



TL-749



IES LM-79-08

MEASUREMENT AND TEST REPORT

For

GREEN CREATIVE LTD

756 North Zhongshan Rd., Unit B301 Zhabei District, Shanghai, China

Test Model: LE159027DIM120VWD/ADR4BL

Report Type:	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution
Test Engineer:	George Yang <i>George Yang</i>
Report Number:	RKSB190722003-10-3
Test Date:	2019-07-22 to 2019-07-23
Report Date:	2019-07-29
Reviewed By:	Ray Gao/EE Engineer <i>Ray Gao</i>
Prepared By:	Bay Area Compliance Laboratories Corp. (Kunshan). No.248 Chenghu Road, Kunshan, Jiangsu province, China. Tel: +86-0512-86175000 Fax: +86-0512-88934268
Test Facility:	Test facility was located at No.248 Chenghu Road, Kunshan, Jiangsu province, China.
Accreditation:	The IAS Accreditation Number TL-749.

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. (Kunshan). 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 2018-07-22 and used for testing.

Model Tested: LE159027DIM120VWD/ADR4BL
 Manufacturer: GREEN CREATIVE LTD
 Brand Name: GREEN CREATIVE
 Product Designation: LED Recessed Downlight
 Aging Time Before Test: 0hour(For New Products)

Rated Values:

Rated Voltage/Frequency: 120-277 VAC 60Hz
 Rated Power: 19.5W
 Nominal CCT: 2700K
 Nominal Lumen Output: 1250lm

2. Standards Used

- IES LM-79-08: Approved Method: Electrical & Photometric Measurement of Solid-state Lighting Products
- ANSI C82.77-10-2014: Harmonic Emission Limits – Related Power Quality Requirements for Lighting Equipment
- IES TM-30-18: IES Method for Evaluating Light Source Color Rendition

3. Description of Test Equipment

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
Integrating Sphere	INVENTFINE	Dia 1.5m	JWWCV090112	2019-01-23	2020-01-22
Power Meter	INVENTFINE	WT500	GSJWQ20009	2019-04-23	2020-04-22
Spectral photometer	INVENTFINE	CMS-3S	GSGSE100017	2019-01-23	2020-01-22
AC Power Supply	INVENTFINE	CHP500	JWJSD010071	2019-04-23	2020-04-22
Standard Light Source	INVENTFINE	N/A	JWWCR020106	2018-12-24	2019-12-23
Thermal Meter	KEJIAN	TA298	N/A	2018-12-01	2019-11-30
DC Power Supply	INVENTFINE	WL3005	JWWCP020069	2019-04-23	2020-04-22
AC Power Supply	INVENTFINE	CHP-5KVA	900511765	2019-04-23	2020-04-22
DC Power Supply	INVENTFINE	WL3010	JWDMP030001	2019-04-23	2020-04-22
Power Meter	INVENTFINE	WT500	GSDSQ200007	2019-04-23	2020-04-22
Goniophotometer	INVENTFINE	GPM-1900	YWGCF120001	2019-01-24	2020-01-23
Wireless Weather Station	ZHONGXING	KG218	N/A	2018-12-01	2019-11-30
Standard Light Source	INVENTFINE	N/A	JWBYR040008	2019-03-08	2020-03-07

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Kunshan) 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.

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 $U_{re}=2.61\%$ ($k=2$), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is $U=34\text{K}$ ($k=2$), at the 95% confidence level. The uncertainty of the CRI is $U=2.5(k=2)$, at the 95% confidence level.

The uncertainty of power meter AC current $U_{re}=0.48\%$ of rdg, AC Voltage $U_{re}=0.25\%$ of rdg, Power $U_{re}=0.44\%$, ($k=2$), 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 (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 flux is $U_{rel}=2.6\%$ ($k=2$), 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**

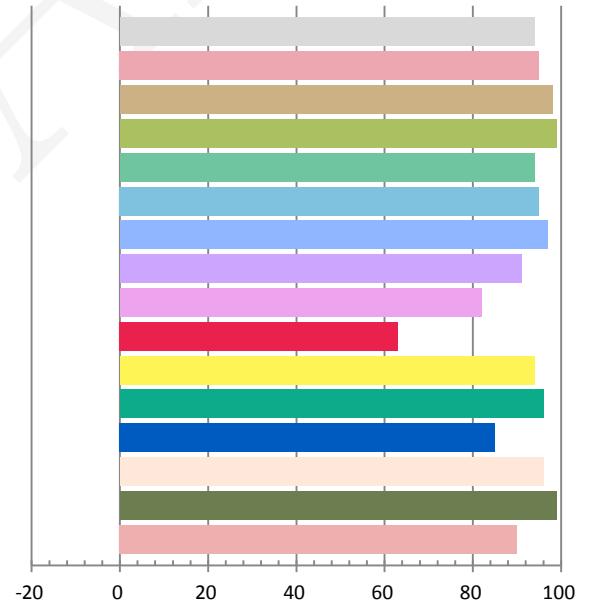
Photometric and Electrical Measurement Result

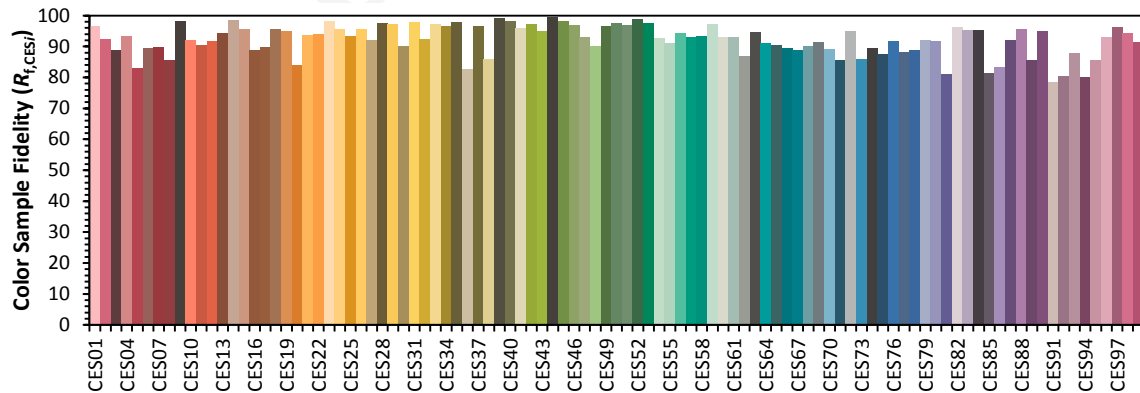
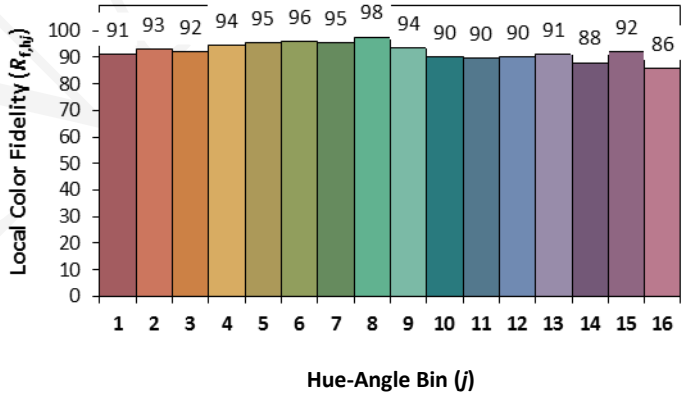
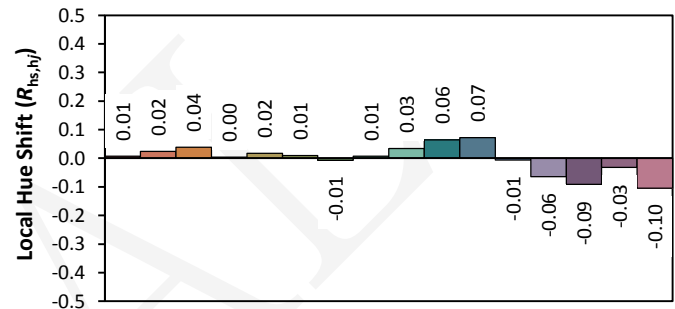
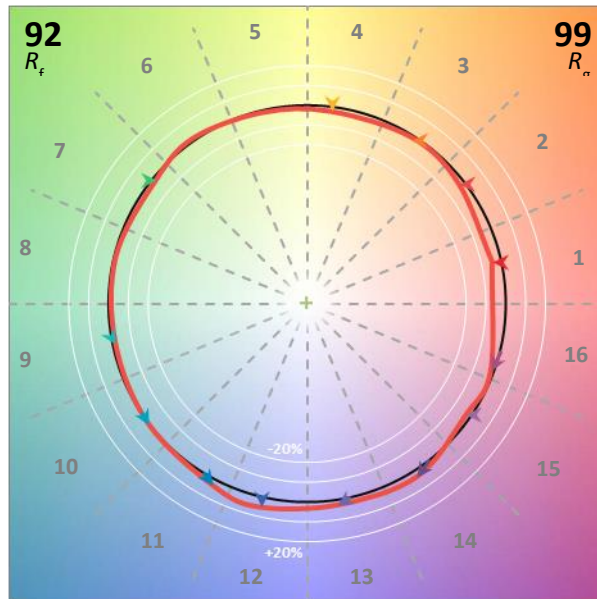
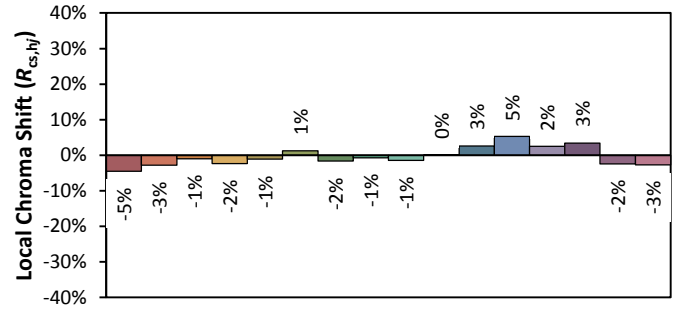
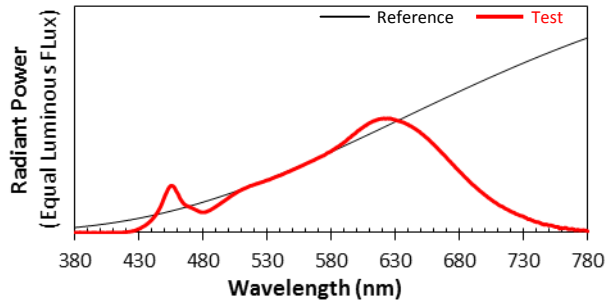
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120	60	0.1694	19.85	0.9765	1365.88	68.81

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
4.847	2695	-0.00079	0.4589	0.4082	0.2629	0.5263

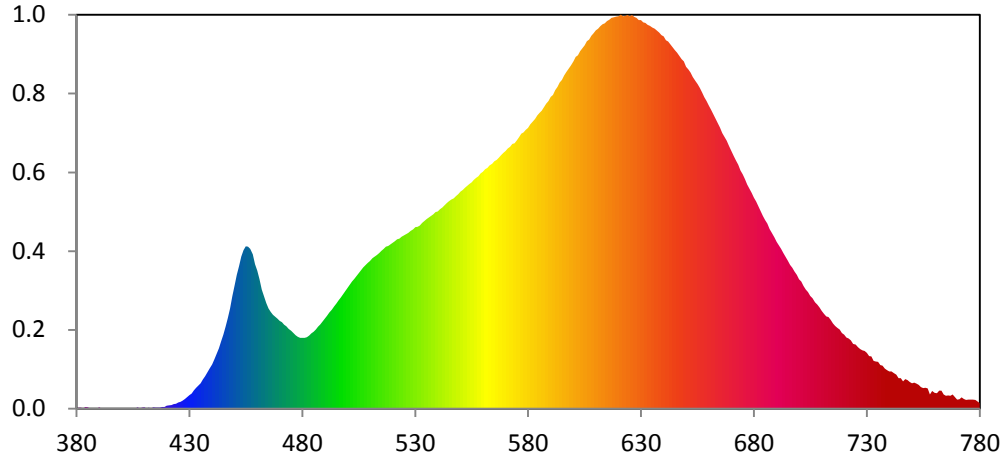
Color Rendering Index

Ra			
93.9			
R1	R2	R3	R4
95	98	99	94
R5	R6	R7	R8
95	97	91	82
R9	R10	R11	R12
63	94	96	85
R13	R14	R15	
96	99	90	





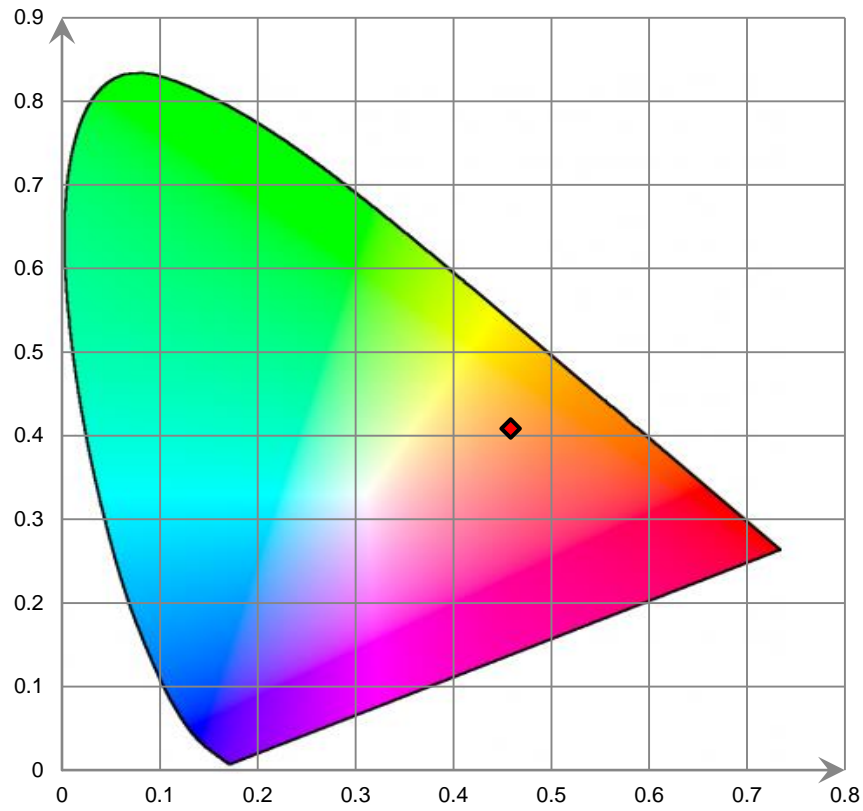
Relative Spectral Power Distribution



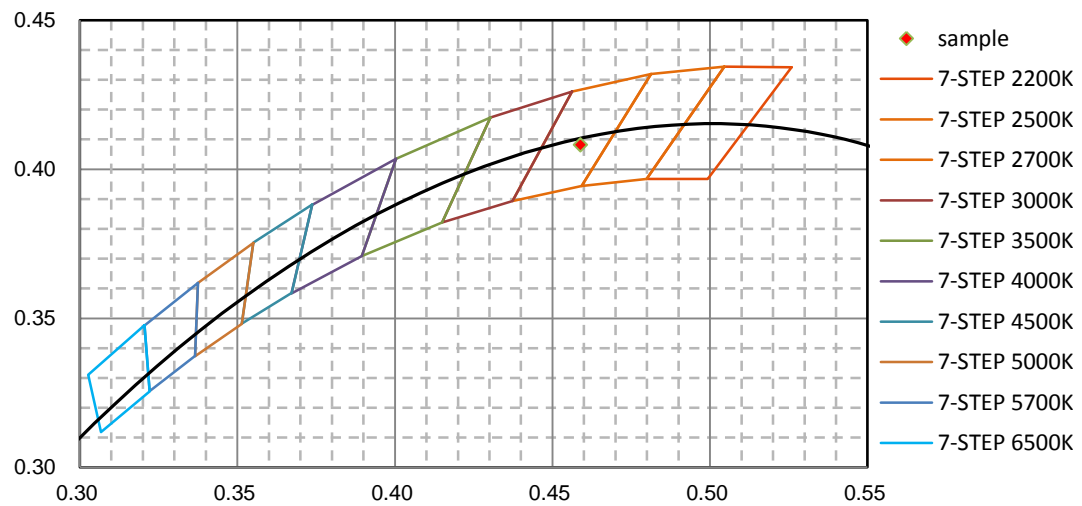
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	4.110E-02	421	2.518E-01	462	9.170E+00	503	9.979E+00	544	1.581E+01
381	7.700E-02	422	2.724E-01	463	8.651E+00	504	1.020E+01	545	1.597E+01
382	7.990E-02	423	3.496E-01	464	8.122E+00	505	1.041E+01	546	1.609E+01
383	3.220E-02	424	3.681E-01	465	7.715E+00	506	1.063E+01	547	1.618E+01
384	1.197E-01	425	4.623E-01	466	7.433E+00	507	1.085E+01	548	1.636E+01
385	9.420E-02	426	5.104E-01	467	7.214E+00	508	1.103E+01	549	1.650E+01
386	7.700E-03	427	6.090E-01	468	7.074E+00	509	1.120E+01	550	1.670E+01
387	4.880E-02	428	7.451E-01	469	6.907E+00	510	1.135E+01	551	1.683E+01
388	3.350E-02	429	8.833E-01	470	6.750E+00	511	1.157E+01	552	1.700E+01
389	1.330E-02	430	1.036E+00	471	6.638E+00	512	1.170E+01	553	1.713E+01
390	9.130E-02	431	1.165E+00	472	6.460E+00	513	1.182E+01	554	1.729E+01
391	2.930E-02	432	1.393E+00	473	6.323E+00	514	1.197E+01	555	1.742E+01
392	4.700E-03	433	1.587E+00	474	6.126E+00	515	1.213E+01	556	1.760E+01
393	1.170E-02	434	1.760E+00	475	5.982E+00	516	1.228E+01	557	1.776E+01
394	8.400E-03	435	1.956E+00	476	5.819E+00	517	1.247E+01	558	1.787E+01
395	5.360E-02	436	2.230E+00	477	5.647E+00	518	1.250E+01	559	1.810E+01
396	4.110E-02	437	2.495E+00	478	5.511E+00	519	1.264E+01	560	1.822E+01
397	1.390E-02	438	2.779E+00	479	5.430E+00	520	1.275E+01	561	1.842E+01
398	9.000E-04	439	3.077E+00	480	5.450E+00	521	1.289E+01	562	1.852E+01
399	0.000E+00	440	3.406E+00	481	5.439E+00	522	1.302E+01	563	1.872E+01
400	0.000E+00	441	3.791E+00	482	5.493E+00	523	1.308E+01	564	1.883E+01
401	2.670E-02	442	4.209E+00	483	5.623E+00	524	1.321E+01	565	1.903E+01
402	3.990E-02	443	4.620E+00	484	5.778E+00	525	1.332E+01	566	1.913E+01
403	2.890E-02	444	5.162E+00	485	5.899E+00	526	1.342E+01	567	1.931E+01
404	1.220E-02	445	5.688E+00	486	6.076E+00	527	1.351E+01	568	1.951E+01
405	4.430E-02	446	6.312E+00	487	6.295E+00	528	1.366E+01	569	1.967E+01
406	1.460E-02	447	6.959E+00	488	6.478E+00	529	1.380E+01	570	1.981E+01
407	9.040E-02	448	7.713E+00	489	6.701E+00	530	1.397E+01	571	2.003E+01
408	8.800E-03	449	8.647E+00	490	6.914E+00	531	1.399E+01	572	2.014E+01
409	8.090E-02	450	9.455E+00	491	7.142E+00	532	1.410E+01	573	2.036E+01
410	8.720E-02	451	1.029E+01	492	7.375E+00	533	1.428E+01	574	2.042E+01
411	5.240E-02	452	1.096E+01	493	7.599E+00	534	1.443E+01	575	2.064E+01
412	7.320E-02	453	1.169E+01	494	7.861E+00	535	1.457E+01	576	2.087E+01
413	1.780E-02	454	1.218E+01	495	8.082E+00	536	1.470E+01	577	2.115E+01
414	8.930E-02	455	1.248E+01	496	8.316E+00	537	1.483E+01	578	2.126E+01
415	5.940E-02	456	1.245E+01	497	8.554E+00	538	1.495E+01	579	2.144E+01
416	7.660E-02	457	1.228E+01	498	8.793E+00	539	1.511E+01	580	2.159E+01
417	7.410E-02	458	1.186E+01	499	9.026E+00	540	1.517E+01	581	2.187E+01
418	1.233E-01	459	1.112E+01	500	9.281E+00	541	1.533E+01	582	2.208E+01
419	1.313E-01	460	1.061E+01	501	9.526E+00	542	1.547E+01	583	2.228E+01
420	2.100E-01	461	9.945E+00	502	9.778E+00	543	1.563E+01	584	2.257E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	2.276E+01	626	3.028E+01	667	2.091E+01	708	8.013E+00	749	2.033E+00
586	2.293E+01	627	3.015E+01	668	2.061E+01	709	7.781E+00	750	1.956E+00
587	2.319E+01	628	3.007E+01	669	2.021E+01	710	7.505E+00	751	1.996E+00
588	2.347E+01	629	2.990E+01	670	1.984E+01	711	7.282E+00	752	1.927E+00
589	2.366E+01	630	2.991E+01	671	1.942E+01	712	7.101E+00	753	1.828E+00
590	2.397E+01	631	2.972E+01	672	1.908E+01	713	7.031E+00	754	1.657E+00
591	2.413E+01	632	2.966E+01	673	1.876E+01	714	6.811E+00	755	1.565E+00
592	2.451E+01	633	2.953E+01	674	1.833E+01	715	6.558E+00	756	1.605E+00
593	2.476E+01	634	2.945E+01	675	1.803E+01	716	6.349E+00	757	1.550E+00
594	2.510E+01	635	2.932E+01	676	1.766E+01	717	6.205E+00	758	1.076E+00
595	2.530E+01	636	2.923E+01	677	1.723E+01	718	6.087E+00	759	1.358E+00
596	2.565E+01	637	2.908E+01	678	1.692E+01	719	5.807E+00	760	1.206E+00
597	2.590E+01	638	2.892E+01	679	1.659E+01	720	5.683E+00	761	1.185E+00
598	2.615E+01	639	2.874E+01	680	1.622E+01	721	5.467E+00	762	1.373E+00
599	2.639E+01	640	2.864E+01	681	1.592E+01	722	5.389E+00	763	1.370E+00
600	2.672E+01	641	2.833E+01	682	1.557E+01	723	5.243E+00	764	1.086E+00
601	2.706E+01	642	2.826E+01	683	1.519E+01	724	4.971E+00	765	9.720E-01
602	2.718E+01	643	2.802E+01	684	1.482E+01	725	4.922E+00	766	9.974E-01
603	2.752E+01	644	2.781E+01	685	1.451E+01	726	4.730E+00	767	9.807E-01
604	2.773E+01	645	2.759E+01	686	1.422E+01	727	4.574E+00	768	1.078E+00
605	2.796E+01	646	2.739E+01	687	1.381E+01	728	4.493E+00	769	8.876E-01
606	2.826E+01	647	2.714E+01	688	1.352E+01	729	4.433E+00	770	6.978E-01
607	2.839E+01	648	2.688E+01	689	1.317E+01	730	4.293E+00	771	7.228E-01
608	2.869E+01	649	2.671E+01	690	1.282E+01	731	4.039E+00	772	8.563E-01
609	2.889E+01	650	2.630E+01	691	1.256E+01	732	4.012E+00	773	7.267E-01
610	2.912E+01	651	2.610E+01	692	1.230E+01	733	3.658E+00	774	6.561E-01
611	2.923E+01	652	2.585E+01	693	1.198E+01	734	3.615E+00	775	6.828E-01
612	2.944E+01	653	2.552E+01	694	1.167E+01	735	3.597E+00	776	6.797E-01
613	2.957E+01	654	2.523E+01	695	1.138E+01	736	3.349E+00	777	6.872E-01
614	2.966E+01	655	2.496E+01	696	1.105E+01	737	3.298E+00	778	6.580E-01
615	2.983E+01	656	2.467E+01	697	1.083E+01	738	3.065E+00	779	5.412E-01
616	2.992E+01	657	2.434E+01	698	1.053E+01	739	2.960E+00	780	4.269E-01
617	3.006E+01	658	2.396E+01	699	1.028E+01	740	2.847E+00		
618	3.013E+01	659	2.366E+01	700	9.957E+00	741	2.864E+00		
619	3.018E+01	660	2.333E+01	701	9.784E+00	742	2.742E+00		
620	3.020E+01	661	2.300E+01	702	9.430E+00	743	2.603E+00		
621	3.031E+01	662	2.266E+01	703	9.170E+00	744	2.349E+00		
622	3.020E+01	663	2.230E+01	704	8.968E+00	745	2.338E+00		
623	3.022E+01	664	2.195E+01	705	8.657E+00	746	2.099E+00		
624	3.030E+01	665	2.162E+01	706	8.485E+00	747	2.265E+00		
625	3.018E+01	666	2.121E+01	707	8.171E+00	748	2.193E+00		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles



[Goniophotometer System]

Total operating time for luminous intensity distribution: **2.0hour**

Test orientation: **Downward**

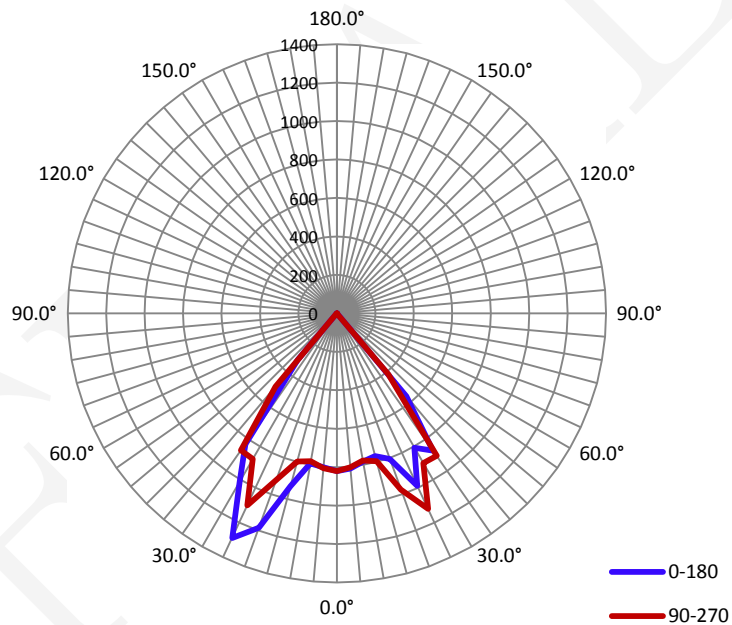
Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
120.0	60	0.1730	19.87	0.9570

Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	$I_{max}(cd)$	S/MH(C0/180)	S/MH(C90/270)
1370.5	69.02	1300.9	1.45	1.47

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50% I_{max}):	75.5	77.0	77.7	76.4	76.7
Field Angle(10% I_{max}):	87.0	87.6	87.7	87.4	87.4

Luminous Intensity (cd) Distribution Data

C γ	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	820	820	820	820	820	820	820	820
5.0°	810	807	804	803	803	803	804	805
10.0°	782	779	777	776	777	779	784	788
15.0°	768	767	768	784	796	831	889	921
20.0°	805	822	862	901	976	1059	1113	1158
25.0°	989	1008	1049	1077	1122	1170	1252	1301
30.0°	807	796	823	858	899	964	996	1030
35.0°	871	876	896	909	905	893	890	888
40.0°	563	542	503	462	416	392	383	385
45.0°	15	10	9	8	8	8	9	10
50.0°	5	4	4	4	5	3	5	5
55.0°	3	3	2	2	2	3	3	3
60.0°	1	0	0	0	1	0	1	0
65.0°	0	0	0	0	0	0	0	0
70.0°	0	0	0	0	0	0	0	0
75.0°	0	0	0	0	0	0	0	0
80.0°	0	0	0	0	0	0	0	0
85.0°	0	0	0	0	0	0	0	0
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

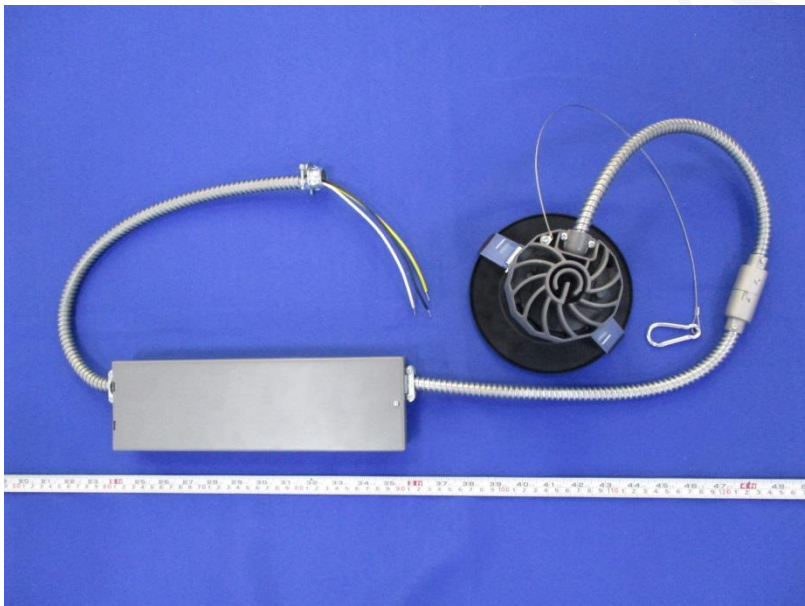
Luminous Intensity (cd) Distribution Data (cont.)

C y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	820	820	820	820	820	820	820	820
5.0°	803	805	806	806	808	810	809	808
10.0°	793	788	781	780	781	785	784	782
15.0°	930	900	872	835	797	775	767	764
20.0°	1186	1125	1041	980	923	866	834	804
25.0°	1289	1240	1183	1135	1101	1065	1026	994
30.0°	1012	975	914	905	875	846	828	808
35.0°	830	846	858	867	870	867	872	878
40.0°	317	373	431	482	497	526	544	548
45.0°	9	10	10	11	11	13	16	12
50.0°	4	4	5	5	4	5	5	5
55.0°	2	3	2	3	3	3	3	3
60.0°	1	1	1	1	1	1	2	0
65.0°	0	0	0	0	0	0	0	0
70.0°	0	0	0	0	0	0	0	0
75.0°	0	0	0	0	0	0	0	0
80.0°	0	0	0	0	0	0	0	0
85.0°	0	0	0	0	0	0	0	0
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)	%	Deg	Flux (lm)	%
0-5	19.4	1.42	0-5	19.4	1.42
5-10	56.8	4.15	0-10	76.3	5.56
10-15	95.2	6.95	0-15	171.5	12.51
15-20	147.4	10.76	0-20	318.9	23.27
20-25	219.3	16.00	0-25	538.1	39.27
25-30	255.7	18.66	0-30	793.9	57.93
30-35	260.9	19.04	0-35	1054.8	76.96
35-40	222.9	16.27	0-40	1277.7	93.23
40-45	87.2	6.36	0-45	1364.9	99.59
45-50	3.1	0.22	0-50	1368.0	99.82
50-55	1.5	0.11	0-55	1369.5	99.93
55-60	0.8	0.06	0-60	1370.3	99.99
60-65	0.2	0.01	0-65	1370.5	100.00
65-70	0.0	0.00	0-70	1370.5	100.00
70-75	0.0	0.00	0-75	1370.5	100.00
75-80	0.0	0.00	0-80	1370.5	100.00
80-85	0.0	0.00	0-85	1370.5	100.00
85-90	0.0	0.00	0-90	1370.5	100.00
90-95	0.0	0.00	0-95	1370.5	100.00
95-100	0.0	0.00	0-100	1370.5	100.00
100-105	0.0	0.00	0-105	1370.5	100.00
105-110	0.0	0.00	0-110	1370.5	100.00
110-115	0.0	0.00	0-115	1370.5	100.00
115-120	0.0	0.00	0-120	1370.5	100.00
120-125	0.0	0.00	0-125	1370.5	100.00
125-130	0.0	0.00	0-130	1370.5	100.00
130-135	0.0	0.00	0-135	1370.5	100.00
135-140	0.0	0.00	0-140	1370.5	100.00
140-145	0.0	0.00	0-145	1370.5	100.00
145-150	0.0	0.00	0-150	1370.5	100.00
150-155	0.0	0.00	0-155	1370.5	100.00
155-160	0.0	0.00	0-160	1370.5	100.00
160-165	0.0	0.00	0-165	1370.5	100.00
165-170	0.0	0.00	0-170	1370.5	100.00
170-175	0.0	0.00	0-175	1370.5	100.00
175-180	0.0	0.00	0-180	1370.5	100.00

6. Product Photo



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