

# 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: 5.5FG40DIM/927/R**

<b>Report Type:</b>	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution
<b>Project Engineer:</b>	Hill Liu
<b>Report Number:</b>	R1KS210205080-10
<b>Test Date:</b>	2021-02-06 to 2021-05-06
<b>Report Date:</b>	2021-06-02
<b>Reviewed By:</b>	Bill Xiong / EE Engineer
<b>Prepared By:</b>	Bay Area Compliance Laboratories Corp. (Dongguan). No.12, Pulong East 1 <sup>st</sup> Road, Tangxia Town, Dongguan, Guangdong, China. Tel: +86-0769-86858888 Fax: +86-0769-86858588
<b>Accreditation:</b>	The IAS Accreditation Number TL-460.

## 1. Product Description

### General Information:

Two samples were received on 2021-02-05. One was tested in integrating sphere and the other was tested in goniophotometer.

Model Tested: 5.5FG40DIM/927/R  
 Manufacturer: GREEN CREATIVE LTD  
 Brand Name: GREEN CREATIVE  
 Product Designation: Decorative LED Lamp  
 Burning Time Before Test: 0hour(For New Products)

### Rated Values:

Rated Voltage/Frequency: 120VAC 60Hz  
 Rated Power: 5.5W  
 Nominal CCT: 2700K  
 Nominal Lumen Output: 500lm

## 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
- IES TM-30-18: IES Method for Evaluating Light Source Color Rendition (This method is not in IAS accreditation scope)

## 3. Description of Test Equipment

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
1.5m integrating sphere	SENSING	1.5m	NA	2020-07-01	2021-06-30
Digital power meter	EVERFINE	PF9811	G135717CN1361159	2020-10-21	2021-10-20
High-precision rapid spectral radiometer	EVERFINE	HAAS-2000	N/A	2020-07-01	2021-06-30
Precision frequency power supply	ALL Power	APW-105N	970663	2021-01-04	2022-01-03
Standard Light Source	EVERFINE	D204	N/A	2020-10-20	2021-10-19
thermometer	SENSING	NA	NA	2021-03-12	2022-03-11
Programmable Precision DC Power Supply	ITECH	IT6154	0061 0417 6471 0010 19	2020-08-25	2021-08-24
AC POWER SUPPLY	EVERFINE	VPS1030 PWM	1012017	2021-01-04	2022-01-03
Digital CC&CV DC Power Supply	EVERFINE	WY12010	1009009	2021-01-04	2022-01-03
Digital power meter	YOKOGAWA	WT-210	91j926132	2021-01-04	2022-01-03
full-field speed goniophotometer	EVERFINE	GO-R5000	YG108492N10120001	2021-03-12	2022-03-11
Wireless Remote Sensor	N/A	433MHz	N/A	2021-03-12	2022-03-11

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
Standard Light Source	EVERFINE	D908	1012003	2020-10-20	2021-10-19

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) 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°C±1°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.

4π 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=2.1% (K=2), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is U=21K (K=2), at the 95% confidence level. The uncertainty of the CRI is U=2.1(K=2), at the 95% confidence level.

The uncertainty of power meter AC current U=0.19 % of rdg, AC Voltage U=0.17% of rdg, Power U=0.48% (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 (γ) 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 intensity is U=2.00% (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: **Base up**

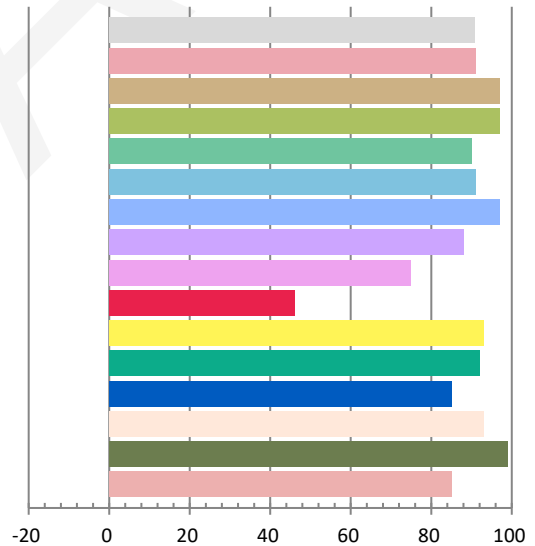
### Photometric and Electrical Measurement Result

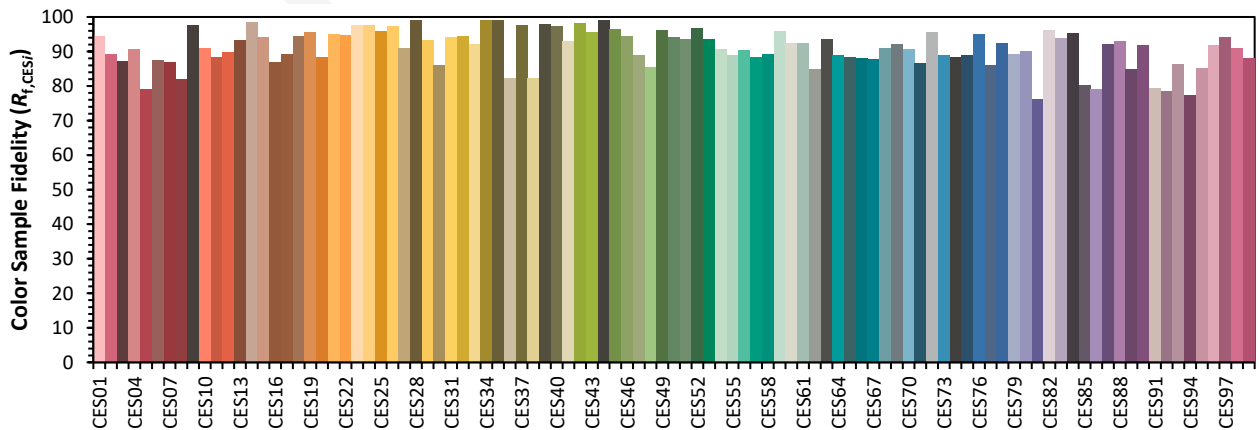
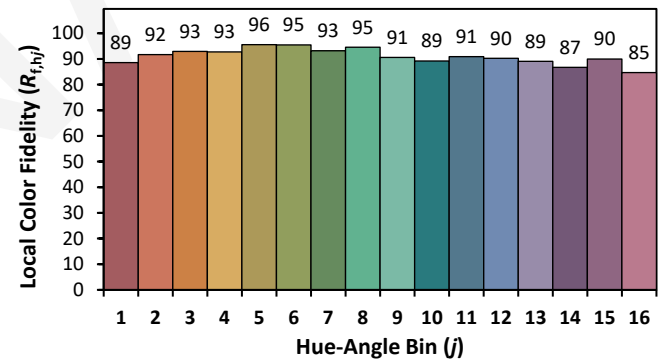
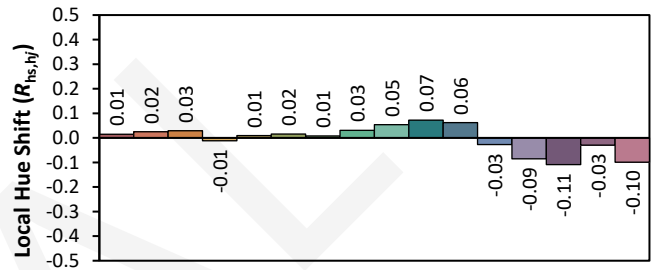
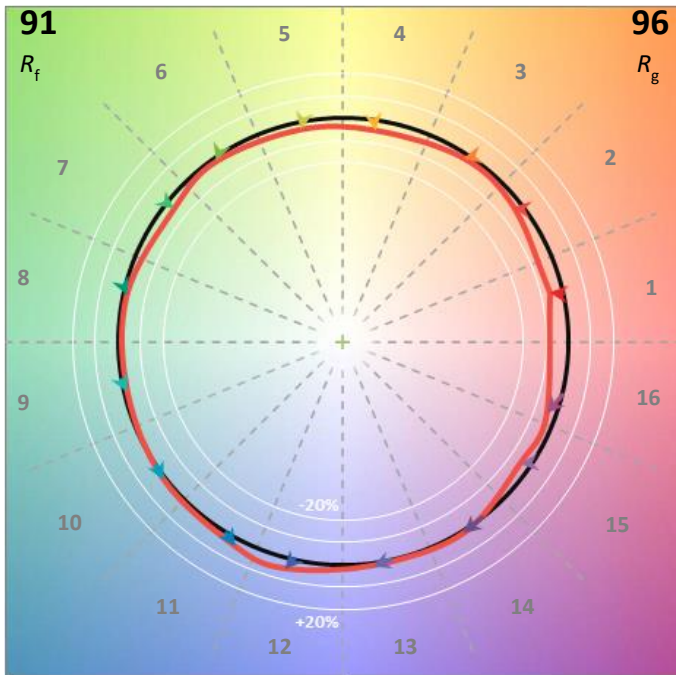
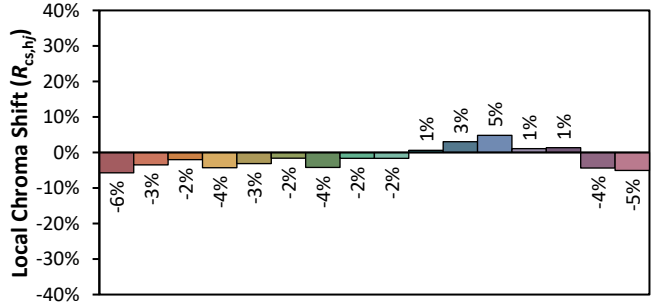
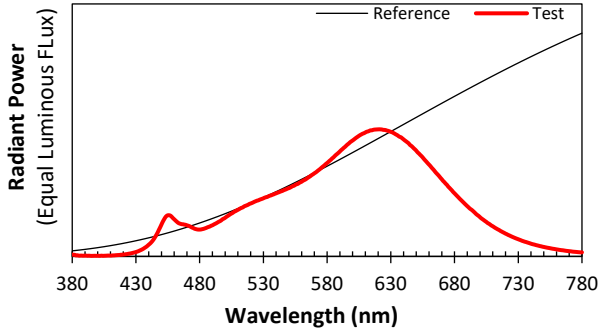
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.05767	5.273	0.7620	560.80	106.36

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
1.907	2781	-0.000549	0.4524	0.4073	0.2591	0.5250

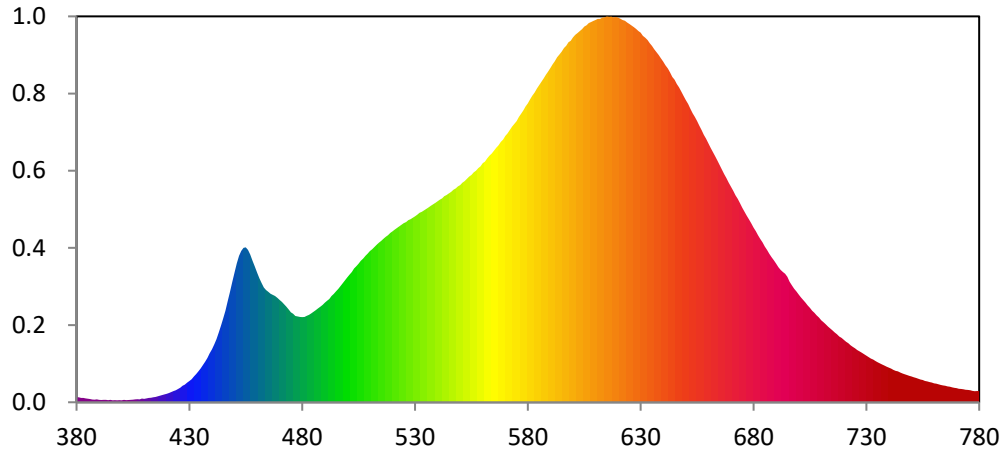
### Color Rendering Index

Ra			
90.8			
R1	R2	R3	R4
91	97	97	90
R5	R6	R7	R8
91	97	88	75
R9	R10	R11	R12
46	93	92	85
R13	R14	R15	
93	99	85	





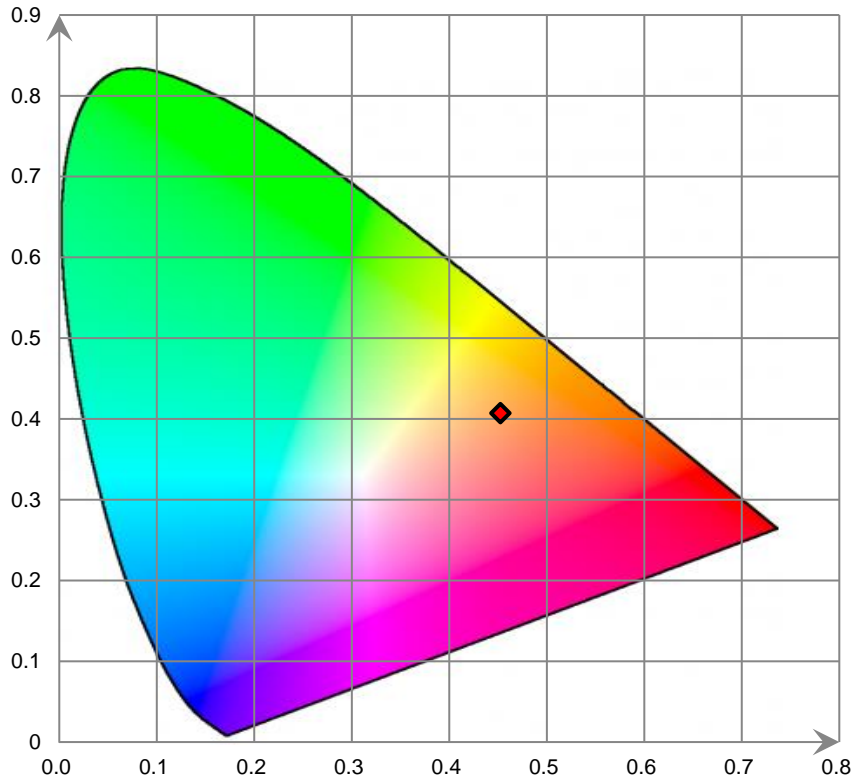
**Relative Spectral Power Distribution**



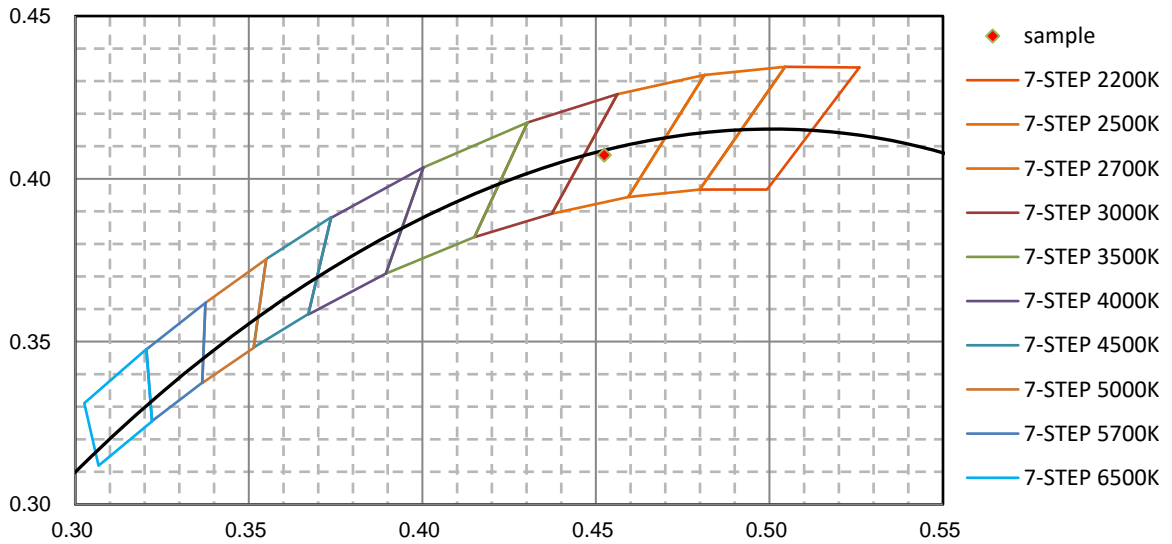
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	1.526E-01	421	2.907E-01	462	3.688E+00	503	4.141E+00	544	6.414E+00
381	1.536E-01	422	3.174E-01	463	3.553E+00	504	4.211E+00	545	6.466E+00
382	1.321E-01	423	3.447E-01	464	3.473E+00	505	4.291E+00	546	6.514E+00
383	1.330E-01	424	3.727E-01	465	3.418E+00	506	4.381E+00	547	6.578E+00
384	1.178E-01	425	4.134E-01	466	3.360E+00	507	4.451E+00	548	6.619E+00
385	1.116E-01	426	4.534E-01	467	3.326E+00	508	4.531E+00	549	6.679E+00
386	9.829E-02	427	5.115E-01	468	3.290E+00	509	4.603E+00	550	6.722E+00
387	8.772E-02	428	5.441E-01	469	3.231E+00	510	4.679E+00	551	6.795E+00
388	7.981E-02	429	6.042E-01	470	3.164E+00	511	4.733E+00	552	6.845E+00
389	8.981E-02	430	6.618E-01	471	3.104E+00	512	4.806E+00	553	6.916E+00
390	7.550E-02	431	7.125E-01	472	3.034E+00	513	4.874E+00	554	6.984E+00
391	6.979E-02	432	7.966E-01	473	2.955E+00	514	4.938E+00	555	7.039E+00
392	7.457E-02	433	8.705E-01	474	2.871E+00	515	4.991E+00	556	7.120E+00
393	7.558E-02	434	9.575E-01	475	2.785E+00	516	5.055E+00	557	7.169E+00
394	6.607E-02	435	1.046E+00	476	2.738E+00	517	5.123E+00	558	7.248E+00
395	7.271E-02	436	1.150E+00	477	2.671E+00	518	5.171E+00	559	7.300E+00
396	6.170E-02	437	1.251E+00	478	2.658E+00	519	5.240E+00	560	7.400E+00
397	6.536E-02	438	1.369E+00	479	2.639E+00	520	5.289E+00	561	7.451E+00
398	6.114E-02	439	1.512E+00	480	2.637E+00	521	5.345E+00	562	7.548E+00
399	6.589E-02	440	1.637E+00	481	2.640E+00	522	5.395E+00	563	7.632E+00
400	6.129E-02	441	1.788E+00	482	2.675E+00	523	5.445E+00	564	7.699E+00
401	7.239E-02	442	1.955E+00	483	2.705E+00	524	5.492E+00	565	7.791E+00
402	6.550E-02	443	2.155E+00	484	2.750E+00	525	5.543E+00	566	7.881E+00
403	7.005E-02	444	2.368E+00	485	2.801E+00	526	5.576E+00	567	7.955E+00
404	7.462E-02	445	2.596E+00	486	2.848E+00	527	5.636E+00	568	8.059E+00
405	8.266E-02	446	2.835E+00	487	2.904E+00	528	5.665E+00	569	8.128E+00
406	9.085E-02	447	3.128E+00	488	2.958E+00	529	5.714E+00	570	8.242E+00
407	9.415E-02	448	3.410E+00	489	3.012E+00	530	5.754E+00	571	8.320E+00
408	9.237E-02	449	3.731E+00	490	3.083E+00	531	5.804E+00	572	8.426E+00
409	1.135E-01	450	4.016E+00	491	3.141E+00	532	5.866E+00	573	8.527E+00
410	1.053E-01	451	4.300E+00	492	3.194E+00	533	5.893E+00	574	8.621E+00
411	1.200E-01	452	4.532E+00	493	3.289E+00	534	5.939E+00	575	8.701E+00
412	1.328E-01	453	4.683E+00	494	3.353E+00	535	5.986E+00	576	8.831E+00
413	1.398E-01	454	4.779E+00	495	3.435E+00	536	6.032E+00	577	8.930E+00
414	1.525E-01	455	4.793E+00	496	3.510E+00	537	6.083E+00	578	9.036E+00
415	1.650E-01	456	4.716E+00	497	3.600E+00	538	6.126E+00	579	9.156E+00
416	1.838E-01	457	4.572E+00	498	3.692E+00	539	6.173E+00	580	9.253E+00
417	2.040E-01	458	4.385E+00	499	3.781E+00	540	6.221E+00	581	9.377E+00
418	2.218E-01	459	4.196E+00	500	3.870E+00	541	6.270E+00	582	9.491E+00
419	2.419E-01	460	4.012E+00	501	3.954E+00	542	6.313E+00	583	9.585E+00
420	2.648E-01	461	3.838E+00	502	4.030E+00	543	6.377E+00	584	9.711E+00

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	9.816E+00	626	1.166E+01	667	7.063E+00	708	2.692E+00	749	8.156E-01
586	9.919E+00	627	1.161E+01	668	6.940E+00	709	2.619E+00	750	7.971E-01
587	1.002E+01	628	1.156E+01	669	6.799E+00	710	2.535E+00	751	7.711E-01
588	1.014E+01	629	1.149E+01	670	6.677E+00	711	2.475E+00	752	7.511E-01
589	1.024E+01	630	1.144E+01	671	6.541E+00	712	2.413E+00	753	7.303E-01
590	1.035E+01	631	1.134E+01	672	6.406E+00	713	2.341E+00	754	7.025E-01
591	1.046E+01	632	1.128E+01	673	6.295E+00	714	2.286E+00	755	6.886E-01
592	1.056E+01	633	1.121E+01	674	6.160E+00	715	2.226E+00	756	6.621E-01
593	1.068E+01	634	1.112E+01	675	6.022E+00	716	2.158E+00	757	6.433E-01
594	1.077E+01	635	1.103E+01	676	5.900E+00	717	2.105E+00	758	6.257E-01
595	1.086E+01	636	1.093E+01	677	5.778E+00	718	2.038E+00	759	6.111E-01
596	1.096E+01	637	1.084E+01	678	5.663E+00	719	1.991E+00	760	5.864E-01
597	1.103E+01	638	1.075E+01	679	5.541E+00	720	1.930E+00	761	5.751E-01
598	1.114E+01	639	1.065E+01	680	5.405E+00	721	1.871E+00	762	5.534E-01
599	1.119E+01	640	1.055E+01	681	5.295E+00	722	1.826E+00	763	5.359E-01
600	1.129E+01	641	1.043E+01	682	5.168E+00	723	1.762E+00	764	5.204E-01
601	1.137E+01	642	1.033E+01	683	5.053E+00	724	1.716E+00	765	5.104E-01
602	1.143E+01	643	1.021E+01	684	4.949E+00	725	1.670E+00	766	4.914E-01
603	1.149E+01	644	1.007E+01	685	4.821E+00	726	1.614E+00	767	4.799E-01
604	1.155E+01	645	9.985E+00	686	4.716E+00	727	1.578E+00	768	4.618E-01
605	1.163E+01	646	9.852E+00	687	4.599E+00	728	1.531E+00	769	4.451E-01
606	1.167E+01	647	9.748E+00	688	4.495E+00	729	1.485E+00	770	4.385E-01
607	1.174E+01	648	9.617E+00	689	4.399E+00	730	1.442E+00	771	4.193E-01
608	1.177E+01	649	9.483E+00	690	4.288E+00	731	1.399E+00	772	4.136E-01
609	1.180E+01	650	9.354E+00	691	4.179E+00	732	1.354E+00	773	4.000E-01
610	1.183E+01	651	9.235E+00	692	4.099E+00	733	1.322E+00	774	3.878E-01
611	1.187E+01	652	9.085E+00	693	4.033E+00	734	1.279E+00	775	3.816E-01
612	1.187E+01	653	8.944E+00	694	3.980E+00	735	1.237E+00	776	3.711E-01
613	1.191E+01	654	8.831E+00	695	3.885E+00	736	1.204E+00	777	3.523E-01
614	1.192E+01	655	8.704E+00	696	3.729E+00	737	1.169E+00	778	3.445E-01
615	1.194E+01	656	8.558E+00	697	3.621E+00	738	1.135E+00	779	3.453E-01
616	1.193E+01	657	8.427E+00	698	3.515E+00	739	1.102E+00	780	3.460E-01
617	1.194E+01	658	8.279E+00	699	3.425E+00	740	1.073E+00		
618	1.191E+01	659	8.156E+00	700	3.333E+00	741	1.040E+00		
619	1.192E+01	660	8.021E+00	701	3.245E+00	742	1.000E+00		
620	1.191E+01	661	7.873E+00	702	3.167E+00	743	9.740E-01		
621	1.187E+01	662	7.743E+00	703	3.084E+00	744	9.539E-01		
622	1.183E+01	663	7.614E+00	704	2.999E+00	745	9.194E-01		
623	1.181E+01	664	7.478E+00	705	2.925E+00	746	8.945E-01		
624	1.175E+01	665	7.342E+00	706	2.835E+00	747	8.662E-01		
625	1.171E+01	666	7.201E+00	707	2.770E+00	748	8.424E-01		

**CIE 1931xy Chromaticity Diagram**



**7-Step Chromaticity Quadrangles**





**[Goniophotometer System]**

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

Test orientation: **Base up**

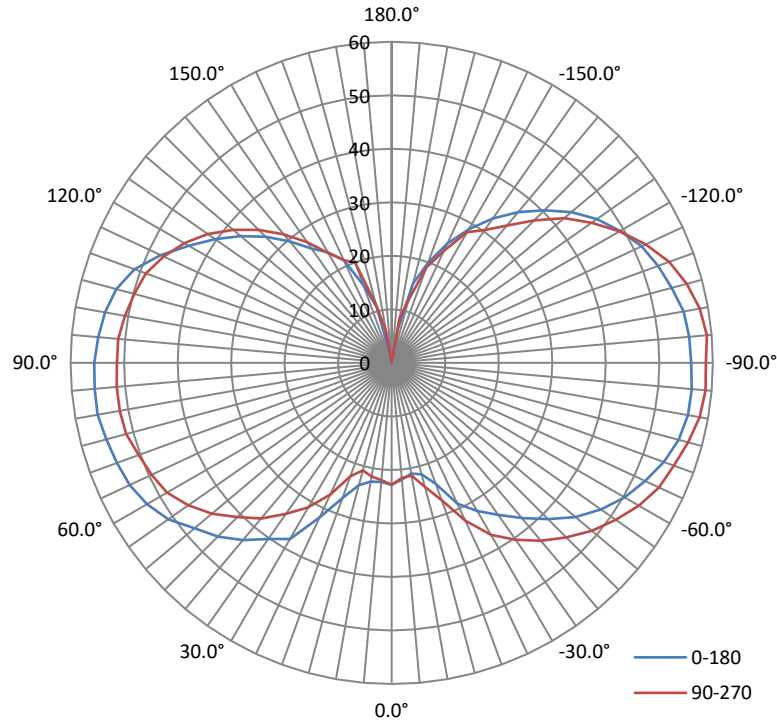
**Electrical Measurement**

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
120.0	60	0.0576	5.280	0.7638

**Photometric Measurement**

Luminous Flux(lm)	Efficacy(lm/W)	I <sub>max</sub> (cd)	S/MH(C0/180)	S/MH(C90/270)
563.035	106.64	60.54	2.47	2.61

**Luminous Intensity Distribution**



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50%I <sub>max</sub> ):	329.6	331.2	330.9	329.6	330.3
Field Angle(10%I <sub>max</sub> ):	342.2	341.9	342.9	341.7	342.2

Luminous Intensity (cd) Distribution Data

C γ	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	23	23	23	23	23	23	23	23
5.0°	22	23	22	22	22	22	22	22
10.0°	23	23	23	22	22	21	21	22
15.0°	24	24	24	22	21	21	22	22
20.0°	27	27	26	25	23	23	24	24
25.0°	32	31	30	28	27	25	27	28
30.0°	38	38	34	32	31	31	31	31
35.0°	40	41	38	36	34	34	34	34
40.0°	43	43	41	38	38	37	37	37
45.0°	46	45	43	41	41	40	40	40
50.0°	48	48	46	44	44	43	43	43
55.0°	51	50	49	47	46	46	46	46
60.0°	53	52	52	49	48	48	48	48
65.0°	54	54	54	51	49	49	50	51
70.0°	55	54	55	52	50	51	52	53
75.0°	55	55	56	52	51	52	53	54
80.0°	56	56	56	52	52	52	54	54
85.0°	56	55	55	52	52	52	55	54
90.0°	56	55	54	53	51	52	55	54
95.0°	55	54	54	53	51	52	54	53
100.0°	54	54	53	52	51	51	54	53
105.0°	53	52	52	51	50	50	53	51
110.0°	51	50	50	49	49	49	51	50
115.0°	48	48	48	48	47	46	49	49
120.0°	44	44	46	46	45	44	47	46
125.0°	40	41	42	43	42	41	44	44
130.0°	37	38	39	40	39	38	40	41
135.0°	33	35	35	36	35	35	37	38
140.0°	30	31	32	32	31	32	33	35
145.0°	26	26	29	29	28	28	29	31
150.0°	24	23	26	28	24	25	26	29
155.0°	21	22	21	22	21	22	23	26
160.0°	15	16	16	17	20	19	20	20
165.0°	11	11	11	11	11	13	12	14
170.0°	2	2	3	3	6	6	6	6
175.0°	0	0	0	0	0	0	0	0
180.0°	0	0	0	0	0	0	0	0

Luminous Intensity (cd) Distribution Data (cont.)

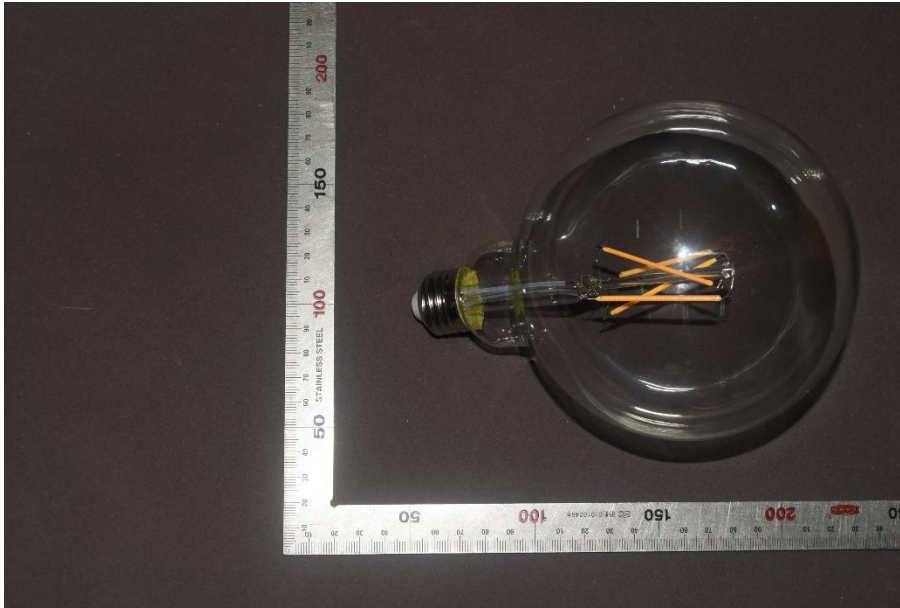
C γ	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	23	23	23	23	23	23	23	23
5.0°	22	21	21	22	22	22	22	22
10.0°	21	21	21	22	21	22	22	22
15.0°	22	23	23	24	24	25	24	24
20.0°	24	25	26	27	27	28	28	27
25.0°	29	29	29	31	33	36	33	31
30.0°	32	33	33	35	37	37	37	36
35.0°	35	35	36	40	40	40	40	40
40.0°	38	39	40	43	43	44	42	42
45.0°	41	42	43	46	46	47	45	45
50.0°	45	45	46	50	49	50	48	47
55.0°	48	48	50	52	51	53	51	50
60.0°	50	50	52	54	53	55	53	52
65.0°	52	52	54	55	55	57	55	53
70.0°	54	54	56	56	56	58	56	54
75.0°	56	55	58	57	57	59	57	54
80.0°	56	56	59	58	58	59	58	54
85.0°	56	57	59	59	59	59	58	54
90.0°	56	57	60	59	59	60	59	54
95.0°	56	57	61	59	59	59	58	54
100.0°	55	56	60	58	58	58	57	54
105.0°	54	55	59	57	57	56	56	53
110.0°	53	53	57	55	55	54	54	51
115.0°	52	51	55	53	52	51	51	48
120.0°	49	49	52	50	49	48	48	45
125.0°	47	46	48	47	46	45	44	42
130.0°	44	43	44	43	42	41	41	39
135.0°	40	39	40	40	38	38	37	35
140.0°	37	35	36	36	33	34	33	32
145.0°	33	32	32	33	30	30	29	30
150.0°	29	28	27	30	28	27	26	25
155.0°	25	24	23	24	23	26	25	20
160.0°	20	21	21	18	19	18	18	17
165.0°	15	15	15	13	12	11	10	10
170.0°	6	6	6	7	8	8	2	2
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	0.5	0.09
5-10	1.6	0.28
10-15	2.7	0.47
15-20	4.0	0.71
20-25	5.8	1.04
25-30	8.1	1.44
30-35	10.5	1.87
35-40	13.0	2.31
40-45	15.5	2.75
45-50	18.1	3.21
50-55	20.7	3.68
55-60	23.2	4.12
60-65	25.3	4.49
65-70	27.1	4.81
70-75	28.5	5.07
75-80	29.6	5.26
80-85	30.3	5.38
85-90	30.6	5.43
90-95	30.5	5.42
95-100	30.1	5.34
100-105	29.1	5.17
105-110	27.7	4.92
110-115	25.8	4.58
115-120	23.5	4.18
120-125	21.0	3.73
125-130	18.4	3.26
130-135	15.7	2.78
135-140	13.0	2.31
140-145	10.5	1.87
145-150	8.3	1.47
150-155	6.3	1.12
155-160	4.4	0.78
160-165	2.6	0.45
165-170	1.0	0.19
170-175	0.1	0.02
175-180	0.0	0.00

Deg	Flux (lm)	%
0-5	0.5	0.09
0-10	2.1	0.37
0-15	4.7	0.84
0-20	8.8	1.55
0-25	14.6	2.59
0-30	22.7	4.03
0-35	33.2	5.90
0-40	46.2	8.21
0-45	61.7	10.96
0-50	79.8	14.17
0-55	100.5	17.85
0-60	123.7	21.97
0-65	149.0	26.46
0-70	176.1	31.27
0-75	204.6	36.34
0-80	234.2	41.60
0-85	264.5	46.98
0-90	295.1	52.41
0-95	325.6	57.83
0-100	355.7	63.17
0-105	384.8	68.34
0-110	412.5	73.26
0-115	438.3	77.84
0-120	461.8	82.02
0-125	482.8	85.75
0-130	501.1	89.01
0-135	516.8	91.79
0-140	529.8	94.10
0-145	540.3	95.97
0-150	548.6	97.44
0-155	554.9	98.56
0-160	559.3	99.34
0-165	561.9	99.79
0-170	562.9	99.98
0-175	563.0	100.00
0-180	563.0	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\*\*\*\*\*