

# 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: INFT6/827/DIM120V**

<b>Report Type:</b>	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution
<b>Test Engineer:</b>	Joker Gu
<b>Report Number:</b>	RKSB200515002-10-1
<b>Test Date:</b>	2020-05-22 to 2020-06-05
<b>Report Date:</b>	2020-06-12
<b>Reviewed By:</b>	Seven Xia/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 2020-05-15 and used for testing.

Model Tested: INFT6/827/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/9W/6.5W  
 Nominal CCT: 2700K  
 Nominal Lumen Output: 1495lm/1035lm/745lm

## 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.

**Note: All the UUTs were tested at Most Consumptive Settings**

## 5. Test Result

### [Integrating Sphere System]

Total operating time for integrating sphere test: **1.0 hour**

Test orientation: **Downward**

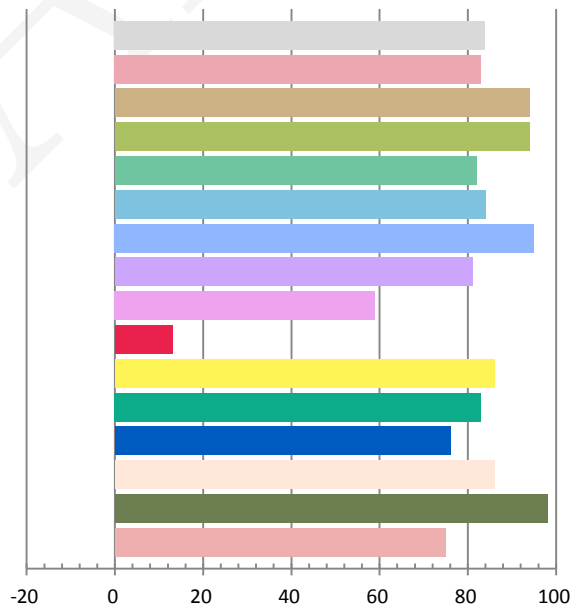
### Photometric and Electrical Measurement Result

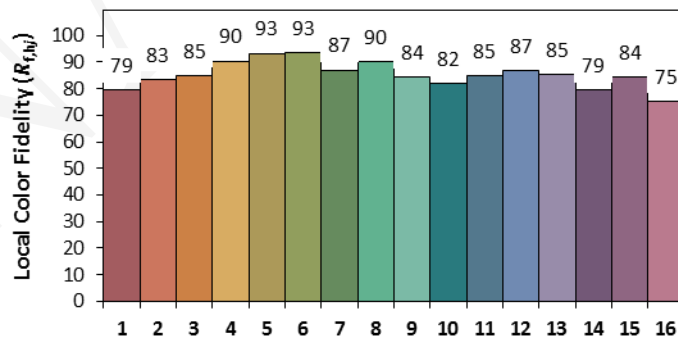
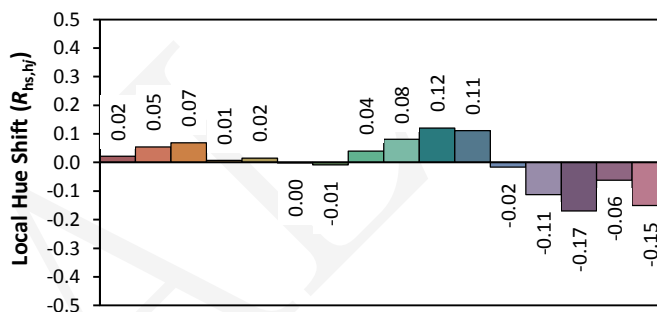
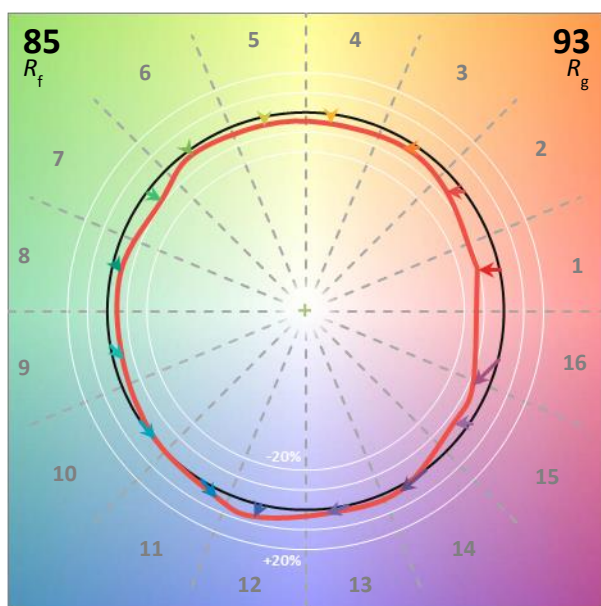
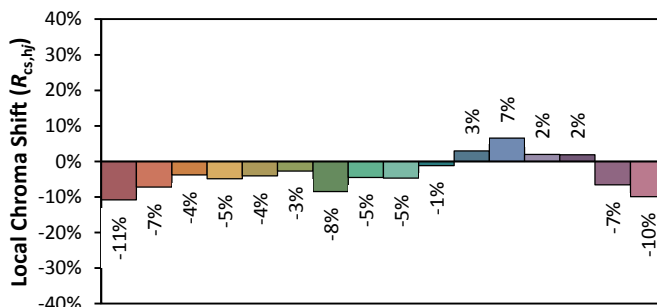
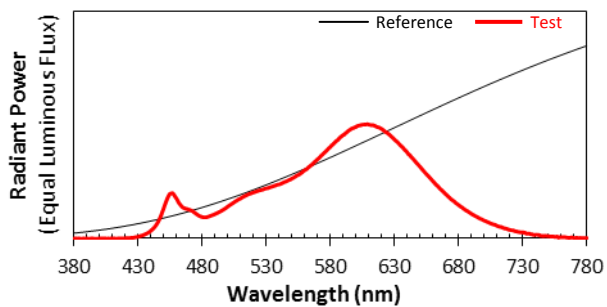
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
119.97	60	0.12	13.82	0.9601	1592.37	115.21

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
4.884	2711	0.00137	0.4613	0.4146	0.2616	0.5291

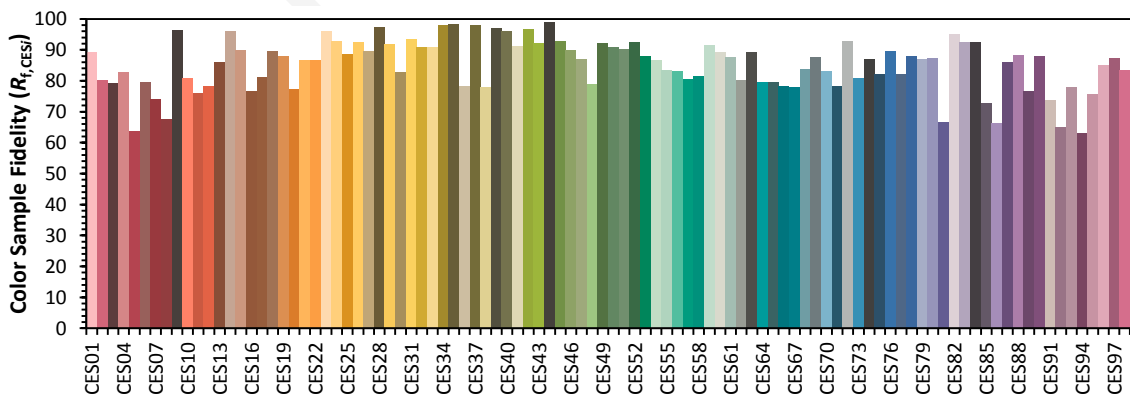
### Color Rendering Index

<b>Ra</b>			
83.9			
<b>R1</b>	<b>R2</b>	<b>R3</b>	<b>R4</b>
83	94	94	82
<b>R5</b>	<b>R6</b>	<b>R7</b>	<b>R8</b>
84	95	81	59
<b>R9</b>	<b>R10</b>	<b>R11</b>	<b>R12</b>
13	86	83	76
<b>R13</b>	<b>R14</b>	<b>R15</b>	
86	98	75	

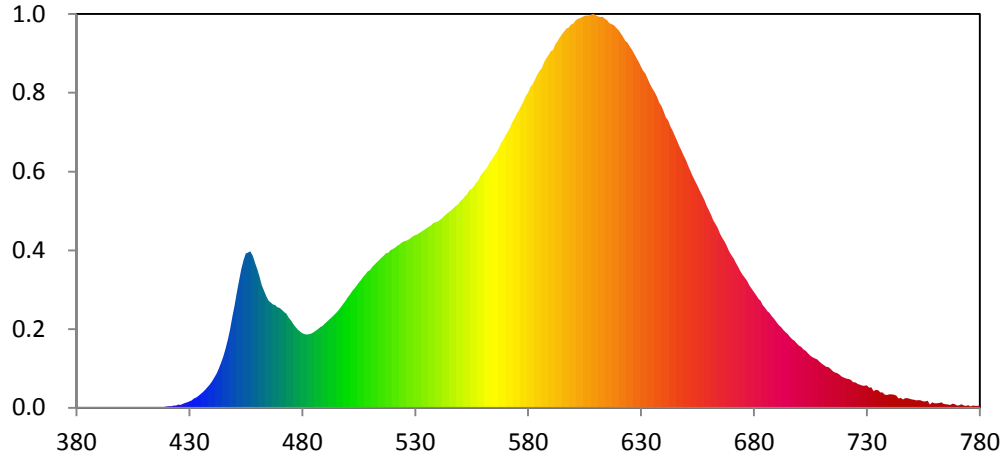




Hue-Angle Bin (j)



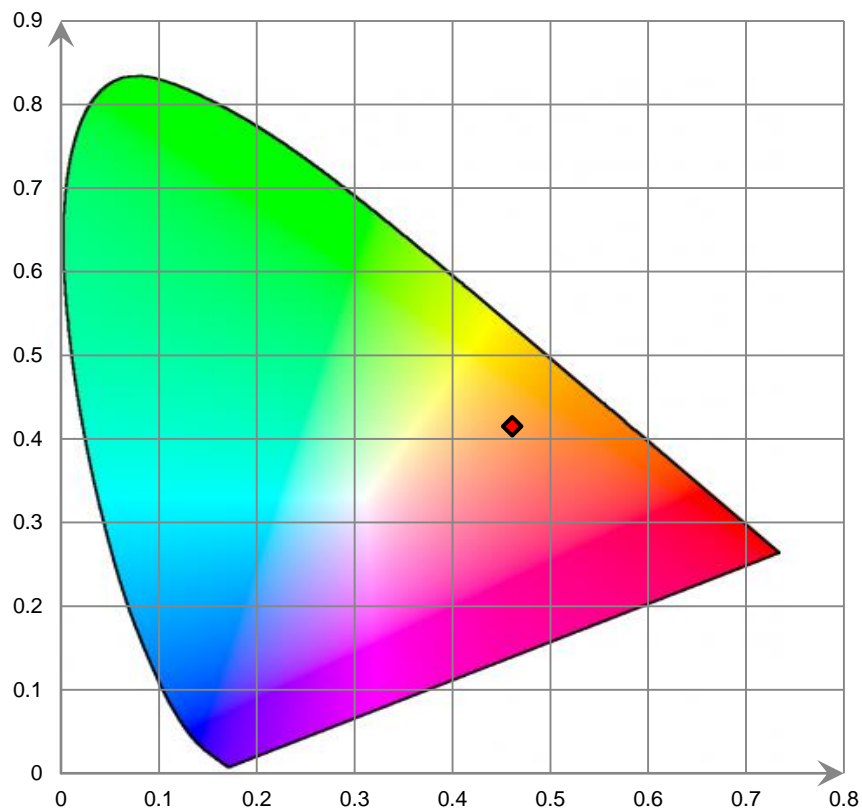
### Relative Spectral Power Distribution



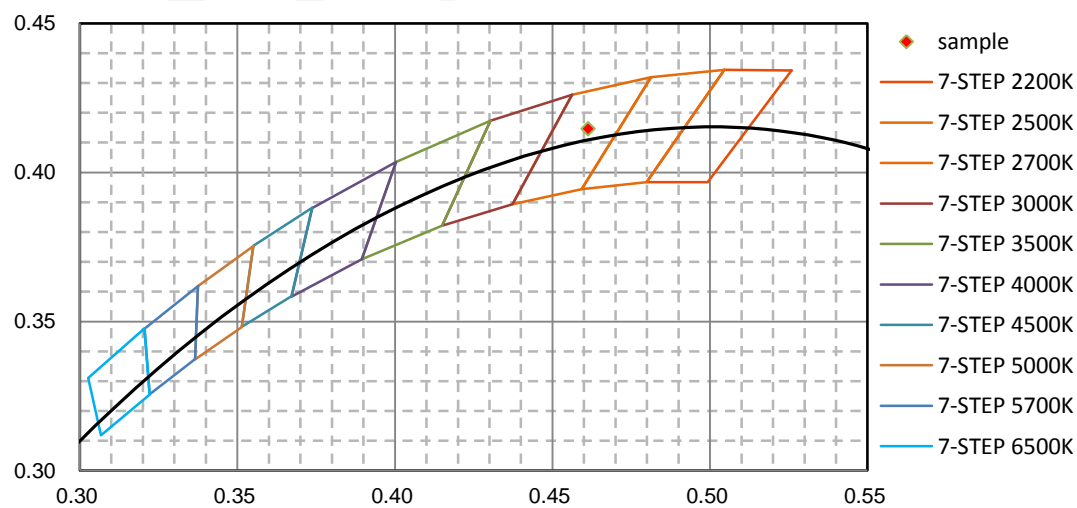
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	1.230E-02	421	1.465E-01	462	1.096E+01	503	1.065E+01	544	1.733E+01
381	5.900E-02	422	1.342E-01	463	1.046E+01	504	1.089E+01	545	1.749E+01
382	6.680E-02	423	1.820E-01	464	9.974E+00	505	1.118E+01	546	1.765E+01
383	1.080E-02	424	1.849E-01	465	9.571E+00	506	1.142E+01	547	1.785E+01
384	5.660E-02	425	2.734E-01	466	9.400E+00	507	1.168E+01	548	1.804E+01
385	2.650E-02	426	2.515E-01	467	9.230E+00	508	1.193E+01	549	1.818E+01
386	2.200E-03	427	3.294E-01	468	9.163E+00	509	1.218E+01	550	1.846E+01
387	3.740E-02	428	4.178E-01	469	8.983E+00	510	1.229E+01	551	1.863E+01
388	4.630E-02	429	4.906E-01	470	8.910E+00	511	1.261E+01	552	1.889E+01
389	5.700E-03	430	5.647E-01	471	8.759E+00	512	1.282E+01	553	1.909E+01
390	5.650E-02	431	6.644E-01	472	8.539E+00	513	1.300E+01	554	1.944E+01
391	2.630E-02	432	8.167E-01	473	8.407E+00	514	1.321E+01	555	1.955E+01
392	5.600E-03	433	9.238E-01	474	8.047E+00	515	1.340E+01	556	1.979E+01
393	2.600E-03	434	1.050E+00	475	7.772E+00	516	1.358E+01	557	2.009E+01
394	1.060E-02	435	1.223E+00	476	7.467E+00	517	1.380E+01	558	2.034E+01
395	5.150E-02	436	1.397E+00	477	7.201E+00	518	1.385E+01	559	2.075E+01
396	1.420E-02	437	1.590E+00	478	6.959E+00	519	1.405E+01	560	2.101E+01
397	1.880E-02	438	1.814E+00	479	6.816E+00	520	1.417E+01	561	2.123E+01
398	5.100E-03	439	2.067E+00	480	6.664E+00	521	1.431E+01	562	2.149E+01
399	2.000E-04	440	2.375E+00	481	6.582E+00	522	1.447E+01	563	2.192E+01
400	0.000E+00	441	2.722E+00	482	6.536E+00	523	1.457E+01	564	2.222E+01
401	2.460E-02	442	3.065E+00	483	6.565E+00	524	1.474E+01	565	2.256E+01
402	4.050E-02	443	3.506E+00	484	6.638E+00	525	1.485E+01	566	2.283E+01
403	2.860E-02	444	4.020E+00	485	6.753E+00	526	1.493E+01	567	2.322E+01
404	2.570E-02	445	4.599E+00	486	6.887E+00	527	1.502E+01	568	2.367E+01
405	2.160E-02	446	5.292E+00	487	7.042E+00	528	1.515E+01	569	2.395E+01
406	8.400E-03	447	6.085E+00	488	7.191E+00	529	1.533E+01	570	2.435E+01
407	6.370E-02	448	6.993E+00	489	7.320E+00	530	1.544E+01	571	2.466E+01
408	1.140E-02	449	8.122E+00	490	7.518E+00	531	1.550E+01	572	2.505E+01
409	5.360E-02	450	9.125E+00	491	7.697E+00	532	1.563E+01	573	2.554E+01
410	5.320E-02	451	1.029E+01	492	7.878E+00	533	1.578E+01	574	2.586E+01
411	2.660E-02	452	1.136E+01	493	8.086E+00	534	1.590E+01	575	2.627E+01
412	5.420E-02	453	1.237E+01	494	8.289E+00	535	1.604E+01	576	2.663E+01
413	8.900E-03	454	1.319E+01	495	8.495E+00	536	1.617E+01	577	2.698E+01
414	3.010E-02	455	1.377E+01	496	8.722E+00	537	1.628E+01	578	2.738E+01
415	2.440E-02	456	1.385E+01	497	8.978E+00	538	1.648E+01	579	2.786E+01
416	2.690E-02	457	1.399E+01	498	9.258E+00	539	1.659E+01	580	2.812E+01
417	3.670E-02	458	1.357E+01	499	9.503E+00	540	1.664E+01	581	2.863E+01
418	4.970E-02	459	1.296E+01	500	9.830E+00	541	1.677E+01	582	2.892E+01
419	7.020E-02	460	1.239E+01	501	1.010E+01	542	1.696E+01	583	2.933E+01
420	1.226E-01	461	1.172E+01	502	1.040E+01	543	1.714E+01	584	2.975E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	3.009E+01	626	3.199E+01	667	1.486E+01	708	4.311E+00	749	8.061E-01
586	3.033E+01	627	3.162E+01	668	1.445E+01	709	4.123E+00	750	7.461E-01
587	3.085E+01	628	3.124E+01	669	1.402E+01	710	3.946E+00	751	7.226E-01
588	3.121E+01	629	3.090E+01	670	1.366E+01	711	3.798E+00	752	6.473E-01
589	3.151E+01	630	3.048E+01	671	1.333E+01	712	3.661E+00	753	6.812E-01
590	3.185E+01	631	3.009E+01	672	1.292E+01	713	3.616E+00	754	6.489E-01
591	3.196E+01	632	2.983E+01	673	1.258E+01	714	3.448E+00	755	5.554E-01
592	3.245E+01	633	2.938E+01	674	1.216E+01	715	3.259E+00	756	5.688E-01
593	3.273E+01	634	2.894E+01	675	1.187E+01	716	3.127E+00	757	6.365E-01
594	3.308E+01	635	2.855E+01	676	1.160E+01	717	3.086E+00	758	2.788E-01
595	3.337E+01	636	2.819E+01	677	1.130E+01	718	2.957E+00	759	4.931E-01
596	3.361E+01	637	2.777E+01	678	1.091E+01	719	2.774E+00	760	4.052E-01
597	3.388E+01	638	2.727E+01	679	1.063E+01	720	2.698E+00	761	3.924E-01
598	3.396E+01	639	2.696E+01	680	1.034E+01	721	2.589E+00	762	4.192E-01
599	3.421E+01	640	2.647E+01	681	1.005E+01	722	2.579E+00	763	4.841E-01
600	3.432E+01	641	2.593E+01	682	9.758E+00	723	2.473E+00	764	3.529E-01
601	3.462E+01	642	2.567E+01	683	9.554E+00	724	2.276E+00	765	3.039E-01
602	3.473E+01	643	2.513E+01	684	9.150E+00	725	2.259E+00	766	2.768E-01
603	3.481E+01	644	2.476E+01	685	8.921E+00	726	2.112E+00	767	2.652E-01
604	3.491E+01	645	2.431E+01	686	8.621E+00	727	2.067E+00	768	3.726E-01
605	3.503E+01	646	2.384E+01	687	8.466E+00	728	1.966E+00	769	3.143E-01
606	3.505E+01	647	2.337E+01	688	8.177E+00	729	1.964E+00	770	2.017E-01
607	3.505E+01	648	2.296E+01	689	7.902E+00	730	2.008E+00	771	2.326E-01
608	3.513E+01	649	2.251E+01	690	7.638E+00	731	1.788E+00	772	3.030E-01
609	3.518E+01	650	2.209E+01	691	7.370E+00	732	1.820E+00	773	1.828E-01
610	3.504E+01	651	2.159E+01	692	7.194E+00	733	1.484E+00	774	1.600E-01
611	3.495E+01	652	2.114E+01	693	6.935E+00	734	1.586E+00	775	2.328E-01
612	3.490E+01	653	2.068E+01	694	6.752E+00	735	1.565E+00	776	1.192E-01
613	3.492E+01	654	2.022E+01	695	6.564E+00	736	1.379E+00	777	1.928E-01
614	3.478E+01	655	1.980E+01	696	6.303E+00	737	1.372E+00	778	1.633E-01
615	3.463E+01	656	1.939E+01	697	6.117E+00	738	1.183E+00	779	1.680E-01
616	3.438E+01	657	1.897E+01	698	5.962E+00	739	1.148E+00	780	2.065E-01
617	3.427E+01	658	1.858E+01	699	5.734E+00	740	1.185E+00		
618	3.415E+01	659	1.807E+01	700	5.542E+00	741	1.205E+00		
619	3.393E+01	660	1.767E+01	701	5.430E+00	742	1.161E+00		
620	3.373E+01	661	1.724E+01	702	5.205E+00	743	1.089E+00		
621	3.344E+01	662	1.674E+01	703	5.078E+00	744	8.373E-01		
622	3.313E+01	663	1.640E+01	704	4.866E+00	745	8.905E-01		
623	3.278E+01	664	1.605E+01	705	4.668E+00	746	7.489E-01		
624	3.261E+01	665	1.555E+01	706	4.519E+00	747	8.399E-01		
625	3.229E+01	666	1.517E+01	707	4.392E+00	748	8.432E-01		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles





### [Goniophotometer System]

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

Test orientation: **Downward**

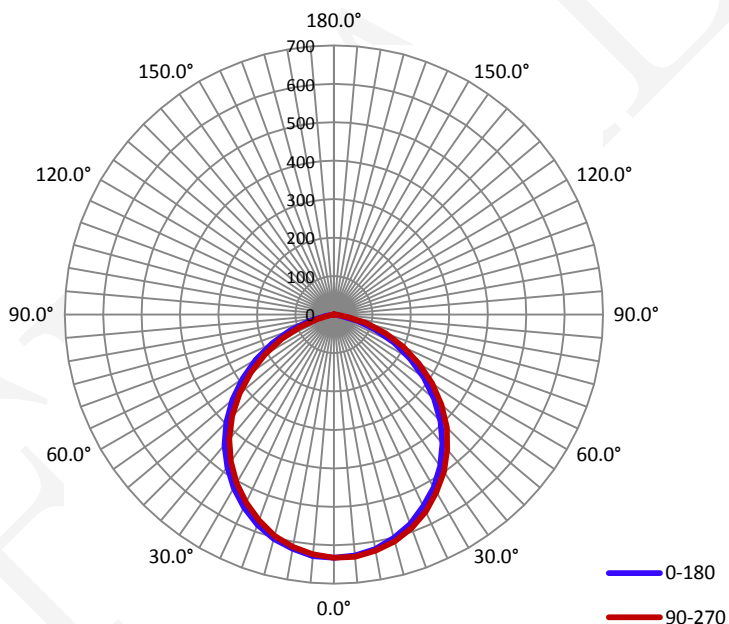
### Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
120.0	60	0.1200	13.9	0.9660

### Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	$I_{max}(cd)$	S/MH(C0/180)	S/MH(C90/270)
1601	115.23	634.4	1.22	1.22

### Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50% $I_{max}$ ):	104.7	104.7	105.0	104.8	104.8
Field Angle(10% $I_{max}$ ):	150.2	150.4	150.5	150.4	150.4

**Luminous Intensity (cd) Distribution Data**

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	633	633	633	633	633	633	633	633
5.0°	629	631	629	634	632	631	634	631
10.0°	619	622	622	627	624	624	625	624
15.0°	602	606	608	612	611	611	612	609
20.0°	580	584	587	592	590	589	591	588
25.0°	550	556	559	565	565	565	564	561
30.0°	519	524	528	532	533	534	533	529
35.0°	482	488	490	500	499	499	499	493
40.0°	439	446	452	458	458	459	458	454
45.0°	392	401	406	413	415	414	412	409
50.0°	340	349	355	362	365	365	362	356
55.0°	285	294	302	310	312	313	310	303
60.0°	229	237	246	253	256	257	254	247
65.0°	173	181	189	198	200	201	198	192
70.0°	116	126	134	140	144	144	141	136
75.0°	63	72	79	86	88	89	86	80
80.0°	18	24	30	35	37	38	35	30
85.0°	5	6	8	9	10	10	9	8
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	1	0	1	0	0	0
180.0°	0	0	0	0	0	0	0	0

Luminous Intensity (cd) Distribution Data (cont.)

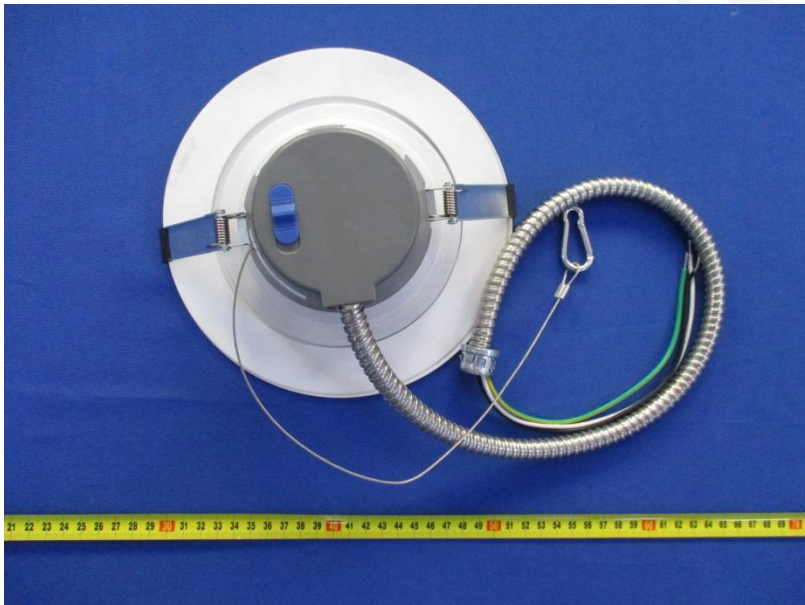
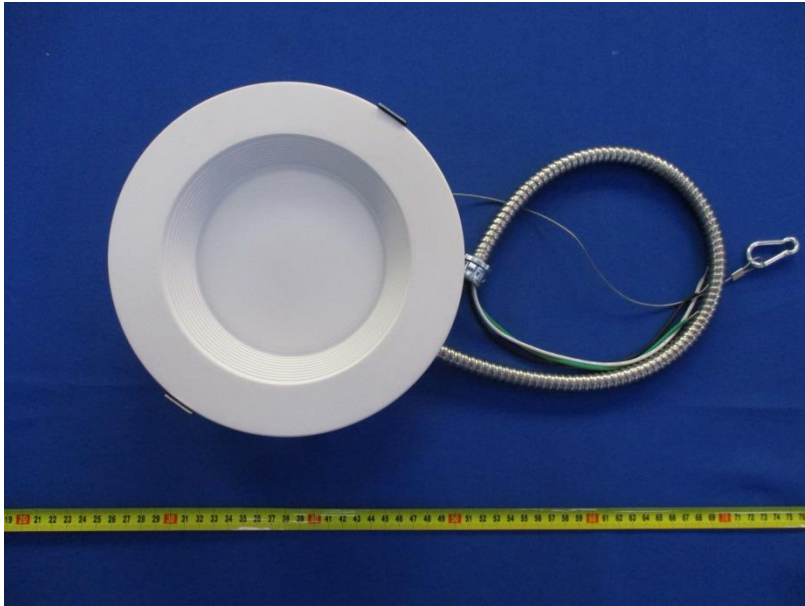
C y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	633	633	633	633	633	633	633	633
5.0°	631	630	627	628	626	626	626	629
10.0°	619	620	615	617	614	615	615	616
15.0°	604	602	598	600	596	595	595	599
20.0°	582	577	572	573	570	570	572	576
25.0°	554	549	543	544	540	539	542	546
30.0°	520	517	510	508	506	505	508	512
35.0°	483	477	472	469	467	467	469	473
40.0°	443	437	429	427	423	424	428	431
45.0°	396	390	381	377	374	373	376	382
50.0°	344	338	328	324	320	321	323	330
55.0°	290	282	273	268	265	263	267	274
60.0°	234	225	216	211	207	206	210	217
65.0°	178	168	160	154	149	149	153	159
70.0°	120	112	103	97	94	94	96	102
75.0°	66	59	51	46	44	43	45	50
80.0°	20	16	13	12	11	11	11	13
85.0°	5	4	3	2	2	2	2	3
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	1	0	0
180.0°	0	0	0	0	0	0	0	0

**Zonal Lumen Density Measurement**

Deg	Flux (lm)	%
0-5	15.1	0.94
5-10	44.7	2.79
10-15	72.6	4.53
15-20	97.6	6.10
20-25	118.9	7.42
25-30	135.7	8.48
30-35	147.6	9.22
35-40	154.2	9.63
40-45	154.8	9.67
45-50	148.9	9.30
50-55	137.1	8.57
55-60	120.1	7.50
60-65	98.8	6.17
65-70	74.4	4.64
70-75	48.1	3.00
75-80	23.4	1.46
80-85	7.5	0.47
85-90	1.5	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	15.1	0.94
0-10	59.8	3.73
0-15	132.4	8.27
0-20	230.0	14.36
0-25	348.8	21.79
0-30	484.5	30.27
0-35	632.2	39.49
0-40	786.4	49.12
0-45	941.2	58.79
0-50	1090.1	68.09
0-55	1227.2	76.66
0-60	1347.3	84.16
0-65	1446.2	90.33
0-70	1520.5	94.98
0-75	1568.6	97.98
0-80	1592.0	99.44
0-85	1599.4	99.91
0-90	1601.0	100.00
0-95	1601.0	100.00
0-100	1601.0	100.00
0-105	1601.0	100.00
0-110	1601.0	100.00
0-115	1601.0	100.00
0-120	1601.0	100.00
0-125	1601.0	100.00
0-130	1601.0	100.00
0-135	1601.0	100.00
0-140	1601.0	100.00
0-145	1601.0	100.00
0-150	1601.0	100.00
0-155	1601.0	100.00
0-160	1601.0	100.00
0-165	1601.0	100.00
0-170	1601.0	100.00
0-175	1601.0	100.00
0-180	1601.0	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\*\*\*\*\*