



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: LE059027DIM120VVN/ADR4BL

Report Type:	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution
Test Engineer:	George Yang <i>George Yang</i>
Report Number:	RKSB190722001-10-9
Test Date:	2019-07-22
Report Date:	2019-08-09
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: LE059027DIM120VVN/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: 5.5W
 Nominal CCT: 2700K
 Nominal Lumen Output: 410lm

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**

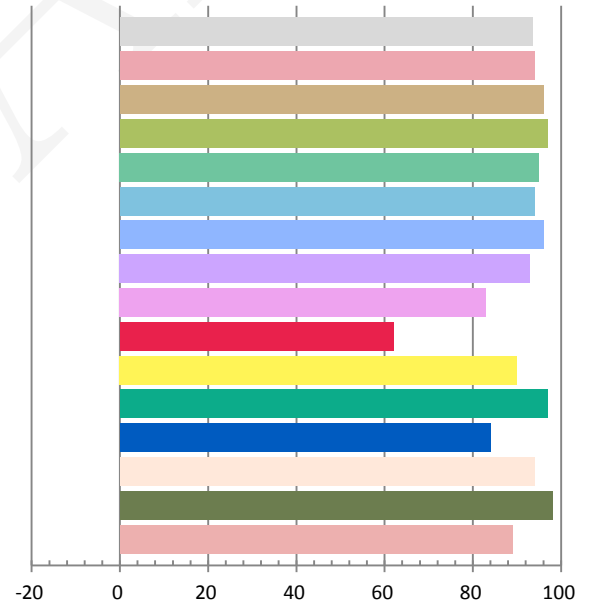
Photometric and Electrical Measurement Result

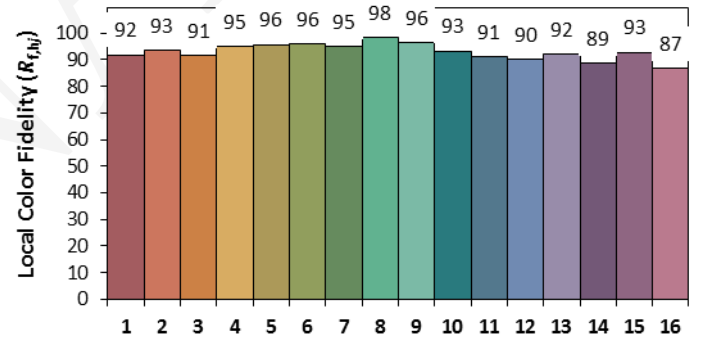
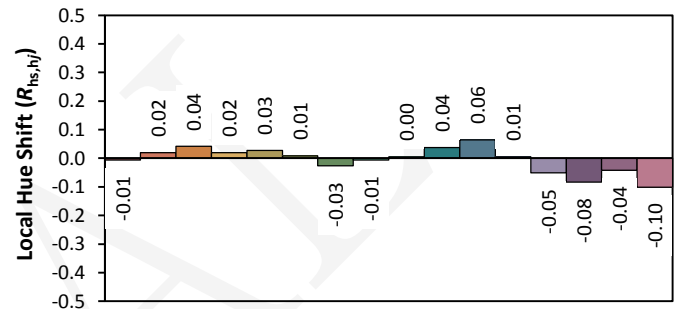
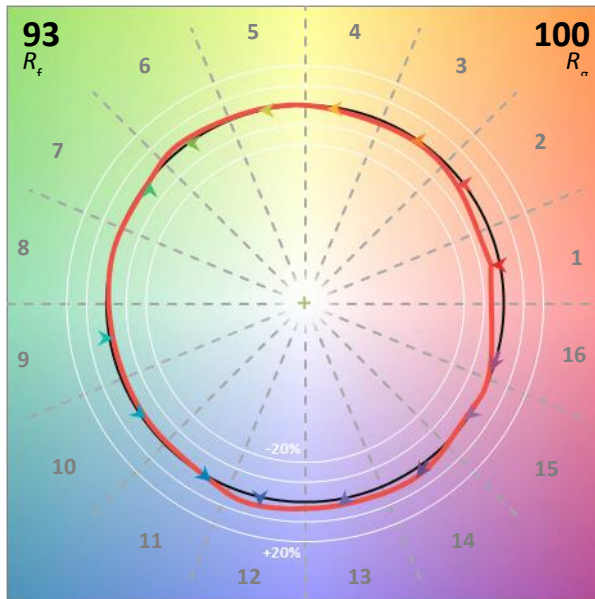
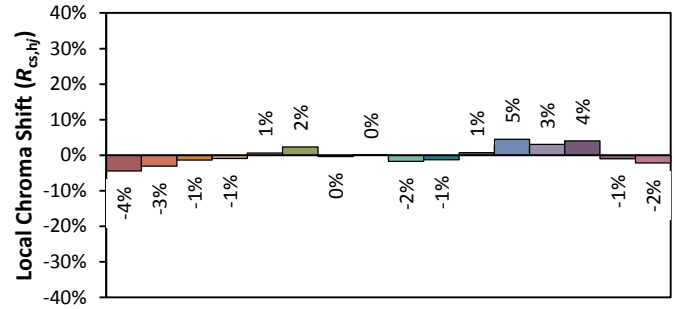
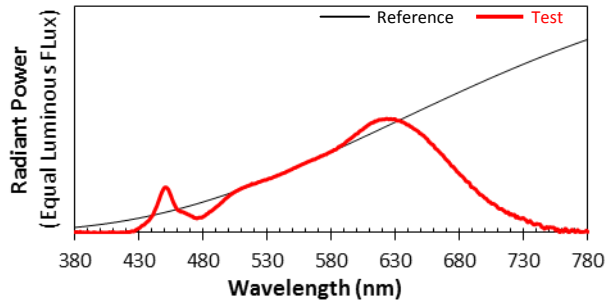
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.02	60	0.0504	5.8	0.9588	432.8	74.62

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
1.498	2704	0.00119	0.4616	0.4142	0.2620	0.5290

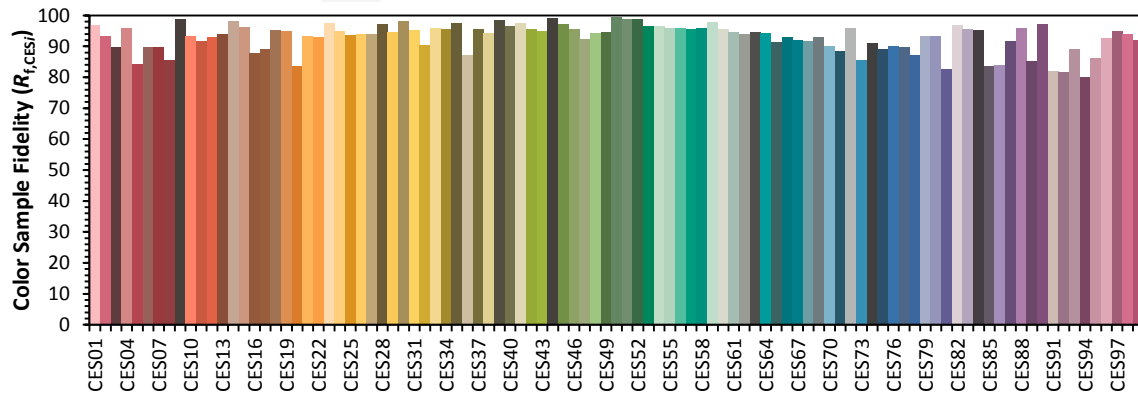
Color Rendering Index

Ra			
93.5			
R1	R2	R3	R4
94	96	97	95
R5	R6	R7	R8
94	96	93	83
R9	R10	R11	R12
62	90	97	84
R13	R14	R15	
94	98	89	

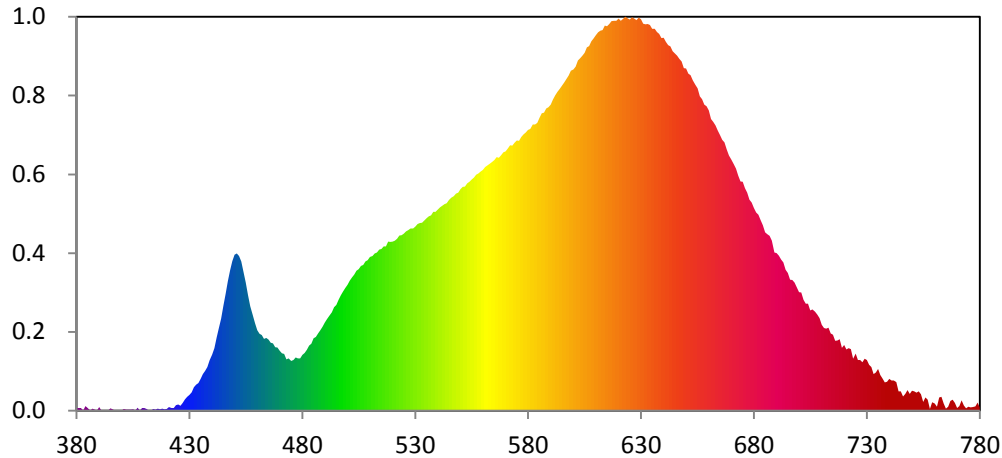




Hue-Angle Bin (j)



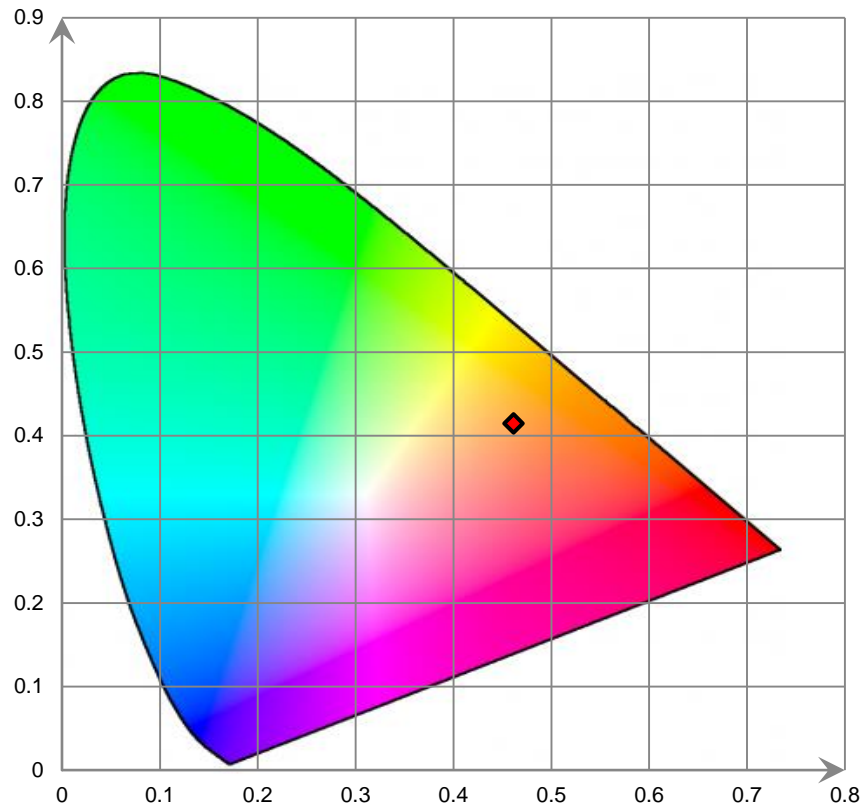
Relative Spectral Power Distribution



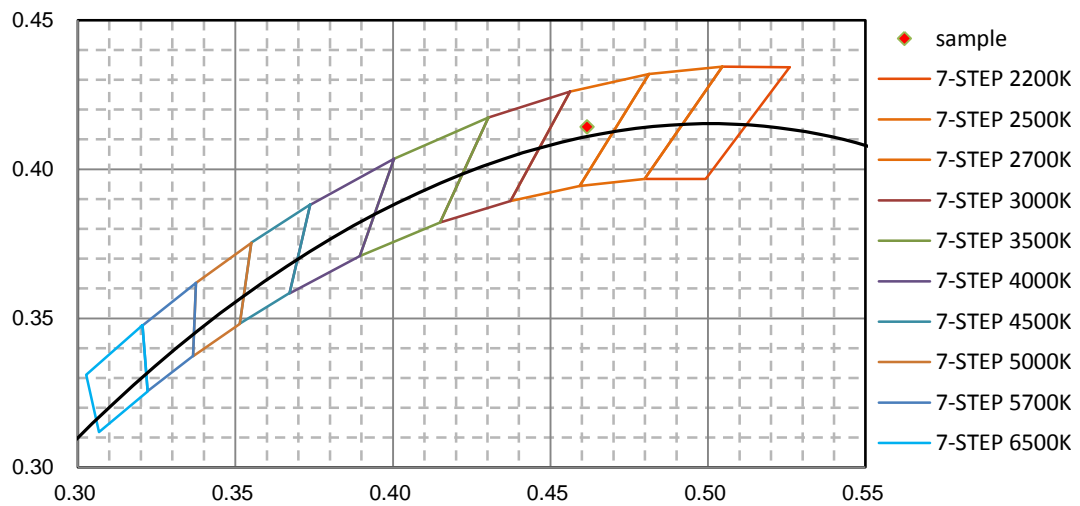
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	6.060E-02	421	8.460E-02	462	1.839E+00	503	3.305E+00	544	5.045E+00
381	6.550E-02	422	6.140E-02	463	1.746E+00	504	3.399E+00	545	5.123E+00
382	6.460E-02	423	6.410E-02	464	1.763E+00	505	3.435E+00	546	5.173E+00
383	1.430E-02	424	1.328E-01	465	1.731E+00	506	3.513E+00	547	5.213E+00
384	1.075E-01	425	1.449E-01	466	1.646E+00	507	3.541E+00	548	5.273E+00
385	6.210E-02	426	1.137E-01	467	1.636E+00	508	3.626E+00	549	5.302E+00
386	3.200E-03	427	1.875E-01	468	1.543E+00	509	3.655E+00	550	5.382E+00
387	4.330E-02	428	2.699E-01	469	1.531E+00	510	3.739E+00	551	5.436E+00
388	2.090E-02	429	3.316E-01	470	1.455E+00	511	3.758E+00	552	5.449E+00
389	3.900E-03	430	3.826E-01	471	1.390E+00	512	3.819E+00	553	5.524E+00
390	8.170E-02	431	4.393E-01	472	1.381E+00	513	3.843E+00	554	5.564E+00
391	1.170E-02	432	5.687E-01	473	1.244E+00	514	3.914E+00	555	5.618E+00
392	4.400E-03	433	6.331E-01	474	1.271E+00	515	3.928E+00	556	5.665E+00
393	9.000E-04	434	6.661E-01	475	1.206E+00	516	3.995E+00	557	5.732E+00
394	1.480E-02	435	7.678E-01	476	1.231E+00	517	3.989E+00	558	5.769E+00
395	5.160E-02	436	8.864E-01	477	1.293E+00	518	4.112E+00	559	5.815E+00
396	2.630E-02	437	9.624E-01	478	1.269E+00	519	4.103E+00	560	5.849E+00
397	7.600E-03	438	1.057E+00	479	1.270E+00	520	4.112E+00	561	5.923E+00
398	3.000E-04	439	1.225E+00	480	1.352E+00	521	4.133E+00	562	5.962E+00
399	0.000E+00	440	1.358E+00	481	1.399E+00	522	4.182E+00	563	6.004E+00
400	0.000E+00	441	1.518E+00	482	1.475E+00	523	4.257E+00	564	6.049E+00
401	4.010E-02	442	1.776E+00	483	1.577E+00	524	4.267E+00	565	6.093E+00
402	2.470E-02	443	2.011E+00	484	1.622E+00	525	4.300E+00	566	6.165E+00
403	2.050E-02	444	2.237E+00	485	1.761E+00	526	4.358E+00	567	6.147E+00
404	2.020E-02	445	2.542E+00	486	1.789E+00	527	4.389E+00	568	6.212E+00
405	3.150E-02	446	2.836E+00	487	1.872E+00	528	4.428E+00	569	6.282E+00
406	7.900E-03	447	3.145E+00	488	1.953E+00	529	4.429E+00	570	6.304E+00
407	7.040E-02	448	3.406E+00	489	2.042E+00	530	4.472E+00	571	6.373E+00
408	3.700E-03	449	3.631E+00	490	2.138E+00	531	4.540E+00	572	6.455E+00
409	6.300E-02	450	3.790E+00	491	2.226E+00	532	4.563E+00	573	6.446E+00
410	5.890E-02	451	3.823E+00	492	2.301E+00	533	4.566E+00	574	6.515E+00
411	3.670E-02	452	3.762E+00	493	2.389E+00	534	4.624E+00	575	6.566E+00
412	1.700E-02	453	3.625E+00	494	2.509E+00	535	4.680E+00	576	6.564E+00
413	7.000E-04	454	3.368E+00	495	2.571E+00	536	4.720E+00	577	6.654E+00
414	3.540E-02	455	3.110E+00	496	2.695E+00	537	4.743E+00	578	6.719E+00
415	1.910E-02	456	2.807E+00	497	2.804E+00	538	4.831E+00	579	6.759E+00
416	4.590E-02	457	2.534E+00	498	2.893E+00	539	4.830E+00	580	6.823E+00
417	2.830E-02	458	2.319E+00	499	2.978E+00	540	4.887E+00	581	6.845E+00
418	4.250E-02	459	2.128E+00	500	3.057E+00	541	4.943E+00	582	6.958E+00
419	2.810E-02	460	1.955E+00	501	3.163E+00	542	4.982E+00	583	6.955E+00
420	3.950E-02	461	1.866E+00	502	3.236E+00	543	5.019E+00	584	6.996E+00

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	7.122E+00	626	9.564E+00	667	6.519E+00	708	2.333E+00	749	4.022E-01
586	7.231E+00	627	9.535E+00	668	6.353E+00	709	2.246E+00	750	4.790E-01
587	7.249E+00	628	9.493E+00	669	6.201E+00	710	2.084E+00	751	4.692E-01
588	7.344E+00	629	9.558E+00	670	6.107E+00	711	2.008E+00	752	4.365E-01
589	7.375E+00	630	9.515E+00	671	5.994E+00	712	1.989E+00	753	4.665E-01
590	7.441E+00	631	9.406E+00	672	5.880E+00	713	2.015E+00	754	3.951E-01
591	7.565E+00	632	9.396E+00	673	5.715E+00	714	1.877E+00	755	2.074E-01
592	7.663E+00	633	9.405E+00	674	5.575E+00	715	1.844E+00	756	3.156E-01
593	7.749E+00	634	9.374E+00	675	5.568E+00	716	1.697E+00	757	2.668E-01
594	7.819E+00	635	9.288E+00	676	5.411E+00	717	1.704E+00	758	3.840E-02
595	7.902E+00	636	9.284E+00	677	5.299E+00	718	1.735E+00	759	2.054E-01
596	7.974E+00	637	9.210E+00	678	5.128E+00	719	1.523E+00	760	1.687E-01
597	8.066E+00	638	9.159E+00	679	5.055E+00	720	1.595E+00	761	9.130E-02
598	8.146E+00	639	9.057E+00	680	4.927E+00	721	1.489E+00	762	3.203E-01
599	8.261E+00	640	9.067E+00	681	4.815E+00	722	1.515E+00	763	3.322E-01
600	8.295E+00	641	8.967E+00	682	4.761E+00	723	1.497E+00	764	1.689E-01
601	8.363E+00	642	8.885E+00	683	4.631E+00	724	1.261E+00	765	4.450E-02
602	8.511E+00	643	8.857E+00	684	4.507E+00	725	1.382E+00	766	9.520E-02
603	8.569E+00	644	8.739E+00	685	4.331E+00	726	1.231E+00	767	2.286E-01
604	8.630E+00	645	8.684E+00	686	4.289E+00	727	1.229E+00	768	2.631E-01
605	8.702E+00	646	8.628E+00	687	4.245E+00	728	1.171E+00	769	1.880E-01
606	8.829E+00	647	8.551E+00	688	4.134E+00	729	1.258E+00	770	5.910E-02
607	8.862E+00	648	8.487E+00	689	3.848E+00	730	1.231E+00	771	1.084E-01
608	8.984E+00	649	8.328E+00	690	3.828E+00	731	1.113E+00	772	2.475E-01
609	9.048E+00	650	8.319E+00	691	3.764E+00	732	1.055E+00	773	1.205E-01
610	9.130E+00	651	8.193E+00	692	3.675E+00	733	8.842E-01	774	5.610E-02
611	9.200E+00	652	8.153E+00	693	3.603E+00	734	9.260E-01	775	9.190E-02
612	9.237E+00	653	8.031E+00	694	3.421E+00	735	1.015E+00	776	7.610E-02
613	9.253E+00	654	7.922E+00	695	3.346E+00	736	8.654E-01	777	8.550E-02
614	9.360E+00	655	7.839E+00	696	3.186E+00	737	7.743E-01	778	1.022E-01
615	9.349E+00	656	7.640E+00	697	3.177E+00	738	6.826E-01	779	1.933E-01
616	9.403E+00	657	7.568E+00	698	3.112E+00	739	6.985E-01	780	7.430E-02
617	9.474E+00	658	7.442E+00	699	2.997E+00	740	7.703E-01		
618	9.476E+00	659	7.402E+00	700	2.881E+00	741	7.329E-01		
619	9.475E+00	660	7.299E+00	701	2.870E+00	742	7.279E-01		
620	9.535E+00	661	7.091E+00	702	2.693E+00	743	6.917E-01		
621	9.479E+00	662	7.019E+00	703	2.595E+00	744	4.693E-01		
622	9.524E+00	663	6.934E+00	704	2.599E+00	745	4.693E-01		
623	9.578E+00	664	6.808E+00	705	2.433E+00	746	3.420E-01		
624	9.545E+00	665	6.701E+00	706	2.457E+00	747	4.045E-01		
625	9.510E+00	666	6.580E+00	707	2.406E+00	748	4.964E-01		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles



[Goniophotometer System]

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

Test orientation: **Downward**

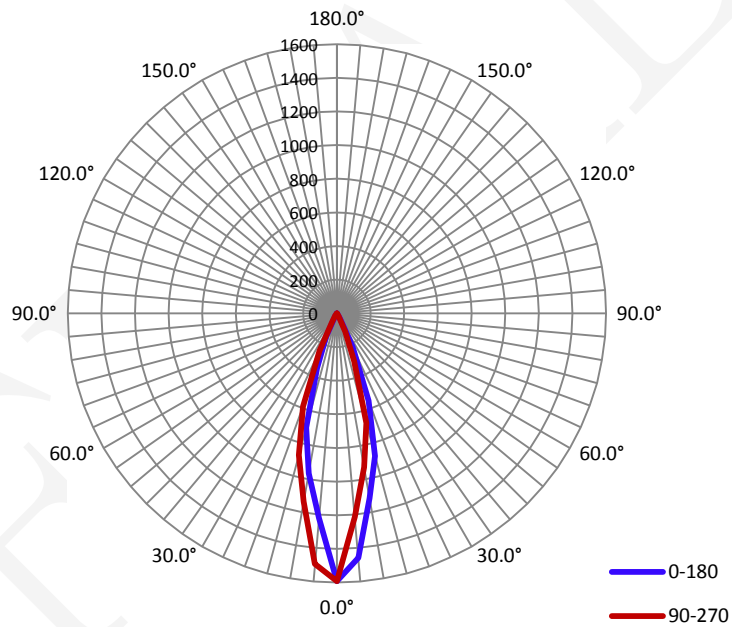
Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
120.0	60	0.0550	5.83	0.8860

Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	$I_{max}(cd)$	S/MH(C0/180)	S/MH(C90/270)
435.9	74.81	1591.4	0.48	0.47

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50% I_{max}):	29.5	29.4	29.0	29.5	29.4
Field Angle(10% I_{max}):	51.4	51.3	51.2	51.3	51.3

Luminous Intensity (cd) Distribution Data

C γ	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	1591	1591	1591	1591	1591	1591	1591	1591
5.0°	1459	1377	1306	1248	1215	1193	1192	1214
10.0°	1116	1051	988	960	930	918	923	937
15.0°	878	815	763	717	675	666	675	687
20.0°	552	468	381	335	303	293	303	325
25.0°	219	189	164	140	119	114	126	143
30.0°	37	27	22	19	18	17	18	21
35.0°	15	14	12	11	11	10	10	11
40.0°	9	8	7	7	7	7	7	7
45.0°	5	3	2	1	1	0	1	2
50.0°	0	0	0	0	0	0	0	0
55.0°	0	0	0	0	0	0	0	0
60.0°	0	0	0	0	0	0	0	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

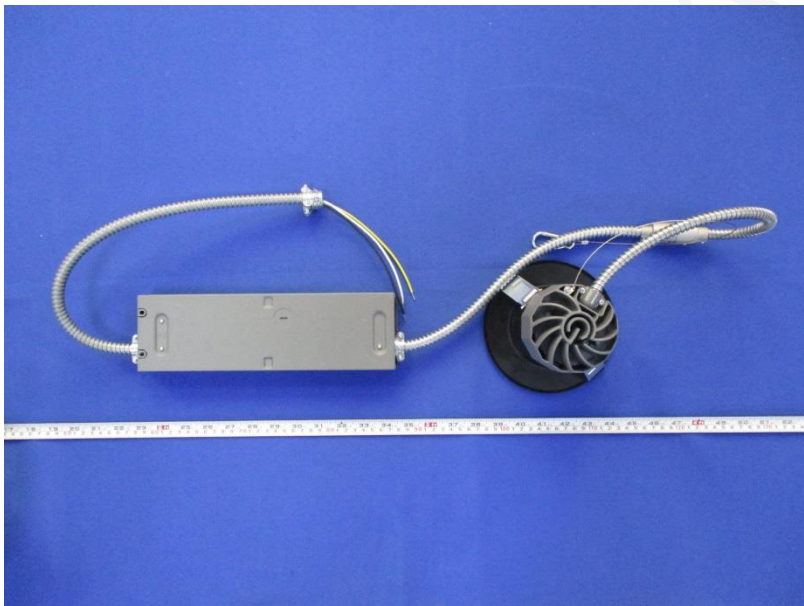
Luminous Intensity (cd) Distribution Data (cont.)

C γ	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	1591	1591	1591	1591	1591	1591	1591	1591
5.0°	1222	1280	1343	1423	1495	1533	1519	1479
10.0°	966	1002	1038	1093	1136	1180	1193	1155
15.0°	703	751	804	844	873	888	904	888
20.0°	345	417	486	551	589	623	617	567
25.0°	148	172	197	222	244	253	245	225
30.0°	22	25	32	46	59	63	58	42
35.0°	12	12	15	14	15	15	16	15
40.0°	7	7	8	9	9	9	10	9
45.0°	2	4	5	5	6	6	6	6
50.0°	0	0	0	0	0	0	0	0
55.0°	0	0	0	0	0	0	0	0
60.0°	0	0	0	0	0	0	0	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	35.1	8.05	0-5	35.1	8.05
5-10	85.1	19.54	0-10	120.2	27.59
10-15	107.9	24.76	0-15	228.2	52.35
15-20	101.4	23.26	0-20	329.6	75.61
20-25	66.0	15.15	0-25	395.6	90.76
25-30	27.3	6.25	0-30	422.8	97.02
30-35	6.8	1.55	0-35	429.6	98.56
35-40	3.5	0.80	0-40	433.1	99.36
40-45	2.1	0.48	0-45	435.2	99.85
45-50	0.7	0.15	0-50	435.9	100.00
50-55	0.0	0.00	0-55	435.9	100.00
55-60	0.0	0.00	0-60	435.9	100.00
60-65	0.0	0.00	0-65	435.9	100.00
65-70	0.0	0.00	0-70	435.9	100.00
70-75	0.0	0.00	0-75	435.9	100.00
75-80	0.0	0.00	0-80	435.9	100.00
80-85	0.0	0.00	0-85	435.9	100.00
85-90	0.0	0.00	0-90	435.9	100.00
90-95	0.0	0.00	0-95	435.9	100.00
95-100	0.0	0.00	0-100	435.9	100.00
100-105	0.0	0.00	0-105	435.9	100.00
105-110	0.0	0.00	0-110	435.9	100.00
110-115	0.0	0.00	0-115	435.9	100.00
115-120	0.0	0.00	0-120	435.9	100.00
120-125	0.0	0.00	0-125	435.9	100.00
125-130	0.0	0.00	0-130	435.9	100.00
130-135	0.0	0.00	0-135	435.9	100.00
135-140	0.0	0.00	0-140	435.9	100.00
140-145	0.0	0.00	0-145	435.9	100.00
145-150	0.0	0.00	0-150	435.9	100.00
150-155	0.0	0.00	0-155	435.9	100.00
155-160	0.0	0.00	0-160	435.9	100.00
160-165	0.0	0.00	0-165	435.9	100.00
165-170	0.0	0.00	0-170	435.9	100.00
170-175	0.0	0.00	0-175	435.9	100.00
175-180	0.0	0.00	0-180	435.9	100.00

6. Product Photo



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