

# IES LM-79-08

## MEASUREMENT AND TEST REPORT For

### GREEN CREATIVE LTD

Room 3603, Level 36, Tower 1, Enterprise Square Five, 38 Wang Chiu Road, Kowloon Bay, KL, Hong Kong

**Test Model: INFT8/830/DIM120V**

<b>Report Type:</b>	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution
<b>Test Engineer:</b>	George Yang
<b>Report Number:</b>	PKS200708088-10
<b>Test Date:</b>	2020-07-10 to 2020-07-15
<b>Report Date:</b>	2020-07-16
<b>Reviewed By:</b>	Ray Gao/ EE Engineer
<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:

One sample was received on 2020-07-08 and used for testing.

Model Tested: INFT8/830/DIM120V  
 Manufacturer: GREEN CREATIVE LTD  
 Brand Name: GREEN CREATIVE  
 Product Designation: LED Recessed Downlight  
 Burning Time Before Test: 0hour(For New Products)

### Rated Values:

Rated Voltage/Frequency: 120VAC 60Hz  
 Rated Power: 17W  
 Nominal CCT: 3000K  
 Nominal Lumen Output: 2060lm

## 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	2020-01-22	2021-01-21
Power Meter	INVENTFINE	WT500	GSJWQ20009	2020-04-02	2021-04-01
Spectral photometer	INVENTFINE	CMS-3S	GSGSE100017	2020-01-22	2021-01-21
AC Power Supply	INVENTFINE	CHP500	JWJSD010071	2020-04-02	2021-04-01
Standard Light Source	INVENTFINE	N/A	JWWCR020104	2019-11-19	2020-11-18
Thermal Meter	KEJIAN	TA298	N/A	2019-12-02	2020-12-01
DC Power Supply	INVENTFINE	WL3005	JWWCP020069	2019-12-20	2020-12-19
AC Power Supply	INVENTFINE	CHP-5KVA	900511765	2020-04-02	2021-04-01
DC Power Supply	INVENTFINE	WL3010	JWDMP030001	2019-12-20	2020-12-19
Power Meter	INVENTFINE	WT500	GSDSQ200007	2020-04-02	2021-04-01
Goniophotometer	INVENTFINE	GPM-1900	YWGCF120001	2020-01-22	2021-01-21
Wireless Weather Station	ZHONGXING	KG218	N/A	2019-12-02	2020-12-01
Standard Light Source	INVENTFINE	N/A	JWBYR040008	2020-03-19	2021-03-18

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  $U_{rel}=2.61\%$  ( $k=2$ ), 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  $U_{rel}=0.48\%$  of rdg, AC Voltage  $U_{rel}=0.25\%$  of rdg, Power  $U_{rel}=0.44\%$ , ( $k=2$ ), 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  $R_i$ ,  $R_g$  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**

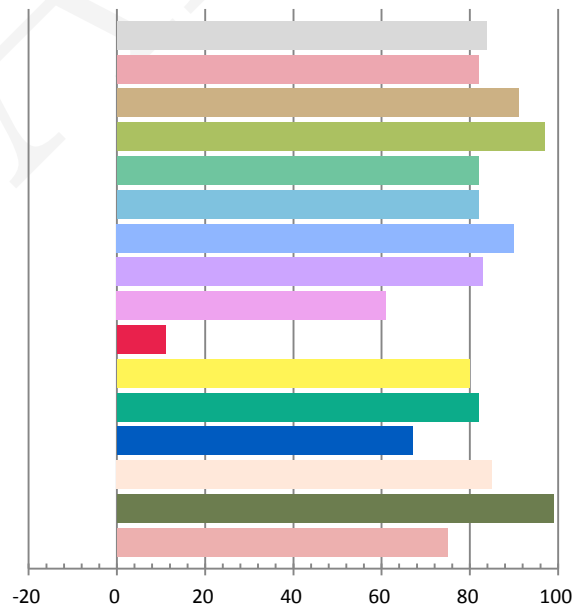
### Photometric and Electrical Measurement Result

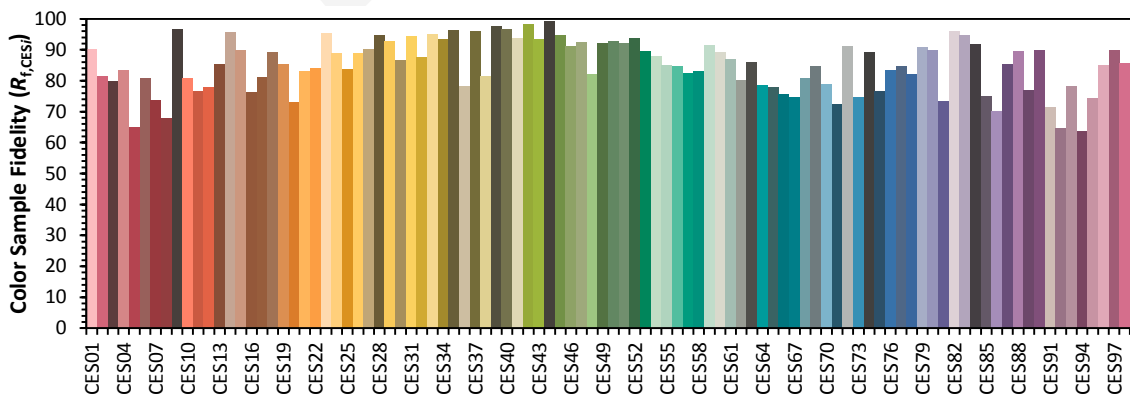
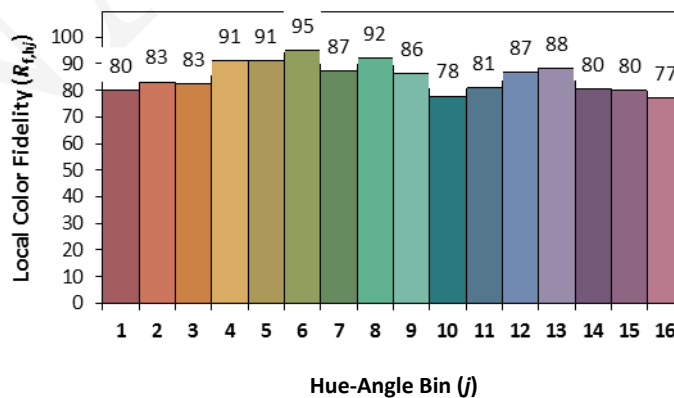
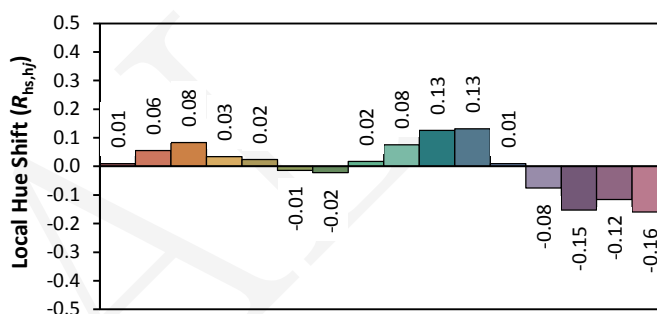
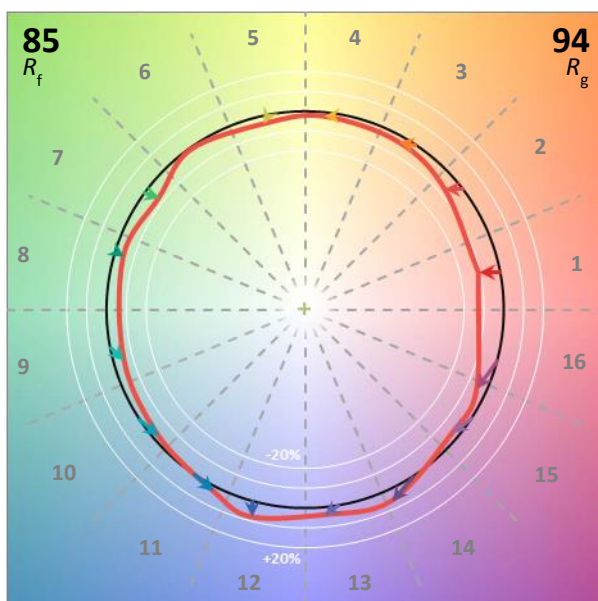
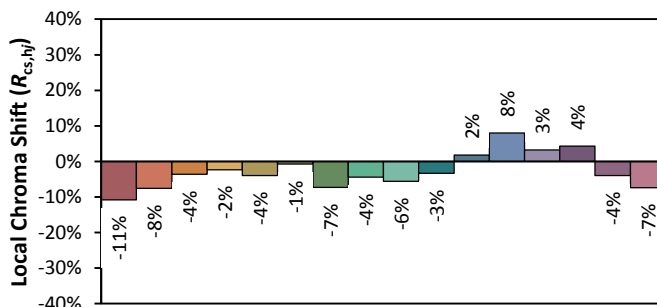
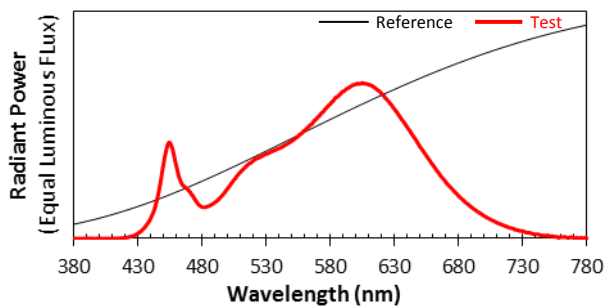
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120	60	0.1517	17.67	0.9709	2213.4	125.26

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
6.624	3084	0.00202	0.4339	0.4081	0.2469	0.5225

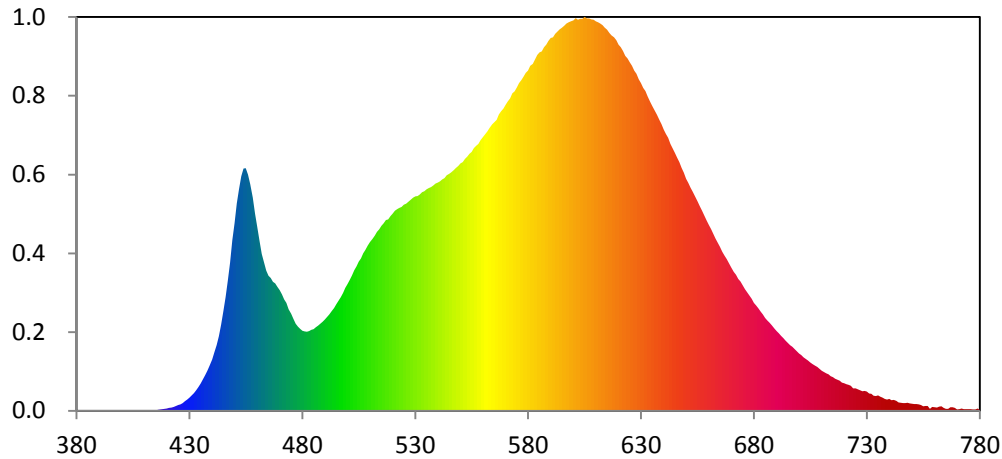
### Color Rendering Index

<b>Ra</b>			
83.8			
<b>R1</b>	<b>R2</b>	<b>R3</b>	<b>R4</b>
82	91	97	82
<b>R5</b>	<b>R6</b>	<b>R7</b>	<b>R8</b>
82	90	83	61
<b>R9</b>	<b>R10</b>	<b>R11</b>	<b>R12</b>
11	80	82	67
<b>R13</b>	<b>R14</b>	<b>R15</b>	
85	99	75	





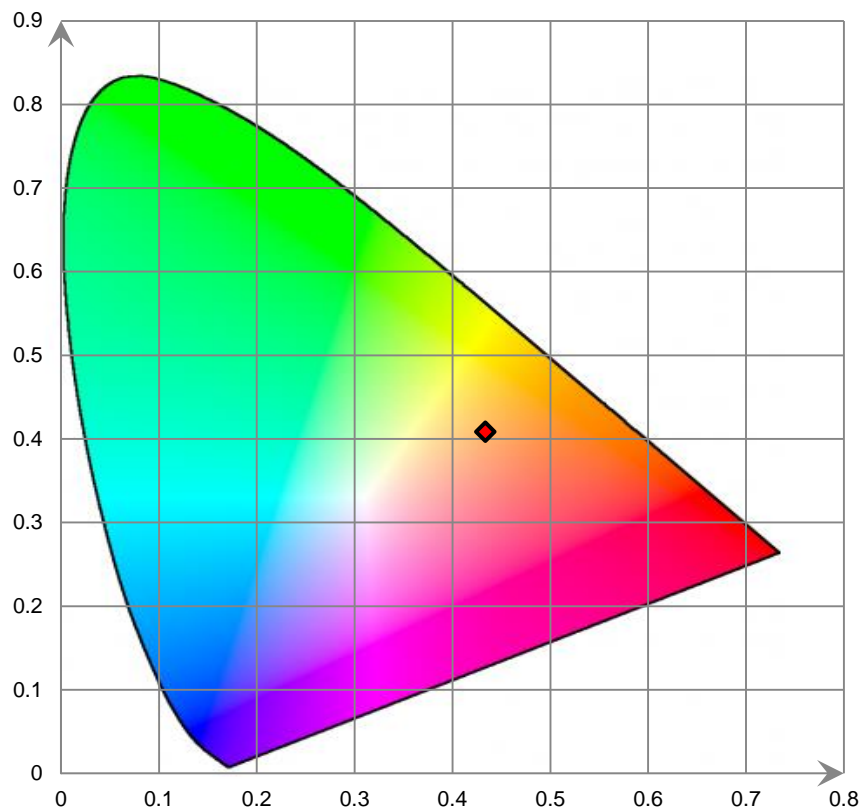
### Relative Spectral Power Distribution



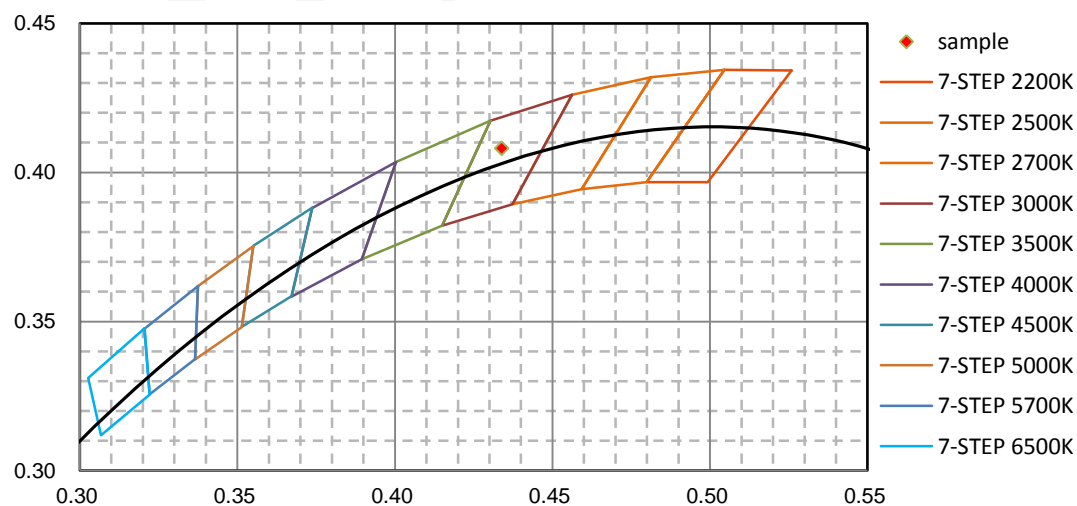
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	3.340E-02	421	3.266E-01	462	1.765E+01	503	1.581E+01	544	2.652E+01
381	1.790E-02	422	3.460E-01	463	1.671E+01	504	1.626E+01	545	2.667E+01
382	3.100E-02	423	4.420E-01	464	1.577E+01	505	1.678E+01	546	2.686E+01
383	2.300E-03	424	5.423E-01	465	1.519E+01	506	1.717E+01	547	2.710E+01
384	2.800E-02	425	6.423E-01	466	1.496E+01	507	1.773E+01	548	2.734E+01
385	4.610E-02	426	7.220E-01	467	1.453E+01	508	1.813E+01	549	2.756E+01
386	2.700E-03	427	8.692E-01	468	1.434E+01	509	1.859E+01	550	2.787E+01
387	2.370E-02	428	1.067E+00	469	1.393E+01	510	1.898E+01	551	2.798E+01
388	1.460E-02	429	1.250E+00	470	1.360E+01	511	1.936E+01	552	2.836E+01
389	6.300E-03	430	1.461E+00	471	1.312E+01	512	1.971E+01	553	2.861E+01
390	7.230E-02	431	1.710E+00	472	1.255E+01	513	2.013E+01	554	2.893E+01
391	1.350E-02	432	1.987E+00	473	1.214E+01	514	2.045E+01	555	2.914E+01
392	4.600E-03	433	2.297E+00	474	1.142E+01	515	2.083E+01	556	2.959E+01
393	1.360E-02	434	2.651E+00	475	1.091E+01	516	2.112E+01	557	2.983E+01
394	1.650E-02	435	3.060E+00	476	1.035E+01	517	2.149E+01	558	3.005E+01
395	1.960E-02	436	3.533E+00	477	9.812E+00	518	2.157E+01	559	3.050E+01
396	4.700E-03	437	3.982E+00	478	9.479E+00	519	2.189E+01	560	3.082E+01
397	6.300E-03	438	4.497E+00	479	9.212E+00	520	2.221E+01	561	3.112E+01
398	3.000E-04	439	5.066E+00	480	9.011E+00	521	2.253E+01	562	3.147E+01
399	0.000E+00	440	5.778E+00	481	8.925E+00	522	2.269E+01	563	3.187E+01
400	0.000E+00	441	6.588E+00	482	8.905E+00	523	2.284E+01	564	3.224E+01
401	4.170E-02	442	7.399E+00	483	8.964E+00	524	2.296E+01	565	3.250E+01
402	1.860E-02	443	8.407E+00	484	9.117E+00	525	2.320E+01	566	3.275E+01
403	1.240E-02	444	9.707E+00	485	9.186E+00	526	2.332E+01	567	3.336E+01
404	2.260E-02	445	1.119E+01	486	9.396E+00	527	2.354E+01	568	3.374E+01
405	3.350E-02	446	1.280E+01	487	9.589E+00	528	2.374E+01	569	3.403E+01
406	6.300E-03	447	1.467E+01	488	9.788E+00	529	2.401E+01	570	3.446E+01
407	5.710E-02	448	1.667E+01	489	1.001E+01	530	2.414E+01	571	3.484E+01
408	3.100E-03	449	1.920E+01	490	1.026E+01	531	2.419E+01	572	3.517E+01
409	5.440E-02	450	2.110E+01	491	1.056E+01	532	2.436E+01	573	3.575E+01
410	6.180E-02	451	2.335E+01	492	1.084E+01	533	2.460E+01	574	3.595E+01
411	5.600E-02	452	2.496E+01	493	1.123E+01	534	2.471E+01	575	3.638E+01
412	2.360E-02	453	2.643E+01	494	1.158E+01	535	2.493E+01	576	3.689E+01
413	2.070E-02	454	2.729E+01	495	1.199E+01	536	2.510E+01	577	3.723E+01
414	4.990E-02	455	2.730E+01	496	1.238E+01	537	2.518E+01	578	3.761E+01
415	5.940E-02	456	2.658E+01	497	1.278E+01	538	2.536E+01	579	3.806E+01
416	1.125E-01	457	2.552E+01	498	1.328E+01	539	2.558E+01	580	3.831E+01
417	1.246E-01	458	2.399E+01	499	1.383E+01	540	2.570E+01	581	3.886E+01
418	1.881E-01	459	2.219E+01	500	1.426E+01	541	2.584E+01	582	3.906E+01
419	2.034E-01	460	2.070E+01	501	1.475E+01	542	2.605E+01	583	3.957E+01
420	2.404E-01	461	1.915E+01	502	1.526E+01	543	2.619E+01	584	4.009E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	4.037E+01	626	3.884E+01	667	1.749E+01	708	4.945E+00	749	8.065E-01
586	4.048E+01	627	3.831E+01	668	1.708E+01	709	4.727E+00	750	7.866E-01
587	4.093E+01	628	3.795E+01	669	1.663E+01	710	4.499E+00	751	7.523E-01
588	4.124E+01	629	3.732E+01	670	1.614E+01	711	4.361E+00	752	7.412E-01
589	4.166E+01	630	3.692E+01	671	1.565E+01	712	4.208E+00	753	7.236E-01
590	4.199E+01	631	3.634E+01	672	1.530E+01	713	4.099E+00	754	6.356E-01
591	4.205E+01	632	3.599E+01	673	1.486E+01	714	3.888E+00	755	5.128E-01
592	4.246E+01	633	3.539E+01	674	1.455E+01	715	3.786E+00	756	5.195E-01
593	4.270E+01	634	3.483E+01	675	1.414E+01	716	3.617E+00	757	5.183E-01
594	4.294E+01	635	3.434E+01	676	1.371E+01	717	3.492E+00	758	2.166E-01
595	4.312E+01	636	3.379E+01	677	1.333E+01	718	3.400E+00	759	4.160E-01
596	4.336E+01	637	3.334E+01	678	1.296E+01	719	3.158E+00	760	4.044E-01
597	4.362E+01	638	3.279E+01	679	1.260E+01	720	3.098E+00	761	3.721E-01
598	4.375E+01	639	3.230E+01	680	1.216E+01	721	2.971E+00	762	4.800E-01
599	4.385E+01	640	3.168E+01	681	1.184E+01	722	2.921E+00	763	4.835E-01
600	4.397E+01	641	3.115E+01	682	1.152E+01	723	2.791E+00	764	3.291E-01
601	4.420E+01	642	3.075E+01	683	1.117E+01	724	2.534E+00	765	1.973E-01
602	4.405E+01	643	3.007E+01	684	1.083E+01	725	2.535E+00	766	2.258E-01
603	4.413E+01	644	2.954E+01	685	1.046E+01	726	2.408E+00	767	3.844E-01
604	4.416E+01	645	2.905E+01	686	1.014E+01	727	2.312E+00	768	3.836E-01
605	4.435E+01	646	2.849E+01	687	9.893E+00	728	2.184E+00	769	3.212E-01
606	4.420E+01	647	2.799E+01	688	9.634E+00	729	2.223E+00	770	1.317E-01
607	4.417E+01	648	2.733E+01	689	9.259E+00	730	2.151E+00	771	1.874E-01
608	4.407E+01	649	2.680E+01	690	8.968E+00	731	1.956E+00	772	2.569E-01
609	4.402E+01	650	2.611E+01	691	8.707E+00	732	1.908E+00	773	1.618E-01
610	4.384E+01	651	2.565E+01	692	8.413E+00	733	1.709E+00	774	1.793E-01
611	4.375E+01	652	2.513E+01	693	8.175E+00	734	1.659E+00	775	1.874E-01
612	4.360E+01	653	2.464E+01	694	7.872E+00	735	1.714E+00	776	1.803E-01
613	4.342E+01	654	2.408E+01	695	7.648E+00	736	1.583E+00	777	1.306E-01
614	4.315E+01	655	2.355E+01	696	7.391E+00	737	1.469E+00	778	1.262E-01
615	4.291E+01	656	2.303E+01	697	7.221E+00	738	1.329E+00	779	2.434E-01
616	4.254E+01	657	2.250E+01	698	6.945E+00	739	1.262E+00	780	1.079E-01
617	4.228E+01	658	2.198E+01	699	6.693E+00	740	1.318E+00		
618	4.203E+01	659	2.142E+01	700	6.450E+00	741	1.202E+00		
619	4.172E+01	660	2.095E+01	701	6.249E+00	742	1.232E+00		
620	4.124E+01	661	2.048E+01	702	6.025E+00	743	1.120E+00		
621	4.095E+01	662	1.993E+01	703	5.819E+00	744	9.277E-01		
622	4.050E+01	663	1.940E+01	704	5.663E+00	745	9.100E-01		
623	3.996E+01	664	1.892E+01	705	5.422E+00	746	8.505E-01		
624	3.968E+01	665	1.846E+01	706	5.271E+00	747	8.485E-01		
625	3.926E+01	666	1.791E+01	707	5.080E+00	748	8.847E-01		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles





### [Goniophotometer System]

Total operating time for luminous intensity distribution: **1.0hour**

Test orientation: **Downward**

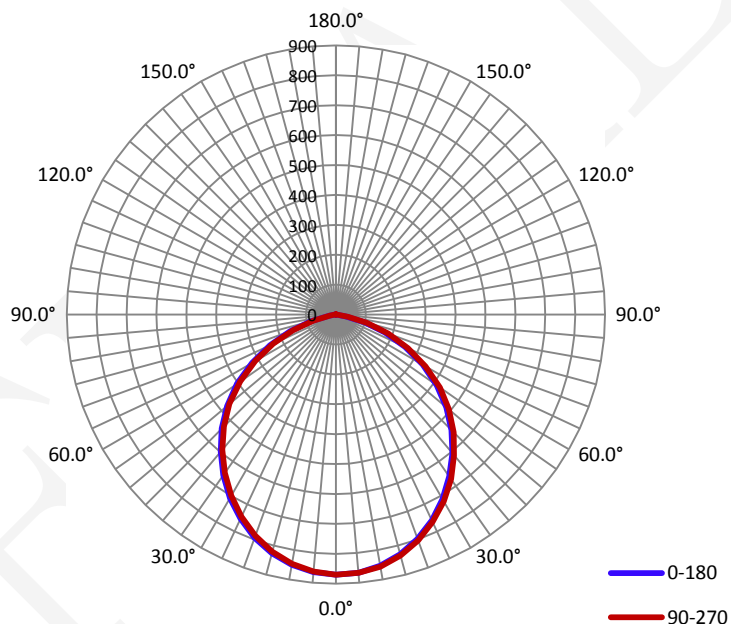
### Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
120.0	60	0.1510	17.68	0.9760

### Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	$I_{max}(cd)$	S/MH(C0/180)	S/MH(C90/270)
2215.6	125.37	869.5	1.22	1.22

### Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50% $I_{max}$ ):	106.2	106.2	106.3	106.1	106.2
Field Angle(10% $I_{max}$ ):	150.9	150.9	151.0	150.9	150.9

**Luminous Intensity (cd) Distribution Data**

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	870	870	870	870	870	870	870	870
5.0°	866	867	866	866	867	867	866	866
10.0°	853	855	856	855	856	853	853	852
15.0°	830	833	832	834	834	833	833	830
20.0°	798	801	802	803	804	803	801	799
25.0°	759	763	764	765	765	765	764	758
30.0°	712	717	718	720	721	719	717	716
35.0°	660	666	668	670	671	670	667	664
40.0°	606	610	614	616	615	615	612	607
45.0°	546	551	554	557	557	555	553	549
50.0°	482	489	492	493	493	492	490	486
55.0°	412	418	422	423	425	422	419	415
60.0°	335	339	345	346	346	345	342	338
65.0°	255	259	264	266	266	266	262	257
70.0°	174	180	182	184	186	184	180	177
75.0°	98	103	106	108	108	107	104	100
80.0°	34	37	40	41	41	41	38	34
85.0°	6	6	7	8	8	8	7	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	1	0	0
175.0°	1	0	1	1	0	1	1	0
180.0°	0	0	0	0	0	0	0	0

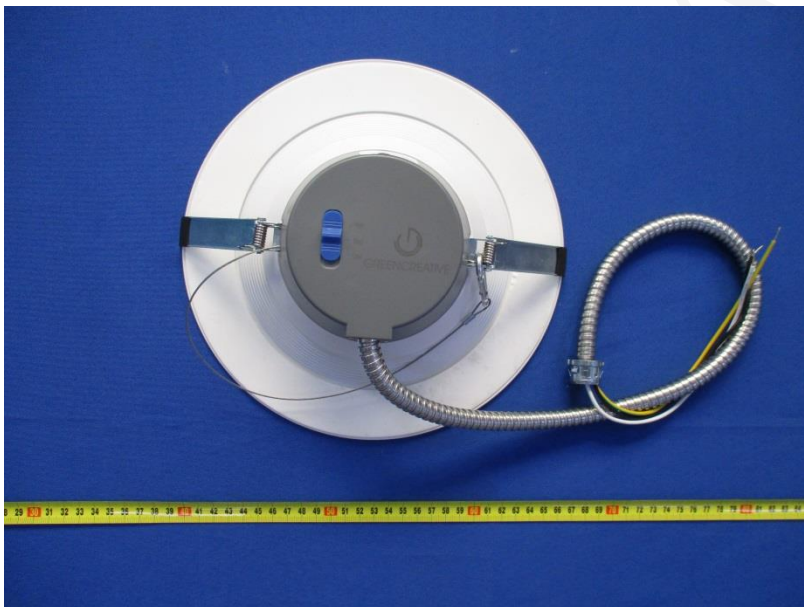
Luminous Intensity (cd) Distribution Data (cont.)

C y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	870	870	870	870	870	870	870	870
5.0°	864	863	862	863	863	863	863	865
10.0°	850	849	847	847	846	847	847	850
15.0°	826	825	821	821	821	821	823	825
20.0°	795	792	788	786	787	787	789	794
25.0°	754	750	748	747	746	747	751	753
30.0°	709	704	701	699	699	699	702	707
35.0°	656	652	650	647	646	646	650	654
40.0°	600	596	593	589	590	590	593	597
45.0°	539	535	532	529	529	530	533	537
50.0°	475	471	465	465	464	464	468	473
55.0°	403	396	393	391	390	391	395	400
60.0°	323	320	315	313	311	313	317	321
65.0°	243	239	234	232	231	232	236	242
70.0°	163	159	154	152	152	152	155	160
75.0°	87	83	79	78	78	78	81	85
80.0°	24	22	20	20	19	21	23	26
85.0°	4	4	3	4	3	3	4	5
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	1	0	0	1	1
175.0°	0	0	0	1	1	1	1	0
180.0°	0	0	0	0	0	0	0	0

### Zonal Lumen Density Measurement

Deg	Flux (lm)	%	Deg	Flux (lm)	%
0-5	20.7	0.94	0-5	20.7	0.94
5-10	61.4	2.77	0-10	82.1	3.71
10-15	99.6	4.49	0-15	181.7	8.20
15-20	133.8	6.04	0-20	315.4	14.24
20-25	162.7	7.35	0-25	478.2	21.58
25-30	185.5	8.37	0-30	663.7	29.96
30-35	201.6	9.10	0-35	865.3	39.05
35-40	210.5	9.50	0-40	1075.7	48.55
40-45	212.1	9.57	0-45	1287.9	58.13
45-50	206.4	9.32	0-50	1494.3	67.45
50-55	192.7	8.70	0-55	1687.0	76.14
55-60	170.2	7.68	0-60	1857.2	83.82
60-65	140.6	6.34	0-65	1997.8	90.17
65-70	105.7	4.77	0-70	2103.4	94.94
70-75	68.2	3.08	0-75	2171.6	98.02
75-80	32.8	1.48	0-80	2204.5	99.50
80-85	9.6	0.43	0-85	2214.1	99.93
85-90	1.5	0.07	0-90	2215.5	100.00
90-95	0.0	0.00	0-95	2215.5	100.00
95-100	0.0	0.00	0-100	2215.5	100.00
100-105	0.0	0.00	0-105	2215.5	100.00
105-110	0.0	0.00	0-110	2215.5	100.00
110-115	0.0	0.00	0-115	2215.5	100.00
115-120	0.0	0.00	0-120	2215.5	100.00
120-125	0.0	0.00	0-125	2215.5	100.00
125-130	0.0	0.00	0-130	2215.5	100.00
130-135	0.0	0.00	0-135	2215.5	100.00
135-140	0.0	0.00	0-140	2215.5	100.00
140-145	0.0	0.00	0-145	2215.5	100.00
145-150	0.0	0.00	0-150	2215.5	100.00
150-155	0.0	0.00	0-155	2215.5	100.00
155-160	0.0	0.00	0-160	2215.5	100.00
160-165	0.0	0.00	0-165	2215.5	100.00
165-170	0.0	0.00	0-170	2215.5	100.00
170-175	0.0	0.00	0-175	2215.6	100.00
175-180	0.0	0.00	0-180	2215.6	100.00

## 6. Product Photo



## Directions

1. The information marked "superscript #" is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report.
2. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.
3. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.
4. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.
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\*\*\*\*\*END OF REPORT\*\*\*\*\*