



# 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: 7MR16DIM/930FL35/RC**

<b>Report Type:</b>	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution
<b>Reviewed By:</b>	George Chen <i>George Chen</i>
<b>Report Number:</b>	KS2211025-54694E-10
<b>Test Date:</b>	2021-07-15 to 2021-07-21
<b>Report Date:</b>	2021-11-16
<b>Approved 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

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

### General Information:

Two samples were received on 2021-07-06. One was tested in integrating sphere and the other was tested in goniophotometer.

Model Tested: 7MR16DIM/930FL35/RC  
Manufacturer: GREEN CREATIVE LTD  
Brand Name: GREEN CREATIVE  
Product Designation: Directional LED Lamp  
Burning Time Before Test: 0hour(For New Products)

### Rated Values:

Rated Voltage/Frequency: 12 VAC 60Hz  
Rated Power: 7W  
Nominal CCT: 3000K  
Nominal Lumen Output: 500lm

### Note:

- The applicant GREEN CREATIVE LTD declare that their products with model 7MR16DIM/930FL35/RC are the same to the products in report#KS2210706-27587E-10 and is authorized by original applicant to use their test data.
- All the data in previous report (KS2210706-27587E-10) is shared in this report.

## 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 (This method is not in IAS 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	2020-10-21	2021-10-20
spectroradiometer	EVERFINE	HAAS-2000	G112048TS81331121	2020-10-21	2021-10-20
Digital Power Meter	EVERFINE	PF2010A	1011004	2020-10-21	2021-10-20
Digital CC&CV DC Power Supply	EVERFINE	WY305-V1	1101047	2021-06-30	2022-06-29
Rapid Recording Photometer	EVERFINE	PHOTO-2000F	1007010	2020-11-05	2021-11-04
Standard Light Source	EVERFINE	D204	N/A	2020-10-20	2021-10-19
Special zero-voltage synchronous switching AC	EVERFINE	DPS1010-YF	1011001T	2021-01-04	2022-01-03
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

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
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
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  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$  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]

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

Test orientation: **Base Up**

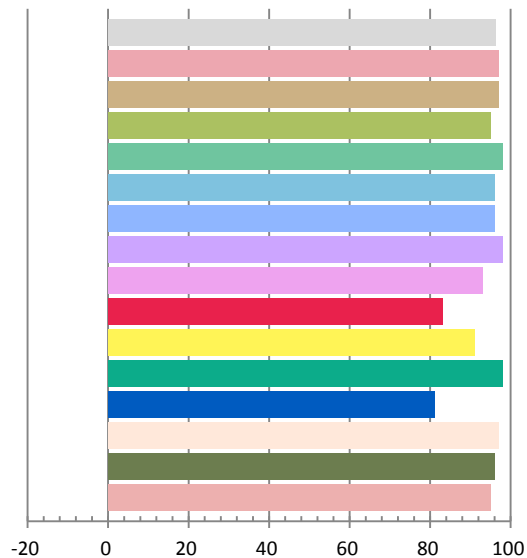
### Photometric and Electrical Measurement Result

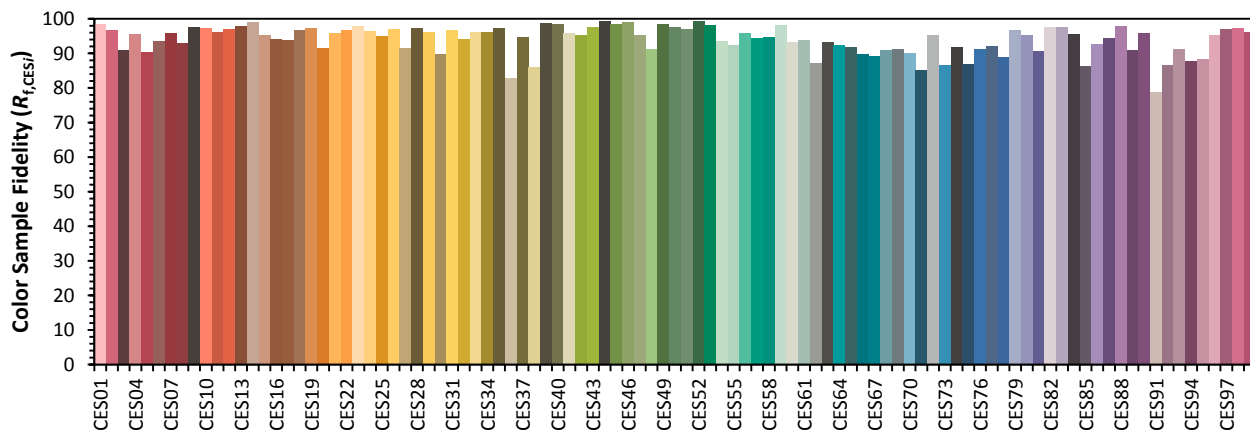
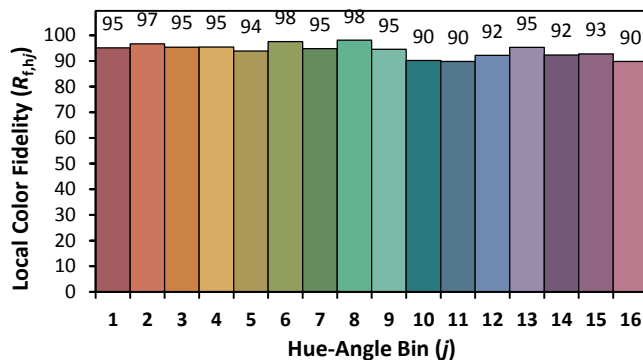
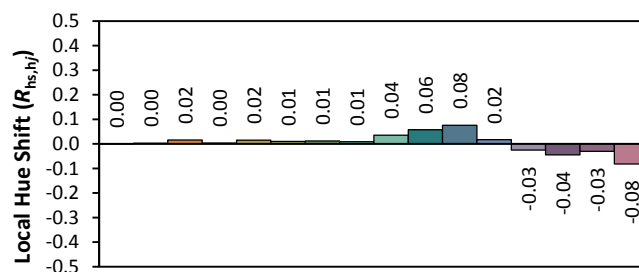
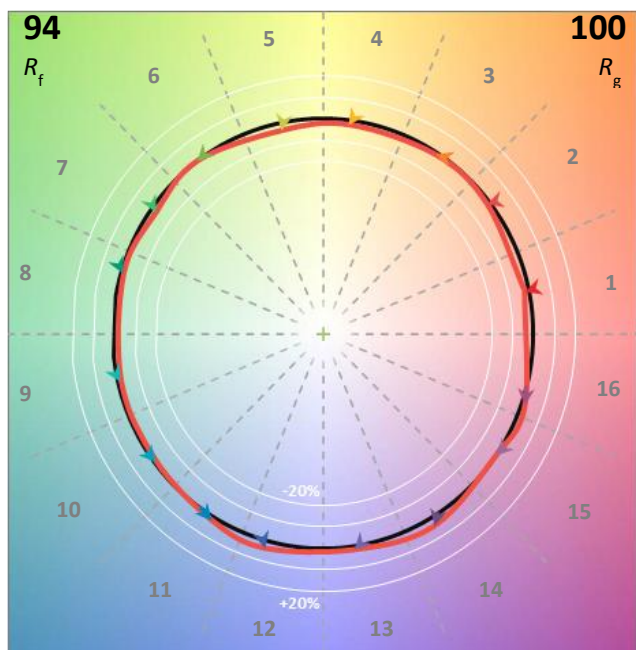
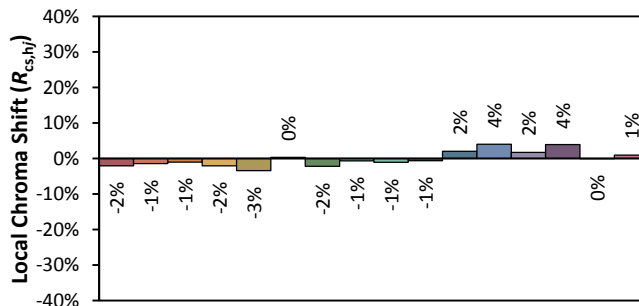
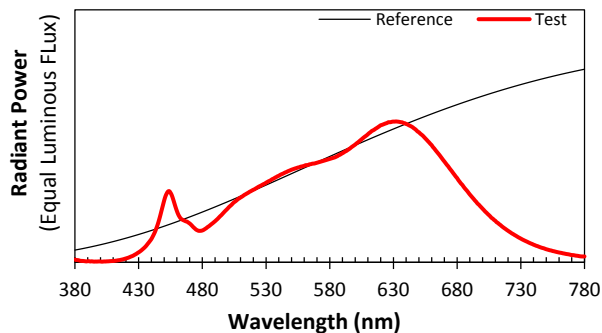
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
12.0	60	0.5646	6.200	0.9151	542.03	87.42

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
1.956	3058	0.0018000	0.4354	0.4081	0.2479	0.5227

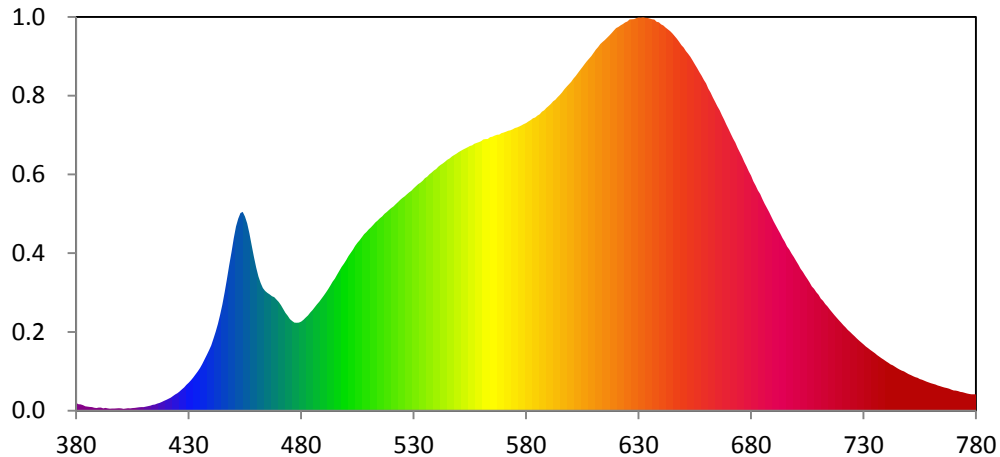
### Color Rendering Index

<b>Ra</b>			
96.3			
<b>R1</b>	<b>R2</b>	<b>R3</b>	<b>R4</b>
97	97	95	98
<b>R5</b>	<b>R6</b>	<b>R7</b>	<b>R8</b>
96	96	98	93
<b>R9</b>	<b>R10</b>	<b>R11</b>	<b>R12</b>
83	91	98	81
<b>R13</b>	<b>R14</b>	<b>R15</b>	
97	96	95	





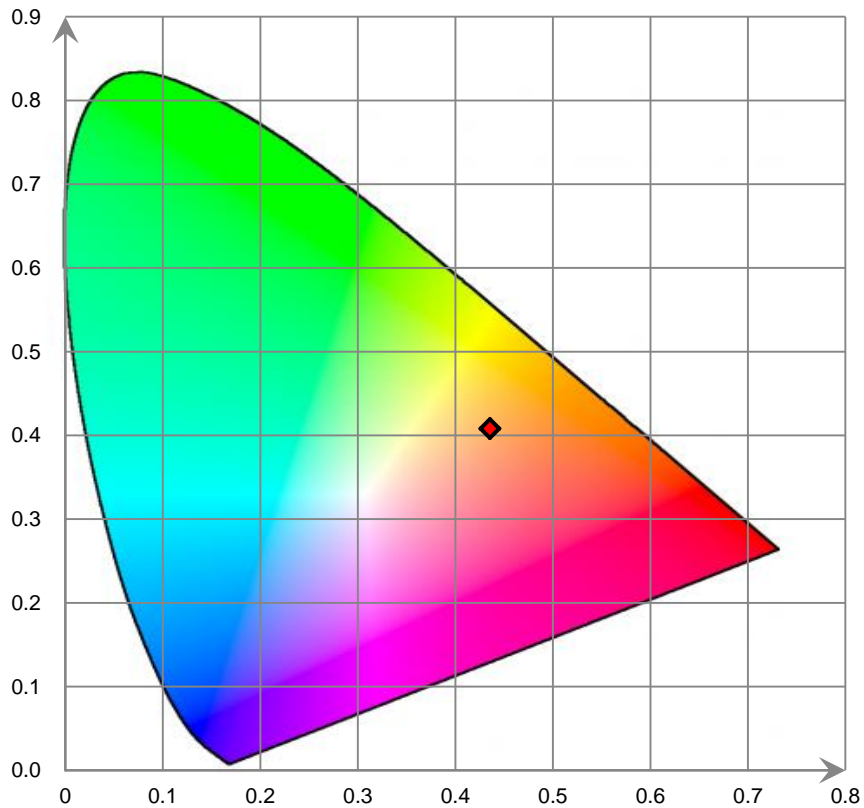
Relative Spectral Power Distribution



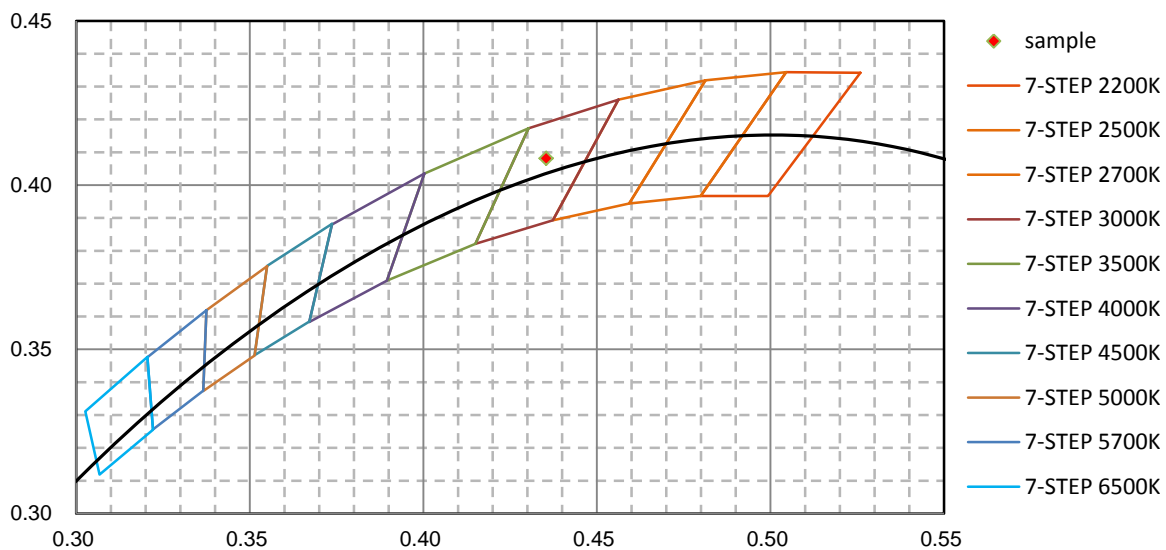
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	2.202E-01	421	3.375E-01	462	3.594E+00	503	4.531E+00	544	7.006E+00
381	1.830E-01	422	3.687E-01	463	3.450E+00	504	4.639E+00	545	7.062E+00
382	1.774E-01	423	4.136E-01	464	3.370E+00	505	4.728E+00	546	7.097E+00
383	1.584E-01	424	4.561E-01	465	3.316E+00	506	4.797E+00	547	7.151E+00
384	1.251E-01	425	4.937E-01	466	3.271E+00	507	4.882E+00	548	7.192E+00
385	1.136E-01	426	5.433E-01	467	3.223E+00	508	4.968E+00	549	7.233E+00
386	1.085E-01	427	6.029E-01	468	3.193E+00	509	5.029E+00	550	7.279E+00
387	1.007E-01	428	6.569E-01	469	3.125E+00	510	5.099E+00	551	7.313E+00
388	8.641E-02	429	7.264E-01	470	3.058E+00	511	5.156E+00	552	7.349E+00
389	7.442E-02	430	7.880E-01	471	2.969E+00	512	5.226E+00	553	7.383E+00
390	9.004E-02	431	8.556E-01	472	2.864E+00	513	5.300E+00	554	7.413E+00
391	9.111E-02	432	9.298E-01	473	2.756E+00	514	5.353E+00	555	7.450E+00
392	6.768E-02	433	1.018E+00	474	2.671E+00	515	5.416E+00	556	7.468E+00
393	8.177E-02	434	1.107E+00	475	2.577E+00	516	5.469E+00	557	7.512E+00
394	6.872E-02	435	1.200E+00	476	2.524E+00	517	5.539E+00	558	7.534E+00
395	5.766E-02	436	1.311E+00	477	2.478E+00	518	5.588E+00	559	7.557E+00
396	6.379E-02	437	1.441E+00	478	2.476E+00	519	5.648E+00	560	7.585E+00
397	6.064E-02	438	1.566E+00	479	2.481E+00	520	5.702E+00	561	7.631E+00
398	6.643E-02	439	1.696E+00	480	2.507E+00	521	5.746E+00	562	7.641E+00
399	7.257E-02	440	1.833E+00	481	2.553E+00	522	5.810E+00	563	7.649E+00
400	6.772E-02	441	2.023E+00	482	2.618E+00	523	5.870E+00	564	7.698E+00
401	5.232E-02	442	2.221E+00	483	2.681E+00	524	5.934E+00	565	7.711E+00
402	5.937E-02	443	2.444E+00	484	2.763E+00	525	5.985E+00	566	7.742E+00
403	6.964E-02	444	2.706E+00	485	2.828E+00	526	6.032E+00	567	7.762E+00
404	6.771E-02	445	2.992E+00	486	2.909E+00	527	6.092E+00	568	7.768E+00
405	7.693E-02	446	3.328E+00	487	2.991E+00	528	6.146E+00	569	7.810E+00
406	8.068E-02	447	3.695E+00	488	3.067E+00	529	6.189E+00	570	7.829E+00
407	8.900E-02	448	4.080E+00	489	3.151E+00	530	6.258E+00	571	7.848E+00
408	9.588E-02	449	4.465E+00	490	3.236E+00	531	6.313E+00	572	7.876E+00
409	1.032E-01	450	4.850E+00	491	3.327E+00	532	6.372E+00	573	7.889E+00
410	1.046E-01	451	5.183E+00	492	3.418E+00	533	6.417E+00	574	7.917E+00
411	1.163E-01	452	5.405E+00	493	3.525E+00	534	6.474E+00	575	7.952E+00
412	1.291E-01	453	5.561E+00	494	3.629E+00	535	6.543E+00	576	7.971E+00
413	1.445E-01	454	5.594E+00	495	3.720E+00	536	6.585E+00	577	7.999E+00
414	1.641E-01	455	5.466E+00	496	3.828E+00	537	6.654E+00	578	8.030E+00
415	1.755E-01	456	5.271E+00	497	3.937E+00	538	6.700E+00	579	8.065E+00
416	1.990E-01	457	4.984E+00	498	4.044E+00	539	6.762E+00	580	8.092E+00
417	2.206E-01	458	4.656E+00	499	4.140E+00	540	6.801E+00	581	8.135E+00
418	2.450E-01	459	4.329E+00	500	4.241E+00	541	6.867E+00	582	8.179E+00
419	2.766E-01	460	4.034E+00	501	4.352E+00	542	6.917E+00	583	8.227E+00
420	3.058E-01	461	3.783E+00	502	4.442E+00	543	6.959E+00	584	8.249E+00

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	8.305E+00	626	1.101E+01	667	8.316E+00	708	3.432E+00	749	1.066E+00
586	8.342E+00	627	1.101E+01	668	8.185E+00	709	3.334E+00	750	1.028E+00
587	8.413E+00	628	1.102E+01	669	8.047E+00	710	3.262E+00	751	1.003E+00
588	8.455E+00	629	1.105E+01	670	7.922E+00	711	3.154E+00	752	9.715E-01
589	8.519E+00	630	1.106E+01	671	7.788E+00	712	3.093E+00	753	9.443E-01
590	8.574E+00	631	1.106E+01	672	7.657E+00	713	3.003E+00	754	9.268E-01
591	8.634E+00	632	1.107E+01	673	7.544E+00	714	2.932E+00	755	8.906E-01
592	8.702E+00	633	1.106E+01	674	7.396E+00	715	2.842E+00	756	8.725E-01
593	8.750E+00	634	1.105E+01	675	7.268E+00	716	2.765E+00	757	8.456E-01
594	8.821E+00	635	1.103E+01	676	7.140E+00	717	2.690E+00	758	8.203E-01
595	8.887E+00	636	1.101E+01	677	7.000E+00	718	2.621E+00	759	7.958E-01
596	8.959E+00	637	1.100E+01	678	6.872E+00	719	2.546E+00	760	7.736E-01
597	9.045E+00	638	1.094E+01	679	6.733E+00	720	2.479E+00	761	7.555E-01
598	9.115E+00	639	1.093E+01	680	6.617E+00	721	2.409E+00	762	7.369E-01
599	9.184E+00	640	1.087E+01	681	6.460E+00	722	2.344E+00	763	7.108E-01
600	9.256E+00	641	1.084E+01	682	6.332E+00	723	2.271E+00	764	6.941E-01
601	9.343E+00	642	1.078E+01	683	6.197E+00	724	2.220E+00	765	6.713E-01
602	9.417E+00	643	1.073E+01	684	6.096E+00	725	2.154E+00	766	6.527E-01
603	9.499E+00	644	1.068E+01	685	5.955E+00	726	2.098E+00	767	6.382E-01
604	9.585E+00	645	1.062E+01	686	5.823E+00	727	2.035E+00	768	6.206E-01
605	9.667E+00	646	1.054E+01	687	5.707E+00	728	1.974E+00	769	5.930E-01
606	9.754E+00	647	1.047E+01	688	5.590E+00	729	1.919E+00	770	5.732E-01
607	9.835E+00	648	1.038E+01	689	5.457E+00	730	1.866E+00	771	5.685E-01
608	9.908E+00	649	1.028E+01	690	5.329E+00	731	1.808E+00	772	5.539E-01
609	9.981E+00	650	1.022E+01	691	5.212E+00	732	1.758E+00	773	5.306E-01
610	1.007E+01	651	1.012E+01	692	5.095E+00	733	1.710E+00	774	5.193E-01
611	1.016E+01	652	1.004E+01	693	4.980E+00	734	1.663E+00	775	5.047E-01
612	1.023E+01	653	9.957E+00	694	4.857E+00	735	1.617E+00	776	4.849E-01
613	1.032E+01	654	9.851E+00	695	4.752E+00	736	1.566E+00	777	4.701E-01
614	1.037E+01	655	9.743E+00	696	4.621E+00	737	1.520E+00	778	4.628E-01
615	1.043E+01	656	9.640E+00	697	4.536E+00	738	1.476E+00	779	4.634E-01
616	1.050E+01	657	9.529E+00	698	4.425E+00	739	1.437E+00	780	4.640E-01
617	1.056E+01	658	9.424E+00	699	4.321E+00	740	1.388E+00		
618	1.063E+01	659	9.309E+00	700	4.211E+00	741	1.350E+00		
619	1.070E+01	660	9.209E+00	701	4.107E+00	742	1.306E+00		
620	1.077E+01	661	9.061E+00	702	3.993E+00	743	1.277E+00		
621	1.080E+01	662	8.951E+00	703	3.906E+00	744	1.235E+00		
622	1.084E+01	663	8.817E+00	704	3.801E+00	745	1.196E+00		
623	1.088E+01	664	8.697E+00	705	3.710E+00	746	1.160E+00		
624	1.092E+01	665	8.572E+00	706	3.611E+00	747	1.130E+00		
625	1.095E+01	666	8.452E+00	707	3.499E+00	748	1.105E+00		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles



### [Goniophotometer System]

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

Test orientation: **Base Up**

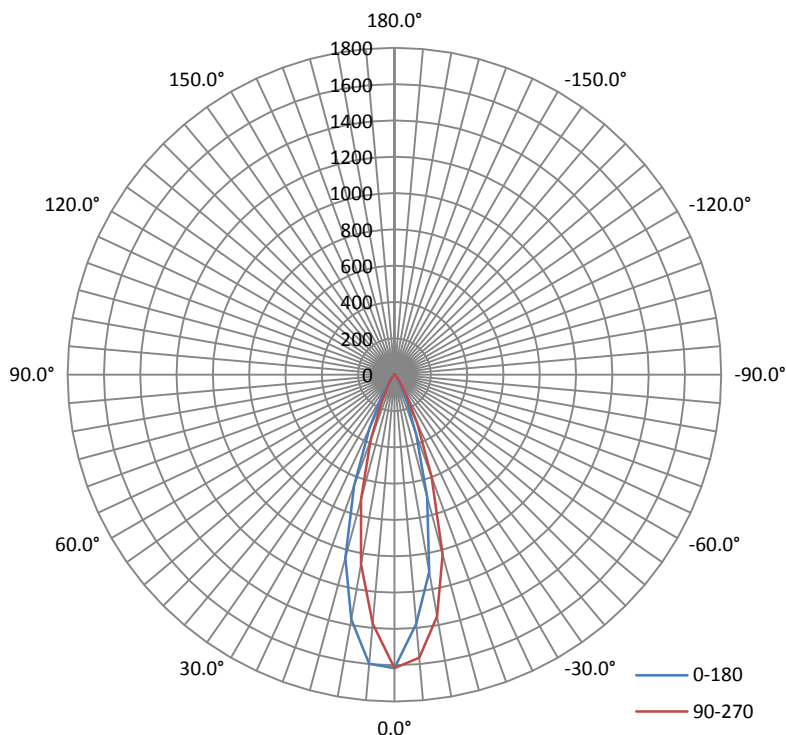
### Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
12.00	60	0.5584	6.250	0.9325

### Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	I <sub>max</sub> (cd)	S/MH(C0/180)	S/MH(C90/270)
545.761	87.32	1677.0	0.46	0.55

### Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50%I <sub>max</sub> ):	31.3	31.5	31.0	30.6	31.1
Field Angle(10%I <sub>max</sub> ):	53.7	54.5	53.6	53.6	53.9

**Luminous Intensity (cd) Distribution Data**

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	1616	1616	1616	1616	1616	1616	1616	1616
5.0°	1598	1528	1461	1410	1376	1356	1346	1354
10.0°	1369	1290	1204	1133	1059	1029	1019	1047
15.0°	1044	973	878	784	711	670	652	667
20.0°	649	581	511	438	383	348	334	339
25.0°	325	282	240	196	160	141	144	152
30.0°	144	121	104	81	70	61	61	65
35.0°	66	55	44	37	33	31	31	34
40.0°	30	27	23	21	18	17	17	17
45.0°	17	15	14	13	13	12	11	12
50.0°	11	10	10	10	9	9	9	9
55.0°	8	8	8	7	7	7	7	7
60.0°	7	7	6	6	6	6	6	6
65.0°	6	6	5	5	5	5	5	5
70.0°	4	5	4	4	4	4	3	4
75.0°	3	4	3	3	3	3	2	2
80.0°	2	2	2	2	2	2	2	2
85.0°	1	2	1	1	1	1	1	1
90.0°	1	1	1	1	1	1	1	1
95.0°	1	1	1	1	0	1	0	0
100.0°	0	1	1	0	0	1	1	1
105.0°	0	2	1	1	1	1	0	0
110.0°	0	1	0	0	0	0	1	1
115.0°	0	0	0	0	0	0	3	3
120.0°	0	2	2	4	0	5	3	3
125.0°	0	2	1	1	0	1	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	1	1	1	1	1	1
145.0°	1	1	1	1	1	1	1	1
150.0°	1	1	1	1	1	1	1	1
155.0°	1	1	1	2	2	2	2	2
160.0°	2	2	2	2	2	2	2	2
165.0°	2	2	2	2	2	2	2	2
170.0°	1	1	1	1	1	1	1	1
175.0°	1	1	1	1	1	1	1	1
180.0°	1	1	1	1	1	1	1	1

Luminous Intensity (cd) Distribution Data (cont.)

C y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	1616	1616	1616	1616	1616	1616	1616	1616
5.0°	1377	1415	1465	1511	1565	1609	1624	1609
10.0°	1102	1171	1250	1297	1352	1405	1416	1370
15.0°	696	767	858	946	1025	1069	1088	1077
20.0°	352	397	455	532	595	643	668	660
25.0°	160	177	216	256	296	324	343	340
30.0°	70	80	100	115	134	146	157	158
35.0°	35	39	48	53	64	70	71	72
40.0°	18	19	22	26	33	34	34	33
45.0°	12	12	13	15	16	17	18	17
50.0°	9	9	10	11	11	11	11	11
55.0°	7	7	8	8	8	8	9	8
60.0°	6	6	6	7	7	7	7	7
65.0°	5	5	5	5	6	6	6	6
70.0°	4	4	4	4	4	4	4	4
75.0°	2	3	3	3	3	3	3	3
80.0°	2	2	2	2	2	2	2	2
85.0°	1	1	1	1	1	1	2	2
90.0°	1	1	1	1	1	1	1	1
95.0°	1	1	0	0	1	1	1	1
100.0°	1	1	0	0	0	0	0	0
105.0°	1	1	0	0	1	1	1	1
110.0°	0	0	1	1	0	1	0	0
115.0°	1	0	1	1	0	0	1	1
120.0°	4	4	5	3	3	1	4	3
125.0°	0	1	0	0	2	2	3	1
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°	1	1	1	1	0	0	0	1
180.0°	1	1	1	1	1	1	1	1

**Zonal Lumen Density Measurement**

Deg	Flux (lm)	%
0-5	36.8	6.73
5-10	96.0	17.59
10-15	123.3	22.60
15-20	110.1	20.17
20-25	72.8	13.34
25-30	40.5	7.41
30-35	21.0	3.85
35-40	11.8	2.16
40-45	6.8	1.25
45-50	4.8	0.88
50-55	3.8	0.69
55-60	3.2	0.60
60-65	2.8	0.52
65-70	2.4	0.43
70-75	1.8	0.33
75-80	1.3	0.24
80-85	0.9	0.16
85-90	0.6	0.11
90-95	0.4	0.07
95-100	0.3	0.05
100-105	0.4	0.07
105-110	0.3	0.06
110-115	0.3	0.05
115-120	1.0	0.17
120-125	1.0	0.18
125-130	0.2	0.03
130-135	0.1	0.02
135-140	0.1	0.02
140-145	0.2	0.03
145-150	0.2	0.04
150-155	0.2	0.04
155-160	0.2	0.04
160-165	0.2	0.03
165-170	0.1	0.03
170-175	0.1	0.01
175-180	0.0	0.00

Deg	Flux (lm)	%
0-5	36.8	6.73
0-10	132.7	24.32
0-15	256.1	46.92
0-20	366.1	67.09
0-25	439.0	80.43
0-30	479.4	87.84
0-35	500.4	91.69
0-40	512.2	93.85
0-45	519.0	95.10
0-50	523.8	95.98
0-55	527.6	96.67
0-60	530.8	97.27
0-65	533.7	97.79
0-70	536.0	98.22
0-75	537.9	98.55
0-80	539.1	98.79
0-85	540.0	98.95
0-90	540.6	99.06
0-95	541.0	99.13
0-100	541.3	99.18
0-105	541.7	99.25
0-110	542.0	99.31
0-115	542.2	99.36
0-120	543.2	99.53
0-125	544.2	99.71
0-130	544.4	99.74
0-135	544.4	99.76
0-140	544.6	99.78
0-145	544.7	99.81
0-150	544.9	99.85
0-155	545.2	99.89
0-160	545.4	99.93
0-165	545.6	99.96
0-170	545.7	99.99
0-175	545.7	100.00
0-180	545.8	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.
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\*\*\*\*\*END OF REPORT\*\*\*\*\*