



IES LM-79-08

MEASUREMENT AND TEST REPORT

For

Maxlite Inc.

12 York Ave. West Caldwell, NJ 07006

Test Model: RR61127W-L9

Report Type:	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution
Test Engineer:	Hexy He <i>Hexy He</i>
Report Number:	RSZ180507510-10
Test Date:	2017-08-13 to 2017-08-14
Report Date:	2018-05-08
Reviewed By:	Blake Zhang/EEEngineer <i>Blake Zhang</i>
Prepared By:	Bay Area Compliance Laboratories Corp. (Dongguan). No.69,Pulongcun,Puxinhu Industrial Area, Tangxia , Dongguan, Guangdong, China. Tel: +86-0769-86858888 Fax:+86-0769-86858588
Accreditation:	The IAS Accreditation Number TL-460.

Note: The test data was only valid for the test sample(s). This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan). 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:

Two samples were received on 2017-08-07 and used for testing. This retrofit is suitable for both 5" and 6" downlight housings and was tested with 5" housing for luminous intensity distribution test.

Model Tested: RR61127W-L9
 Manufacturer: Maxlite Inc.
 Product Designation: SSL downlight retrofit
 Burning Time Before Test: 0 hour (For New Products)

Rated Values:

Rated Voltage/Frequency: 120 VAC 60Hz
 Rated Power: 11W
 Nominal CCT: 2700K
 Auxiliary Equipment: H25ICAT Cooper Lighting, LLC (The can was only used in goniophotometer)

Note: The samples were assembled with E26 lamp base that connect to driver by a connector or wiring. Products may also be sold with GU24, GU10 base together in packaging.

Note:

1. The applicant Maxlite Inc. declares that their products with model RR61127W-L9 are the same to the products in report #RSZ170807517-10A1 and is authorized by original applicant to use their test data.
2. All the data in previous report (RSZ170807517-10A1) is shared in this report.

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 IAS 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	2016-11-18	2017-11-18
spectroradiometer	EVERFINE	HAAS-2000	20140912	380-780nm	2016-11-18	2017-11-18
Digital Power Meter	EVERFINE	PF2010A	1011004	600V/20A	2017-07-11	2018-07-11
Digital CC&CV DC Power Supply	EVERFINE	WY305-V1	1101047	30V/5A	2017-07-07	2018-07-07
Rapid Recording Photometer	EVERFINE	PHOTO-2000F	1007010	0.1lm—200klm	2016-11-18	2017-11-18
Standard Light Source	SENSING	N/A	LSD090808	N/A	2016-12-05	2017-12-05
Special zero-voltage synchronous switching AC	EVERFINE	DPS1010-YF	1011001T	0-150V, 0-300V	2017-03-03	2018-03-03

Device	Manufacture	Model No	Serial No	Test Range	Calibration date	Calibration due date
AC POWER SUPPLY	EVERFINE	VPS1030 PWM	1012017	0-150V, 0-300V	2017-03-03	2018-03-03
Digital CC&CV DC Power Supply	EVERFINE	WY12010	1009009	30V/5A	2017-03-03	2018-03-03
Digital power meter	YOKOGAWA	WT-210	91KB35700	15/30/60/150/300/600 V	2017-03-03	2018-03-03
full-field speed goniophotometer	EVERFINE	GO-R5000	YG108492N10120001	1600mm,3000W/10A	2017-03-09	2018-03-09
Wireless Remote Sensor	N/A	433MHz	N/A	0°C~50°C;-20°C~60°C	2017-03-20	2018-03-20
Standard Light Source	EVERFINE	D908	1012003	N/A	2016-12-17	2017-12-17

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) 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°C±1°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.

4π 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=1.9% (K=2), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is U=25K (K=2), at the 95% confidence level. The uncertainty of the CRI is U=1.9(K=2), at the 95% confidence level.

The uncertainty of power meter AC current U=0.19 % of rdg, AC Voltage U=0.18% of rdg, Power U=0.46%) (K=2), at the 95% confidence level.

Goniophotometer System

The luminaire was tested in a can.

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 (γ) 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=2.82% (K=2), at the 95% confidence level.

Fidelity Index and Gamut Index Calculation

The R_i , 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**

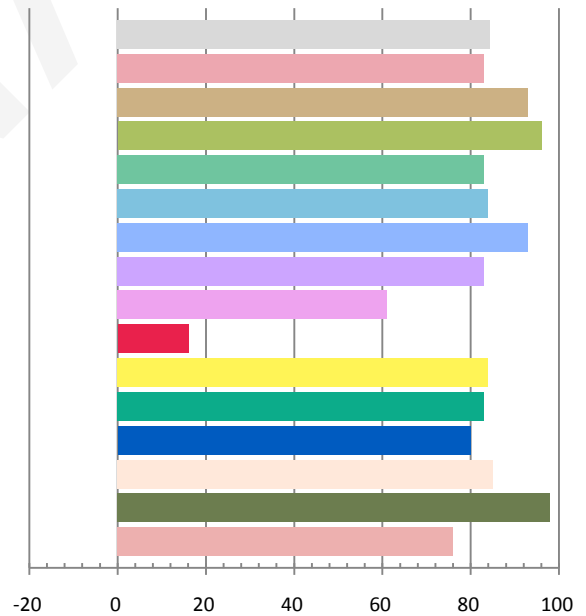
Photometric and Electrical Measurement Result

Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.1	60	0.111	10.65	0.799	848.46	79.68

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
2.6965	2717	0.00042	0.4592	0.4116	0.2616	0.5276

Color Rendering Index

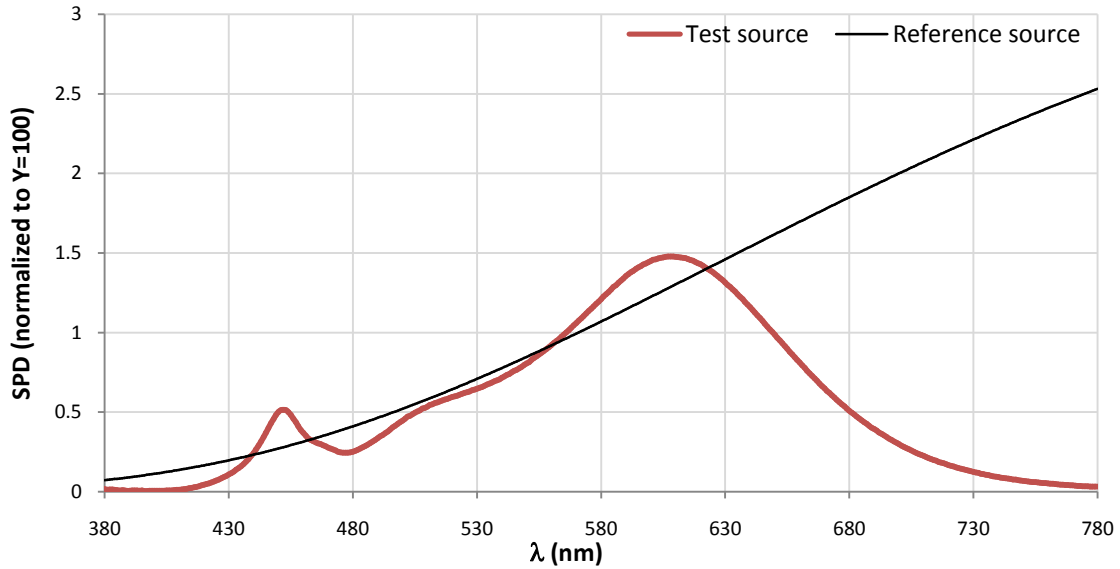
Ra			
84.4			
R1	R2	R3	R4
83	93	96	83
R5	R6	R7	R8
84	93	83	61
R9	R10	R11	R12
16	84	83	80
R13	R14	R15	
85	98	76	



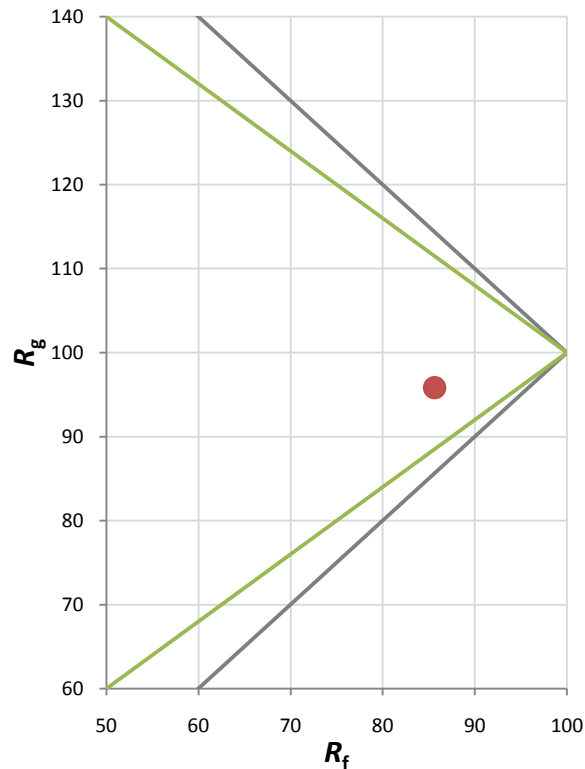
Fidelity Index and Gamut Index

Fidelity Index R_f	86
Gamut Index R_g	96

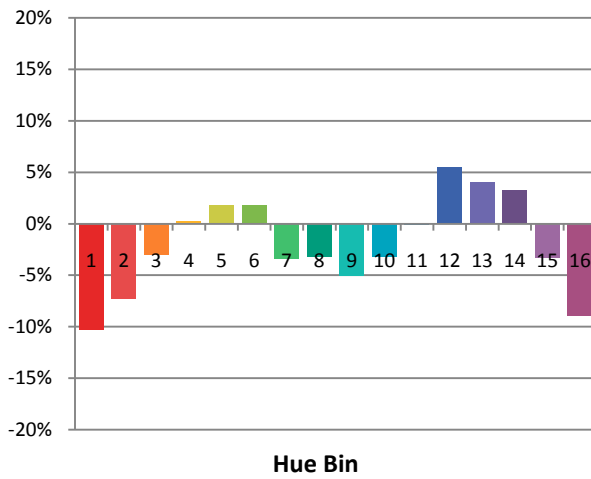
Spectral Power Distribution Comparison



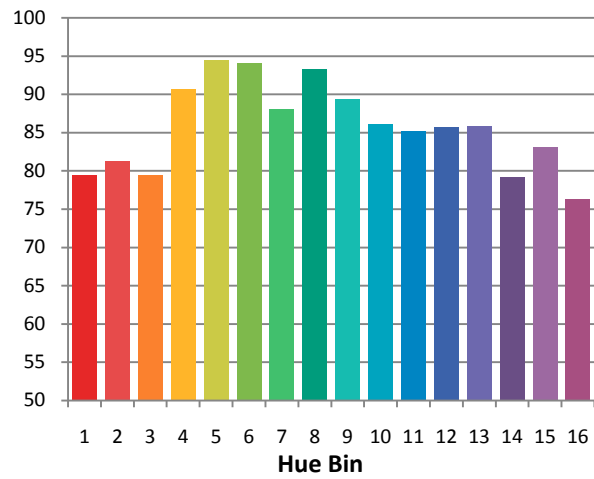
Plot of R_g versus R_f



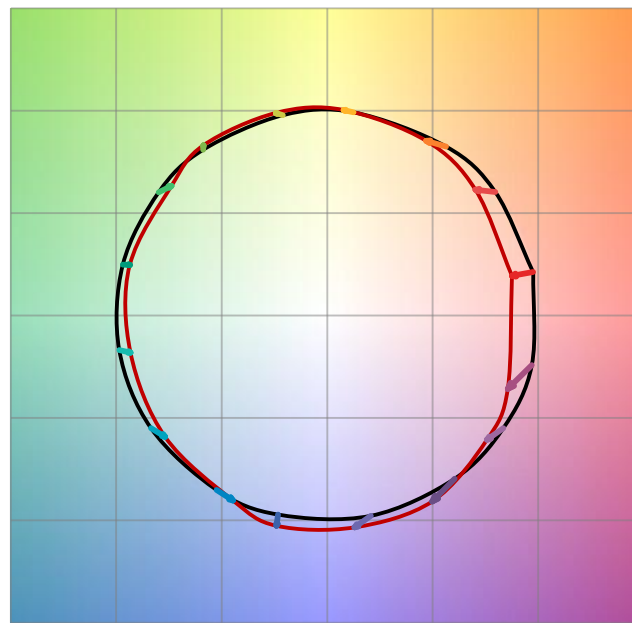
Chroma Shift by Hue



R_f by Hue

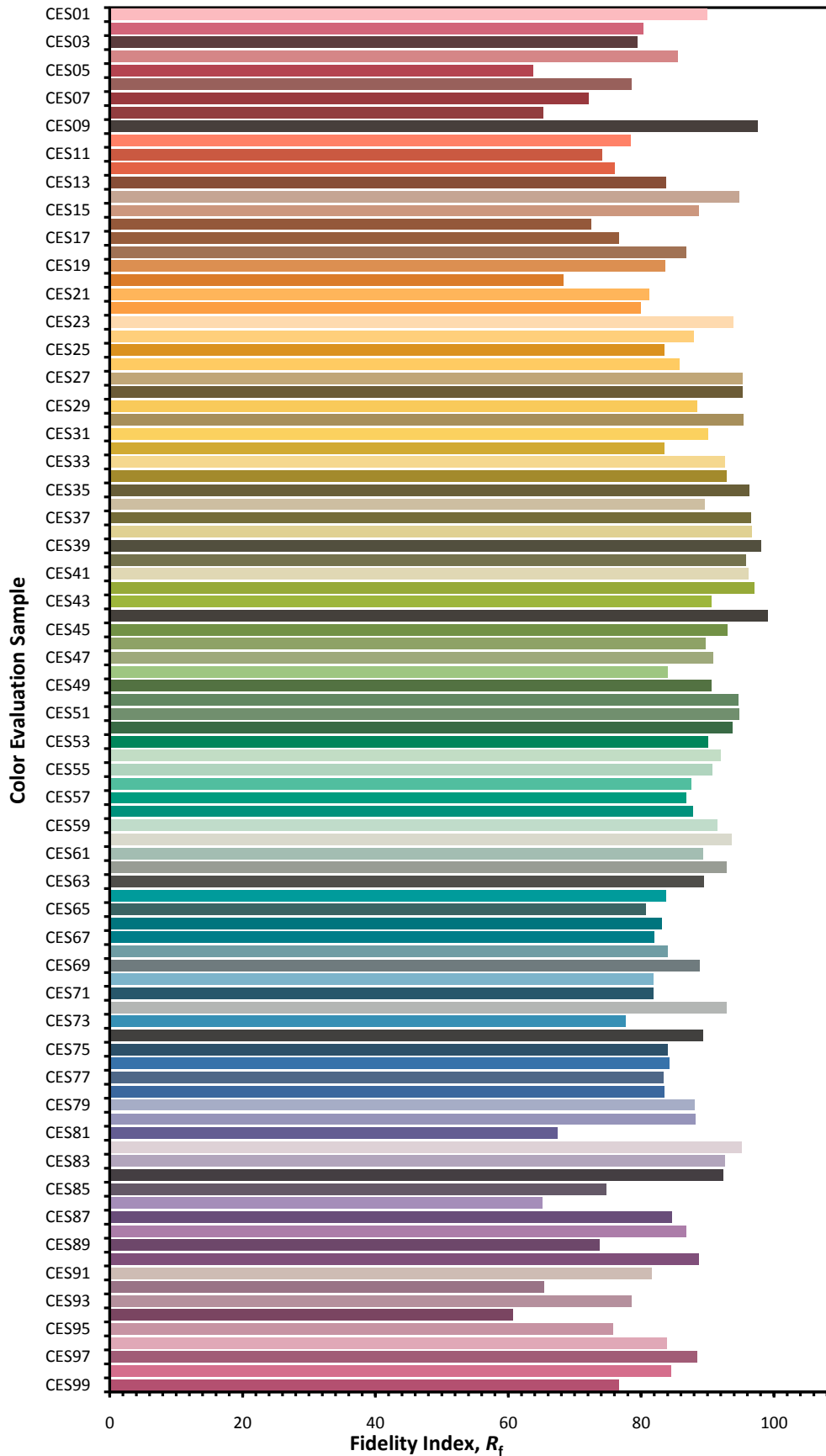


Color Vector Graphic

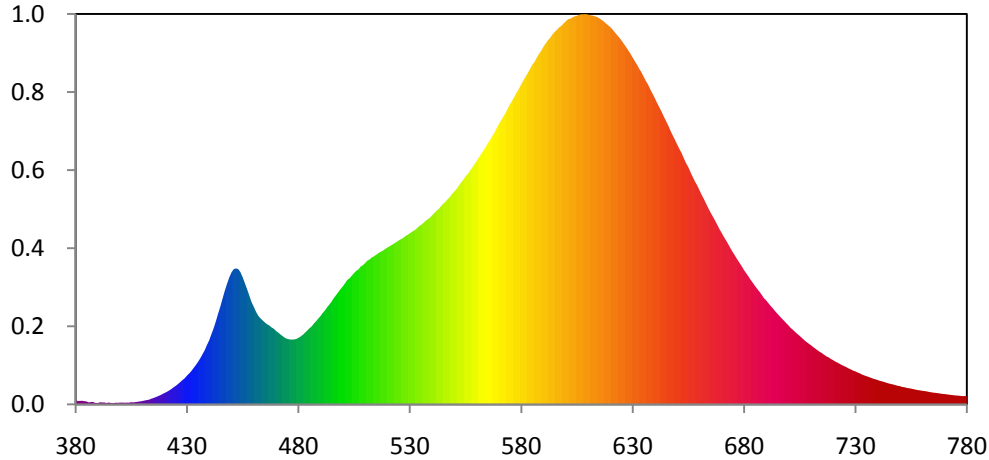


— Reference Illuminat — Test Source

Color Fidelity by CES Sample



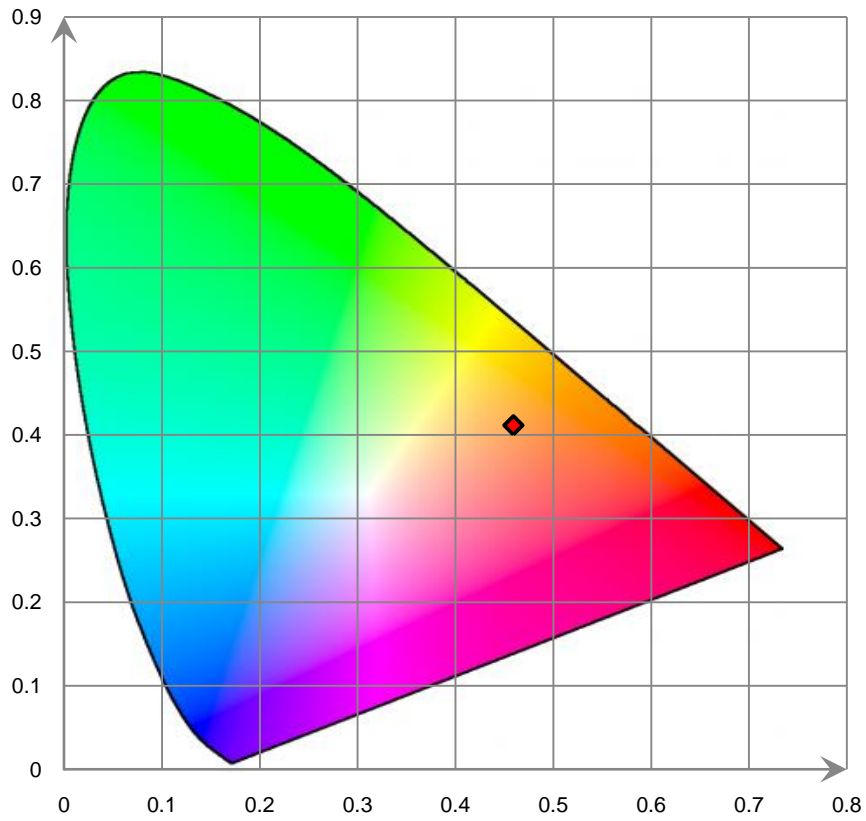
Relative Spectral Power Distribution



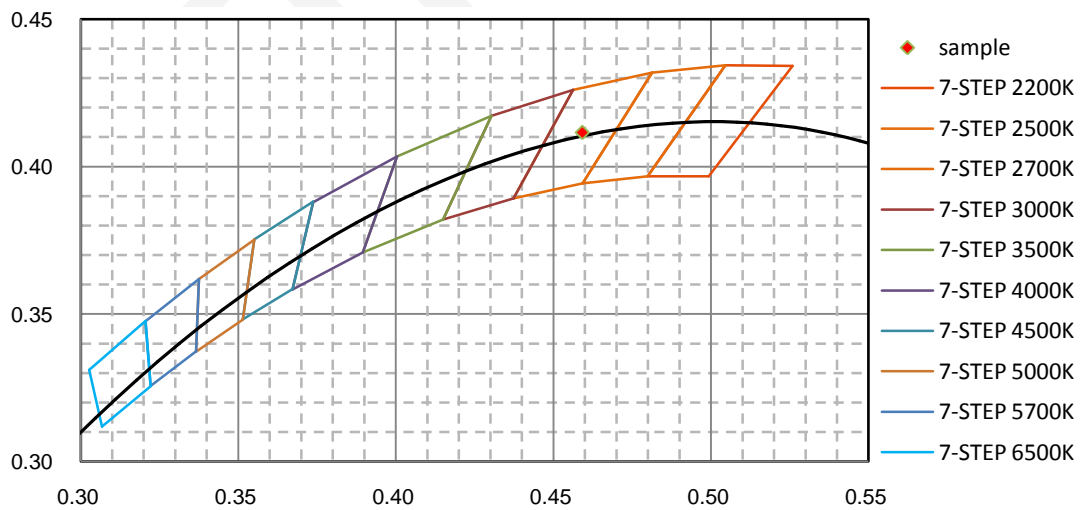
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	2.249E-01	421	5.918E-01	462	4.169E+00	503	5.926E+00	544	9.312E+00
381	1.521E-01	422	6.525E-01	463	4.048E+00	504	6.054E+00	545	9.431E+00
382	1.627E-01	423	7.227E-01	464	3.948E+00	505	6.173E+00	546	9.526E+00
383	1.686E-01	424	8.024E-01	465	3.853E+00	506	6.279E+00	547	9.646E+00
384	1.509E-01	425	8.728E-01	466	3.767E+00	507	6.349E+00	548	9.749E+00
385	1.354E-01	426	9.574E-01	467	3.711E+00	508	6.482E+00	549	9.897E+00
386	8.743E-02	427	1.050E+00	468	3.618E+00	509	6.547E+00	550	1.001E+01
387	1.161E-01	428	1.143E+00	469	3.557E+00	510	6.646E+00	551	1.012E+01
388	1.097E-01	429	1.228E+00	470	3.451E+00	511	6.764E+00	552	1.028E+01
389	6.204E-02	430	1.349E+00	471	3.377E+00	512	6.816E+00	553	1.043E+01
390	6.459E-02	431	1.453E+00	472	3.285E+00	513	6.909E+00	554	1.055E+01
391	9.861E-02	432	1.571E+00	473	3.209E+00	514	6.969E+00	555	1.072E+01
392	9.113E-02	433	1.711E+00	474	3.127E+00	515	7.036E+00	556	1.083E+01
393	8.819E-02	434	1.849E+00	475	3.082E+00	516	7.118E+00	557	1.098E+01
394	6.453E-02	435	2.001E+00	476	3.057E+00	517	7.181E+00	558	1.113E+01
395	8.983E-02	436	2.170E+00	477	3.048E+00	518	7.230E+00	559	1.129E+01
396	5.862E-02	437	2.357E+00	478	3.052E+00	519	7.306E+00	560	1.143E+01
397	5.884E-02	438	2.553E+00	479	3.071E+00	520	7.379E+00	561	1.161E+01
398	7.955E-02	439	2.797E+00	480	3.126E+00	521	7.441E+00	562	1.177E+01
399	7.344E-02	440	3.015E+00	481	3.190E+00	522	7.499E+00	563	1.191E+01
400	8.228E-02	441	3.301E+00	482	3.270E+00	523	7.569E+00	564	1.208E+01
401	8.387E-02	442	3.585E+00	483	3.371E+00	524	7.632E+00	565	1.227E+01
402	7.876E-02	443	3.911E+00	484	3.472E+00	525	7.703E+00	566	1.243E+01
403	8.343E-02	444	4.266E+00	485	3.579E+00	526	7.763E+00	567	1.261E+01
404	8.166E-02	445	4.605E+00	486	3.669E+00	527	7.825E+00	568	1.278E+01
405	1.034E-01	446	4.978E+00	487	3.803E+00	528	7.911E+00	569	1.298E+01
406	9.550E-02	447	5.346E+00	488	3.913E+00	529	7.973E+00	570	1.317E+01
407	1.075E-01	448	5.673E+00	489	4.044E+00	530	8.044E+00	571	1.335E+01
408	1.252E-01	449	5.968E+00	490	4.159E+00	531	8.116E+00	572	1.353E+01
409	1.392E-01	450	6.207E+00	491	4.307E+00	532	8.177E+00	573	1.370E+01
410	1.573E-01	451	6.359E+00	492	4.426E+00	533	8.259E+00	574	1.391E+01
411	1.825E-01	452	6.392E+00	493	4.579E+00	534	8.362E+00	575	1.411E+01
412	2.037E-01	453	6.367E+00	494	4.705E+00	535	8.434E+00	576	1.429E+01
413	2.197E-01	454	6.219E+00	495	4.845E+00	536	8.518E+00	577	1.447E+01
414	2.664E-01	455	5.982E+00	496	5.013E+00	537	8.618E+00	578	1.467E+01
415	3.009E-01	456	5.702E+00	497	5.144E+00	538	8.697E+00	579	1.484E+01
416	3.408E-01	457	5.422E+00	498	5.286E+00	539	8.773E+00	580	1.504E+01
417	3.851E-01	458	5.119E+00	499	5.427E+00	540	8.880E+00	581	1.523E+01
418	4.303E-01	459	4.813E+00	500	5.554E+00	541	8.991E+00	582	1.541E+01
419	4.861E-01	460	4.593E+00	501	5.700E+00	542	9.104E+00	583	1.558E+01
420	5.384E-01	461	4.359E+00	502	5.857E+00	543	9.188E+00	584	1.578E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.597E+01	626	1.697E+01	667	8.655E+00	708	2.940E+00	749	8.756E-01
586	1.611E+01	627	1.682E+01	668	8.450E+00	709	2.863E+00	750	8.556E-01
587	1.630E+01	628	1.666E+01	669	8.247E+00	710	2.788E+00	751	8.205E-01
588	1.648E+01	629	1.650E+01	670	8.068E+00	711	2.704E+00	752	8.052E-01
589	1.663E+01	630	1.632E+01	671	7.874E+00	712	2.626E+00	753	7.763E-01
590	1.682E+01	631	1.614E+01	672	7.708E+00	713	2.546E+00	754	7.600E-01
591	1.697E+01	632	1.598E+01	673	7.527E+00	714	2.474E+00	755	7.422E-01
592	1.712E+01	633	1.579E+01	674	7.337E+00	715	2.411E+00	756	7.191E-01
593	1.724E+01	634	1.562E+01	675	7.155E+00	716	2.333E+00	757	6.958E-01
594	1.739E+01	635	1.541E+01	676	6.992E+00	717	2.259E+00	758	6.729E-01
595	1.751E+01	636	1.521E+01	677	6.820E+00	718	2.210E+00	759	6.612E-01
596	1.760E+01	637	1.503E+01	678	6.658E+00	719	2.138E+00	760	6.385E-01
597	1.772E+01	638	1.481E+01	679	6.498E+00	720	2.083E+00	761	6.263E-01
598	1.780E+01	639	1.461E+01	680	6.318E+00	721	2.011E+00	762	6.113E-01
599	1.791E+01	640	1.440E+01	681	6.173E+00	722	1.965E+00	763	5.872E-01
600	1.801E+01	641	1.418E+01	682	6.020E+00	723	1.904E+00	764	5.701E-01
601	1.811E+01	642	1.398E+01	683	5.860E+00	724	1.847E+00	765	5.524E-01
602	1.813E+01	643	1.377E+01	684	5.715E+00	725	1.797E+00	766	5.424E-01
603	1.820E+01	644	1.355E+01	685	5.565E+00	726	1.748E+00	767	5.272E-01
604	1.825E+01	645	1.334E+01	686	5.427E+00	727	1.690E+00	768	5.124E-01
605	1.827E+01	646	1.312E+01	687	5.297E+00	728	1.643E+00	769	4.925E-01
606	1.832E+01	647	1.288E+01	688	5.149E+00	729	1.586E+00	770	4.859E-01
607	1.835E+01	648	1.266E+01	689	4.993E+00	730	1.553E+00	771	4.721E-01
608	1.835E+01	649	1.245E+01	690	4.889E+00	731	1.502E+00	772	4.583E-01
609	1.835E+01	650	1.223E+01	691	4.757E+00	732	1.461E+00	773	4.433E-01
610	1.833E+01	651	1.202E+01	692	4.627E+00	733	1.405E+00	774	4.338E-01
611	1.830E+01	652	1.182E+01	693	4.515E+00	734	1.365E+00	775	4.193E-01
612	1.829E+01	653	1.158E+01	694	4.383E+00	735	1.326E+00	776	4.125E-01
613	1.825E+01	654	1.135E+01	695	4.267E+00	736	1.291E+00	777	4.020E-01
614	1.822E+01	655	1.117E+01	696	4.153E+00	737	1.250E+00	778	3.892E-01
615	1.816E+01	656	1.092E+01	697	4.036E+00	738	1.209E+00	779	3.910E-01
616	1.809E+01	657	1.070E+01	698	3.931E+00	739	1.180E+00	780	3.918E-01
617	1.802E+01	658	1.048E+01	699	3.820E+00	740	1.147E+00		
618	1.792E+01	659	1.030E+01	700	3.714E+00	741	1.107E+00		
619	1.783E+01	660	1.008E+01	701	3.594E+00	742	1.081E+00		
620	1.775E+01	661	9.859E+00	702	3.505E+00	743	1.052E+00		
621	1.764E+01	662	9.662E+00	703	3.405E+00	744	1.016E+00		
622	1.750E+01	663	9.445E+00	704	3.310E+00	745	9.849E-01		
623	1.738E+01	664	9.234E+00	705	3.223E+00	746	9.588E-01		
624	1.725E+01	665	9.030E+00	706	3.127E+00	747	9.350E-01		
625	1.713E+01	666	8.843E+00	707	3.030E+00	748	9.031E-01		

CIE 1931xy Chromaticity Diagram



7-StepChromaticity Quadrangles



[Goniophotometer System]

Total operating time for luminous intensity distribution:**1.5 hours**

Test orientation:**Downward**

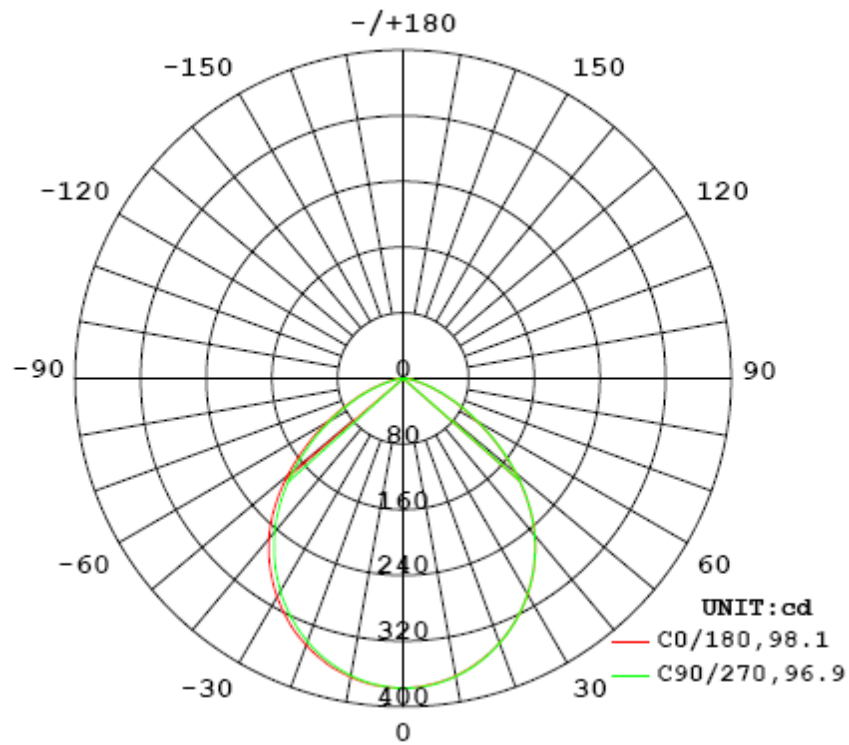
Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
120.0	60	0.1108	10.79	0.8113

Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	$I_{max}(cd)$	S/MH(C0/180)	S/MH(C90/270)
858.82	79.56	377.2	1.20	1.20

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50% I_{max}):	98.1	96.8	96.9	97.9	97.4
Field Angle(10% I_{max}):	143.9	143.4	143.5	144.0	143.7

Luminous Intensity (cd) Distribution Data

C \ y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	377	377	377	377	377	377	377	377
5.0°	375	375	375	375	375	374	374	374
10.0°	369	369	368	368	367	367	367	367
15.0°	360	359	358	357	356	356	356	356
20.0°	346	345	343	342	341	341	341	342
25.0°	329	327	325	323	322	322	323	323
30.0°	308	306	303	301	299	299	300	301
35.0°	283	281	278	275	273	273	275	276
40.0°	255	252	249	246	244	244	246	247
45.0°	222	219	216	213	211	211	212	213
50.0°	184	182	179	176	174	174	175	175
55.0°	145	143	141	139	137	137	137	137
60.0°	108	106	105	103	102	102	101	101
65.0°	75	74	73	72	71	71	70	70
70.0°	48	47	46	45	44	44	44	44
75.0°	26	26	25	24	24	23	23	23
80.0°	12	12	12	11	11	11	11	11
85.0°	5	5	5	5	4	4	4	4
90.0°	0	0	0	0	0	0	0	0
95.0°	0	0	0	0	0	0	0	0
100.0°	0	0	0	0	0	0	0	0
105.0°	0	0	0	0	0	0	0	0
110.0°	0	0	0	0	0	0	0	0
115.0°	0	0	0	0	0	0	0	0
120.0°	0	0	0	0	0	0	0	0
125.0°	0	0	0	0	0	0	0	0
130.0°	0	0	0	0	0	0	0	0
135.0°	0	0	0	0	0	0	0	0
140.0°	0	0	0	0	0	0	0	0
145.0°	0	0	0	0	0	0	0	0
150.0°	0	0	0	0	0	0	0	0
155.0°	1	1	1	1	1	1	1	1
160.0°	1	1	1	1	1	1	1	1
165.0°	1	1	1	1	1	1	1	1
170.0°	1	1	1	1	1	1	1	1
175.0°	1	1	1	1	1	1	1	1
180.0°	0	0	0	0	0	0	0	0

Luminous Intensity (cd) Distribution Data (cont.)

C Y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	377	377	377	377	377	377	377	377
5.0°	374	375	375	375	375	375	376	376
10.0°	368	368	368	368	369	369	370	370
15.0°	357	357	357	357	358	359	360	360
20.0°	343	343	342	343	343	345	346	347
25.0°	325	325	324	324	325	327	329	330
30.0°	304	303	302	302	304	306	309	310
35.0°	278	277	276	276	278	281	284	286
40.0°	250	248	246	246	250	253	256	258
45.0°	216	215	212	212	216	221	224	225
50.0°	179	177	174	175	180	184	187	188
55.0°	140	139	136	137	142	146	148	149
60.0°	104	102	100	101	105	108	110	111
65.0°	72	71	69	70	73	76	78	78
70.0°	46	45	44	45	47	49	50	50
75.0°	25	25	25	26	26	27	28	28
80.0°	12	12	13	13	13	13	13	14
85.0°	5	5	5	6	6	6	6	6
90.0°	0	0	0	0	0	0	0	0
95.0°	0	0	0	0	0	0	0	0
100.0°	0	0	0	0	0	0	0	0
105.0°	0	0	0	0	0	0	0	0
110.0°	0	0	0	0	0	0	0	0
115.0°	0	0	0	0	0	0	0	0
120.0°	0	0	0	0	0	0	0	0
125.0°	0	0	0	0	0	0	0	0
130.0°	0	0	0	0	0	0	0	0
135.0°	0	0	0	0	0	0	0	0
140.0°	0	0	0	0	0	0	0	0
145.0°	0	0	0	0	0	0	0	0
150.0°	0	0	0	0	0	0	0	0
155.0°	0	0	0	0	0	0	0	0
160.0°	0	0	0	0	0	0	0	0
165.0°	0	0	0	0	0	0	0	0
170.0°	0	0	0	0	0	0	0	0
175.0°	0	0	0	0	0	0	0	0
180.0°	0	0	0	0	0	0	0	0

Zonal Lumen Density Measurement

Deg	Flux (lm)	%
0-5	9.0	1.05
5-10	26.6	3.09
10-15	43.1	5.02
15-20	57.8	6.72
20-25	70.1	8.17
25-30	79.6	9.27
30-35	85.6	9.97
35-40	88.0	10.25
40-45	86.2	10.04
45-50	79.8	9.29
50-55	69.4	8.08
55-60	56.4	6.57
60-65	42.8	4.99
65-70	29.9	3.47
70-75	18.4	2.15
75-80	9.6	1.12
80-85	4.5	0.52
85-90	1.0	0.12
90-95	0.0	0.00
95-100	0.0	0.00
100-105	0.0	0.00
105-110	0.0	0.01
110-115	0.0	0.00
115-120	0.0	0.01
120-125	0.0	0.00
125-130	0.1	0.01
130-135	0.1	0.01
135-140	0.1	0.01
140-145	0.1	0.01
145-150	0.1	0.01
150-155	0.1	0.01
155-160	0.1	0.01
160-165	0.1	0.01
165-170	0.1	0.00
170-175	0.0	0.01
175-180	0.0	0.00

Deg	Flux (lm)	%
0-5	9.0	1.05
0-10	35.6	4.14
0-15	78.6	9.16
0-20	136.4	15.88
0-25	206.5	24.05
0-30	286.1	33.32
0-35	371.8	43.29
0-40	459.8	53.54
0-45	546.0	63.58
0-50	625.8	72.87
0-55	695.2	80.95
0-60	751.7	87.52
0-65	794.5	92.51
0-70	824.3	95.98
0-75	842.7	98.13
0-80	852.4	99.25
0-85	856.9	99.77
0-90	857.9	99.89
0-95	857.9	99.89
0-100	857.9	99.89
0-105	857.9	99.89
0-110	857.9	99.90
0-115	858.0	99.90
0-120	858.0	99.91
0-125	858.1	99.91
0-130	858.1	99.92
0-135	858.2	99.93
0-140	858.3	99.94
0-145	858.4	99.95
0-150	858.5	99.96
0-155	858.6	99.97
0-160	858.6	99.98
0-165	858.7	99.99
0-170	858.8	99.99
0-175	858.8	100.00
0-180	858.8	100.00

6. Product Photo



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