

# 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: INFT8/850/DIM010UNV**

<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>	PKS200825091-10
<b>Test Date:</b>	2020-08-28 to 2020-09-05
<b>Report Date:</b>	2020-09-07
<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 2020-08-25 and used for testing.

Model Tested: INFT8/850/DIM010UNV  
 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: 120-277VAC 50/60Hz  
 Rated Power: 17W  
 Nominal CCT: 5000K  
 Nominal Lumen Output: 2125lm

## 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  $U_{re}=2.61\%$  ( $k=2$ ), 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  $U_{re}=2.6\%$  ( $k=2$ ), 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**

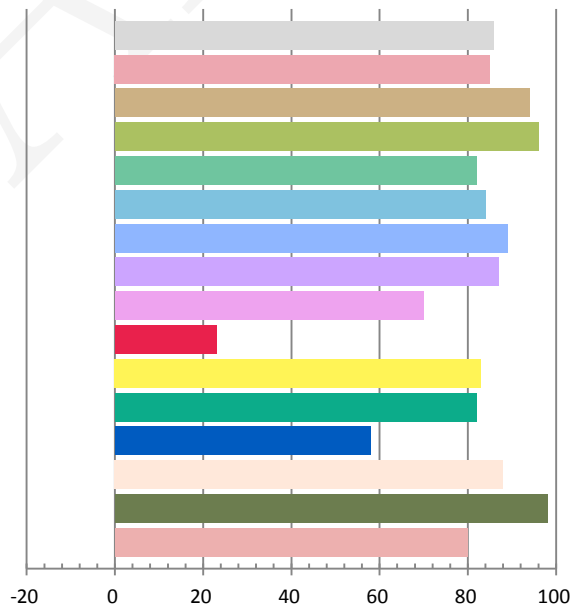
### Photometric and Electrical Measurement Result

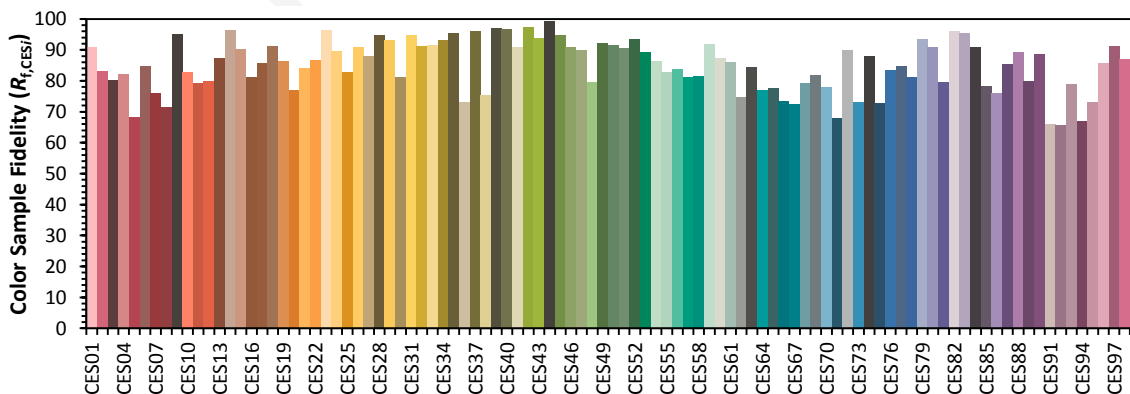
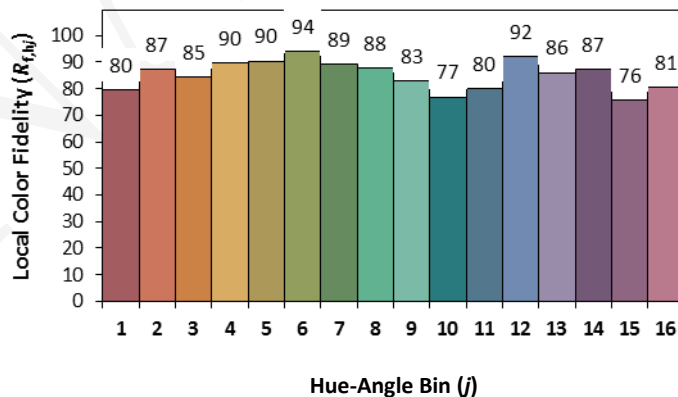
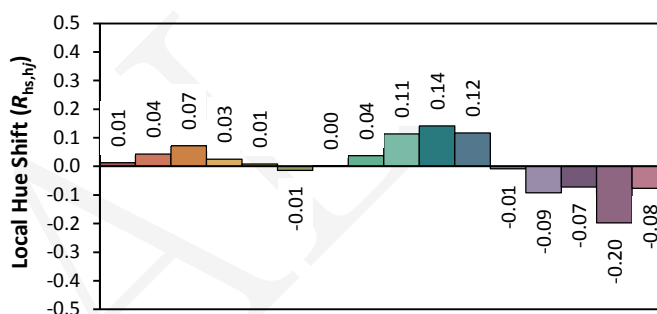
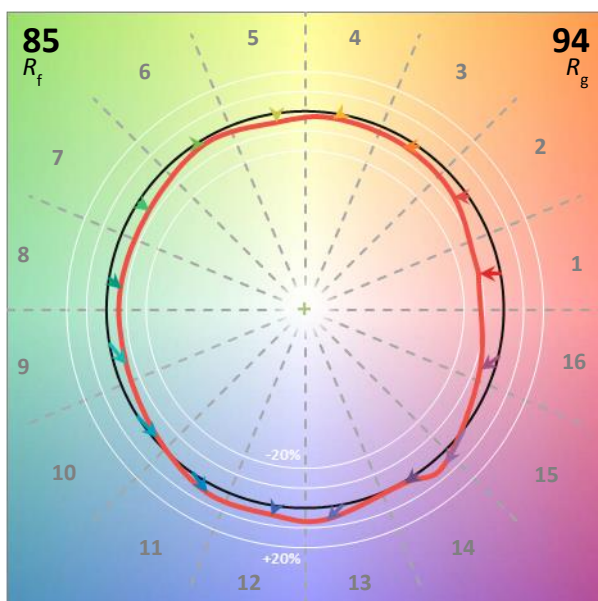
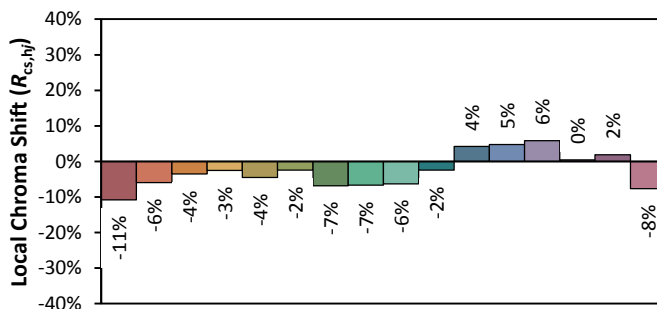
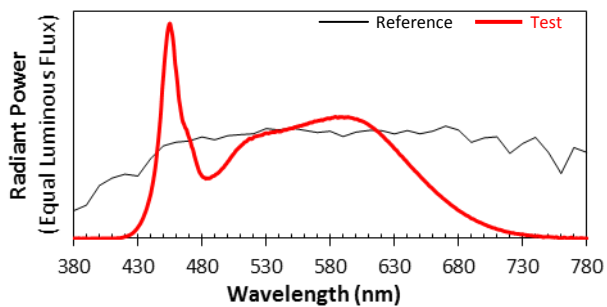
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120	60	0.1489	17.42	0.9749	2275.42	130.62

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
7.102	4939	0.00284	0.3475	0.3592	0.2101	0.4887

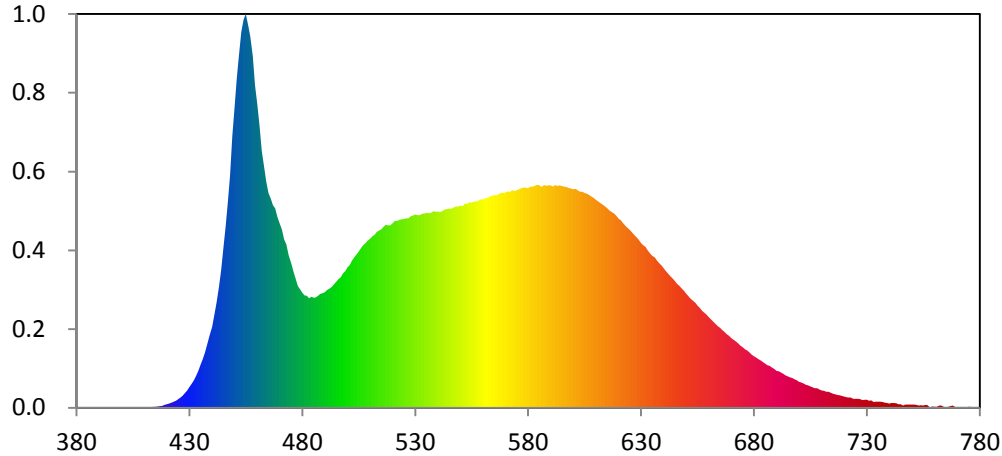
### Color Rendering Index

<b>Ra</b>			
85.9			
<b>R1</b>	<b>R2</b>	<b>R3</b>	<b>R4</b>
85	94	96	82
<b>R5</b>	<b>R6</b>	<b>R7</b>	<b>R8</b>
84	89	87	70
<b>R9</b>	<b>R10</b>	<b>R11</b>	<b>R12</b>
23	83	82	58
<b>R13</b>	<b>R14</b>	<b>R15</b>	
88	98	80	





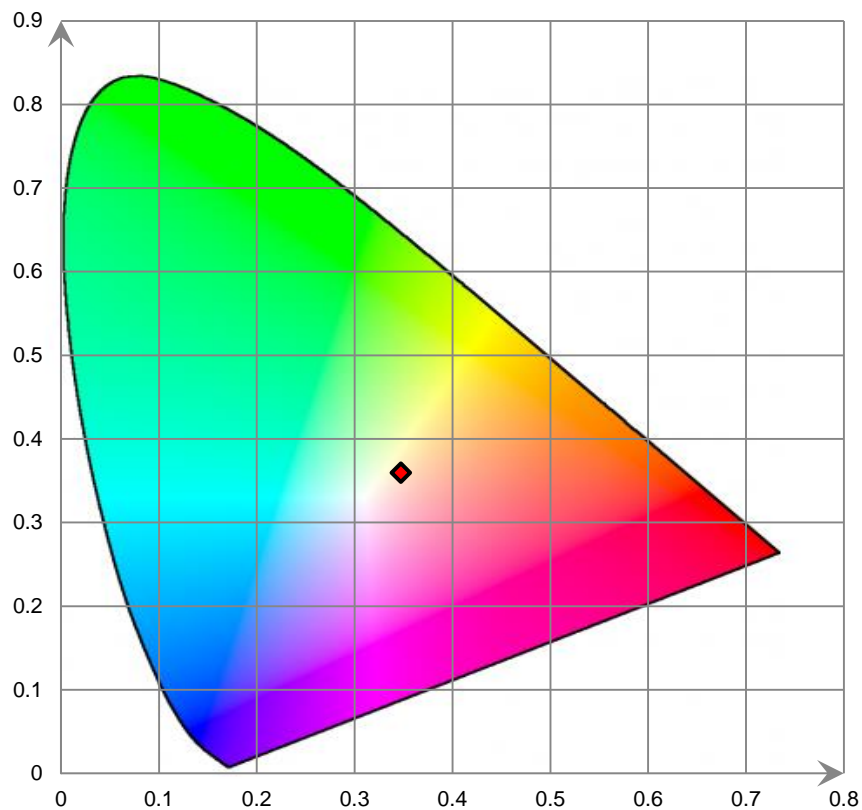
### Relative Spectral Power Distribution



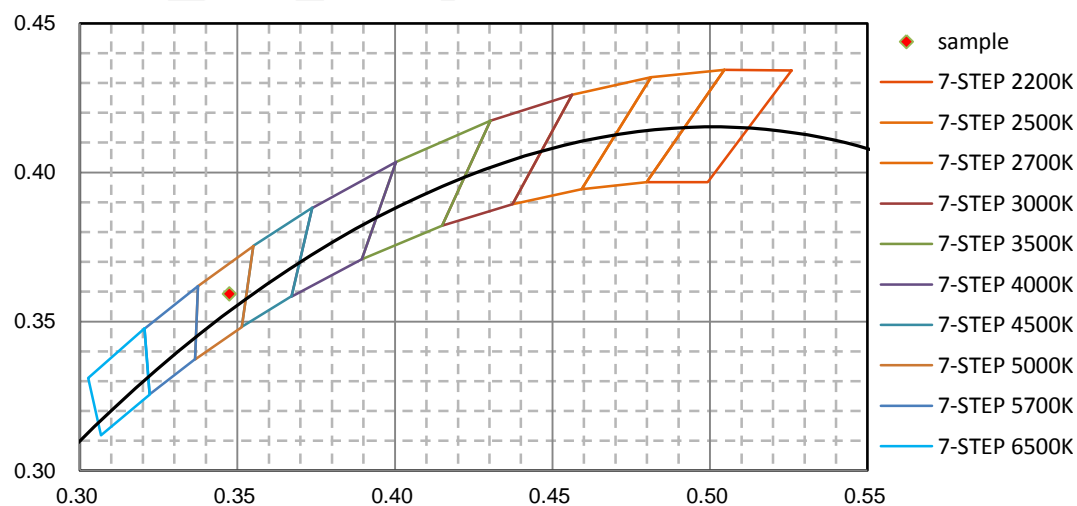
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	2.660E-02	421	6.613E-01	462	4.110E+01	503	2.404E+01	544	3.181E+01
381	7.260E-02	422	7.946E-01	463	3.866E+01	504	2.454E+01	545	3.183E+01
382	8.770E-02	423	9.473E-01	464	3.622E+01	505	2.496E+01	546	3.187E+01
383	4.330E-02	424	1.117E+00	465	3.434E+01	506	2.552E+01	547	3.204E+01
384	1.112E-01	425	1.360E+00	466	3.350E+01	507	2.599E+01	548	3.222E+01
385	4.490E-02	426	1.614E+00	467	3.240E+01	508	2.634E+01	549	3.222E+01
386	7.500E-03	427	1.961E+00	468	3.191E+01	509	2.673E+01	550	3.237E+01
387	3.880E-02	428	2.367E+00	469	3.051E+01	510	2.705E+01	551	3.224E+01
388	1.590E-02	429	2.768E+00	470	2.950E+01	511	2.745E+01	552	3.268E+01
389	2.990E-02	430	3.300E+00	471	2.852E+01	512	2.770E+01	553	3.263E+01
390	5.450E-02	431	3.846E+00	472	2.694E+01	513	2.818E+01	554	3.286E+01
391	2.180E-02	432	4.390E+00	473	2.611E+01	514	2.834E+01	555	3.279E+01
392	9.000E-04	433	5.137E+00	474	2.443E+01	515	2.855E+01	556	3.303E+01
393	4.000E-04	434	5.928E+00	475	2.314E+01	516	2.900E+01	557	3.299E+01
394	1.510E-02	435	6.913E+00	476	2.180E+01	517	2.930E+01	558	3.312E+01
395	4.340E-02	436	7.840E+00	477	2.063E+01	518	2.920E+01	559	3.334E+01
396	3.330E-02	437	8.927E+00	478	1.948E+01	519	2.919E+01	560	3.333E+01
397	1.460E-02	438	1.024E+01	479	1.892E+01	520	2.956E+01	561	3.353E+01
398	1.830E-02	439	1.158E+01	480	1.837E+01	521	2.988E+01	562	3.352E+01
399	2.270E-02	440	1.295E+01	481	1.796E+01	522	2.991E+01	563	3.379E+01
400	1.500E-03	441	1.491E+01	482	1.790E+01	523	3.003E+01	564	3.394E+01
401	1.950E-02	442	1.691E+01	483	1.751E+01	524	3.015E+01	565	3.400E+01
402	5.240E-02	443	1.925E+01	484	1.775E+01	525	3.019E+01	566	3.399E+01
403	1.550E-02	444	2.196E+01	485	1.761E+01	526	3.029E+01	567	3.422E+01
404	4.350E-02	445	2.549E+01	486	1.767E+01	527	3.029E+01	568	3.440E+01
405	4.190E-02	446	2.891E+01	487	1.792E+01	528	3.061E+01	569	3.437E+01
406	1.580E-02	447	3.288E+01	488	1.821E+01	529	3.079E+01	570	3.444E+01
407	9.590E-02	448	3.724E+01	489	1.832E+01	530	3.090E+01	571	3.459E+01
408	1.960E-02	449	4.348E+01	490	1.848E+01	531	3.084E+01	572	3.457E+01
409	6.730E-02	450	4.801E+01	491	1.886E+01	532	3.080E+01	573	3.480E+01
410	8.000E-02	451	5.272E+01	492	1.905E+01	533	3.104E+01	574	3.465E+01
411	7.330E-02	452	5.655E+01	493	1.937E+01	534	3.108E+01	575	3.482E+01
412	1.052E-01	453	6.010E+01	494	1.974E+01	535	3.117E+01	576	3.497E+01
413	5.250E-02	454	6.208E+01	495	2.018E+01	536	3.115E+01	577	3.510E+01
414	1.518E-01	455	6.302E+01	496	2.058E+01	537	3.117E+01	578	3.521E+01
415	1.622E-01	456	6.134E+01	497	2.089E+01	538	3.146E+01	579	3.520E+01
416	1.880E-01	457	5.944E+01	498	2.148E+01	539	3.140E+01	580	3.510E+01
417	2.426E-01	458	5.629E+01	499	2.187E+01	540	3.137E+01	581	3.540E+01
418	3.169E-01	459	5.156E+01	500	2.246E+01	541	3.132E+01	582	3.537E+01
419	4.387E-01	460	4.860E+01	501	2.284E+01	542	3.143E+01	583	3.553E+01
420	5.648E-01	461	4.516E+01	502	2.355E+01	543	3.170E+01	584	3.569E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	3.556E+01	626	2.807E+01	667	1.215E+01	708	3.113E+00	749	5.142E-01
586	3.535E+01	627	2.764E+01	668	1.176E+01	709	2.899E+00	750	4.875E-01
587	3.565E+01	628	2.731E+01	669	1.151E+01	710	2.769E+00	751	5.021E-01
588	3.552E+01	629	2.686E+01	670	1.117E+01	711	2.694E+00	752	4.811E-01
589	3.560E+01	630	2.637E+01	671	1.087E+01	712	2.551E+00	753	3.777E-01
590	3.557E+01	631	2.603E+01	672	1.057E+01	713	2.545E+00	754	3.907E-01
591	3.539E+01	632	2.575E+01	673	1.028E+01	714	2.414E+00	755	3.457E-01
592	3.561E+01	633	2.517E+01	674	9.911E+00	715	2.225E+00	756	4.389E-01
593	3.547E+01	634	2.470E+01	675	9.653E+00	716	2.131E+00	757	3.954E-01
594	3.560E+01	635	2.432E+01	676	9.388E+00	717	2.020E+00	758	9.320E-02
595	3.548E+01	636	2.405E+01	677	9.138E+00	718	1.969E+00	759	1.815E-01
596	3.540E+01	637	2.357E+01	678	8.860E+00	719	1.896E+00	760	1.731E-01
597	3.535E+01	638	2.313E+01	679	8.498E+00	720	1.800E+00	761	1.582E-01
598	3.520E+01	639	2.280E+01	680	8.259E+00	721	1.672E+00	762	3.292E-01
599	3.506E+01	640	2.231E+01	681	8.032E+00	722	1.633E+00	763	3.493E-01
600	3.496E+01	641	2.187E+01	682	7.797E+00	723	1.652E+00	764	1.413E-01
601	3.500E+01	642	2.146E+01	683	7.579E+00	724	1.425E+00	765	8.430E-02
602	3.476E+01	643	2.105E+01	684	7.339E+00	725	1.434E+00	766	1.604E-01
603	3.456E+01	644	2.066E+01	685	7.070E+00	726	1.404E+00	767	2.305E-01
604	3.455E+01	645	2.029E+01	686	6.818E+00	727	1.363E+00	768	3.488E-01
605	3.435E+01	646	1.980E+01	687	6.693E+00	728	1.208E+00	769	1.373E-01
606	3.424E+01	647	1.951E+01	688	6.454E+00	729	1.274E+00	770	8.400E-02
607	3.403E+01	648	1.911E+01	689	6.205E+00	730	1.271E+00	771	1.053E-01
608	3.379E+01	649	1.873E+01	690	5.883E+00	731	1.130E+00	772	1.353E-01
609	3.358E+01	650	1.825E+01	691	5.812E+00	732	1.148E+00	773	5.530E-02
610	3.330E+01	651	1.786E+01	692	5.645E+00	733	9.343E-01	774	8.870E-02
611	3.300E+01	652	1.748E+01	693	5.412E+00	734	9.432E-01	775	1.334E-01
612	3.277E+01	653	1.713E+01	694	5.174E+00	735	9.660E-01	776	1.567E-01
613	3.252E+01	654	1.677E+01	695	5.025E+00	736	9.441E-01	777	8.730E-02
614	3.225E+01	655	1.634E+01	696	4.837E+00	737	9.181E-01	778	8.430E-02
615	3.192E+01	656	1.599E+01	697	4.739E+00	738	7.963E-01	779	8.060E-02
616	3.159E+01	657	1.549E+01	698	4.547E+00	739	7.548E-01	780	6.950E-02
617	3.134E+01	658	1.520E+01	699	4.371E+00	740	6.722E-01		
618	3.108E+01	659	1.490E+01	700	4.165E+00	741	7.473E-01		
619	3.070E+01	660	1.450E+01	701	4.026E+00	742	7.651E-01		
620	3.024E+01	661	1.413E+01	702	3.873E+00	743	7.168E-01		
621	3.002E+01	662	1.375E+01	703	3.688E+00	744	5.650E-01		
622	2.955E+01	663	1.339E+01	704	3.584E+00	745	5.788E-01		
623	2.915E+01	664	1.307E+01	705	3.421E+00	746	3.745E-01		
624	2.878E+01	665	1.277E+01	706	3.260E+00	747	5.177E-01		
625	2.847E+01	666	1.245E+01	707	3.133E+00	748	4.823E-01		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles





### [Goniophotometer System]

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

Test orientation: **Downward**

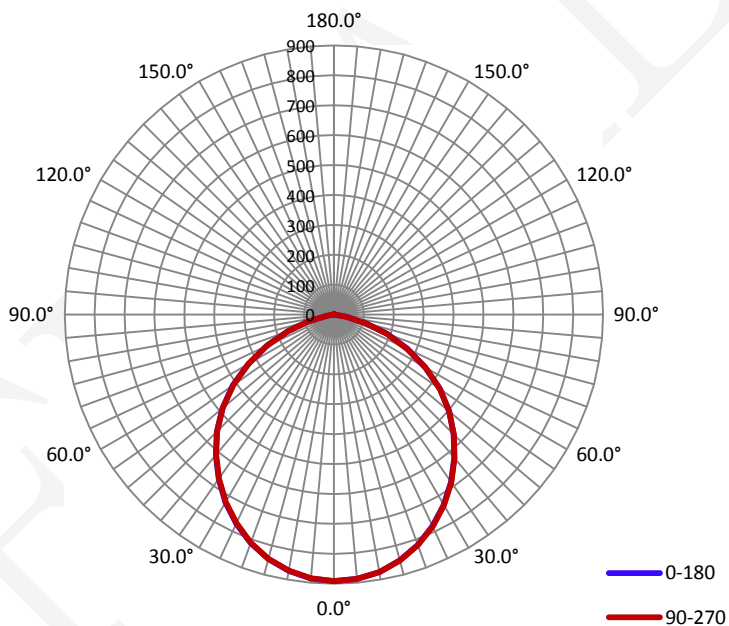
### Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
120.0	60	0.1490	17.49	0.9790

### Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	$I_{max}(cd)$	S/MH(C0/180)	S/MH(C90/270)
2285.2	130.71	891.0	1.22	1.22

### Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50% $I_{max}$ ):	106.8	106.6	106.7	106.6	106.7
Field Angle(10% $I_{max}$ ):	151.4	151.3	151.3	151.3	151.3

**Luminous Intensity (cd) Distribution Data**

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	891	891	891	891	891	891	891	891
5.0°	887	888	887	888	887	888	887	886
10.0°	875	874	875	875	875	874	874	873
15.0°	851	852	853	853	852	852	850	848
20.0°	819	821	822	822	821	820	818	817
25.0°	781	782	783	783	781	781	778	777
30.0°	735	736	736	737	736	734	733	730
35.0°	683	684	685	686	684	682	680	677
40.0°	626	627	629	628	627	626	623	620
45.0°	566	567	569	569	568	564	563	559
50.0°	502	504	504	504	503	500	496	493
55.0°	432	434	434	433	432	429	424	420
60.0°	352	355	356	354	353	349	345	340
65.0°	271	272	274	273	270	267	262	258
70.0°	189	190	190	191	188	183	178	176
75.0°	110	112	112	111	110	106	101	97
80.0°	40	42	43	42	41	38	34	31
85.0°	8	8	9	8	8	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	1	0
160.0°	1	1	1	0	1	0	1	1
165.0°	1	1	1	1	1	1	1	1
170.0°	2	1	1	1	1	1	2	1
175.0°	2	2	2	2	1	2	1	2
180.0°	0	0	0	0	0	0	0	0

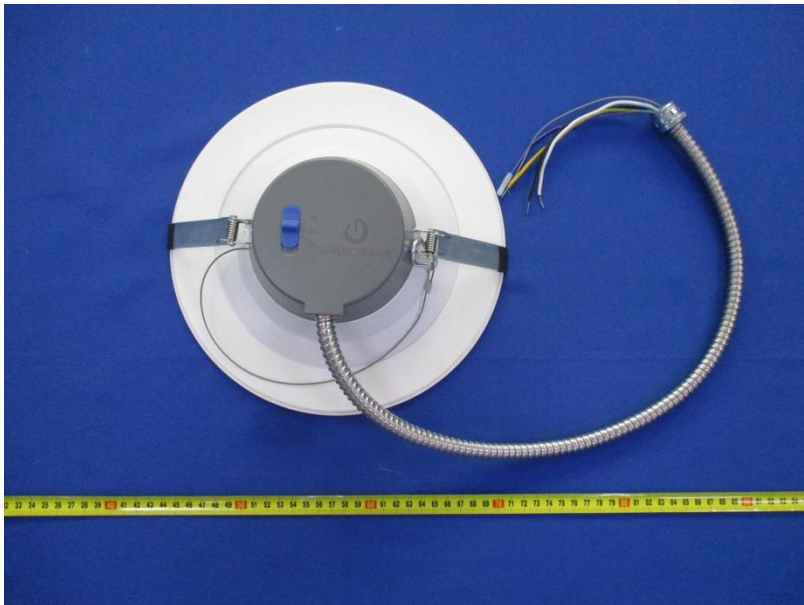
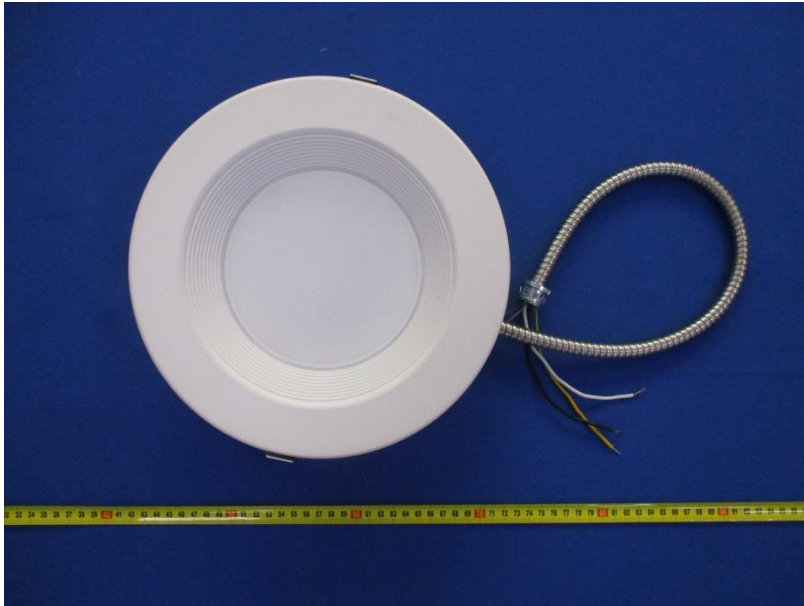
Luminous Intensity (cd) Distribution Data (cont.)

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°	886	885	884	884	885	886	886	886
10.0°	870	870	869	869	869	871	871	872
15.0°	846	845	843	844	845	846	847	849
20.0°	813	811	810	811	812	813	815	817
25.0°	772	770	769	770	770	772	774	776
30.0°	726	723	722	722	724	725	728	730
35.0°	672	670	669	668	670	672	674	678
40.0°	614	613	611	611	612	616	617	621
45.0°	553	550	549	550	552	553	556	561
50.0°	487	484	482	482	485	487	491	495
55.0°	412	408	407	408	409	413	418	421
60.0°	330	328	327	326	329	334	337	342
65.0°	247	244	243	244	246	251	255	260
70.0°	164	160	160	162	163	168	173	178
75.0°	87	84	83	85	87	90	94	99
80.0°	24	23	22	23	24	27	28	31
85.0°	4	3	3	3	4	4	5	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	1	1	1	1	1	0	1
165.0°	0	1	1	1	1	1	1	1
170.0°	1	2	2	2	1	1	1	1
175.0°	1	2	2	1	2	2	2	2
180.0°	0	0	0	0	0	0	0	0

### Zonal Lumen Density Measurement

Deg	Flux (lm)	%	Deg	Flux (lm)	%
0-5	21.2	0.93	0-5	21.2	0.93
5-10	62.9	2.75	0-10	84.1	3.68
10-15	102.1	4.47	0-15	186.2	8.15
15-20	137.2	6.00	0-20	323.4	14.15
20-25	167.0	7.31	0-25	490.4	21.46
25-30	190.6	8.34	0-30	681.0	29.80
30-35	207.2	9.07	0-35	888.2	38.87
35-40	216.4	9.47	0-40	1104.6	48.34
40-45	218.4	9.56	0-45	1322.9	57.89
45-50	212.8	9.31	0-50	1535.7	67.20
50-55	198.9	8.70	0-55	1734.6	75.90
55-60	176.1	7.71	0-60	1910.7	83.61
60-65	145.8	6.38	0-65	2056.5	89.99
65-70	110.0	4.81	0-70	2166.5	94.81
70-75	71.5	3.13	0-75	2238.0	97.94
75-80	34.8	1.52	0-80	2272.8	99.46
80-85	10.3	0.45	0-85	2283.1	99.91
85-90	1.6	0.07	0-90	2284.7	99.98
90-95	0.0	0.00	0-95	2284.7	99.98
95-100	0.0	0.00	0-100	2284.7	99.98
100-105	0.0	0.00	0-105	2284.7	99.98
105-110	0.0	0.00	0-110	2284.7	99.98
110-115	0.0	0.00	0-115	2284.7	99.98
115-120	0.0	0.00	0-120	2284.7	99.98
120-125	0.0	0.00	0-125	2284.7	99.98
125-130	0.0	0.00	0-130	2284.7	99.98
130-135	0.0	0.00	0-135	2284.7	99.98
135-140	0.0	0.00	0-140	2284.7	99.98
140-145	0.0	0.00	0-145	2284.7	99.98
145-150	0.0	0.00	0-150	2284.7	99.98
150-155	0.0	0.00	0-155	2284.7	99.98
155-160	0.1	0.00	0-160	2284.8	99.98
160-165	0.1	0.01	0-165	2284.9	99.99
165-170	0.1	0.01	0-170	2285.1	99.99
170-175	0.1	0.00	0-175	2285.2	100.00
175-180	0.0	0.00	0-180	2285.2	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.
6. 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.

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