

# 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: INFT8/835/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>	PKS200708089-10
<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: INFT8/835/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: 3500K  
 Nominal Lumen Output: 2090lm

## 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**

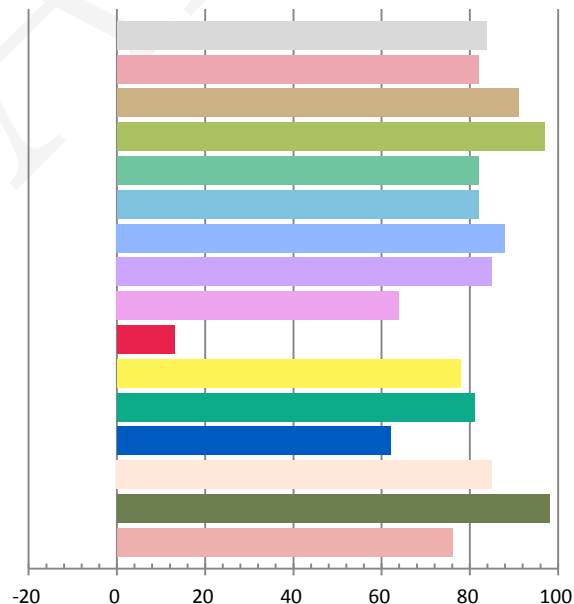
### Photometric and Electrical Measurement Result

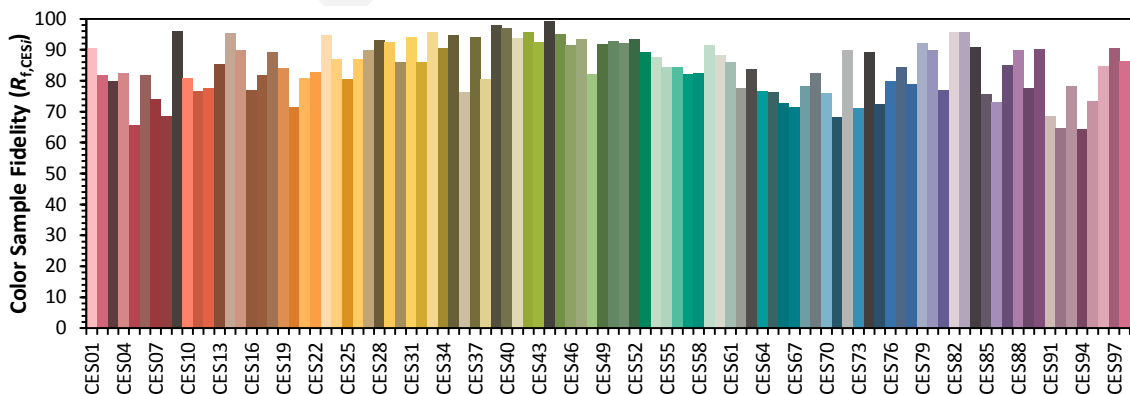
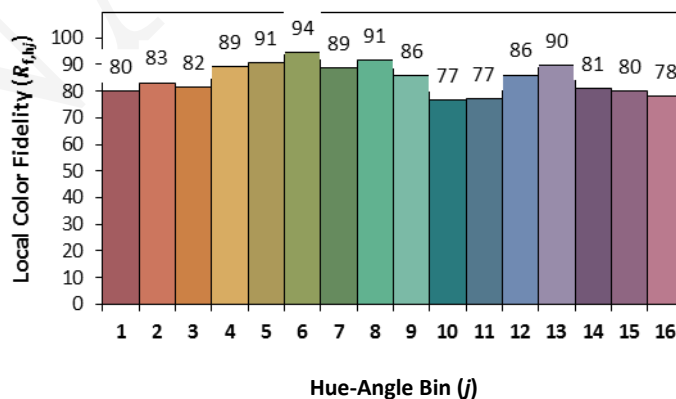
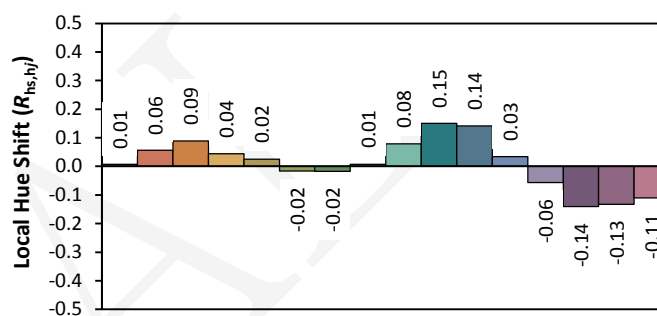
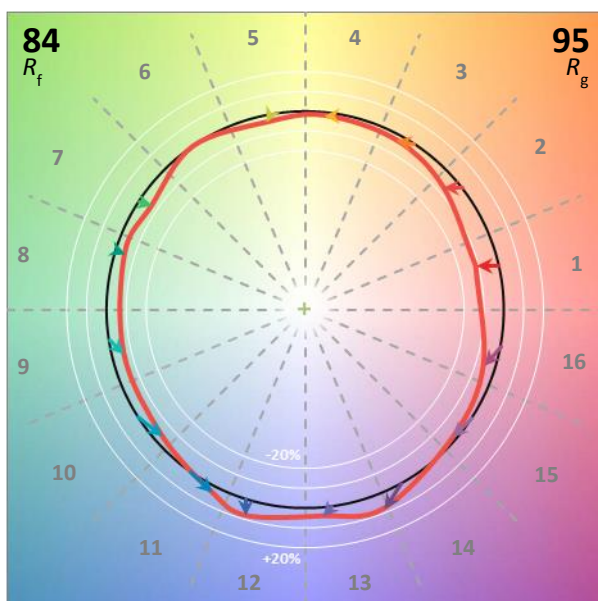
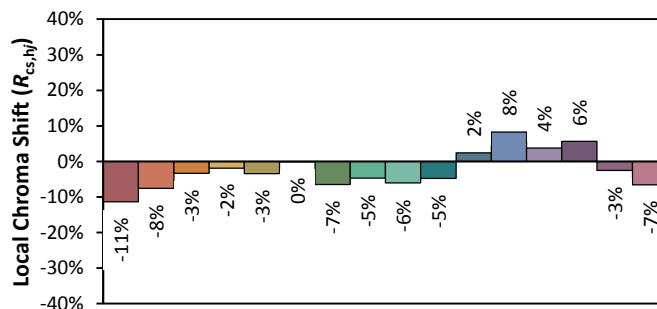
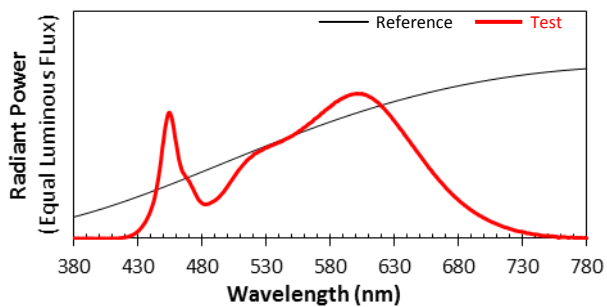
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.01	60	0.1481	17.26	0.9711	2226.36	128.99

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
6.671	3433	0.00130	0.4106	0.3963	0.2368	0.5143

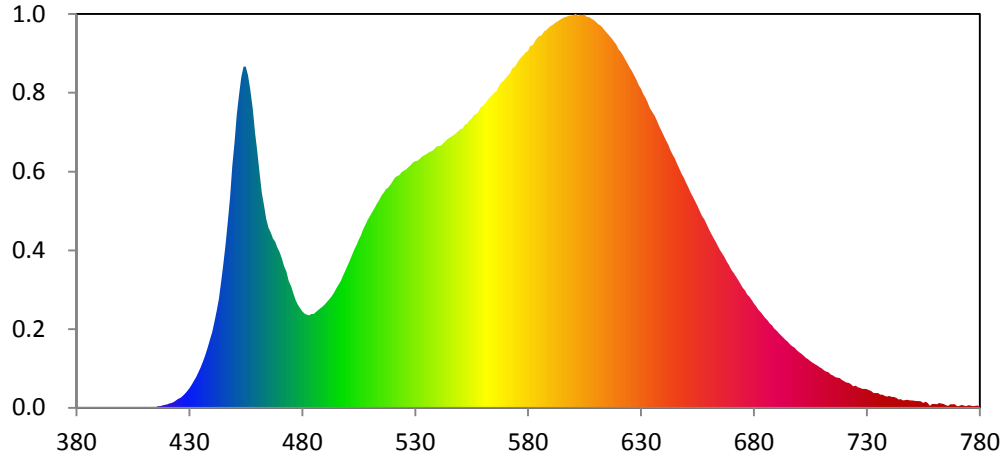
### Color Rendering Index

<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	88	85	64
<b>R9</b>	<b>R10</b>	<b>R11</b>	<b>R12</b>
13	78	81	62
<b>R13</b>	<b>R14</b>	<b>R15</b>	
85	98	76	





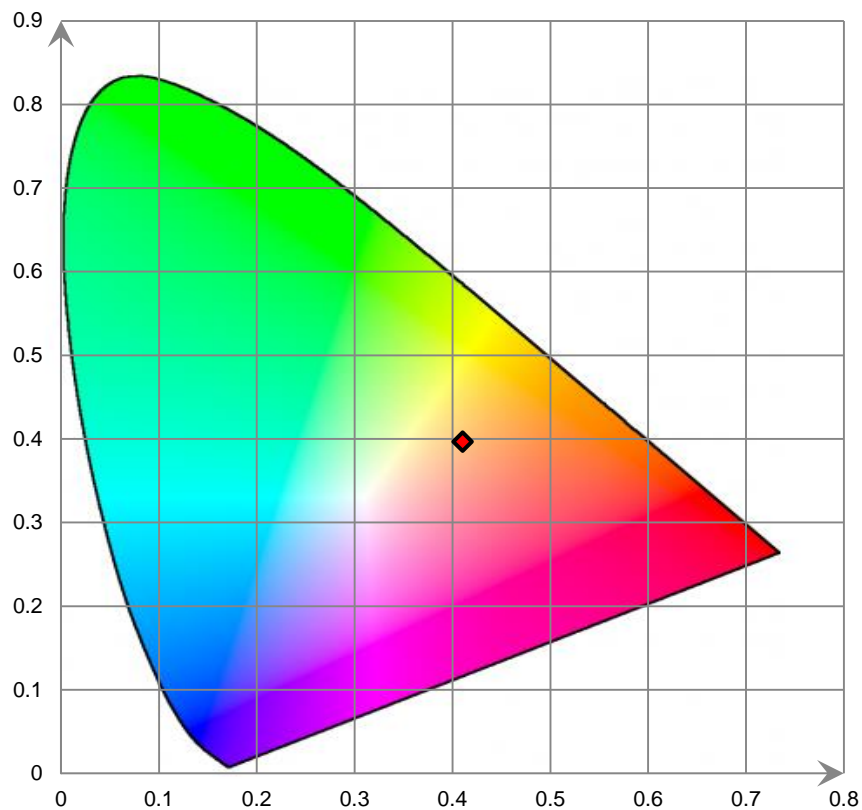
### Relative Spectral Power Distribution



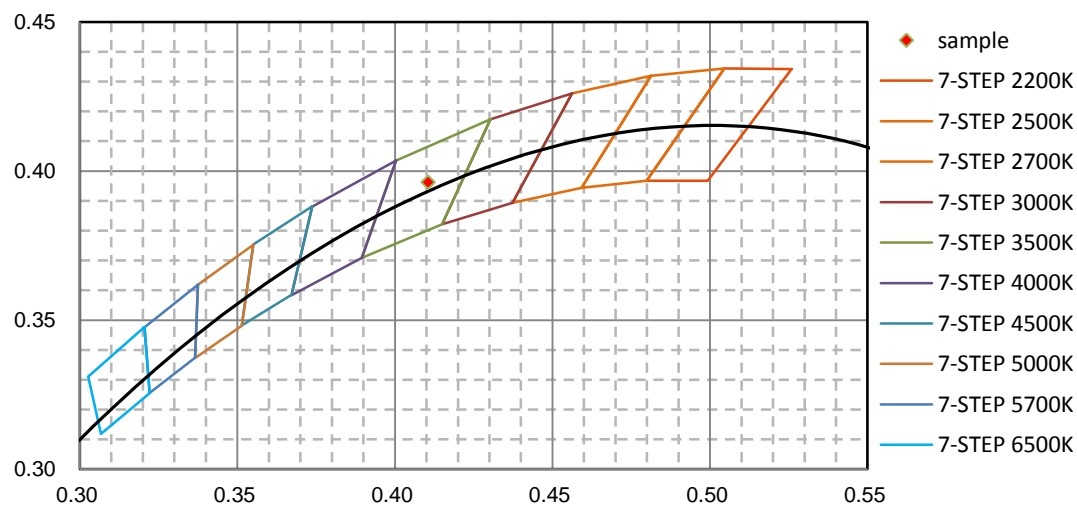
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	2.690E-02	421	4.318E-01	462	2.273E+01	503	1.668E+01	544	2.828E+01
381	4.000E-02	422	4.982E-01	463	2.138E+01	504	1.717E+01	545	2.848E+01
382	2.470E-02	423	6.013E-01	464	1.993E+01	505	1.775E+01	546	2.864E+01
383	3.190E-02	424	7.624E-01	465	1.901E+01	506	1.823E+01	547	2.881E+01
384	7.510E-02	425	9.287E-01	466	1.853E+01	507	1.884E+01	548	2.900E+01
385	3.280E-02	426	1.043E+00	467	1.786E+01	508	1.933E+01	549	2.920E+01
386	2.400E-03	427	1.260E+00	468	1.753E+01	509	1.982E+01	550	2.943E+01
387	5.890E-02	428	1.499E+00	469	1.689E+01	510	2.024E+01	551	2.952E+01
388	2.560E-02	429	1.755E+00	470	1.641E+01	511	2.071E+01	552	2.992E+01
389	1.170E-02	430	2.066E+00	471	1.575E+01	512	2.111E+01	553	3.001E+01
390	6.830E-02	431	2.432E+00	472	1.495E+01	513	2.155E+01	554	3.035E+01
391	1.260E-02	432	2.834E+00	473	1.440E+01	514	2.192E+01	555	3.055E+01
392	4.000E-04	433	3.247E+00	474	1.343E+01	515	2.241E+01	556	3.093E+01
393	2.600E-03	434	3.756E+00	475	1.279E+01	516	2.272E+01	557	3.102E+01
394	2.120E-02	435	4.258E+00	476	1.205E+01	517	2.308E+01	558	3.125E+01
395	3.780E-02	436	4.854E+00	477	1.135E+01	518	2.324E+01	559	3.174E+01
396	2.290E-02	437	5.518E+00	478	1.087E+01	519	2.356E+01	560	3.188E+01
397	5.000E-03	438	6.255E+00	479	1.050E+01	520	2.393E+01	561	3.214E+01
398	2.000E-04	439	7.048E+00	480	1.019E+01	521	2.429E+01	562	3.246E+01
399	3.000E-04	440	7.985E+00	481	9.924E+00	522	2.448E+01	563	3.280E+01
400	1.000E-04	441	9.046E+00	482	9.841E+00	523	2.459E+01	564	3.302E+01
401	4.280E-02	442	1.019E+01	483	9.779E+00	524	2.487E+01	565	3.330E+01
402	3.590E-02	443	1.150E+01	484	9.886E+00	525	2.506E+01	566	3.347E+01
403	4.570E-02	444	1.327E+01	485	9.913E+00	526	2.519E+01	567	3.396E+01
404	3.780E-02	445	1.520E+01	486	1.010E+01	527	2.541E+01	568	3.433E+01
405	2.650E-02	446	1.728E+01	487	1.031E+01	528	2.563E+01	569	3.450E+01
406	1.020E-02	447	1.970E+01	488	1.050E+01	529	2.592E+01	570	3.482E+01
407	6.620E-02	448	2.223E+01	489	1.066E+01	530	2.604E+01	571	3.507E+01
408	1.640E-02	449	2.560E+01	490	1.090E+01	531	2.610E+01	572	3.534E+01
409	6.850E-02	450	2.806E+01	491	1.119E+01	532	2.630E+01	573	3.588E+01
410	1.031E-01	451	3.098E+01	492	1.146E+01	533	2.655E+01	574	3.600E+01
411	6.620E-02	452	3.305E+01	493	1.180E+01	534	2.668E+01	575	3.634E+01
412	2.160E-02	453	3.490E+01	494	1.215E+01	535	2.680E+01	576	3.675E+01
413	3.030E-02	454	3.601E+01	495	1.261E+01	536	2.696E+01	577	3.699E+01
414	8.590E-02	455	3.604E+01	496	1.301E+01	537	2.709E+01	578	3.724E+01
415	7.910E-02	456	3.511E+01	497	1.340E+01	538	2.721E+01	579	3.757E+01
416	1.530E-01	457	3.362E+01	498	1.397E+01	539	2.749E+01	580	3.769E+01
417	1.739E-01	458	3.156E+01	499	1.446E+01	540	2.765E+01	581	3.822E+01
418	2.485E-01	459	2.906E+01	500	1.499E+01	541	2.765E+01	582	3.830E+01
419	2.942E-01	460	2.709E+01	501	1.553E+01	542	2.782E+01	583	3.872E+01
420	3.242E-01	461	2.489E+01	502	1.613E+01	543	2.804E+01	584	3.906E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	3.927E+01	626	3.555E+01	667	1.590E+01	708	4.457E+00	749	7.871E-01
586	3.935E+01	627	3.509E+01	668	1.544E+01	709	4.302E+00	750	7.812E-01
587	3.974E+01	628	3.466E+01	669	1.507E+01	710	4.153E+00	751	7.313E-01
588	3.989E+01	629	3.407E+01	670	1.460E+01	711	3.966E+00	752	7.148E-01
589	4.012E+01	630	3.368E+01	671	1.424E+01	712	3.830E+00	753	6.968E-01
590	4.031E+01	631	3.316E+01	672	1.386E+01	713	3.743E+00	754	6.646E-01
591	4.045E+01	632	3.274E+01	673	1.348E+01	714	3.513E+00	755	5.156E-01
592	4.066E+01	633	3.225E+01	674	1.309E+01	715	3.402E+00	756	6.250E-01
593	4.081E+01	634	3.165E+01	675	1.267E+01	716	3.244E+00	757	5.022E-01
594	4.097E+01	635	3.128E+01	676	1.239E+01	717	3.161E+00	758	1.934E-01
595	4.109E+01	636	3.082E+01	677	1.195E+01	718	3.123E+00	759	4.174E-01
596	4.123E+01	637	3.031E+01	678	1.171E+01	719	2.923E+00	760	4.077E-01
597	4.131E+01	638	2.973E+01	679	1.139E+01	720	2.808E+00	761	3.738E-01
598	4.141E+01	639	2.927E+01	680	1.102E+01	721	2.680E+00	762	5.038E-01
599	4.143E+01	640	2.875E+01	681	1.071E+01	722	2.615E+00	763	4.412E-01
600	4.148E+01	641	2.824E+01	682	1.033E+01	723	2.496E+00	764	3.878E-01
601	4.160E+01	642	2.783E+01	683	1.012E+01	724	2.272E+00	765	2.715E-01
602	4.142E+01	643	2.720E+01	684	9.809E+00	725	2.317E+00	766	1.945E-01
603	4.152E+01	644	2.672E+01	685	9.480E+00	726	2.154E+00	767	3.723E-01
604	4.148E+01	645	2.633E+01	686	9.261E+00	727	2.104E+00	768	3.846E-01
605	4.153E+01	646	2.576E+01	687	8.913E+00	728	1.999E+00	769	3.782E-01
606	4.125E+01	647	2.525E+01	688	8.714E+00	729	2.004E+00	770	1.606E-01
607	4.128E+01	648	2.471E+01	689	8.363E+00	730	1.948E+00	771	2.141E-01
608	4.110E+01	649	2.430E+01	690	8.145E+00	731	1.848E+00	772	2.855E-01
609	4.096E+01	650	2.375E+01	691	7.875E+00	732	1.766E+00	773	2.237E-01
610	4.076E+01	651	2.329E+01	692	7.644E+00	733	1.533E+00	774	1.754E-01
611	4.051E+01	652	2.274E+01	693	7.387E+00	734	1.557E+00	775	2.527E-01
612	4.038E+01	653	2.232E+01	694	7.167E+00	735	1.556E+00	776	2.157E-01
613	4.015E+01	654	2.177E+01	695	6.949E+00	736	1.380E+00	777	1.638E-01
614	3.985E+01	655	2.131E+01	696	6.671E+00	737	1.370E+00	778	1.989E-01
615	3.957E+01	656	2.077E+01	697	6.484E+00	738	1.261E+00	779	2.432E-01
616	3.929E+01	657	2.026E+01	698	6.354E+00	739	1.170E+00	780	1.245E-01
617	3.905E+01	658	1.989E+01	699	6.067E+00	740	1.252E+00		
618	3.866E+01	659	1.939E+01	700	5.890E+00	741	1.136E+00		
619	3.836E+01	660	1.888E+01	701	5.710E+00	742	1.134E+00		
620	3.785E+01	661	1.841E+01	702	5.499E+00	743	1.043E+00		
621	3.758E+01	662	1.798E+01	703	5.276E+00	744	8.853E-01		
622	3.722E+01	663	1.758E+01	704	5.149E+00	745	9.059E-01		
623	3.677E+01	664	1.710E+01	705	4.927E+00	746	7.692E-01		
624	3.637E+01	665	1.666E+01	706	4.761E+00	747	8.166E-01		
625	3.592E+01	666	1.629E+01	707	4.604E+00	748	8.342E-01		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles





### [Goniophotometer System]

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

Test orientation: **Downward**

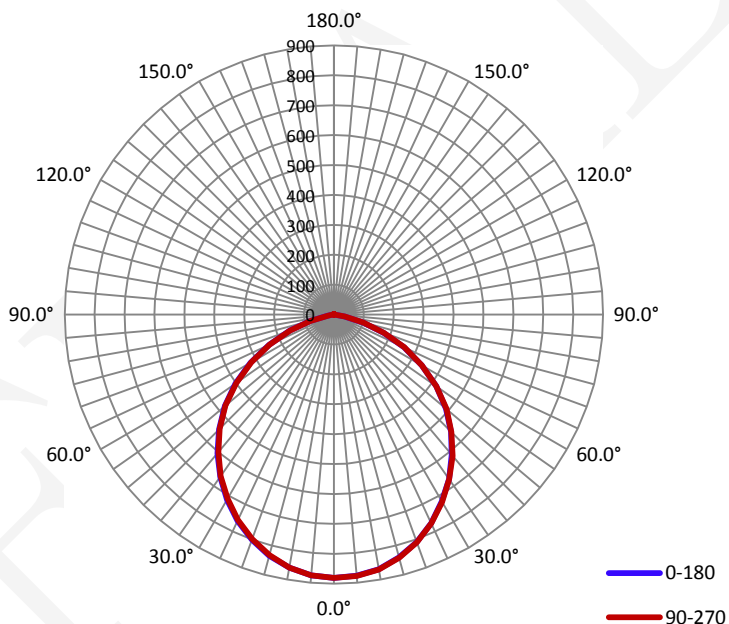
### Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
120.0	60	0.1480	17.3	0.9770

### Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	$I_{max}(cd)$	S/MH(C0/180)	S/MH(C90/270)
2231.8	129.06	880.4	1.21	1.21

### Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50% $I_{max}$ ):	105.9	105.8	105.7	105.7	105.8
Field Angle(10% $I_{max}$ ):	150.6	150.8	150.6	150.7	150.7

**Luminous Intensity (cd) Distribution Data**

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	880	880	880	880	880	880	880	880
5.0°	876	879	874	877	877	875	876	876
10.0°	865	864	863	863	865	862	864	860
15.0°	841	842	841	843	842	841	840	838
20.0°	809	810	811	809	811	809	808	806
25.0°	770	771	770	770	770	768	768	764
30.0°	721	724	724	724	723	722	720	716
35.0°	671	672	673	673	672	671	669	665
40.0°	613	615	616	617	617	614	612	610
45.0°	553	557	556	556	556	555	551	549
50.0°	489	492	492	493	492	489	487	484
55.0°	418	419	421	421	418	417	414	410
60.0°	339	341	343	342	340	338	334	330
65.0°	258	261	263	262	259	256	253	250
70.0°	177	180	181	180	178	176	172	169
75.0°	101	103	105	104	102	101	98	94
80.0°	36	37	39	38	37	36	34	31
85.0°	8	8	8	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	1	0	1
165.0°	0	1	0	1	1	0	0	1
170.0°	1	1	1	1	1	1	1	0
175.0°	1	1	1	1	2	1	1	1
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°	880	880	880	880	880	880	880	880
5.0°	876	874	874	873	876	873	875	875
10.0°	859	859	856	858	859	857	860	861
15.0°	835	834	833	831	833	833	836	836
20.0°	801	801	799	799	799	801	802	805
25.0°	762	761	757	757	758	759	762	764
30.0°	715	712	710	710	711	712	716	716
35.0°	663	661	657	658	660	659	663	664
40.0°	606	602	600	601	601	602	606	608
45.0°	543	541	539	539	540	543	544	547
50.0°	477	475	474	473	473	476	478	481
55.0°	402	400	396	397	399	400	403	406
60.0°	322	319	317	317	318	320	324	328
65.0°	239	236	235	234	237	238	242	246
70.0°	158	156	155	154	156	158	161	165
75.0°	82	81	81	79	81	84	87	90
80.0°	23	22	21	21	22	24	26	28
85.0°	4	4	4	4	4	4	5	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	1	0	0	0	0
165.0°	0	0	0	1	1	0	1	1
170.0°	0	1	1	1	1	1	1	1
175.0°	0	1	2	1	1	1	1	1
180.0°	0	0	0	0	0	0	0	0

### Zonal Lumen Density Measurement

Deg	Flux (lm)	%
0-5	21.0	0.94
5-10	62.1	2.78
10-15	100.7	4.51
15-20	135.3	6.06
20-25	164.6	7.38
25-30	187.5	8.40
30-35	203.6	9.12
35-40	212.6	9.53
40-45	214.2	9.60
45-50	208.3	9.33
50-55	193.8	8.69
55-60	170.6	7.65
60-65	140.4	6.29
65-70	105.1	4.71
70-75	67.7	3.03
75-80	32.5	1.46
80-85	9.7	0.43
85-90	1.7	0.07
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	0.1	0.00
170-175	0.1	0.00
175-180	0.0	0.00

Deg	Flux (lm)	%
0-5	21.0	0.94
0-10	83.1	3.72
0-15	183.8	8.24
0-20	319.2	14.30
0-25	483.8	21.68
0-30	671.3	30.08
0-35	874.9	39.20
0-40	1087.5	48.73
0-45	1301.7	58.33
0-50	1510.0	67.66
0-55	1703.8	76.34
0-60	1874.5	83.99
0-65	2014.9	90.28
0-70	2120.0	94.99
0-75	2187.7	98.02
0-80	2220.2	99.48
0-85	2229.9	99.92
0-90	2231.6	99.99
0-95	2231.6	99.99
0-100	2231.6	99.99
0-105	2231.6	99.99
0-110	2231.6	99.99
0-115	2231.6	99.99
0-120	2231.6	99.99
0-125	2231.6	99.99
0-130	2231.6	99.99
0-135	2231.6	99.99
0-140	2231.6	99.99
0-145	2231.6	99.99
0-150	2231.6	99.99
0-155	2231.6	99.99
0-160	2231.6	99.99
0-165	2231.6	99.99
0-170	2231.7	100.00
0-175	2231.8	100.00
0-180	2231.8	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\*\*\*\*\*