

# 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: 2FB11DIM/927**

<b>Report Type:</b>	Electrical and Photometric tests including: Luminous Flux, Power Factor, Chromaticity, Luminous Intensity Distribution
<b>Reviewed By:</b>	James Liang <i>James Liang</i>
<b>Report Number:</b>	KS2220331-20926E-10-2
<b>Test Date:</b>	2022-04-01 to 2022-04-02
<b>Report Date:</b>	2022-11-03
<b>Approved by:</b>	Blake Zhang / EE Engineer
<b>Prepared By:</b>	Bay Area Compliance Laboratories Corp. (Shenzhen) 5/F(B-West) -7/F, the 3rd Phase of Wan Li Industrial Building D, Shihua Road, Futian Free Trade Zone Shenzhen, Guangdong, China. Tel: +86-755-33320018 Fax: +86-755-33320008
<b>Test Facility:</b>	Test facility was located at No.12, Pulong East 1 <sup>st</sup> Road, Tangxia Town, Dongguan, Guangdong, China.

**Note:** This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.(Shenzhen). This report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, or any agency of the U.S. Government.

## 1. Product Description<sup>#</sup>

### General Information:

One test sample was in good condition and received on 2022-03-31, and used for testing.

Model Tested: 2FB11DIM/927  
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: 120 V AC 60Hz  
Rated Power: 2W  
Nominal CCT: 2700K  
Nominal Lumen Output: 200lm

## 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 NVLAP accreditation scope)

## 3. Description of Test Equipment

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
2.0m integrating sphere	EVERFINE	R98	11010018	2021-09-27	2022-09-26
spectroradiometer	EVERFINE	HAAS-2000	G112048TS81331121	2021-09-27	2022-09-26
Digital Power Meter	EVERFINE	PF2010A	1011004	2022-01-12	2023-01-11
Digital CC&CV DC Power Supply	EVERFINE	WY305-V1	1101047	2022-01-06	2023-01-05
Standard Light Source	EVERFINE	D204	N/A	2021-10-15	2022-10-14
Special zero-voltage synchronous switching AC	EVERFINE	DPS1010-YF	1011001T	2022-01-06	2023-01-05
AC POWER SUPPLY	EVERFINE	VPS1030 PWM	1012017	2022-01-06	2023-01-05
Digital CC&CV DC Power Supply	EVERFINE	WY12010	1009009	2022-01-06	2023-01-05
Digital power meter	YOKOGAWA	WT-210	91j926132	2022-01-06	2023-01-05
full-field speed goniophotometer	EVERFINE	GO-R5000	YG108492N10120001	2021-10-26	2022-10-25
wireless remote thermohygrometer	N/A	433MHz	N/A	2022-01-10	2023-01-09
Standard Light Source	EVERFINE	D908	1012003	2021-10-15	2022-10-14

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Shenzhen) 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  $U=2.1\%$  ( $K=2$ ), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is  $U=22\text{K}$  ( $K=2$ ), 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  $U=0.18\%$  of rdg, Power  $U=0.46\%$  ( $K=2$ ), 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 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]

The Stabilization time: **30 minutes**

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

Test orientation: **Base Up**

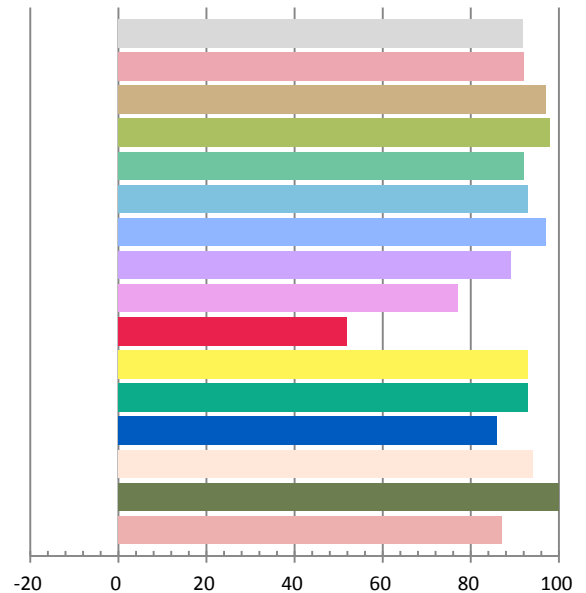
### Photometric and Electrical Measurement Result

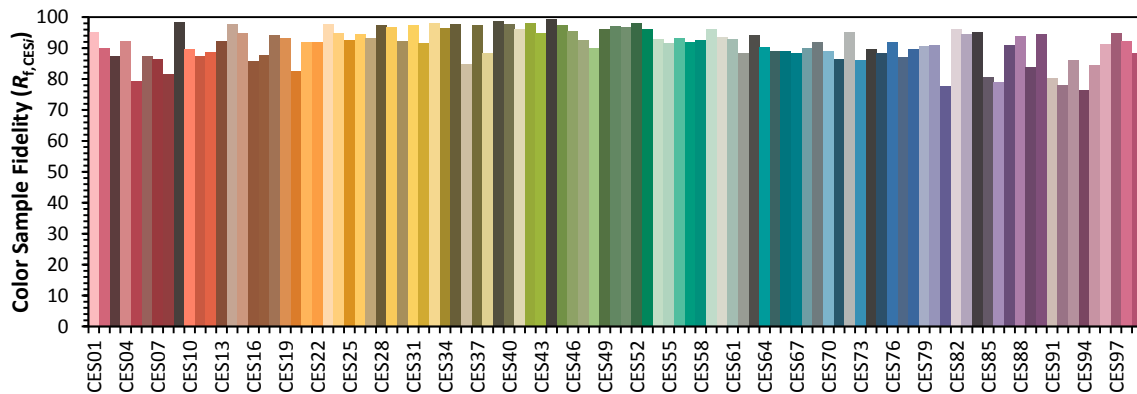
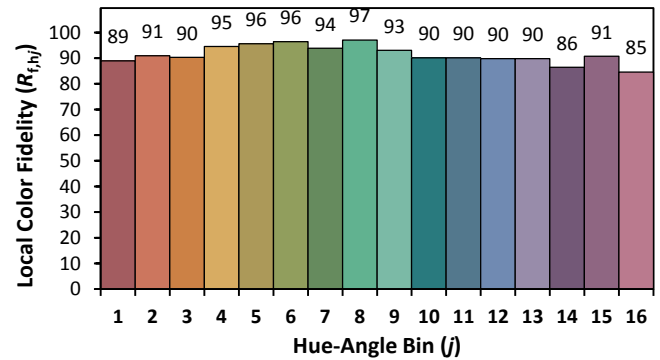
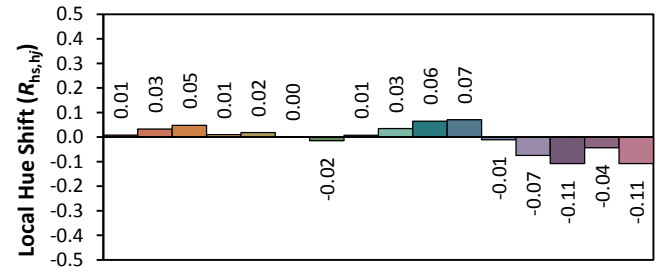
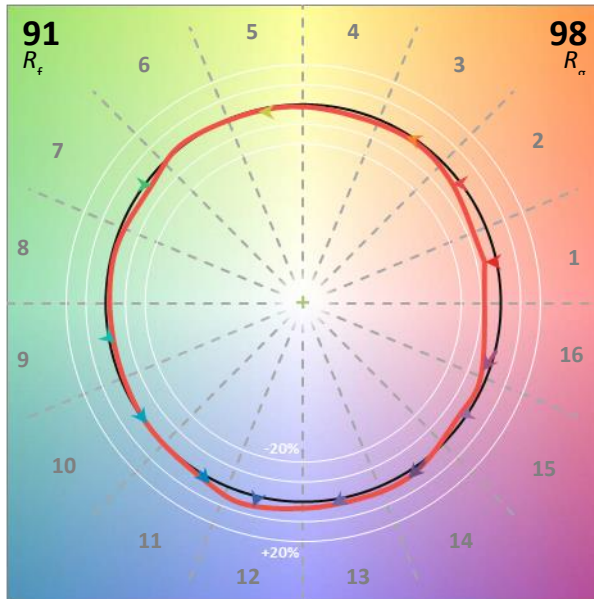
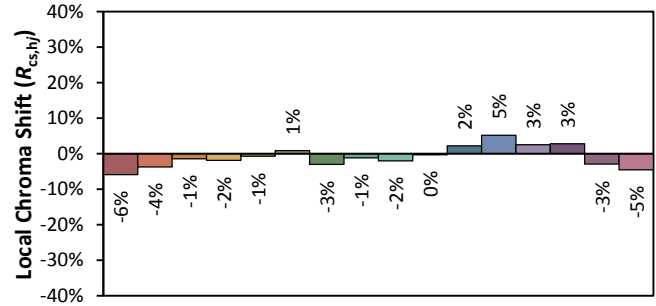
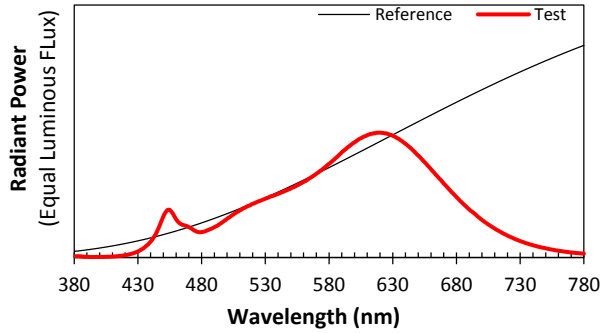
Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.0	60	0.01994	1.824	0.7620	205.39	112.60

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
0.71252	2721	-0.0006050	0.4571	0.4083	0.2617	0.5261

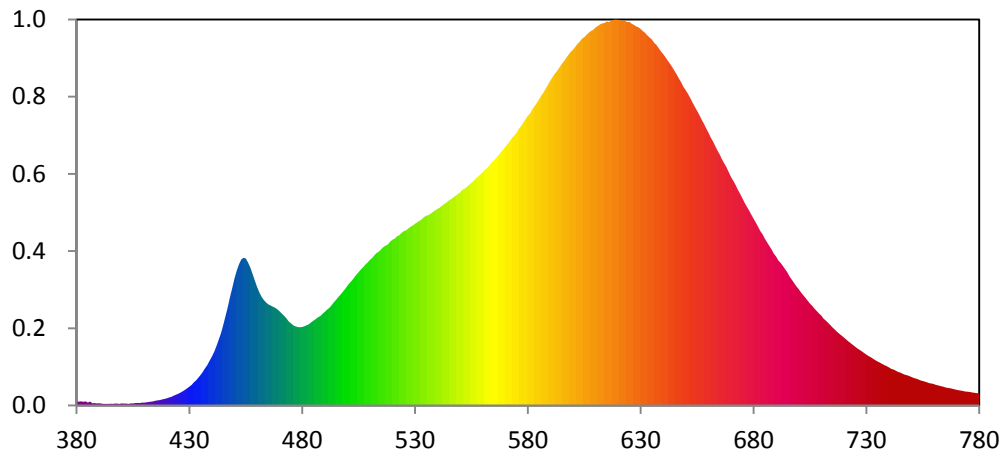
### Color Rendering Index

<b>Ra</b>			
91.9			
<b>R1</b>	<b>R2</b>	<b>R3</b>	<b>R4</b>
92	97	98	92
<b>R5</b>	<b>R6</b>	<b>R7</b>	<b>R8</b>
93	97	89	77
<b>R9</b>	<b>R10</b>	<b>R11</b>	<b>R12</b>
52	93	93	86
<b>R13</b>	<b>R14</b>	<b>R15</b>	
94	100	87	





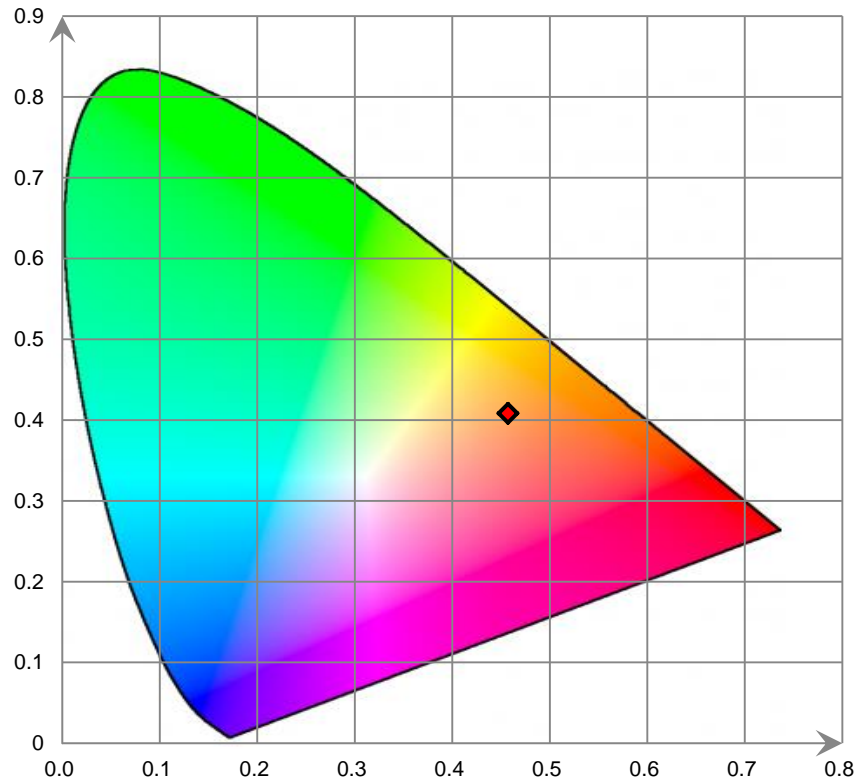
### Relative Spectral Power Distribution



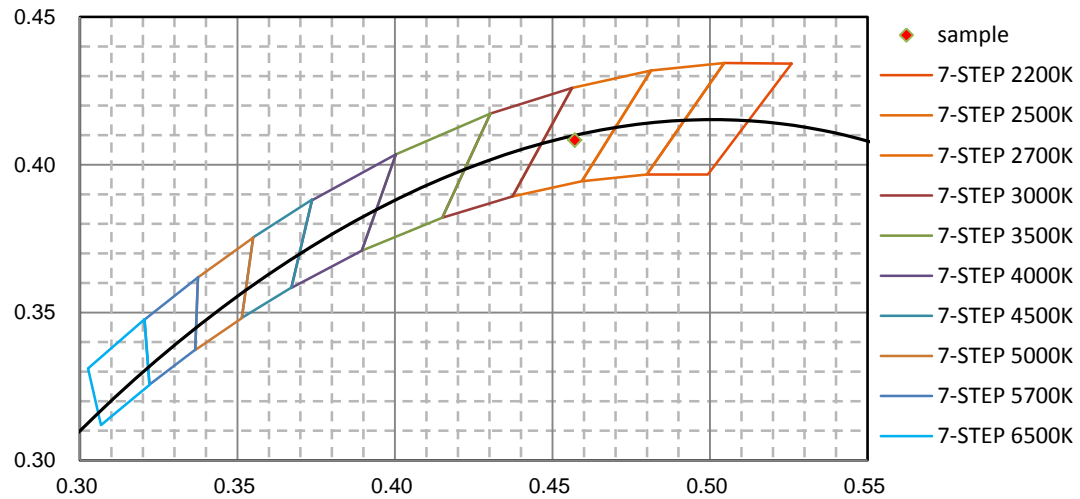
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	4.792E-02	421	9.213E-02	462	1.256E+00	503	1.478E+00	544	2.346E+00
381	4.447E-02	422	9.950E-02	463	1.219E+00	504	1.511E+00	545	2.370E+00
382	4.828E-02	423	1.119E-01	464	1.191E+00	505	1.541E+00	546	2.388E+00
383	4.344E-02	424	1.240E-01	465	1.170E+00	506	1.572E+00	547	2.408E+00
384	4.843E-02	425	1.342E-01	466	1.157E+00	507	1.602E+00	548	2.427E+00
385	3.245E-02	426	1.479E-01	467	1.144E+00	508	1.630E+00	549	2.447E+00
386	4.541E-02	427	1.619E-01	468	1.130E+00	509	1.655E+00	550	2.465E+00
387	2.492E-02	428	1.791E-01	469	1.113E+00	510	1.684E+00	551	2.493E+00
388	2.710E-02	429	1.982E-01	470	1.088E+00	511	1.706E+00	552	2.510E+00
389	2.448E-02	430	2.186E-01	471	1.062E+00	512	1.738E+00	553	2.529E+00
390	2.563E-02	431	2.378E-01	472	1.036E+00	513	1.764E+00	554	2.552E+00
391	2.285E-02	432	2.678E-01	473	1.009E+00	514	1.781E+00	555	2.577E+00
392	1.934E-02	433	2.909E-01	474	9.730E-01	515	1.807E+00	556	2.599E+00
393	1.802E-02	434	3.214E-01	475	9.510E-01	516	1.833E+00	557	2.624E+00
394	1.804E-02	435	3.542E-01	476	9.298E-01	517	1.850E+00	558	2.650E+00
395	2.114E-02	436	3.913E-01	477	9.170E-01	518	1.864E+00	559	2.673E+00
396	1.820E-02	437	4.308E-01	478	9.065E-01	519	1.898E+00	560	2.699E+00
397	2.269E-02	438	4.685E-01	479	9.038E-01	520	1.918E+00	561	2.726E+00
398	2.289E-02	439	5.176E-01	480	9.081E-01	521	1.930E+00	562	2.746E+00
399	1.801E-02	440	5.673E-01	481	9.172E-01	522	1.957E+00	563	2.776E+00
400	2.318E-02	441	6.217E-01	482	9.279E-01	523	1.969E+00	564	2.812E+00
401	2.234E-02	442	6.876E-01	483	9.405E-01	524	1.995E+00	565	2.837E+00
402	2.299E-02	443	7.603E-01	484	9.621E-01	525	2.016E+00	566	2.867E+00
403	1.869E-02	444	8.351E-01	485	9.806E-01	526	2.026E+00	567	2.896E+00
404	2.383E-02	445	9.285E-01	486	9.986E-01	527	2.047E+00	568	2.928E+00
405	2.473E-02	446	1.031E+00	487	1.020E+00	528	2.067E+00	569	2.959E+00
406	2.822E-02	447	1.133E+00	488	1.035E+00	529	2.082E+00	570	2.992E+00
407	3.001E-02	448	1.251E+00	489	1.061E+00	530	2.103E+00	571	3.023E+00
408	2.728E-02	449	1.362E+00	490	1.083E+00	531	2.120E+00	572	3.058E+00
409	3.339E-02	450	1.470E+00	491	1.109E+00	532	2.136E+00	573	3.095E+00
410	3.340E-02	451	1.563E+00	492	1.129E+00	533	2.155E+00	574	3.124E+00
411	3.621E-02	452	1.633E+00	493	1.158E+00	534	2.178E+00	575	3.157E+00
412	4.124E-02	453	1.689E+00	494	1.192E+00	535	2.194E+00	576	3.200E+00
413	4.378E-02	454	1.708E+00	495	1.220E+00	536	2.203E+00	577	3.232E+00
414	4.717E-02	455	1.701E+00	496	1.253E+00	537	2.222E+00	578	3.271E+00
415	5.428E-02	456	1.655E+00	497	1.284E+00	538	2.240E+00	579	3.313E+00
416	5.827E-02	457	1.599E+00	498	1.316E+00	539	2.258E+00	580	3.349E+00
417	6.328E-02	458	1.526E+00	499	1.347E+00	540	2.275E+00	581	3.380E+00
418	7.006E-02	459	1.444E+00	500	1.385E+00	541	2.290E+00	582	3.423E+00
419	7.504E-02	460	1.369E+00	501	1.416E+00	542	2.313E+00	583	3.464E+00
420	8.259E-02	461	1.308E+00	502	1.443E+00	543	2.332E+00	584	3.501E+00

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	3.545E+00	626	4.417E+00	667	2.803E+00	708	1.093E+00	749	3.398E-01
586	3.586E+00	627	4.403E+00	668	2.757E+00	709	1.064E+00	750	3.298E-01
587	3.622E+00	628	4.386E+00	669	2.702E+00	710	1.039E+00	751	3.187E-01
588	3.673E+00	629	4.375E+00	670	2.647E+00	711	1.004E+00	752	3.103E-01
589	3.713E+00	630	4.354E+00	671	2.598E+00	712	9.820E-01	753	3.018E-01
590	3.758E+00	631	4.331E+00	672	2.553E+00	713	9.564E-01	754	2.913E-01
591	3.800E+00	632	4.309E+00	673	2.498E+00	714	9.308E-01	755	2.827E-01
592	3.838E+00	633	4.280E+00	674	2.450E+00	715	9.038E-01	756	2.765E-01
593	3.870E+00	634	4.255E+00	675	2.400E+00	716	8.789E-01	757	2.671E-01
594	3.911E+00	635	4.233E+00	676	2.348E+00	717	8.537E-01	758	2.573E-01
595	3.951E+00	636	4.194E+00	677	2.303E+00	718	8.318E-01	759	2.526E-01
596	3.983E+00	637	4.169E+00	678	2.258E+00	719	8.082E-01	760	2.451E-01
597	4.022E+00	638	4.132E+00	679	2.211E+00	720	7.872E-01	761	2.362E-01
598	4.056E+00	639	4.097E+00	680	2.159E+00	721	7.633E-01	762	2.316E-01
599	4.090E+00	640	4.065E+00	681	2.115E+00	722	7.424E-01	763	2.241E-01
600	4.115E+00	641	4.029E+00	682	2.068E+00	723	7.220E-01	764	2.180E-01
601	4.149E+00	642	3.989E+00	683	2.018E+00	724	7.021E-01	765	2.098E-01
602	4.181E+00	643	3.951E+00	684	1.980E+00	725	6.816E-01	766	2.030E-01
603	4.211E+00	644	3.913E+00	685	1.930E+00	726	6.613E-01	767	2.003E-01
604	4.244E+00	645	3.871E+00	686	1.887E+00	727	6.429E-01	768	1.931E-01
605	4.262E+00	646	3.826E+00	687	1.848E+00	728	6.246E-01	769	1.862E-01
606	4.289E+00	647	3.780E+00	688	1.807E+00	729	6.068E-01	770	1.811E-01
607	4.313E+00	648	3.736E+00	689	1.758E+00	730	5.883E-01	771	1.765E-01
608	4.333E+00	649	3.683E+00	690	1.721E+00	731	5.720E-01	772	1.724E-01
609	4.346E+00	650	3.647E+00	691	1.677E+00	732	5.565E-01	773	1.664E-01
610	4.373E+00	651	3.602E+00	692	1.648E+00	733	5.404E-01	774	1.615E-01
611	4.389E+00	652	3.554E+00	693	1.613E+00	734	5.226E-01	775	1.587E-01
612	4.408E+00	653	3.502E+00	694	1.577E+00	735	5.091E-01	776	1.549E-01
613	4.420E+00	654	3.455E+00	695	1.539E+00	736	4.955E-01	777	1.496E-01
614	4.425E+00	655	3.408E+00	696	1.492E+00	737	4.803E-01	778	1.457E-01
615	4.443E+00	656	3.361E+00	697	1.454E+00	738	4.656E-01	779	1.420E-01
616	4.435E+00	657	3.307E+00	698	1.418E+00	739	4.543E-01	780	1.423E-01
617	4.455E+00	658	3.261E+00	699	1.378E+00	740	4.403E-01		
618	4.460E+00	659	3.208E+00	700	1.346E+00	741	4.246E-01		
619	4.464E+00	660	3.159E+00	701	1.308E+00	742	4.170E-01		
620	4.460E+00	661	3.100E+00	702	1.277E+00	743	4.032E-01		
621	4.461E+00	662	3.056E+00	703	1.246E+00	744	3.888E-01		
622	4.451E+00	663	3.002E+00	704	1.213E+00	745	3.805E-01		
623	4.449E+00	664	2.950E+00	705	1.179E+00	746	3.688E-01		
624	4.435E+00	665	2.904E+00	706	1.154E+00	747	3.566E-01		
625	4.438E+00	666	2.849E+00	707	1.122E+00	748	3.490E-01		

CIE 1931 x y Chromaticity Diagram



7-Step Chromaticity Quadrangles





The Stabilization time: **30 minutes**

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

Test orientation: **Base Up**

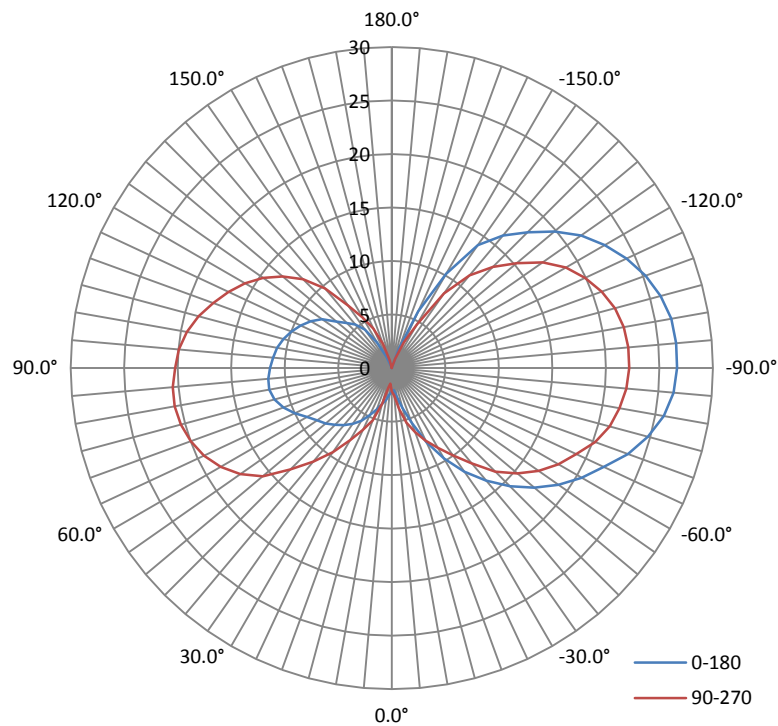
### Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.0	60	0.0199	1.825	0.7630

### Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	$I_{\max}$ (cd)	S/MH (C0/180)	S/MH (C90/270)
206.004	112.88	32.34	4.84	4.54

### Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% $I_{\max}$ ):	106.9	319.8	323.7	321.9	268.1
Field Angle (10% $I_{\max}$ ):	309.2	325.6	329.0	328.6	323.1

**Luminous Intensity (cd) Distribution Data**

C γ	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	2	2	2	2	2	2	2	2
5.0°	2	2	2	2	1	1	2	2
10.0°	3	2	2	2	2	2	2	2
15.0°	3	3	3	4	3	3	3	3
20.0°	4	4	5	5	5	4	5	5
25.0°	5	5	6	7	6	5	6	6
30.0°	6	6	8	9	8	6	8	8
35.0°	6	7	9	10	10	7	10	10
40.0°	7	8	10	12	11	9	12	12
45.0°	8	9	12	14	13	10	15	14
50.0°	8	10	13	16	16	12	17	16
55.0°	9	10	14	18	17	14	19	18
60.0°	9	11	15	19	18	15	20	19
65.0°	10	13	16	21	19	16	22	21
70.0°	11	14	18	22	20	18	23	22
75.0°	11	15	18	23	20	19	25	23
80.0°	12	15	19	24	21	20	26	24
85.0°	12	15	19	24	21	20	27	25
90.0°	11	15	19	25	20	21	27	25
95.0°	11	15	19	25	20	21	27	25
100.0°	11	15	19	25	19	21	27	25
105.0°	10	14	18	24	19	21	27	25
110.0°	10	14	18	24	18	21	26	24
115.0°	9	13	17	23	17	20	25	24
120.0°	9	13	16	22	16	20	24	23
125.0°	8	12	15	21	15	19	23	21
130.0°	7	10	14	19	13	17	21	20
135.0°	6	9	13	17	12	15	20	18
140.0°	5	8	11	14	10	13	17	16
145.0°	4	7	9	11	7	10	13	14
150.0°	3	4	6	7	5	8	10	10
155.0°	1	2	3	4	4	5	6	6
160.0°	0	0	1	2	2	3	3	2
165.0°	0	0	0	0	1	1	1	1
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

**Luminous Intensity (cd) Distribution Data (cont.)**

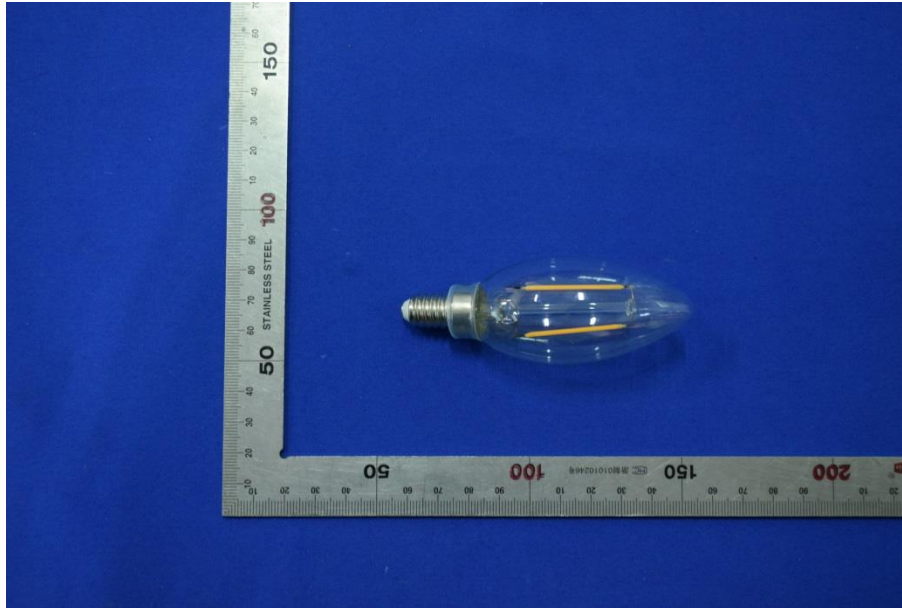
C Y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	2	2	2	2	2	2	2	2
5.0°	2	3	3	3	3	3	4	3
10.0°	3	4	5	4	4	4	5	4
15.0°	4	5	7	7	5	6	6	5
20.0°	5	7	9	10	6	8	8	6
25.0°	8	9	11	12	7	9	9	7
30.0°	10	12	14	15	9	10	11	8
35.0°	12	14	16	18	10	12	12	9
40.0°	14	16	18	20	12	13	14	10
45.0°	16	18	21	22	14	15	15	11
50.0°	17	20	22	24	15	16	17	12
55.0°	19	21	24	26	17	17	18	12
60.0°	20	23	26	28	18	18	19	13
65.0°	22	24	27	29	19	19	20	14
70.0°	23	25	28	31	20	19	21	15
75.0°	25	26	29	32	21	19	21	15
80.0°	26	27	30	32	22	19	22	15
85.0°	26	28	30	32	22	19	22	15
90.0°	27	28	30	32	22	19	22	15
95.0°	27	28	30	32	22	19	21	15
100.0°	27	28	30	31	22	19	21	14
105.0°	26	27	29	30	22	18	20	13
110.0°	25	26	28	29	21	17	19	13
115.0°	24	25	27	28	20	16	18	12
120.0°	23	24	25	26	19	15	17	11
125.0°	22	22	23	24	17	14	15	10
130.0°	20	20	21	22	15	12	13	8
135.0°	18	18	19	19	13	10	11	7
140.0°	16	16	16	15	11	6	8	6
145.0°	14	13	12	11	9	4	5	4
150.0°	10	10	9	7	5	3	3	2
155.0°	6	5	4	3	3	2	2	1
160.0°	2	2	1	1	1	1	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	0.1	0.03
5-10	0.2	0.09
10-15	0.4	0.22
15-20	0.9	0.42
20-25	1.4	0.68
25-30	2.1	1.03
30-35	2.9	1.42
35-40	3.9	1.88
40-45	4.9	2.39
45-50	6.0	2.92
50-55	7.1	3.46
55-60	8.2	3.98
60-65	9.2	4.48
65-70	10.2	4.93
70-75	11.0	5.36
75-80	11.7	5.67
80-85	12.1	5.87
85-90	12.3	5.98
90-95	12.3	5.96
95-100	12.1	5.87
100-105	11.7	5.67
105-110	11.1	5.38
110-115	10.3	5.01
115-120	9.4	4.59
120-125	8.4	4.09
125-130	7.3	3.53
130-135	6.1	2.96
135-140	4.9	2.36
140-145	3.5	1.72
145-150	2.3	1.12
150-155	1.3	0.61
155-160	0.5	0.25
160-165	0.1	0.06
165-170	0.0	0.01
170-175	0.0	0.00
175-180	0.0	0.00

Deg	Flux (lm)	%
0-5	0.1	0.03
0-10	0.2	0.12
0-15	0.7	0.34
0-20	1.6	0.76
0-25	3.0	1.44
0-30	5.1	2.47
0-35	8.0	3.89
0-40	11.9	5.77
0-45	16.8	8.16
0-50	22.8	11.08
0-55	30.0	14.54
0-60	38.2	18.52
0-65	47.4	23.00
0-70	57.5	27.93
0-75	68.6	33.29
0-80	80.3	38.96
0-85	92.4	44.83
0-90	104.7	50.81
0-95	117.0	56.77
0-100	129.0	62.64
0-105	140.7	68.31
0-110	151.8	73.69
0-115	162.1	78.70
0-120	171.6	83.29
0-125	180.0	87.38
0-130	187.3	90.91
0-135	193.4	93.87
0-140	198.2	96.23
0-145	201.8	97.95
0-150	204.1	99.07
0-155	205.4	99.68
0-160	205.9	99.93
0-165	206.0	99.99
0-170	206.0	100.00
0-175	206.0	100.00
0-180	206.0	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. This report includes some test methods are not in NVLAP accreditation scope marked \*.
3. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.
4. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.
5. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor  $K=2$  with the 95% confidence interval.
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\*\*\*\*\*END OF REPORT\*\*\*\*\*