

# 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: INFT6/840/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>	PKS200708086-10
<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: INFT6/840/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: 13W  
 Nominal CCT: 4000K  
 Nominal Lumen Output: 1600lm

## 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**

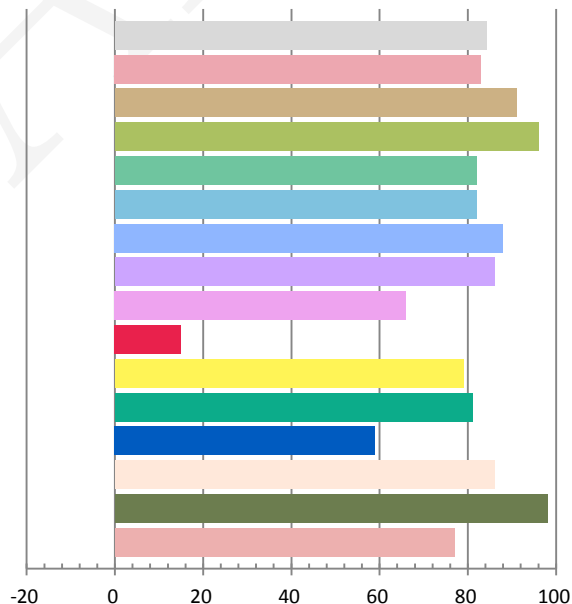
### Photometric and Electrical Measurement Result

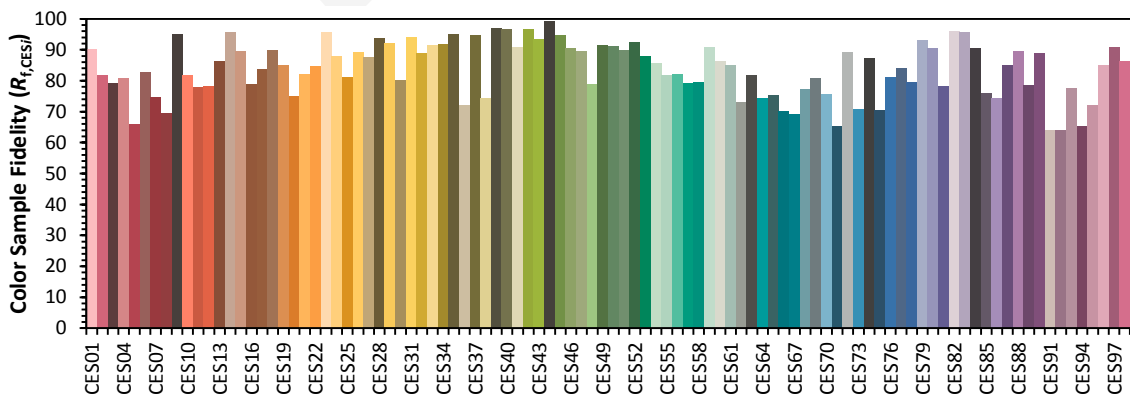
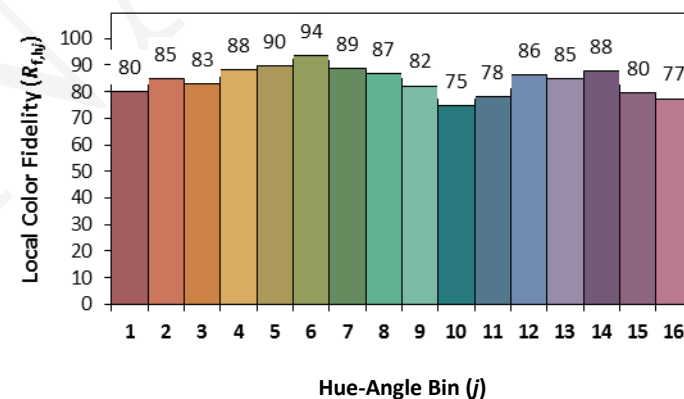
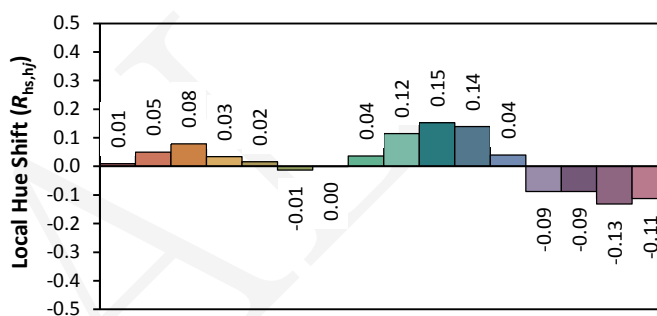
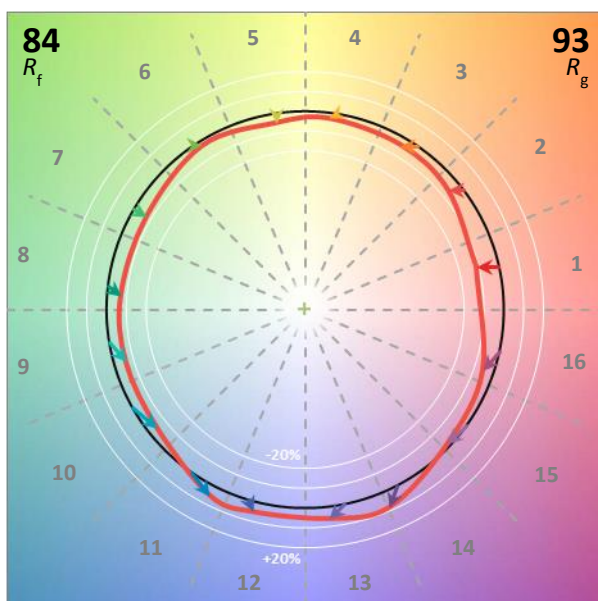
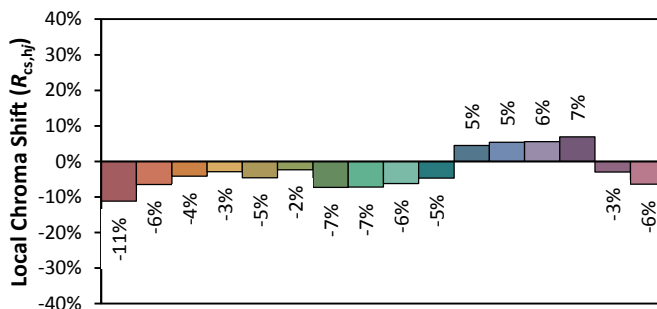
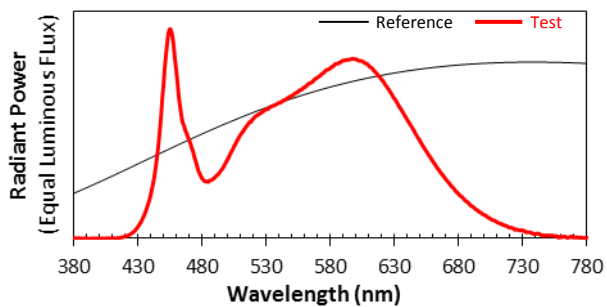
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.02	60	0.1156	13.28	0.9572	1723.86	129.81

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
5.202	3930	0.00186	0.3850	0.3836	0.2254	0.5052

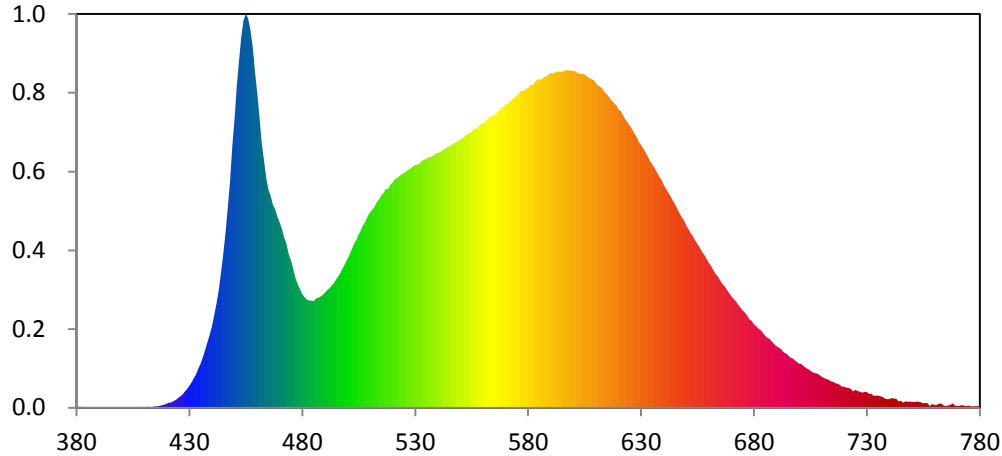
### Color Rendering Index

<b>Ra</b>			
84.3			
<b>R1</b>	<b>R2</b>	<b>R3</b>	<b>R4</b>
83	91	96	82
<b>R5</b>	<b>R6</b>	<b>R7</b>	<b>R8</b>
82	88	86	66
<b>R9</b>	<b>R10</b>	<b>R11</b>	<b>R12</b>
15	79	81	59
<b>R13</b>	<b>R14</b>	<b>R15</b>	
86	98	77	





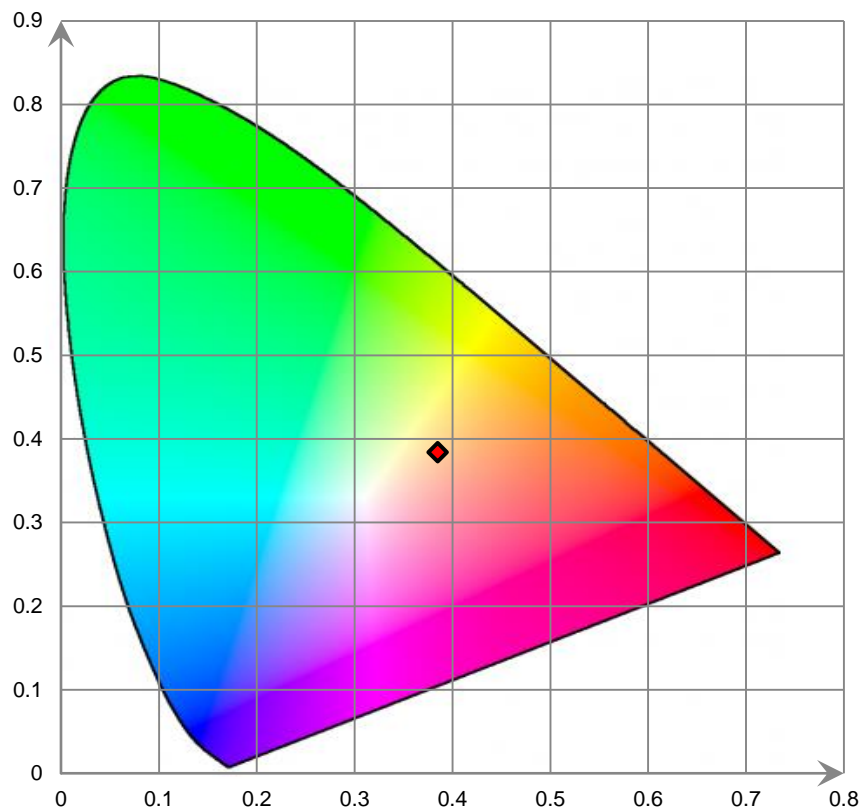
### Relative Spectral Power Distribution



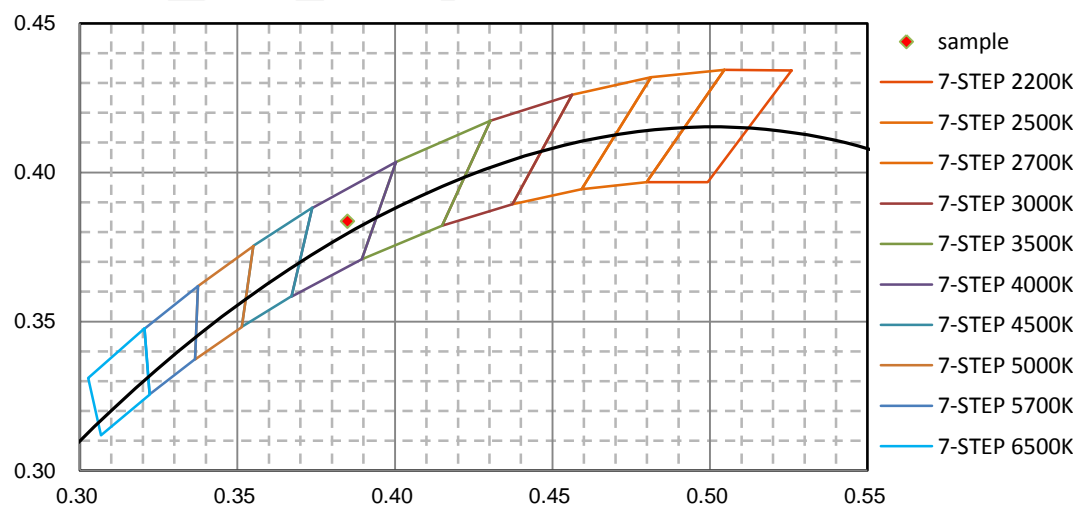
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	5.410E-02	421	4.396E-01	462	2.344E+01	503	1.452E+01	544	2.308E+01
381	8.890E-02	422	4.906E-01	463	2.191E+01	504	1.487E+01	545	2.310E+01
382	7.720E-02	423	5.938E-01	464	2.037E+01	505	1.536E+01	546	2.326E+01
383	1.590E-02	424	6.950E-01	465	1.930E+01	506	1.570E+01	547	2.342E+01
384	8.150E-02	425	8.654E-01	466	1.877E+01	507	1.619E+01	548	2.350E+01
385	5.230E-02	426	1.011E+00	467	1.797E+01	508	1.650E+01	549	2.367E+01
386	3.500E-03	427	1.183E+00	468	1.759E+01	509	1.695E+01	550	2.377E+01
387	3.260E-02	428	1.430E+00	469	1.691E+01	510	1.728E+01	551	2.386E+01
388	2.520E-02	429	1.671E+00	470	1.641E+01	511	1.758E+01	552	2.409E+01
389	1.230E-02	430	1.948E+00	471	1.584E+01	512	1.784E+01	553	2.420E+01
390	5.170E-02	431	2.269E+00	472	1.509E+01	513	1.824E+01	554	2.435E+01
391	1.880E-02	432	2.622E+00	473	1.455E+01	514	1.847E+01	555	2.443E+01
392	8.000E-04	433	2.981E+00	474	1.362E+01	515	1.880E+01	556	2.470E+01
393	6.000E-04	434	3.475E+00	475	1.298E+01	516	1.905E+01	557	2.471E+01
394	1.250E-02	435	3.921E+00	476	1.222E+01	517	1.940E+01	558	2.484E+01
395	5.870E-02	436	4.465E+00	477	1.142E+01	518	1.937E+01	559	2.511E+01
396	2.100E-02	437	5.098E+00	478	1.091E+01	519	1.974E+01	560	2.517E+01
397	1.210E-02	438	5.782E+00	479	1.047E+01	520	1.994E+01	561	2.532E+01
398	2.500E-02	439	6.426E+00	480	1.005E+01	521	2.023E+01	562	2.554E+01
399	1.510E-02	440	7.294E+00	481	9.780E+00	522	2.035E+01	563	2.574E+01
400	5.000E-04	441	8.285E+00	482	9.565E+00	523	2.052E+01	564	2.586E+01
401	1.550E-02	442	9.301E+00	483	9.489E+00	524	2.065E+01	565	2.595E+01
402	3.240E-02	443	1.048E+01	484	9.499E+00	525	2.081E+01	566	2.605E+01
403	4.580E-02	444	1.203E+01	485	9.426E+00	526	2.091E+01	567	2.632E+01
404	4.170E-02	445	1.368E+01	486	9.667E+00	527	2.109E+01	568	2.654E+01
405	3.470E-02	446	1.555E+01	487	9.710E+00	528	2.120E+01	569	2.665E+01
406	1.610E-02	447	1.774E+01	488	9.829E+00	529	2.141E+01	570	2.682E+01
407	8.840E-02	448	2.009E+01	489	9.968E+00	530	2.152E+01	571	2.694E+01
408	1.360E-02	449	2.318E+01	490	1.017E+01	531	2.151E+01	572	2.709E+01
409	4.280E-02	450	2.557E+01	491	1.039E+01	532	2.165E+01	573	2.734E+01
410	5.860E-02	451	2.851E+01	492	1.058E+01	533	2.188E+01	574	2.746E+01
411	6.990E-02	452	3.074E+01	493	1.081E+01	534	2.197E+01	575	2.763E+01
412	7.200E-02	453	3.282E+01	494	1.106E+01	535	2.208E+01	576	2.789E+01
413	3.030E-02	454	3.433E+01	495	1.138E+01	536	2.216E+01	577	2.805E+01
414	9.870E-02	455	3.488E+01	496	1.167E+01	537	2.222E+01	578	2.808E+01
415	1.082E-01	456	3.454E+01	497	1.198E+01	538	2.235E+01	579	2.823E+01
416	1.416E-01	457	3.357E+01	498	1.241E+01	539	2.248E+01	580	2.832E+01
417	1.845E-01	458	3.191E+01	499	1.278E+01	540	2.259E+01	581	2.857E+01
418	2.279E-01	459	2.972E+01	500	1.319E+01	541	2.261E+01	582	2.859E+01
419	2.885E-01	460	2.787E+01	501	1.358E+01	542	2.278E+01	583	2.884E+01
420	3.711E-01	461	2.572E+01	502	1.407E+01	543	2.290E+01	584	2.907E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	2.909E+01	626	2.468E+01	667	1.076E+01	708	3.040E+00	749	5.340E-01
586	2.909E+01	627	2.430E+01	668	1.048E+01	709	2.893E+00	750	5.161E-01
587	2.929E+01	628	2.400E+01	669	1.019E+01	710	2.737E+00	751	5.084E-01
588	2.932E+01	629	2.356E+01	670	9.892E+00	711	2.625E+00	752	5.273E-01
589	2.952E+01	630	2.327E+01	671	9.629E+00	712	2.545E+00	753	5.344E-01
590	2.963E+01	631	2.300E+01	672	9.396E+00	713	2.493E+00	754	4.720E-01
591	2.962E+01	632	2.263E+01	673	9.126E+00	714	2.351E+00	755	3.927E-01
592	2.970E+01	633	2.227E+01	674	8.850E+00	715	2.282E+00	756	4.139E-01
593	2.978E+01	634	2.185E+01	675	8.613E+00	716	2.182E+00	757	3.822E-01
594	2.976E+01	635	2.158E+01	676	8.408E+00	717	2.130E+00	758	1.388E-01
595	2.977E+01	636	2.123E+01	677	8.156E+00	718	2.044E+00	759	3.244E-01
596	2.986E+01	637	2.084E+01	678	7.827E+00	719	1.875E+00	760	2.177E-01
597	2.990E+01	638	2.048E+01	679	7.690E+00	720	1.867E+00	761	2.577E-01
598	2.991E+01	639	2.017E+01	680	7.406E+00	721	1.789E+00	762	3.560E-01
599	2.984E+01	640	1.976E+01	681	7.218E+00	722	1.765E+00	763	3.614E-01
600	2.985E+01	641	1.942E+01	682	7.012E+00	723	1.663E+00	764	2.081E-01
601	2.979E+01	642	1.907E+01	683	6.888E+00	724	1.455E+00	765	1.390E-01
602	2.961E+01	643	1.876E+01	684	6.623E+00	725	1.582E+00	766	2.013E-01
603	2.960E+01	644	1.838E+01	685	6.373E+00	726	1.472E+00	767	2.603E-01
604	2.957E+01	645	1.804E+01	686	6.206E+00	727	1.406E+00	768	3.880E-01
605	2.952E+01	646	1.763E+01	687	6.084E+00	728	1.342E+00	769	2.100E-01
606	2.935E+01	647	1.726E+01	688	5.877E+00	729	1.416E+00	770	1.585E-01
607	2.923E+01	648	1.688E+01	689	5.600E+00	730	1.398E+00	771	1.559E-01
608	2.912E+01	649	1.660E+01	690	5.433E+00	731	1.215E+00	772	2.362E-01
609	2.902E+01	650	1.620E+01	691	5.320E+00	732	1.238E+00	773	1.866E-01
610	2.875E+01	651	1.585E+01	692	5.183E+00	733	1.044E+00	774	1.499E-01
611	2.854E+01	652	1.548E+01	693	4.943E+00	734	1.074E+00	775	1.957E-01
612	2.844E+01	653	1.519E+01	694	4.814E+00	735	1.085E+00	776	1.340E-01
613	2.826E+01	654	1.480E+01	695	4.668E+00	736	1.010E+00	777	1.071E-01
614	2.792E+01	655	1.448E+01	696	4.455E+00	737	9.540E-01	778	1.266E-01
615	2.774E+01	656	1.418E+01	697	4.382E+00	738	8.127E-01	779	1.511E-01
616	2.749E+01	657	1.381E+01	698	4.223E+00	739	7.725E-01	780	1.721E-01
617	2.720E+01	658	1.354E+01	699	4.041E+00	740	7.653E-01		
618	2.697E+01	659	1.317E+01	700	3.920E+00	741	8.381E-01		
619	2.678E+01	660	1.284E+01	701	3.885E+00	742	8.297E-01		
620	2.643E+01	661	1.256E+01	702	3.678E+00	743	7.955E-01		
621	2.626E+01	662	1.221E+01	703	3.528E+00	744	5.731E-01		
622	2.595E+01	663	1.186E+01	704	3.436E+00	745	6.211E-01		
623	2.554E+01	664	1.164E+01	705	3.288E+00	746	4.619E-01		
624	2.530E+01	665	1.131E+01	706	3.134E+00	747	5.687E-01		
625	2.496E+01	666	1.099E+01	707	3.059E+00	748	5.298E-01		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles





### [Goniophotometer System]

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

Test orientation: **Downward**

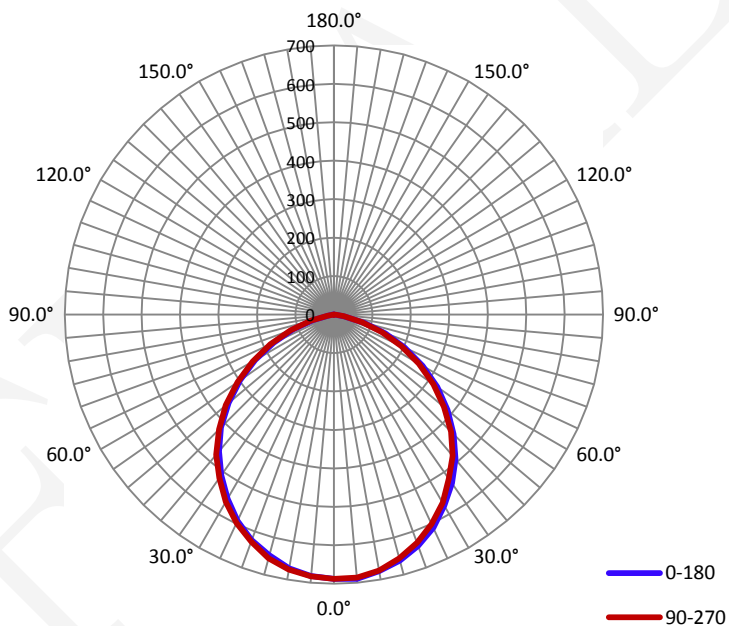
### Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
120.0	60	0.1150	13.32	0.9640

### Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	$I_{max}(cd)$	S/MH(C0/180)	S/MH(C90/270)
1729.8	129.91	689.6	1.22	1.22

### Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50% $I_{max}$ ):	104.6	104.4	104.5	104.6	104.5
Field Angle(10% $I_{max}$ ):	150.1	150.1	150.1	150.0	150.1

**Luminous Intensity (cd) Distribution Data**

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	687	687	687	687	687	687	687	687
5.0°	690	689	682	686	687	684	683	683
10.0°	678	680	675	673	676	671	670	667
15.0°	663	665	659	658	656	654	653	652
20.0°	640	640	633	633	632	628	629	628
25.0°	612	614	605	601	601	596	595	593
30.0°	574	574	567	569	565	561	559	558
35.0°	535	533	530	526	521	521	518	515
40.0°	491	488	484	482	480	477	472	470
45.0°	440	441	436	433	431	426	424	421
50.0°	386	386	381	378	374	371	367	364
55.0°	328	328	323	319	316	312	308	305
60.0°	266	268	262	258	255	251	247	245
65.0°	203	204	201	197	193	190	186	183
70.0°	143	143	140	137	133	129	126	124
75.0°	82	83	81	78	76	72	69	67
80.0°	28	29	28	27	26	23	21	20
85.0°	7	8	8	8	7	7	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	0	1	0
175.0°	0	0	0	0	0	0	1	0
180.0°	0	0	0	0	0	0	0	0

Luminous Intensity (cd) Distribution Data (cont.)

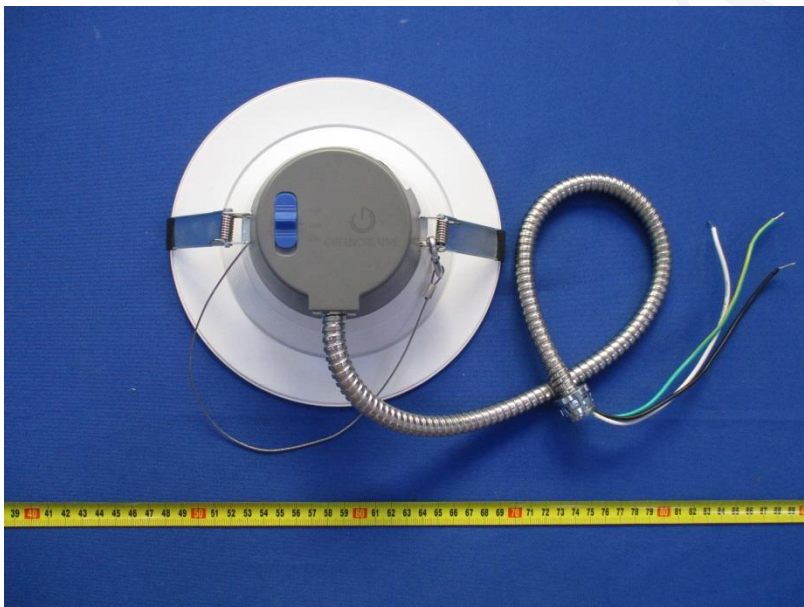
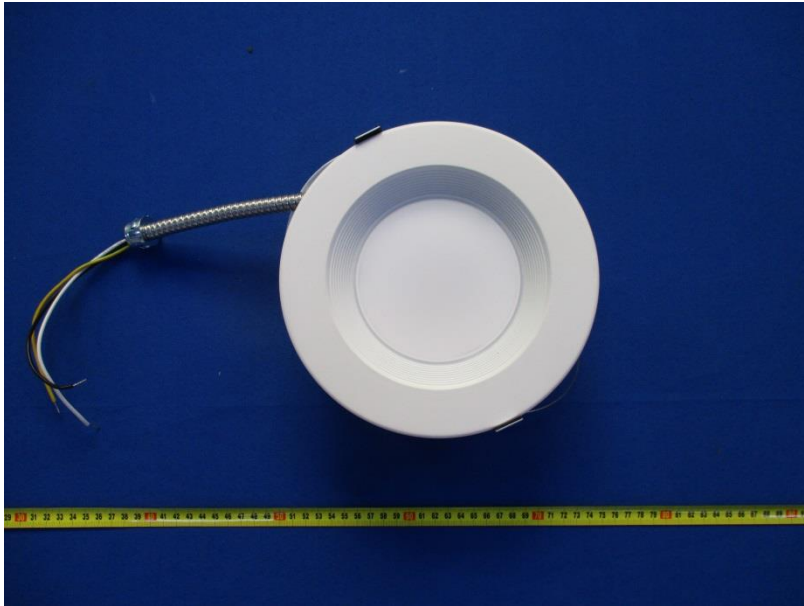
C y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	687	687	687	687	687	687	687	687
5.0°	682	681	681	680	684	684	687	683
10.0°	670	673	671	669	673	677	678	675
15.0°	648	651	651	652	657	655	659	658
20.0°	624	623	622	628	628	631	634	633
25.0°	592	591	591	593	598	598	605	603
30.0°	553	556	552	557	562	564	567	568
35.0°	510	513	514	516	519	525	527	529
40.0°	465	467	466	470	476	479	482	483
45.0°	415	416	415	419	423	427	432	433
50.0°	358	357	358	363	367	370	375	378
55.0°	298	298	299	302	306	310	315	318
60.0°	236	236	237	239	244	250	252	254
65.0°	173	174	176	178	182	186	191	194
70.0°	113	112	114	117	120	124	128	132
75.0°	56	56	57	60	62	66	69	72
80.0°	14	15	15	16	18	20	21	22
85.0°	3	3	4	4	5	6	6	7
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	16.4	0.95
5-10	48.6	2.81
10-15	78.8	4.56
15-20	106.0	6.13
20-25	129.0	7.46
25-30	147.1	8.50
30-35	159.8	9.24
35-40	166.7	9.64
40-45	167.4	9.68
45-50	161.2	9.32
50-55	148.3	8.57
55-60	129.8	7.50
60-65	106.5	6.16
65-70	79.8	4.61
70-75	51.2	2.96
75-80	24.2	1.40
80-85	7.5	0.43
85-90	1.6	0.09
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	16.4	0.95
0-10	65.0	3.76
0-15	143.8	8.31
0-20	249.8	14.44
0-25	378.8	21.90
0-30	525.8	30.40
0-35	685.6	39.63
0-40	852.3	49.27
0-45	1019.6	58.95
0-50	1180.8	68.26
0-55	1329.1	76.84
0-60	1458.9	84.34
0-65	1565.4	90.50
0-70	1645.2	95.11
0-75	1696.5	98.07
0-80	1720.7	99.47
0-85	1728.1	99.91
0-90	1729.8	100.00
0-95	1729.8	100.00
0-100	1729.8	100.00
0-105	1729.8	100.00
0-110	1729.8	100.00
0-115	1729.8	100.00
0-120	1729.8	100.00
0-125	1729.8	100.00
0-130	1729.8	100.00
0-135	1729.8	100.00
0-140	1729.8	100.00
0-145	1729.8	100.00
0-150	1729.8	100.00
0-155	1729.8	100.00
0-160	1729.8	100.00
0-165	1729.8	100.00
0-170	1729.8	100.00
0-175	1729.8	100.00
0-180	1729.8	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.
5. This report cannot be reproduced except in full, without prior written approval of the Company.
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\*\*\*\*\*END OF REPORT\*\*\*\*\*