

# IES LM-79-08

## MEASUREMENT AND TEST REPORT

For

### GREEN CREATIVE LTD

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

**Test Model: LE079027DIM120VNR/ADR4BL**

<b>Report Type:</b>	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution
<b>Test Engineer:</b>	George Yang <i>George Yang</i>
<b>Report Number:</b>	RKSB190722002-10-1
<b>Test Date:</b>	2019-07-22
<b>Report Date:</b>	2019-07-29
<b>Reviewed By:</b>	Ray Gao/EE Engineer <i>Ry Gao</i>
<b>Prepared By:</b>	Bay Area Compliance Laboratories Corp. (Kunshan). No.248 Chenghu Road, Kunshan, Jiangsu province, China. Tel: +86-0512-86175000 Fax: +86-0512-88934268
<b>Accreditation:</b>	The IAS Accreditation Number TL-749.

## 1. Product Description

### General Information:

A sample was received on 2019-07-22 and used for testing.

Model Tested: LE079027DIM120VNR/ADR4BL  
 Manufacturer: GREEN CREATIVE LTD  
 Brand Name: GREEN CREATIVE  
 Product Designation: LED Recessed Downlight  
 Burning TimeBefore Test: 0hour(For New Products)

### Rated Values:

Rated Voltage/Frequency: 120-277 VAC 60Hz  
 Rated Power: 8W  
 Nominal CCT: 2700K  
 Nominal Lumen Output: 580lm

## 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.

$4\pi$  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  $U_{\text{rel}}=2.70\%$  ( $k=2$ ), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is  $U=27\text{K}$  ( $k=2$ ), at the 95% confidence level. The uncertainty of the CRI is  $U=2.7(k=2)$ , at the 95% confidence level.

The uncertainty of power meter AC current  $U_{\text{rel}}=0.27\%$  of rdg, AC Voltage  $U_{\text{rel}}=0.26\%$  of rdg, Power  $U_{\text{rel}}=0.41\%$  ( $k=2$ ), 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 flux is  $U_{\text{rel}}=2.6\%$  ( $k=2$ ), at the 95% confidence level.

### Fidelity Index and Gamut Index Calculation

The  $R_i$ ,  $R_g$  was calculated according to IES TM-30-18 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**

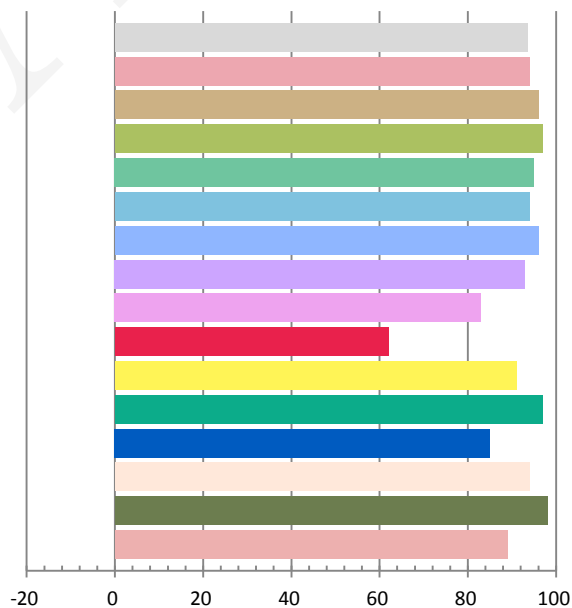
### Photometric and Electrical Measurement Result

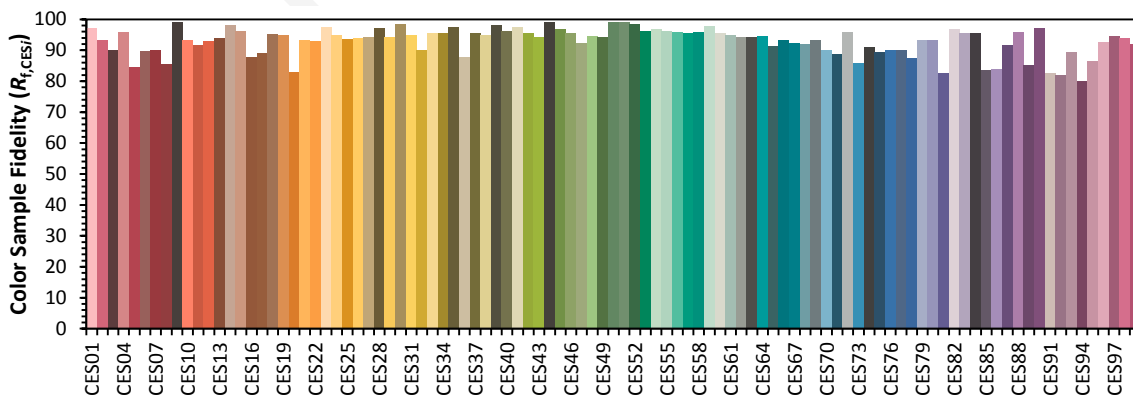
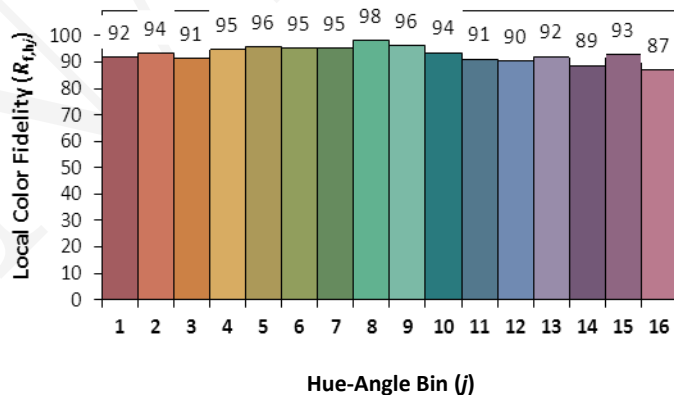
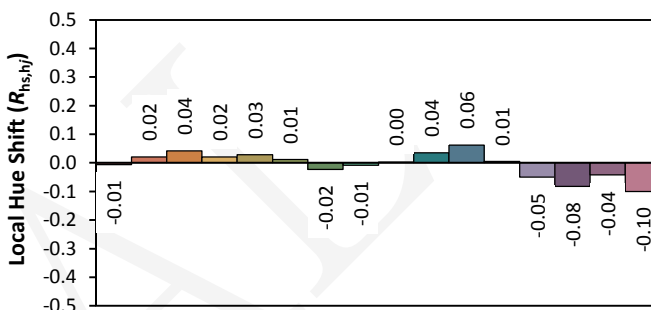
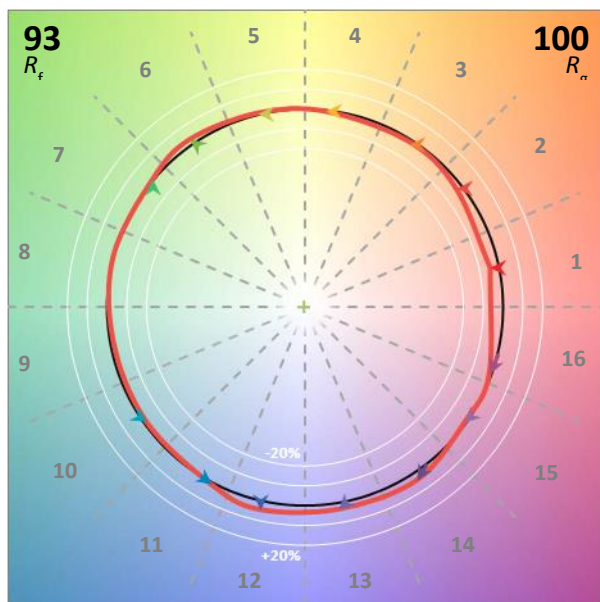
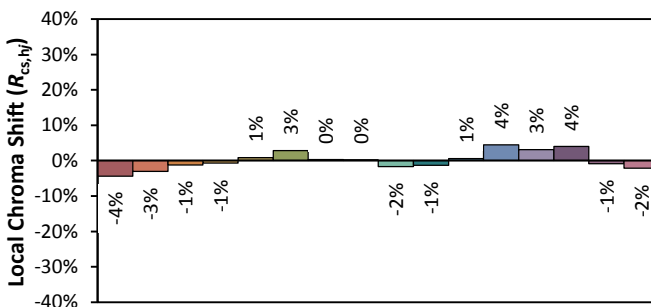
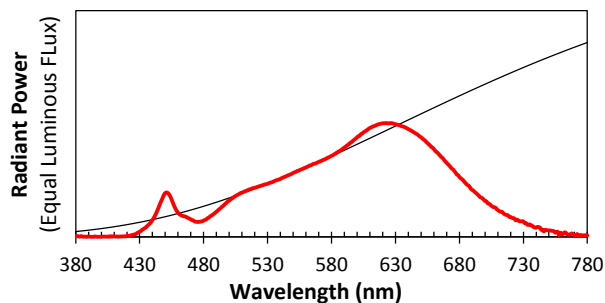
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120	60	0.0686	8.05	0.9779	601.77	74.75

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
2.102	2696	0.00096	0.4618	0.4136	0.2624	0.5288

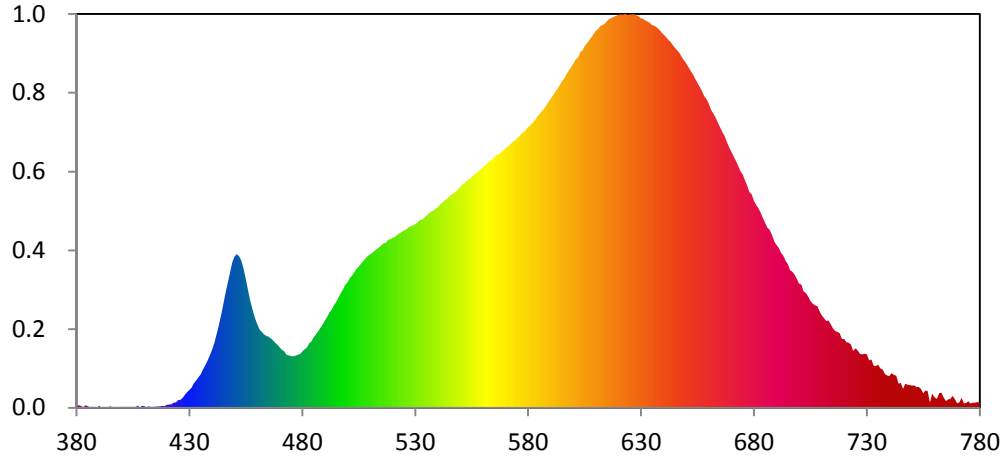
### Color Rendering Index

<b>Ra</b>			
93.6			
<b>R1</b>	<b>R2</b>	<b>R3</b>	<b>R4</b>
94	96	97	95
<b>R5</b>	<b>R6</b>	<b>R7</b>	<b>R8</b>
94	96	93	83
<b>R9</b>	<b>R10</b>	<b>R11</b>	<b>R12</b>
62	91	97	85
<b>R13</b>	<b>R14</b>	<b>R15</b>	
94	98	89	





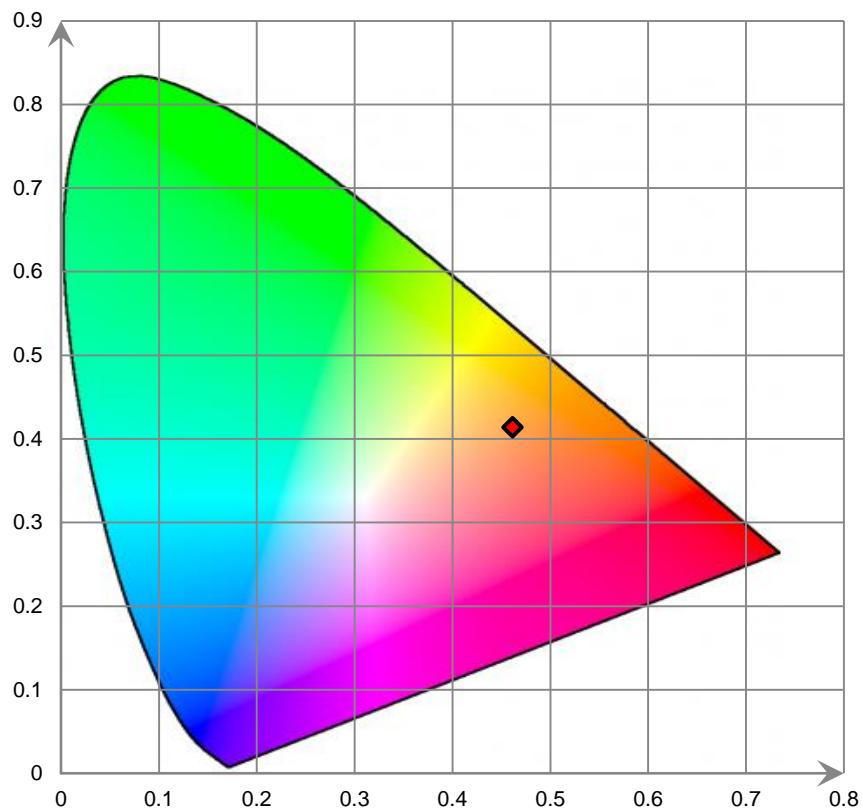
### Relative Spectral Power Distribution



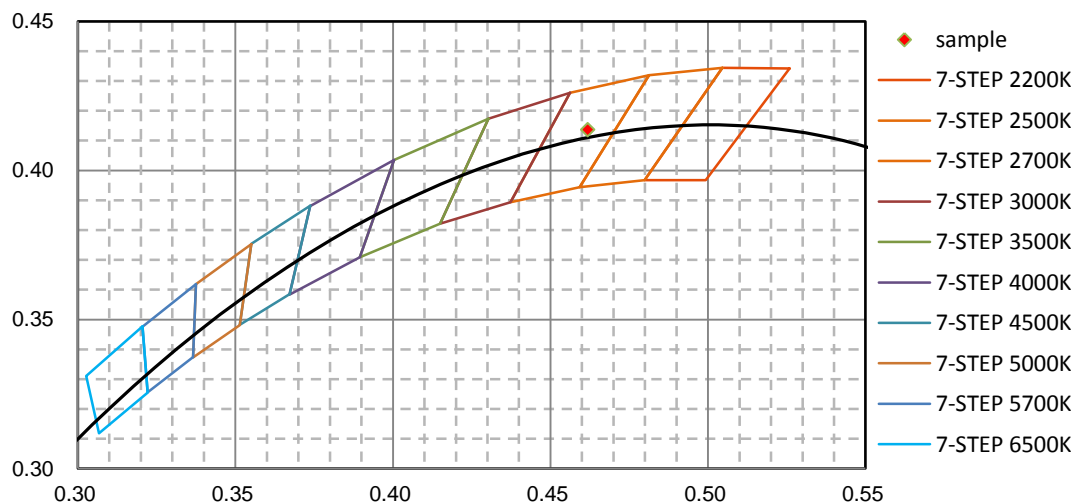
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	4.720E-02	421	1.080E-01	462	2.555E+00	503	4.565E+00	544	7.046E+00
381	8.180E-02	422	1.154E-01	463	2.478E+00	504	4.692E+00	545	7.121E+00
382	5.970E-02	423	1.771E-01	464	2.428E+00	505	4.765E+00	546	7.191E+00
383	1.490E-02	424	1.799E-01	465	2.397E+00	506	4.863E+00	547	7.238E+00
384	8.320E-02	425	2.636E-01	466	2.344E+00	507	4.943E+00	548	7.302E+00
385	5.280E-02	426	2.656E-01	467	2.274E+00	508	5.027E+00	549	7.376E+00
386	3.800E-03	427	3.360E-01	468	2.186E+00	509	5.123E+00	550	7.465E+00
387	2.900E-02	428	4.398E-01	469	2.123E+00	510	5.170E+00	551	7.540E+00
388	9.000E-03	429	5.288E-01	470	2.036E+00	511	5.233E+00	552	7.583E+00
389	2.600E-03	430	6.017E-01	471	1.958E+00	512	5.299E+00	553	7.677E+00
390	5.860E-02	431	6.766E-01	472	1.911E+00	513	5.357E+00	554	7.714E+00
391	1.830E-02	432	8.329E-01	473	1.791E+00	514	5.427E+00	555	7.789E+00
392	8.000E-04	433	9.147E-01	474	1.769E+00	515	5.484E+00	556	7.860E+00
393	0.000E+00	434	1.026E+00	475	1.743E+00	516	5.549E+00	557	7.917E+00
394	3.600E-03	435	1.127E+00	476	1.737E+00	517	5.573E+00	558	7.987E+00
395	4.810E-02	436	1.280E+00	477	1.764E+00	518	5.667E+00	559	8.053E+00
396	8.200E-03	437	1.421E+00	478	1.796E+00	519	5.693E+00	560	8.110E+00
397	7.000E-03	438	1.572E+00	479	1.816E+00	520	5.733E+00	561	8.187E+00
398	4.000E-04	439	1.750E+00	480	1.900E+00	521	5.769E+00	562	8.247E+00
399	0.000E+00	440	1.970E+00	481	1.973E+00	522	5.830E+00	563	8.331E+00
400	0.000E+00	441	2.195E+00	482	2.027E+00	523	5.882E+00	564	8.371E+00
401	2.090E-02	442	2.479E+00	483	2.174E+00	524	5.928E+00	565	8.452E+00
402	3.010E-02	443	2.786E+00	484	2.239E+00	525	5.980E+00	566	8.537E+00
403	2.110E-02	444	3.131E+00	485	2.380E+00	526	6.017E+00	567	8.551E+00
404	1.540E-02	445	3.502E+00	486	2.478E+00	527	6.081E+00	568	8.615E+00
405	2.730E-02	446	3.890E+00	487	2.571E+00	528	6.126E+00	569	8.682E+00
406	5.700E-03	447	4.225E+00	488	2.689E+00	529	6.160E+00	570	8.762E+00
407	7.900E-02	448	4.565E+00	489	2.804E+00	530	6.198E+00	571	8.818E+00
408	7.100E-03	449	4.914E+00	490	2.936E+00	531	6.256E+00	572	8.876E+00
409	5.810E-02	450	5.108E+00	491	3.058E+00	532	6.335E+00	573	8.960E+00
410	5.750E-02	451	5.182E+00	492	3.212E+00	533	6.353E+00	574	9.005E+00
411	2.370E-02	452	5.119E+00	493	3.314E+00	534	6.418E+00	575	9.079E+00
412	4.830E-02	453	4.968E+00	494	3.466E+00	535	6.489E+00	576	9.155E+00
413	9.500E-03	454	4.697E+00	495	3.577E+00	536	6.558E+00	577	9.234E+00
414	3.170E-02	455	4.353E+00	496	3.727E+00	537	6.622E+00	578	9.308E+00
415	3.200E-02	456	3.970E+00	497	3.865E+00	538	6.654E+00	579	9.376E+00
416	4.360E-02	457	3.603E+00	498	3.996E+00	539	6.716E+00	580	9.469E+00
417	3.920E-02	458	3.282E+00	499	4.149E+00	540	6.769E+00	581	9.527E+00
418	5.880E-02	459	3.020E+00	500	4.232E+00	541	6.858E+00	582	9.637E+00
419	5.090E-02	460	2.818E+00	501	4.379E+00	542	6.919E+00	583	9.715E+00
420	1.014E-01	461	2.650E+00	502	4.460E+00	543	6.989E+00	584	9.824E+00

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	9.914E+00	626	1.328E+01	667	9.179E+00	708	3.432E+00	749	7.616E-01
586	1.001E+01	627	1.328E+01	668	8.989E+00	709	3.259E+00	750	7.438E-01
587	1.009E+01	628	1.324E+01	669	8.797E+00	710	3.120E+00	751	7.521E-01
588	1.020E+01	629	1.321E+01	670	8.653E+00	711	3.026E+00	752	7.043E-01
589	1.032E+01	630	1.315E+01	671	8.482E+00	712	2.932E+00	753	6.974E-01
590	1.043E+01	631	1.313E+01	672	8.331E+00	713	2.943E+00	754	6.332E-01
591	1.054E+01	632	1.307E+01	673	8.162E+00	714	2.822E+00	755	4.797E-01
592	1.066E+01	633	1.304E+01	674	7.978E+00	715	2.674E+00	756	5.822E-01
593	1.077E+01	634	1.298E+01	675	7.871E+00	716	2.590E+00	757	5.623E-01
594	1.088E+01	635	1.292E+01	676	7.683E+00	717	2.556E+00	758	1.736E-01
595	1.101E+01	636	1.288E+01	677	7.494E+00	718	2.515E+00	759	4.717E-01
596	1.111E+01	637	1.283E+01	678	7.277E+00	719	2.317E+00	760	3.462E-01
597	1.126E+01	638	1.276E+01	679	7.206E+00	720	2.326E+00	761	3.052E-01
598	1.138E+01	639	1.267E+01	680	6.991E+00	721	2.216E+00	762	4.963E-01
599	1.149E+01	640	1.259E+01	681	6.851E+00	722	2.187E+00	763	5.011E-01
600	1.162E+01	641	1.252E+01	682	6.731E+00	723	2.138E+00	764	3.430E-01
601	1.176E+01	642	1.242E+01	683	6.589E+00	724	1.921E+00	765	2.221E-01
602	1.182E+01	643	1.235E+01	684	6.403E+00	725	2.007E+00	766	2.807E-01
603	1.200E+01	644	1.225E+01	685	6.247E+00	726	1.922E+00	767	2.977E-01
604	1.207E+01	645	1.215E+01	686	6.086E+00	727	1.814E+00	768	4.015E-01
605	1.221E+01	646	1.207E+01	687	6.001E+00	728	1.807E+00	769	2.954E-01
606	1.230E+01	647	1.198E+01	688	5.839E+00	729	1.819E+00	770	1.460E-01
607	1.239E+01	648	1.185E+01	689	5.607E+00	730	1.802E+00	771	1.809E-01
608	1.251E+01	649	1.172E+01	690	5.485E+00	731	1.599E+00	772	3.320E-01
609	1.262E+01	650	1.164E+01	691	5.386E+00	732	1.629E+00	773	1.512E-01
610	1.273E+01	651	1.150E+01	692	5.230E+00	733	1.422E+00	774	1.589E-01
611	1.278E+01	652	1.137E+01	693	5.124E+00	734	1.404E+00	775	2.164E-01
612	1.288E+01	653	1.127E+01	694	4.958E+00	735	1.457E+00	776	1.338E-01
613	1.292E+01	654	1.110E+01	695	4.850E+00	736	1.333E+00	777	1.721E-01
614	1.298E+01	655	1.096E+01	696	4.649E+00	737	1.294E+00	778	1.706E-01
615	1.305E+01	656	1.082E+01	697	4.593E+00	738	1.144E+00	779	1.895E-01
616	1.312E+01	657	1.068E+01	698	4.489E+00	739	1.091E+00	780	1.625E-01
617	1.316E+01	658	1.051E+01	699	4.349E+00	740	1.067E+00		
618	1.320E+01	659	1.042E+01	700	4.189E+00	741	1.168E+00		
619	1.323E+01	660	1.026E+01	701	4.162E+00	742	1.115E+00		
620	1.326E+01	661	1.006E+01	702	3.936E+00	743	1.079E+00		
621	1.328E+01	662	9.932E+00	703	3.878E+00	744	8.082E-01		
622	1.327E+01	663	9.802E+00	704	3.769E+00	745	8.396E-01		
623	1.329E+01	664	9.636E+00	705	3.622E+00	746	6.372E-01		
624	1.325E+01	665	9.473E+00	706	3.524E+00	747	8.042E-01		
625	1.327E+01	666	9.309E+00	707	3.459E+00	748	7.816E-01		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles





### [Goniophotometer System]

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

Test orientation: **Downward**

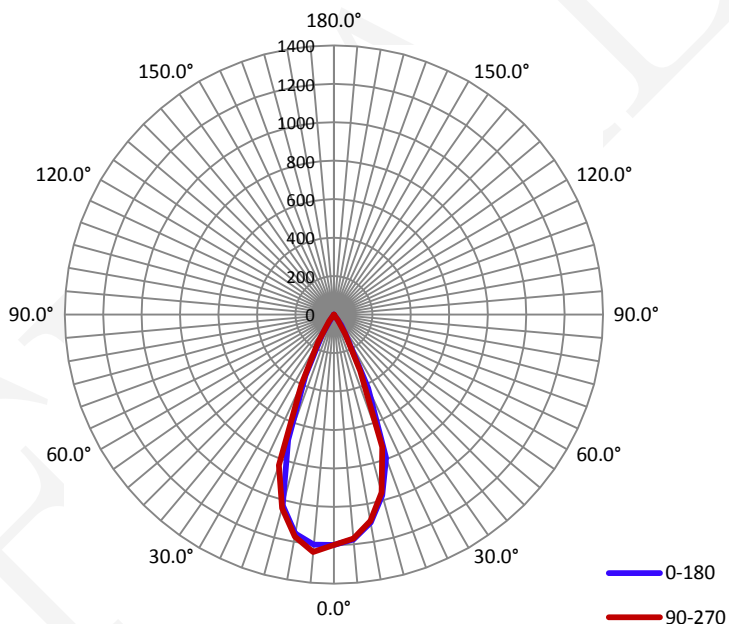
### Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
120.0	60	0.0720	8.06	0.9330

### Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	$I_{max}(cd)$	S/MH(C0/180)	S/MH(C90/270)
603.7	74.95	1240.1	0.74	0.75

### Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50% $I_{max}$ ):	44.0	44.3	43.8	44.2	44.1
Field Angle(10% $I_{max}$ ):	60.8	61.0	61.4	61.3	61.1

**Luminous Intensity (cd) Distribution Data**

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	1199	1199	1199	1199	1199	1199	1199	1199
5.0°	1174	1150	1136	1156	1169	1183	1204	1210
10.0°	1098	1073	1062	1074	1090	1119	1138	1159
15.0°	973	963	948	954	958	973	999	1023
20.0°	793	781	777	753	734	728	737	745
25.0°	422	394	376	344	323	327	340	354
30.0°	130	123	119	115	116	117	118	123
35.0°	66	61	50	42	35	30	27	28
40.0°	8	6	6	4	5	6	5	6
45.0°	2	2	1	2	1	1	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.)

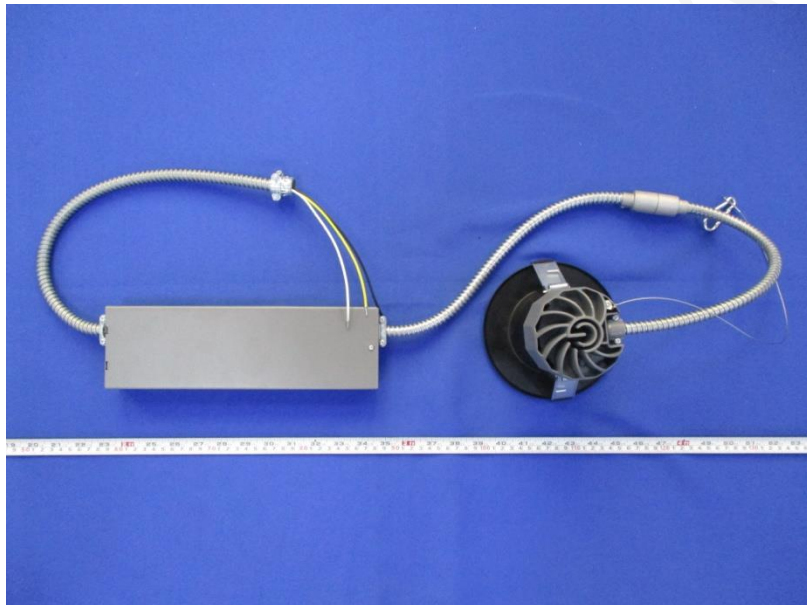
C y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	1199	1199	1199	1199	1199	1199	1199	1199
5.0°	1201	1200	1212	1226	1240	1230	1211	1194
10.0°	1156	1149	1154	1160	1173	1166	1165	1146
15.0°	1027	1034	1039	1048	1042	1029	1019	999
20.0°	694	723	778	827	835	822	816	794
25.0°	351	365	380	391	398	404	404	402
30.0°	122	134	145	157	162	158	147	135
35.0°	24	26	30	36	43	48	53	53
40.0°	6	6	7	7	8	7	8	8
45.0°	1	2	2	3	3	3	2	3
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)	%
0-5	28.6	4.74
5-10	83.1	13.77
10-15	126.5	20.95
15-20	146.1	24.20
20-25	120.0	19.88
25-30	64.0	10.61
30-35	25.5	4.23
35-40	7.9	1.30
40-45	1.5	0.26
45-50	0.4	0.07
50-55	0.0	0.00
55-60	0.0	0.00
60-65	0.0	0.00
65-70	0.0	0.00
70-75	0.0	0.00
75-80	0.0	0.00
80-85	0.0	0.00
85-90	0.0	0.00
90-95	0.0	0.00
95-100	0.0	0.00
100-105	0.0	0.00
105-110	0.0	0.00
110-115	0.0	0.00
115-120	0.0	0.00
120-125	0.0	0.00
125-130	0.0	0.00
130-135	0.0	0.00
135-140	0.0	0.00
140-145	0.0	0.00
145-150	0.0	0.00
150-155	0.0	0.00
155-160	0.0	0.00
160-165	0.0	0.00
165-170	0.0	0.00
170-175	0.0	0.00
175-180	0.0	0.00

Deg	Flux (lm)	%
0-5	28.6	4.74
0-10	111.7	18.51
0-15	238.2	39.46
0-20	384.3	63.66
0-25	504.3	83.54
0-30	568.3	94.14
0-35	593.9	98.37
0-40	601.7	99.68
0-45	603.3	99.93
0-50	603.7	100.00
0-55	603.7	100.00
0-60	603.7	100.00
0-65	603.7	100.00
0-70	603.7	100.00
0-75	603.7	100.00
0-80	603.7	100.00
0-85	603.7	100.00
0-90	603.7	100.00
0-95	603.7	100.00
0-100	603.7	100.00
0-105	603.7	100.00
0-110	603.7	100.00
0-115	603.7	100.00
0-120	603.7	100.00
0-125	603.7	100.00
0-130	603.7	100.00
0-135	603.7	100.00
0-140	603.7	100.00
0-145	603.7	100.00
0-150	603.7	100.00
0-155	603.7	100.00
0-160	603.7	100.00
0-165	603.7	100.00
0-170	603.7	100.00
0-175	603.7	100.00
0-180	603.7	100.00

## 6. Product Photo



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