



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: 6.5MR16DIM/827FL35/35W

Report Type:	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution
Project Engineer:	George Chen <i>George Chen</i>
Report Number:	KS2211025-54715E-10
Test Date:	2021-03-04 to 2021-03-05
Report Date:	2021-11-16
Reviewed By:	Blake Zhang / EE Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Dongguan). No.12, Pulong East 1 st Road, Tangxia Town, Dongguan, Guangdong, China. Tel: +86-0769-86858888 Fax: +86-0769-86858588
Accreditation:	The IAS Accreditation Number TL-460.

1. Product Description[#]

General Information:

Two samples were received on 2021-03-04. One was tested in integrating sphere and the other was tested in goniophotometer.

Model Tested: 6.5MR16DIM/827FL35/35W
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: 6.5W
Nominal CCT: 2700K
Nominal Lumen Output: 460lm

Note:

1. The applicant GREEN CREATIVE LTD declare that their products with model 6.5MR16DIM/827FL35/35W are the same to the products in report#KS2210303-27532E-10-2 and is authorized by original applicant to use their test data.
2. All the data in previous report (KS2210303-27532E-10-2) 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	2020-07-01	2021-06-30
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	2020-03-13	2021-03-12

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
Digital CC&CV DC Power Supply	EVERFINE	WY12010	1009009	2020-03-13	2021-03-12
Digital power meter	YOKOGAWA	WT-210	91j926132	2020-03-13	2021-03-12
full-field speed goniophotometer	EVERFINE	GO-R5000	YG108492N10120001	2020-03-13	2021-03-12
Wireless Remote Sensor	N/A	433MHz	N/A	2020-03-13	2021-03-12
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.

4 π 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=22K (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 (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**

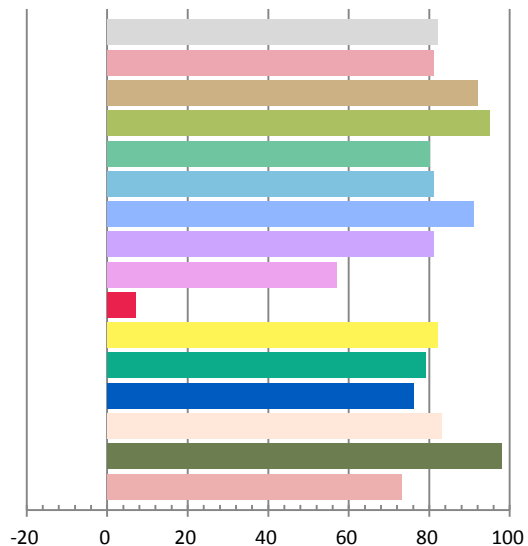
Photometric and Electrical Measurement Result

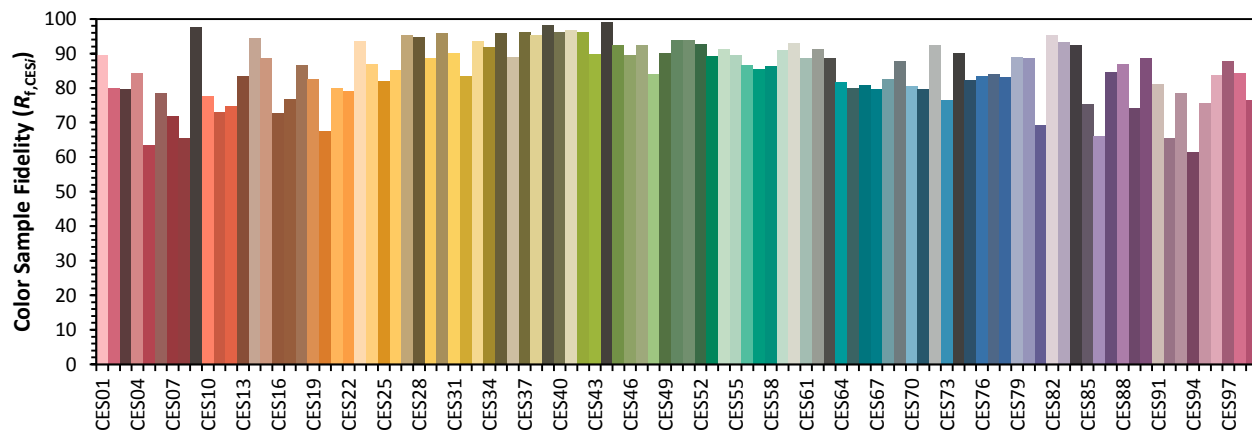
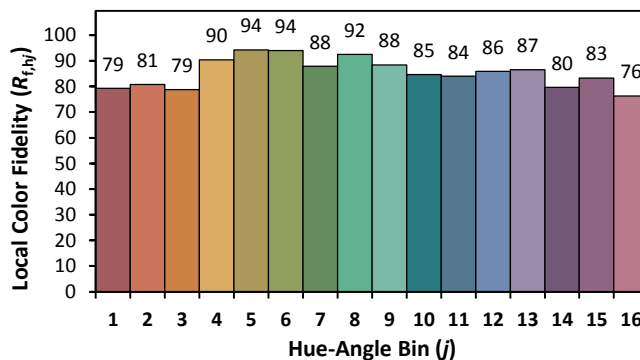
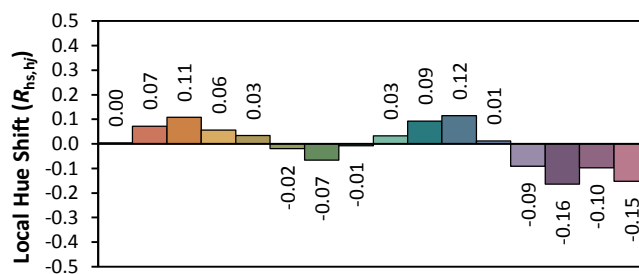
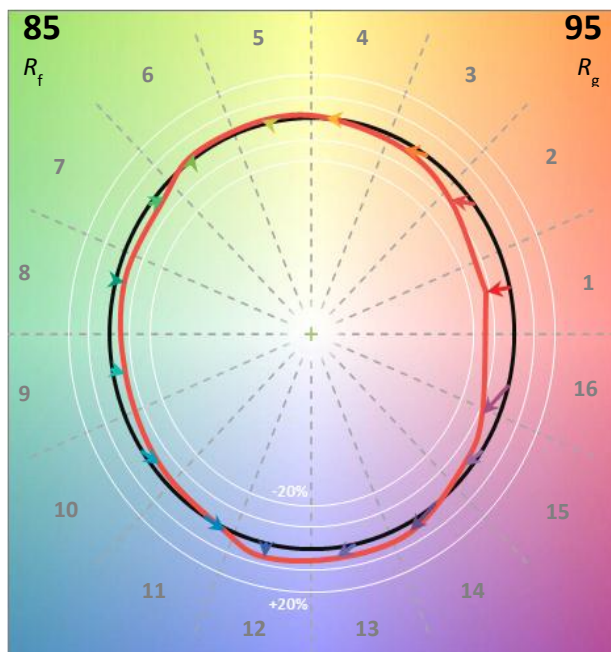
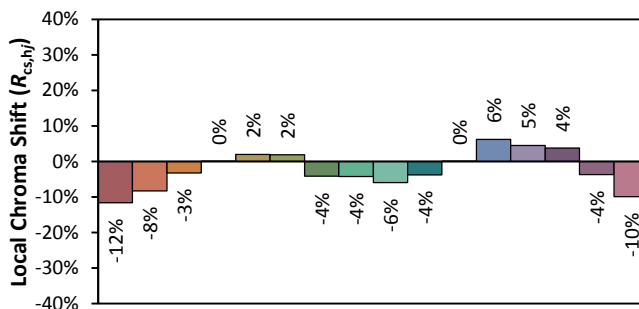
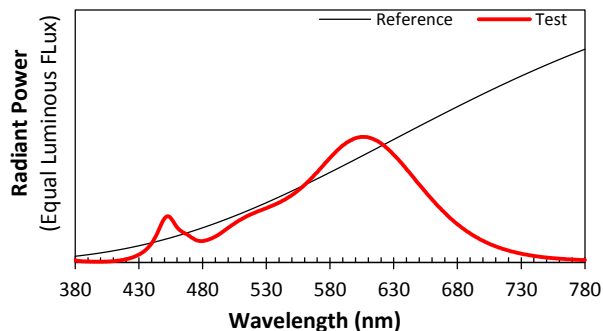
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
12.0	60	0.5295	5.969	0.9393	469.84	78.72

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
1.459	2717	-0.000102	0.4583	0.4100	0.2618	0.5269

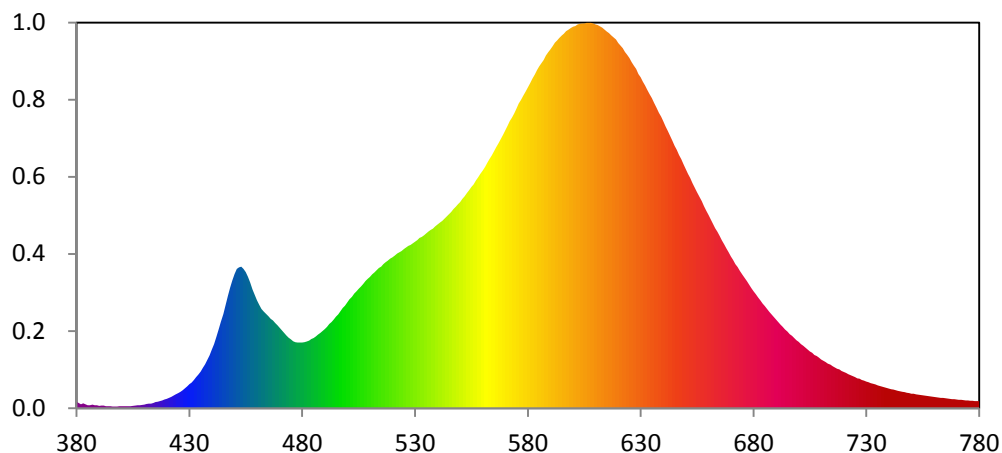
Color Rendering Index

Ra			
82.1			
R1	R2	R3	R4
81	92	95	80
R5	R6	R7	R8
81	91	81	57
R9	R10	R11	R12
7	82	79	76
R13	R14	R15	
83	98	73	





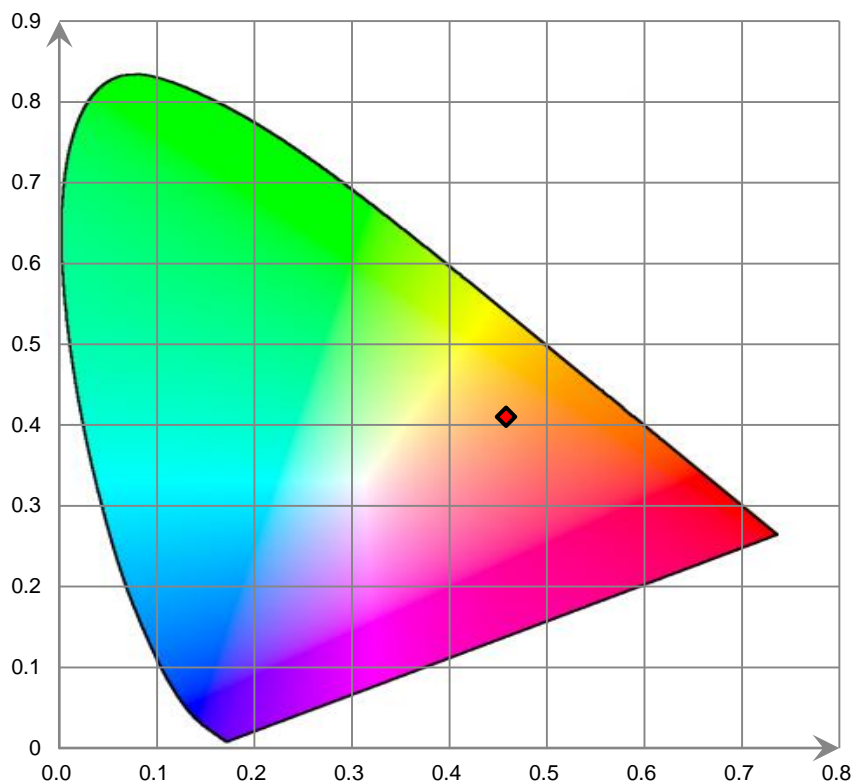
Relative Spectral Power Distribution



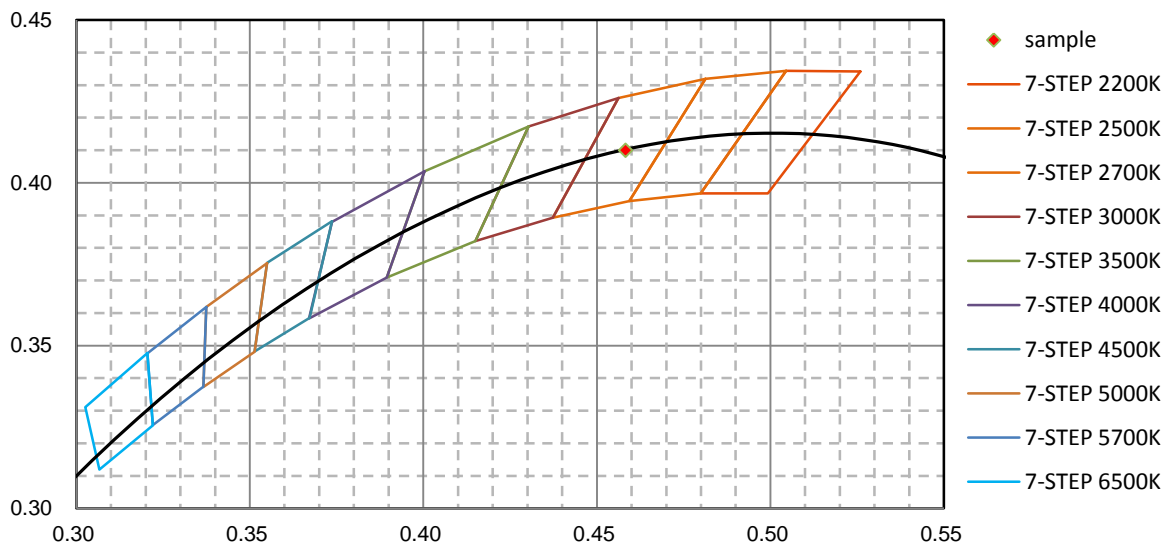
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	1.732E-01	421	2.731E-01	462	2.613E+00	503	3.012E+00	544	5.041E+00
381	1.376E-01	422	3.011E-01	463	2.540E+00	504	3.073E+00	545	5.097E+00
382	1.074E-01	423	3.333E-01	464	2.475E+00	505	3.139E+00	546	5.162E+00
383	1.323E-01	424	3.627E-01	465	2.414E+00	506	3.198E+00	547	5.233E+00
384	1.029E-01	425	3.990E-01	466	2.347E+00	507	3.271E+00	548	5.290E+00
385	7.812E-02	426	4.315E-01	467	2.304E+00	508	3.341E+00	549	5.361E+00
386	7.949E-02	427	4.753E-01	468	2.240E+00	509	3.403E+00	550	5.424E+00
387	9.666E-02	428	5.219E-01	469	2.180E+00	510	3.453E+00	551	5.500E+00
388	7.724E-02	429	5.747E-01	470	2.111E+00	511	3.519E+00	552	5.568E+00
389	7.722E-02	430	6.358E-01	471	2.047E+00	512	3.569E+00	553	5.659E+00
390	5.984E-02	431	6.801E-01	472	1.981E+00	513	3.629E+00	554	5.735E+00
391	6.725E-02	432	7.456E-01	473	1.915E+00	514	3.684E+00	555	5.817E+00
392	6.733E-02	433	8.178E-01	474	1.850E+00	515	3.725E+00	556	5.885E+00
393	5.094E-02	434	8.908E-01	475	1.810E+00	516	3.785E+00	557	5.984E+00
394	5.183E-02	435	9.639E-01	476	1.764E+00	517	3.835E+00	558	6.064E+00
395	5.353E-02	436	1.066E+00	477	1.740E+00	518	3.884E+00	559	6.158E+00
396	5.015E-02	437	1.159E+00	478	1.727E+00	519	3.931E+00	560	6.255E+00
397	4.712E-02	438	1.277E+00	479	1.725E+00	520	3.966E+00	561	6.342E+00
398	4.935E-02	439	1.396E+00	480	1.728E+00	521	4.015E+00	562	6.454E+00
399	5.423E-02	440	1.540E+00	481	1.736E+00	522	4.063E+00	563	6.553E+00
400	5.354E-02	441	1.690E+00	482	1.755E+00	523	4.101E+00	564	6.648E+00
401	5.617E-02	442	1.869E+00	483	1.778E+00	524	4.135E+00	565	6.757E+00
402	5.403E-02	443	2.061E+00	484	1.817E+00	525	4.182E+00	566	6.863E+00
403	5.674E-02	444	2.266E+00	485	1.848E+00	526	4.227E+00	567	6.966E+00
404	5.663E-02	445	2.480E+00	486	1.890E+00	527	4.266E+00	568	7.074E+00
405	6.287E-02	446	2.709E+00	487	1.935E+00	528	4.294E+00	569	7.189E+00
406	7.251E-02	447	2.948E+00	488	1.981E+00	529	4.332E+00	570	7.301E+00
407	7.715E-02	448	3.164E+00	489	2.028E+00	530	4.380E+00	571	7.420E+00
408	8.145E-02	449	3.361E+00	490	2.080E+00	531	4.417E+00	572	7.547E+00
409	8.546E-02	450	3.524E+00	491	2.142E+00	532	4.476E+00	573	7.637E+00
410	9.507E-02	451	3.658E+00	492	2.213E+00	533	4.506E+00	574	7.747E+00
411	1.103E-01	452	3.706E+00	493	2.268E+00	534	4.547E+00	575	7.879E+00
412	1.174E-01	453	3.722E+00	494	2.335E+00	535	4.592E+00	576	8.006E+00
413	1.221E-01	454	3.664E+00	495	2.409E+00	536	4.648E+00	577	8.107E+00
414	1.418E-01	455	3.581E+00	496	2.467E+00	537	4.691E+00	578	8.215E+00
415	1.618E-01	456	3.448E+00	497	2.549E+00	538	4.725E+00	579	8.329E+00
416	1.745E-01	457	3.302E+00	498	2.635E+00	539	4.778E+00	580	8.440E+00
417	1.901E-01	458	3.124E+00	499	2.698E+00	540	4.830E+00	581	8.550E+00
418	2.074E-01	459	2.982E+00	500	2.783E+00	541	4.881E+00	582	8.668E+00
419	2.281E-01	460	2.838E+00	501	2.863E+00	542	4.923E+00	583	8.770E+00
420	2.500E-01	461	2.725E+00	502	2.929E+00	543	4.985E+00	584	8.882E+00

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	8.983E+00	626	9.095E+00	667	4.311E+00	708	1.373E+00	749	4.012E-01
586	9.067E+00	627	9.006E+00	668	4.202E+00	709	1.332E+00	750	3.864E-01
587	9.158E+00	628	8.914E+00	669	4.104E+00	710	1.284E+00	751	3.815E-01
588	9.269E+00	629	8.788E+00	670	3.989E+00	711	1.252E+00	752	3.681E-01
589	9.353E+00	630	8.696E+00	671	3.902E+00	712	1.212E+00	753	3.547E-01
590	9.431E+00	631	8.578E+00	672	3.791E+00	713	1.173E+00	754	3.459E-01
591	9.513E+00	632	8.482E+00	673	3.711E+00	714	1.144E+00	755	3.392E-01
592	9.605E+00	633	8.365E+00	674	3.610E+00	715	1.105E+00	756	3.273E-01
593	9.664E+00	634	8.252E+00	675	3.514E+00	716	1.073E+00	757	3.220E-01
594	9.733E+00	635	8.149E+00	676	3.430E+00	717	1.041E+00	758	3.146E-01
595	9.792E+00	636	8.024E+00	677	3.340E+00	718	1.018E+00	759	3.103E-01
596	9.841E+00	637	7.891E+00	678	3.251E+00	719	9.817E-01	760	2.998E-01
597	9.908E+00	638	7.766E+00	679	3.160E+00	720	9.568E-01	761	2.903E-01
598	9.953E+00	639	7.662E+00	680	3.074E+00	721	9.266E-01	762	2.813E-01
599	9.994E+00	640	7.539E+00	681	2.997E+00	722	8.949E-01	763	2.760E-01
600	1.003E+01	641	7.401E+00	682	2.909E+00	723	8.666E-01	764	2.746E-01
601	1.005E+01	642	7.287E+00	683	2.838E+00	724	8.438E-01	765	2.639E-01
602	1.009E+01	643	7.157E+00	684	2.757E+00	725	8.183E-01	766	2.535E-01
603	1.010E+01	644	7.035E+00	685	2.689E+00	726	7.897E-01	767	2.504E-01
604	1.012E+01	645	6.903E+00	686	2.611E+00	727	7.733E-01	768	2.421E-01
605	1.012E+01	646	6.788E+00	687	2.536E+00	728	7.452E-01	769	2.361E-01
606	1.013E+01	647	6.660E+00	688	2.466E+00	729	7.232E-01	770	2.321E-01
607	1.013E+01	648	6.546E+00	689	2.398E+00	730	7.030E-01	771	2.237E-01
608	1.013E+01	649	6.412E+00	690	2.330E+00	731	6.864E-01	772	2.188E-01
609	1.012E+01	650	6.290E+00	691	2.262E+00	732	6.596E-01	773	2.140E-01
610	1.009E+01	651	6.163E+00	692	2.202E+00	733	6.406E-01	774	2.075E-01
611	1.007E+01	652	6.055E+00	693	2.135E+00	734	6.253E-01	775	2.037E-01
612	1.004E+01	653	5.913E+00	694	2.076E+00	735	6.005E-01	776	1.957E-01
613	1.001E+01	654	5.801E+00	695	2.015E+00	736	5.842E-01	777	1.962E-01
614	9.950E+00	655	5.680E+00	696	1.947E+00	737	5.670E-01	778	1.922E-01
615	9.906E+00	656	5.553E+00	697	1.905E+00	738	5.510E-01	779	1.924E-01
616	9.861E+00	657	5.443E+00	698	1.844E+00	739	5.360E-01	780	1.927E-01
617	9.804E+00	658	5.310E+00	699	1.787E+00	740	5.204E-01		
618	9.741E+00	659	5.196E+00	700	1.742E+00	741	5.018E-01		
619	9.692E+00	660	5.082E+00	701	1.690E+00	742	4.900E-01		
620	9.602E+00	661	4.963E+00	702	1.640E+00	743	4.718E-01		
621	9.528E+00	662	4.850E+00	703	1.593E+00	744	4.617E-01		
622	9.462E+00	663	4.731E+00	704	1.539E+00	745	4.482E-01		
623	9.368E+00	664	4.634E+00	705	1.493E+00	746	4.352E-01		
624	9.292E+00	665	4.526E+00	706	1.457E+00	747	4.274E-01		
625	9.202E+00	666	4.410E+00	707	1.403E+00	748	4.109E-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**

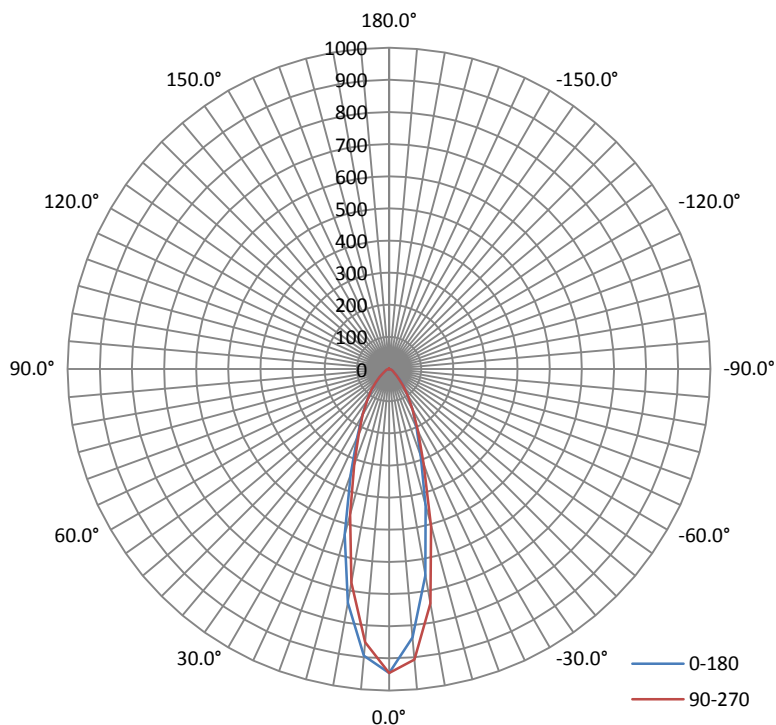
Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
12.006	60	0.5327	5.9540	0.9310

Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	I _{max} (cd)	S/MH(C0/180)	S/MH(C90/270)
467.671	78.55	956.7	0.47	0.52

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50%I _{max}):	30.6	30.9	30.5	30.2	30.6
Field Angle(10%I _{max}):	74.4	74.8	74.5	74.0	74.4

Luminous Intensity (cd) Distribution Data

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	945	945	945	945	945	945	945	945
5.0°	895	869	856	852	853	853	851	847
10.0°	739	712	696	685	675	668	665	661
15.0°	534	525	508	489	469	454	448	447
20.0°	347	348	340	326	315	305	299	295
25.0°	235	241	239	230	224	219	215	209
30.0°	167	173	173	168	164	162	159	152
35.0°	119	124	124	122	120	118	115	110
40.0°	83	86	87	85	85	82	78	77
45.0°	55	57	58	58	58	53	50	51
50.0°	37	37	36	39	38	33	31	33
55.0°	24	24	24	26	25	22	21	22
60.0°	17	17	16	18	17	15	15	15
65.0°	13	12	12	13	12	11	11	11
70.0°	10	9	9	9	9	8	8	8
75.0°	7	7	7	7	6	6	6	6
80.0°	5	5	4	4	4	4	4	4
85.0°	3	3	2	2	2	2	2	2
90.0°	1	1	1	1	1	1	1	1
95.0°	1	1	1	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°	1	1	1	1	1	1	1	1
150.0°	1	1	1	1	1	1	1	1
155.0°	1	1	1	1	1	1	1	1
160.0°	1	1	1	1	1	1	1	1
165.0°	1	1	1	1	1	1	1	1
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°	945	945	945	945	945	945	945	945
5.0°	838	841	853	876	907	935	941	920
10.0°	653	662	683	708	740	772	781	759
15.0°	441	454	474	491	507	520	524	523
20.0°	291	297	306	311	316	322	327	333
25.0°	205	208	211	212	212	217	222	224
30.0°	148	148	149	148	149	153	158	159
35.0°	104	102	102	100	103	105	108	112
40.0°	72	69	68	67	69	69	70	77
45.0°	48	44	43	44	45	43	44	50
50.0°	32	29	27	29	29	28	28	32
55.0°	21	20	19	20	20	19	19	21
60.0°	15	15	14	15	15	14	14	15
65.0°	11	11	11	12	12	11	11	12
70.0°	8	8	9	9	9	9	9	9
75.0°	6	6	7	7	7	7	7	7
80.0°	4	4	5	5	5	5	5	5
85.0°	2	2	3	3	3	3	3	3
90.0°	1	1	1	1	1	1	1	1
95.0°	1	1	1	1	1	1	1	1
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	0	0	0
180.0°	1	1	1	1	1	1	1	1

Zonal Lumen Density Measurement

Deg	Flux (lm)	%
0-5	21.7	4.65
5-10	56.2	12.01
10-15	69.9	14.95
15-20	64.6	13.82
20-25	55.1	11.79
25-30	47.2	10.10
30-35	39.2	8.39
35-40	31.0	6.63
40-45	23.1	4.95
45-50	16.3	3.49
50-55	11.5	2.46
55-60	8.5	1.82
60-65	6.6	1.40
65-70	5.2	1.10
70-75	4.0	0.86
75-80	3.0	0.63
80-85	1.9	0.41
85-90	0.9	0.19
90-95	0.4	0.09
95-100	0.2	0.05
100-105	0.1	0.02
105-110	0.0	0.00
110-115	0.0	0.01
115-120	0.0	0.00
120-125	0.0	0.00
125-130	0.0	0.00
130-135	0.0	0.01
135-140	0.1	0.01
140-145	0.1	0.02
145-150	0.1	0.03
150-155	0.1	0.03
155-160	0.1	0.03
160-165	0.1	0.02
165-170	0.1	0.02
170-175	0.0	0.01
175-180	0.0	0.00

Deg	Flux (lm)	%
0-5	21.7	4.65
0-10	77.9	16.66
0-15	147.8	31.61
0-20	212.5	45.43
0-25	267.6	57.22
0-30	314.8	67.32
0-35	354.1	75.71
0-40	385.1	82.34
0-45	408.2	87.29
0-50	424.6	90.78
0-55	436.1	93.24
0-60	444.6	95.06
0-65	451.1	96.46
0-70	456.3	97.56
0-75	460.3	98.42
0-80	463.2	99.05
0-85	465.1	99.46
0-90	466.0	99.65
0-95	466.5	99.74
0-100	466.7	99.79
0-105	466.8	99.81
0-110	466.8	99.81
0-115	466.8	99.82
0-120	466.8	99.82
0-125	466.8	99.82
0-130	466.9	99.82
0-135	466.9	99.83
0-140	466.9	99.84
0-145	467.0	99.86
0-150	467.2	99.89
0-155	467.3	99.92
0-160	467.4	99.95
0-165	467.5	99.97
0-170	467.6	99.99
0-175	467.7	100.00
0-180	467.7	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*****