	2	2	2	2	2
150.0°	3	3	2	2	2	3	3	3
155.0°	3	3	3	3	3	3	3	3
160.0°	3	3	3	3	3	3	3	3
165.0°	3	3	3	3	3	3	3	3
170.0°	3	3	3	3	3	3	3	3
175.0°	3	3	3	3	3	3	3	3
180.0°	3	2	2	2	2	2	3	3

Luminous Intensity (cd) Distribution Data (cont.)

C \ y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	2083	2083	2083	2083	2083	2083	2083	2083
5.0°	2073	2026	1989	1971	1972	1989	2018	2056
10.0°	2108	1983	1882	1839	1848	1878	1923	2004
15.0°	2236	1974	1761	1692	1721	1747	1791	1942
20.0°	2504	2047	1657	1561	1627	1623	1647	1923
25.0°	2926	2235	1629	1468	1575	1528	1553	2009
30.0°	3478	2512	1683	1406	1541	1452	1542	2213
35.0°	4086	2750	1718	1351	1504	1385	1564	2442
40.0°	4527	2884	1678	1282	1450	1314	1559	2587
45.0°	4521	2868	1591	1194	1361	1222	1512	2673
50.0°	3807	2611	1436	1059	1200	1085	1393	2580
55.0°	2709	2144	1224	893	970	901	1216	2246
60.0°	2149	1574	965	701	694	706	994	1754
65.0°	1618	1024	640	476	351	480	697	1182
70.0°	781	551	370	242	218	249	412	641
75.0°	409	360	259	163	142	165	271	418
80.0°	181	172	140	112	92	115	154	219
85.0°	35	37	40	52	44	56	48	46
90.0°	0	1	1	1	1	1	1	0
95.0°	0	1	1	1	1	1	1	1
100.0°	1	1	1	1	1	1	1	1
105.0°	1	1	1	1	1	1	1	1
110.0°	1	1	2	2	2	2	1	1
115.0°	1	2	2	2	2	2	2	2
120.0°	1	2	2	2	2	2	2	2
125.0°	2	2	2	2	2	2	2	2
130.0°	2	2	2	3	2	3	2	2
135.0°	2	2	3	3	3	3	3	3
140.0°	2	2	3	3	3	3	3	3
145.0°	2	2	2	3	3	3	3	2
150.0°	2	2	2	2	2	3	2	2
155.0°	2	2	2	2	2	3	2	2
160.0°	2	2	2	2	2	2	2	2
165.0°	2	2	2	2	2	2	2	3
170.0°	2	2	2	2	2	2	2	2
175.0°	2	2	2	2	2	2	2	3
180.0°	2	2	2	2	2	2	3	3

Zonal Lumen Density Measurement

Deg	Flux (lm)	%	Deg	Flux (lm)	%
0-5	49.8	0.45	0-5	49.8	0.45
5-10	149.1	1.33	0-10	198.9	1.78
10-15	248.9	2.23	0-15	447.8	4.01
15-20	354.1	3.16	0-20	801.9	7.17
20-25	474.0	4.24	0-25	1275.8	11.41
25-30	617.9	5.53	0-30	1893.8	16.94
30-35	792.1	7.09	0-35	2685.9	24.03
35-40	993.2	8.89	0-40	3679.1	32.92
40-45	1179.7	10.55	0-45	4858.8	43.47
45-50	1277.8	11.43	0-50	6136.6	54.90
50-55	1289.8	11.54	0-55	7426.3	66.44
55-60	1204.2	10.77	0-60	8630.5	77.21
60-65	981.0	8.78	0-65	9611.5	85.99
65-70	724.6	6.48	0-70	10336.1	92.47
70-75	463.9	4.15	0-75	10800.0	96.62
75-80	248.2	2.22	0-80	11048.2	98.84
80-85	102.7	0.92	0-85	11150.9	99.76
85-90	16.8	0.15	0-90	11167.7	99.91
90-95	0.4	0.01	0-95	11168.0	99.92
95-100	0.4	0.00	0-100	11168.4	99.92
100-105	0.5	0.00	0-105	11168.9	99.92
105-110	0.6	0.01	0-110	11169.5	99.93
110-115	0.6	0.01	0-115	11170.1	99.94
115-120	0.7	0.00	0-120	11170.8	99.94
120-125	0.7	0.01	0-125	11171.5	99.95
125-130	0.7	0.00	0-130	11172.2	99.95
130-135	0.8	0.01	0-135	11173.0	99.96
135-140	0.8	0.01	0-140	11173.7	99.97
140-145	0.7	0.00	0-145	11174.5	99.97
145-150	0.7	0.01	0-150	11175.2	99.98
150-155	0.6	0.01	0-155	11175.8	99.99
155-160	0.5	0.00	0-160	11176.3	99.99
160-165	0.4	0.01	0-165	11176.8	100.00
165-170	0.3	0.00	0-170	11177.1	100.00
170-175	0.2	0.00	0-175	11177.3	100.00
175-180	0.1	0.00	0-180	11177.3	100.00

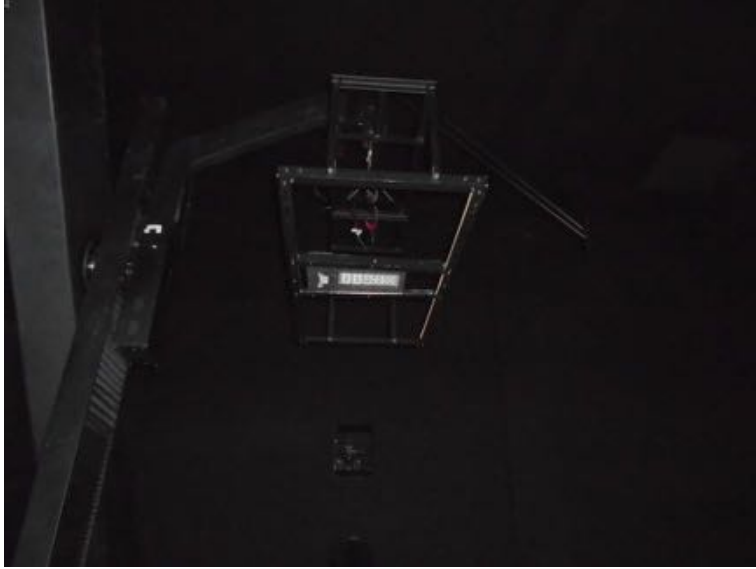
**[Additional Test]**

Test Item	Test Voltage (V)	Frequency (Hz)	Test Result
Power Factor:	200.0	60	0.9967
Total Harmonic Distortion:	480.0	60	6.13%
Total Harmonic Distortion:	200.0	60	6.30%

**6. Product Photo**



## 7. Product Test orientation in the Goniophotometer



\*\*\*\*\*END OF REPORT\*\*\*\*\*