



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: LE059027DIM120VNR/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>	RKSB190722001-10-1
<b>Test Date:</b>	2019-07-22
<b>Report Date:</b>	2019-07-29
<b>Reviewed By:</b>	Ray Gao/EE Engineer <i>Ray 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>Test Facility:</b>	Test facility was located at No.248 Chenghu Road, Kunshan, Jiangsu province, China.
<b>Accreditation:</b>	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: LE059027DIM120VNR/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.

$4\pi$  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  $U_{re}=2.61\%$  ( $k=2$ ), 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 ( $\gamma$ ) 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  $U_{rel}=2.6\%$  ( $k=2$ ), 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**

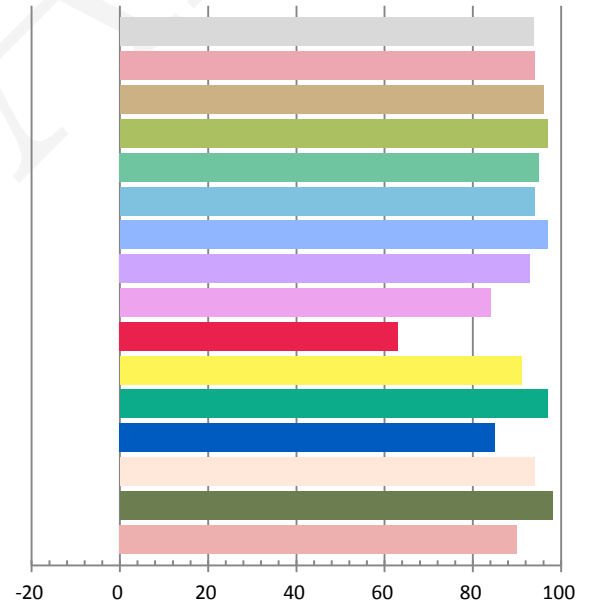
### Photometric and Electrical Measurement Result

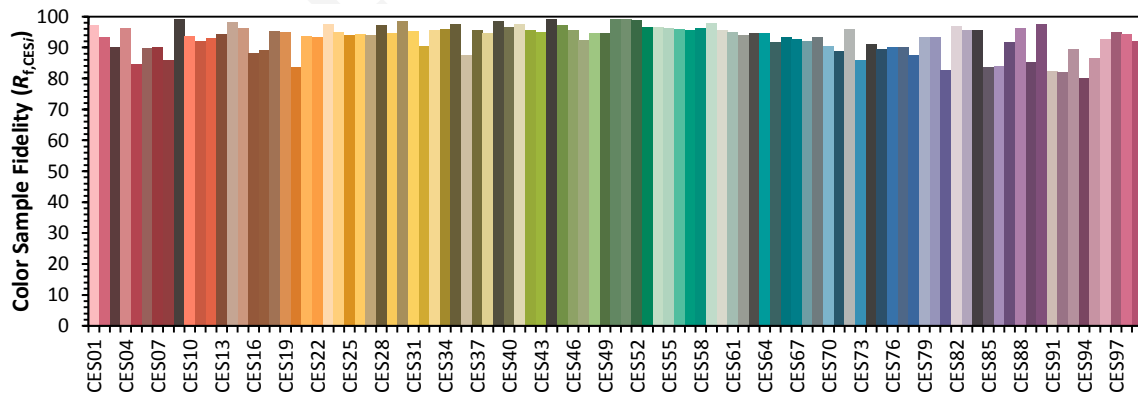
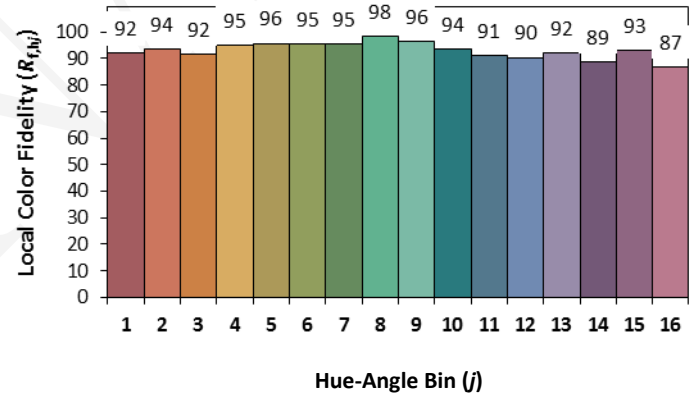
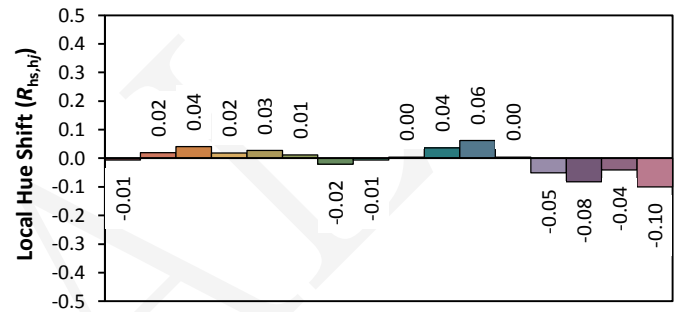
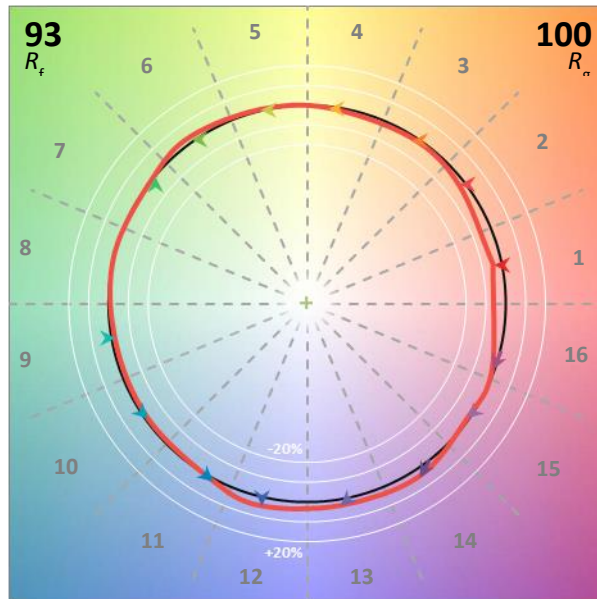
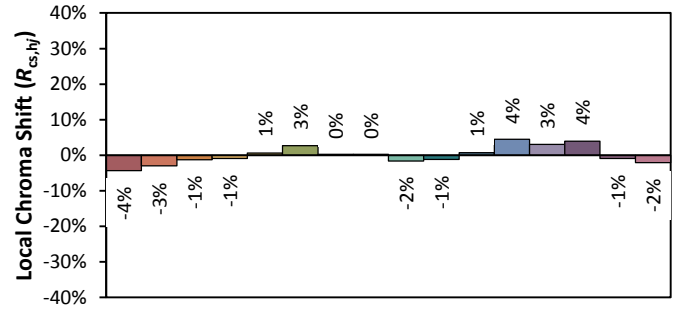
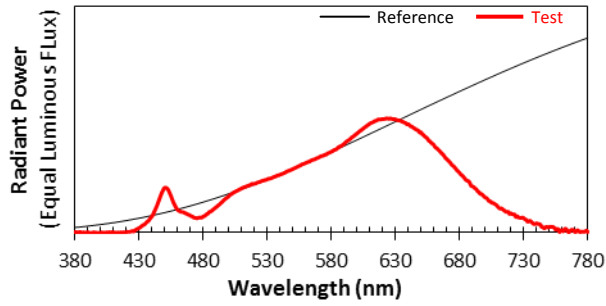
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120	60	0.0503	5.79	0.9592	443.41	76.58

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
1.543	2696	0.00108	0.4621	0.4140	0.2624	0.5290

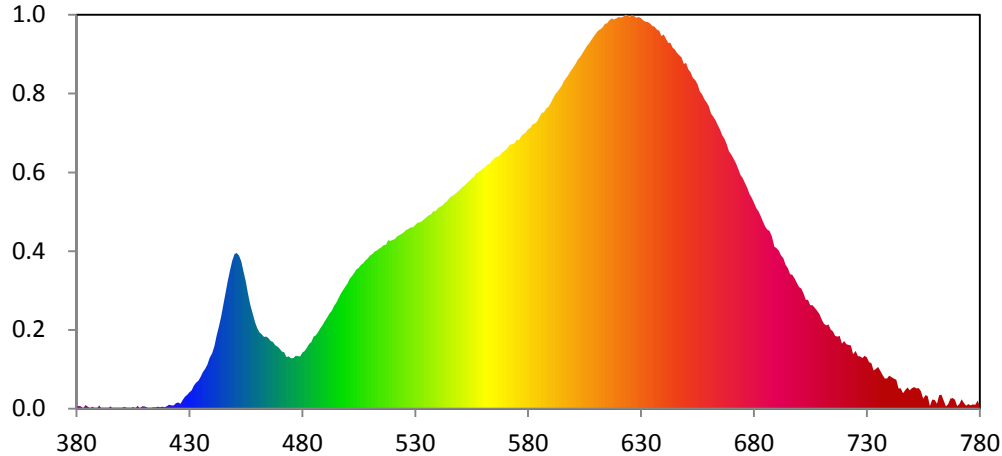
### Color Rendering Index

<b>Ra</b>			
93.7			
<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	97	93	84
<b>R9</b>	<b>R10</b>	<b>R11</b>	<b>R12</b>
63	91	97	85
<b>R13</b>	<b>R14</b>	<b>R15</b>	
94	98	90	





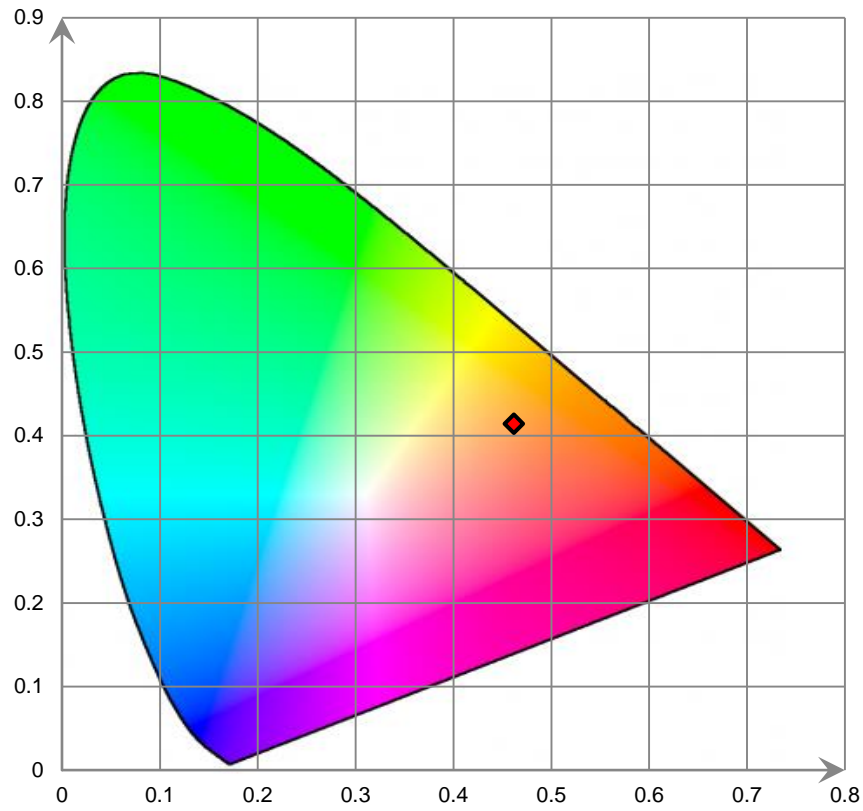
### Relative Spectral Power Distribution



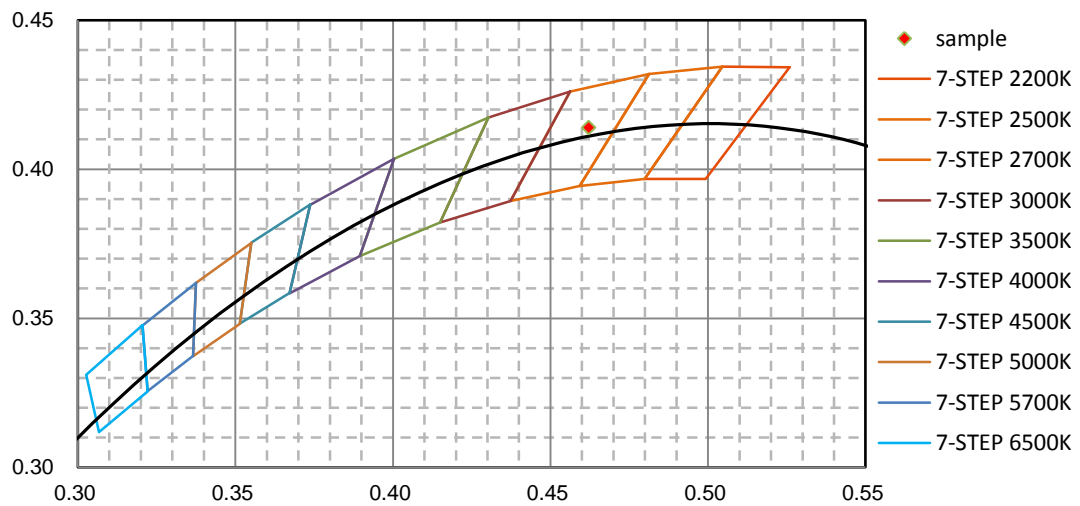
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	6.110E-02	421	9.870E-02	462	1.855E+00	503	3.390E+00	544	5.175E+00
381	6.310E-02	422	7.930E-02	463	1.792E+00	504	3.479E+00	545	5.248E+00
382	5.720E-02	423	7.870E-02	464	1.799E+00	505	3.517E+00	546	5.298E+00
383	1.490E-02	424	1.351E-01	465	1.762E+00	506	3.590E+00	547	5.337E+00
384	8.790E-02	425	1.512E-01	466	1.688E+00	507	3.630E+00	548	5.381E+00
385	4.950E-02	426	1.153E-01	467	1.665E+00	508	3.702E+00	549	5.425E+00
386	2.400E-03	427	2.155E-01	468	1.583E+00	509	3.747E+00	550	5.483E+00
387	4.350E-02	428	2.967E-01	469	1.554E+00	510	3.821E+00	551	5.539E+00
388	1.390E-02	429	3.458E-01	470	1.497E+00	511	3.859E+00	552	5.579E+00
389	2.400E-03	430	4.075E-01	471	1.421E+00	512	3.923E+00	553	5.642E+00
390	7.790E-02	431	4.537E-01	472	1.405E+00	513	3.948E+00	554	5.690E+00
391	1.130E-02	432	5.724E-01	473	1.288E+00	514	3.998E+00	555	5.749E+00
392	4.000E-04	433	6.432E-01	474	1.299E+00	515	4.026E+00	556	5.789E+00
393	0.000E+00	434	6.921E-01	475	1.256E+00	516	4.086E+00	557	5.879E+00
394	1.520E-02	435	7.868E-01	476	1.266E+00	517	4.094E+00	558	5.912E+00
395	5.100E-02	436	9.099E-01	477	1.318E+00	518	4.206E+00	559	5.945E+00
396	1.910E-02	437	9.914E-01	478	1.308E+00	519	4.193E+00	560	5.993E+00
397	9.600E-03	438	1.096E+00	479	1.304E+00	520	4.216E+00	561	6.038E+00
398	4.000E-04	439	1.265E+00	480	1.396E+00	521	4.233E+00	562	6.101E+00
399	0.000E+00	440	1.384E+00	481	1.435E+00	522	4.298E+00	563	6.117E+00
400	0.000E+00	441	1.557E+00	482	1.514E+00	523	4.337E+00	564	6.195E+00
401	3.890E-02	442	1.818E+00	483	1.615E+00	524	4.366E+00	565	6.249E+00
402	2.120E-02	443	2.049E+00	484	1.660E+00	525	4.404E+00	566	6.289E+00
403	1.670E-02	444	2.297E+00	485	1.801E+00	526	4.459E+00	567	6.304E+00
404	1.300E-02	445	2.600E+00	486	1.826E+00	527	4.481E+00	568	6.372E+00
405	3.770E-02	446	2.893E+00	487	1.914E+00	528	4.527E+00	569	6.422E+00
406	6.900E-03	447	3.194E+00	488	2.005E+00	529	4.536E+00	570	6.457E+00
407	7.110E-02	448	3.463E+00	489	2.090E+00	530	4.593E+00	571	6.522E+00
408	3.700E-03	449	3.700E+00	490	2.181E+00	531	4.642E+00	572	6.595E+00
409	5.700E-02	450	3.865E+00	491	2.266E+00	532	4.655E+00	573	6.601E+00
410	5.660E-02	451	3.883E+00	492	2.365E+00	533	4.688E+00	574	6.636E+00
411	3.010E-02	452	3.821E+00	493	2.446E+00	534	4.730E+00	575	6.718E+00
412	1.530E-02	453	3.674E+00	494	2.569E+00	535	4.783E+00	576	6.708E+00
413	4.600E-03	454	3.426E+00	495	2.649E+00	536	4.828E+00	577	6.809E+00
414	3.140E-02	455	3.183E+00	496	2.761E+00	537	4.854E+00	578	6.864E+00
415	2.340E-02	456	2.869E+00	497	2.870E+00	538	4.934E+00	579	6.900E+00
416	4.330E-02	457	2.597E+00	498	2.961E+00	539	4.934E+00	580	6.978E+00
417	2.790E-02	458	2.369E+00	499	3.049E+00	540	4.995E+00	581	7.010E+00
418	4.920E-02	459	2.160E+00	500	3.126E+00	541	5.041E+00	582	7.105E+00
419	3.020E-02	460	2.007E+00	501	3.249E+00	542	5.069E+00	583	7.125E+00
420	5.110E-02	461	1.901E+00	502	3.314E+00	543	5.130E+00	584	7.179E+00

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	7.291E+00	626	9.835E+00	667	6.741E+00	708	2.442E+00	749	4.514E-01
586	7.387E+00	627	9.803E+00	668	6.608E+00	709	2.359E+00	750	5.113E-01
587	7.407E+00	628	9.762E+00	669	6.431E+00	710	2.226E+00	751	5.313E-01
588	7.503E+00	629	9.784E+00	670	6.345E+00	711	2.116E+00	752	5.040E-01
589	7.542E+00	630	9.754E+00	671	6.235E+00	712	2.079E+00	753	5.105E-01
590	7.636E+00	631	9.696E+00	672	6.124E+00	713	2.106E+00	754	4.275E-01
591	7.746E+00	632	9.667E+00	673	5.985E+00	714	1.974E+00	755	2.510E-01
592	7.848E+00	633	9.659E+00	674	5.835E+00	715	1.930E+00	756	3.364E-01
593	7.918E+00	634	9.629E+00	675	5.759E+00	716	1.811E+00	757	3.076E-01
594	7.992E+00	635	9.559E+00	676	5.638E+00	717	1.796E+00	758	6.680E-02
595	8.076E+00	636	9.538E+00	677	5.520E+00	718	1.814E+00	759	2.230E-01
596	8.195E+00	637	9.464E+00	678	5.366E+00	719	1.619E+00	760	2.134E-01
597	8.266E+00	638	9.442E+00	679	5.273E+00	720	1.685E+00	761	1.227E-01
598	8.346E+00	639	9.309E+00	680	5.151E+00	721	1.605E+00	762	3.318E-01
599	8.441E+00	640	9.349E+00	681	5.011E+00	722	1.592E+00	763	3.443E-01
600	8.529E+00	641	9.242E+00	682	4.930E+00	723	1.577E+00	764	2.015E-01
601	8.616E+00	642	9.139E+00	683	4.810E+00	724	1.357E+00	765	5.450E-02
602	8.721E+00	643	9.137E+00	684	4.678E+00	725	1.437E+00	766	1.122E-01
603	8.785E+00	644	9.016E+00	685	4.548E+00	726	1.313E+00	767	2.463E-01
604	8.874E+00	645	8.973E+00	686	4.471E+00	727	1.303E+00	768	2.656E-01
605	8.963E+00	646	8.887E+00	687	4.438E+00	728	1.266E+00	769	2.259E-01
606	9.058E+00	647	8.830E+00	688	4.297E+00	729	1.321E+00	770	6.170E-02
607	9.119E+00	648	8.773E+00	689	4.043E+00	730	1.279E+00	771	1.107E-01
608	9.214E+00	649	8.609E+00	690	4.003E+00	731	1.156E+00	772	2.325E-01
609	9.293E+00	650	8.635E+00	691	3.943E+00	732	1.133E+00	773	1.417E-01
610	9.374E+00	651	8.473E+00	692	3.820E+00	733	9.540E-01	774	6.740E-02
611	9.441E+00	652	8.403E+00	693	3.759E+00	734	9.925E-01	775	1.068E-01
612	9.476E+00	653	8.267E+00	694	3.586E+00	735	1.041E+00	776	7.860E-02
613	9.523E+00	654	8.204E+00	695	3.513E+00	736	9.402E-01	777	1.067E-01
614	9.607E+00	655	8.098E+00	696	3.360E+00	737	8.398E-01	778	9.740E-02
615	9.625E+00	656	7.921E+00	697	3.345E+00	738	7.484E-01	779	2.001E-01
616	9.697E+00	657	7.855E+00	698	3.253E+00	739	7.551E-01	780	6.850E-02
617	9.745E+00	658	7.727E+00	699	3.141E+00	740	8.203E-01		
618	9.721E+00	659	7.650E+00	700	3.034E+00	741	7.791E-01		
619	9.747E+00	660	7.554E+00	701	3.001E+00	742	7.523E-01		
620	9.787E+00	661	7.372E+00	702	2.881E+00	743	7.201E-01		
621	9.771E+00	662	7.290E+00	703	2.720E+00	744	5.061E-01		
622	9.787E+00	663	7.204E+00	704	2.720E+00	745	5.034E-01		
623	9.840E+00	664	7.083E+00	705	2.578E+00	746	3.823E-01		
624	9.824E+00	665	6.973E+00	706	2.578E+00	747	4.593E-01		
625	9.785E+00	666	6.831E+00	707	2.508E+00	748	5.236E-01		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles





### [Goniophotometer System]

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

Test orientation: **Downward**

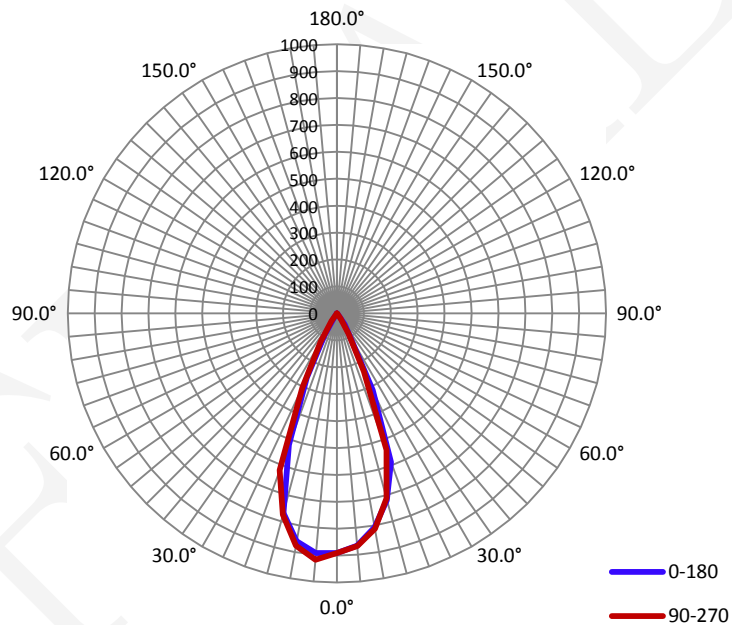
#### Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
120.0	60	0.0550	5.84	0.8860

#### Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	$I_{max}(cd)$	S/MH(C0/180)	S/MH(C90/270)
448.4	76.83	919.0	0.74	0.75

#### Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50% $I_{max}$ ):	44.0	44.2	43.9	44.1	44.1
Field Angle(10% $I_{max}$ ):	60.5	61.1	61.5	61.3	61.1

Luminous Intensity (cd) Distribution Data

C γ	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	891	891	891	891	891	891	891	891
5.0°	866	848	844	859	868	885	898	901
10.0°	806	792	784	800	813	833	850	862
15.0°	719	708	706	705	711	728	752	766
20.0°	588	577	566	555	540	539	536	549
25.0°	314	292	268	249	238	242	250	266
30.0°	93	90	87	84	86	87	88	90
35.0°	49	44	36	28	25	21	19	20
40.0°	5	5	4	4	4	3	4	4
45.0°	1	1	0	0	0	0	0	1
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

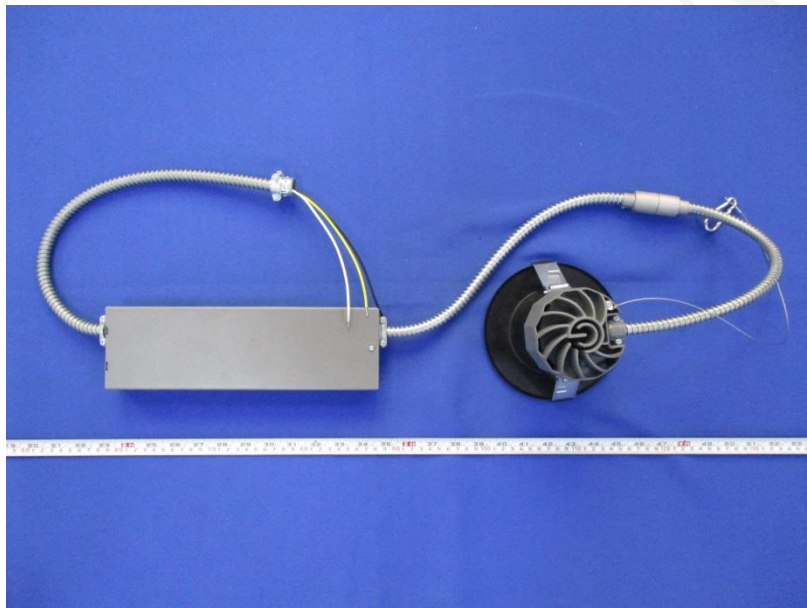
Luminous Intensity (cd) Distribution Data (cont.)

C y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	891	891	891	891	891	891	891	891
5.0°	893	894	902	914	919	911	895	882
10.0°	859	856	861	866	877	867	859	843
15.0°	769	775	778	786	774	768	758	736
20.0°	521	548	589	617	620	611	609	584
25.0°	263	277	290	295	305	305	302	303
30.0°	91	101	111	119	122	116	108	98
35.0°	17	19	22	28	35	37	41	44
40.0°	4	5	5	5	6	5	6	5
45.0°	0	2	1	2	1	2	2	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

### Zonal Lumen Density Measurement

Deg	Flux (lm)	%	Deg	Flux (lm)	%
0-5	21.2	4.74	0-5	21.2	4.74
5-10	61.7	13.77	0-10	83.0	18.50
10-15	94.0	20.97	0-15	177.0	39.47
15-20	108.6	24.22	0-20	285.6	63.70
20-25	89.2	19.89	0-25	374.8	83.59
25-30	47.7	10.63	0-30	422.5	94.22
30-35	18.9	4.22	0-35	441.4	98.43
35-40	5.8	1.30	0-40	447.2	99.73
40-45	1.0	0.23	0-45	448.2	99.96
45-50	0.2	0.04	0-50	448.4	100.00
50-55	0.0	0.00	0-55	448.4	100.00
55-60	0.0	0.00	0-60	448.4	100.00
60-65	0.0	0.00	0-65	448.4	100.00
65-70	0.0	0.00	0-70	448.4	100.00
70-75	0.0	0.00	0-75	448.4	100.00
75-80	0.0	0.00	0-80	448.4	100.00
80-85	0.0	0.00	0-85	448.4	100.00
85-90	0.0	0.00	0-90	448.4	100.00
90-95	0.0	0.00	0-95	448.4	100.00
95-100	0.0	0.00	0-100	448.4	100.00
100-105	0.0	0.00	0-105	448.4	100.00
105-110	0.0	0.00	0-110	448.4	100.00
110-115	0.0	0.00	0-115	448.4	100.00
115-120	0.0	0.00	0-120	448.4	100.00
120-125	0.0	0.00	0-125	448.4	100.00
125-130	0.0	0.00	0-130	448.4	100.00
130-135	0.0	0.00	0-135	448.4	100.00
135-140	0.0	0.00	0-140	448.4	100.00
140-145	0.0	0.00	0-145	448.4	100.00
145-150	0.0	0.00	0-150	448.4	100.00
150-155	0.0	0.00	0-155	448.4	100.00
155-160	0.0	0.00	0-160	448.4	100.00
160-165	0.0	0.00	0-165	448.4	100.00
165-170	0.0	0.00	0-170	448.4	100.00
170-175	0.0	0.00	0-175	448.4	100.00
175-180	0.0	0.00	0-180	448.4	100.00

## 6. Product Photo



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