



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/930NF25/RC

Report Type:	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution
Reviewed By:	George Chen <i>George Chen</i>
Report Number:	KS2211025-54690E-10
Test Date:	2021-07-15 to 2021-07-21
Report Date:	2021-11-16
Approved by:	Bill Xiong / 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

1. Product Description[#]

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/930NF25/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/930NF25/RC are the same to the products in report#KS2210706-27586E-10 and is authorized by original applicant to use their test data.
- All the data in previous report (KS2210706-27586E-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°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**

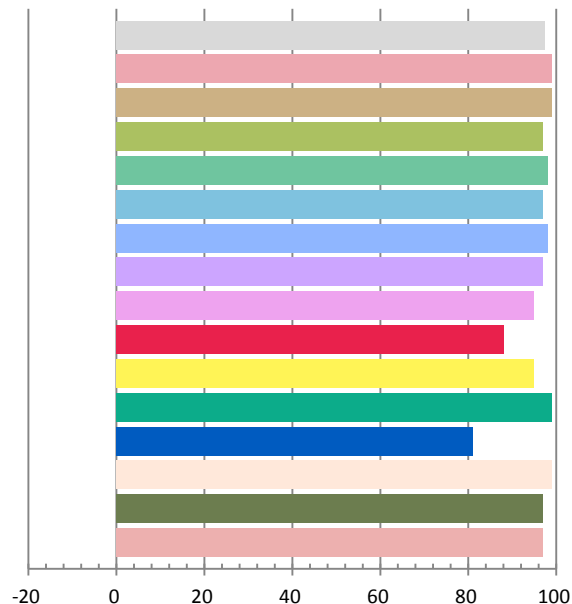
Photometric and Electrical Measurement Result

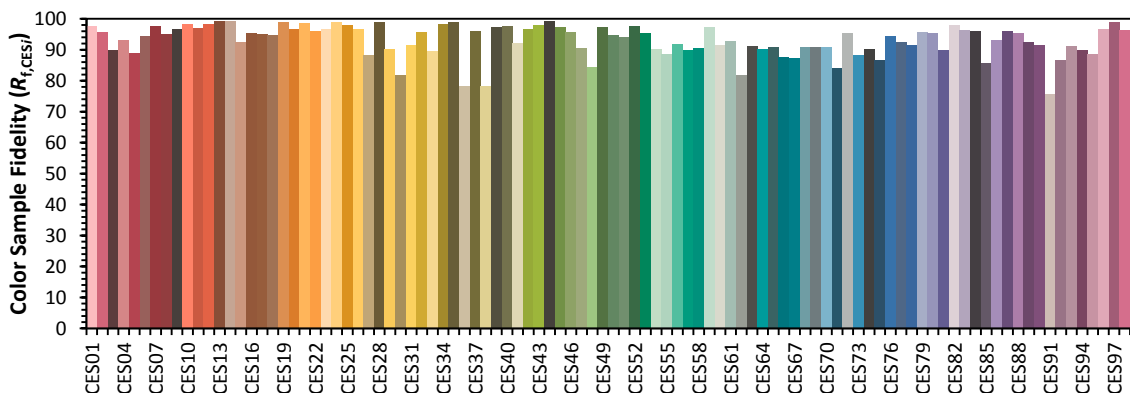
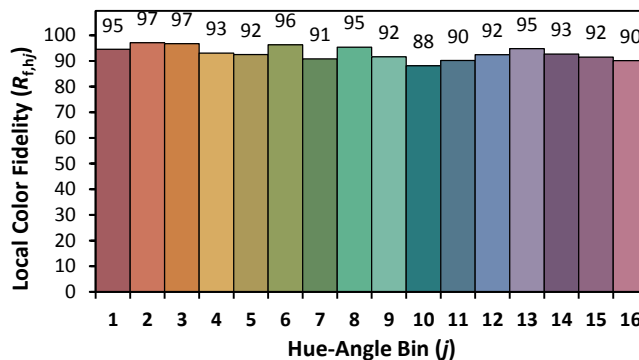
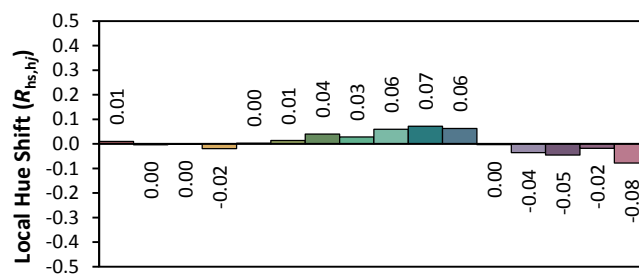
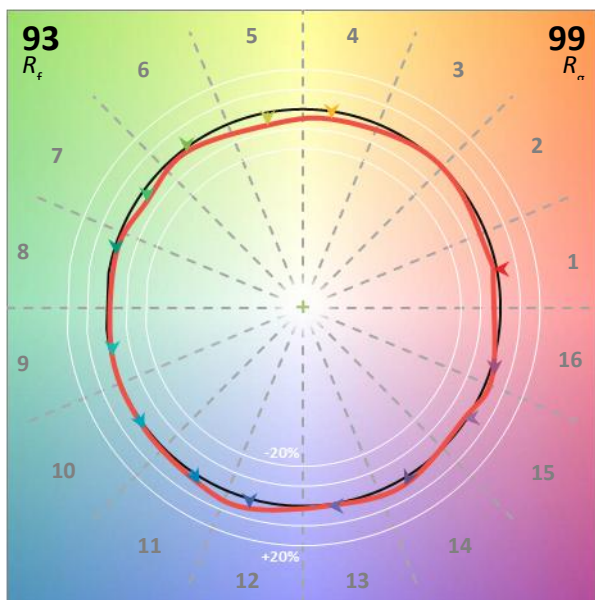
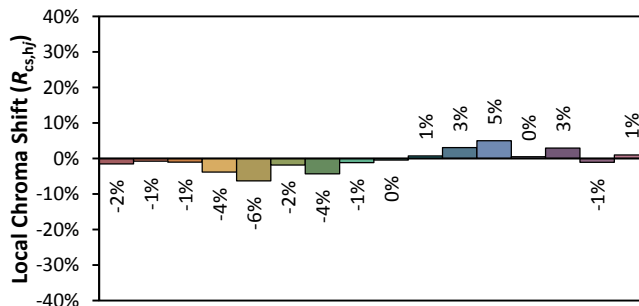
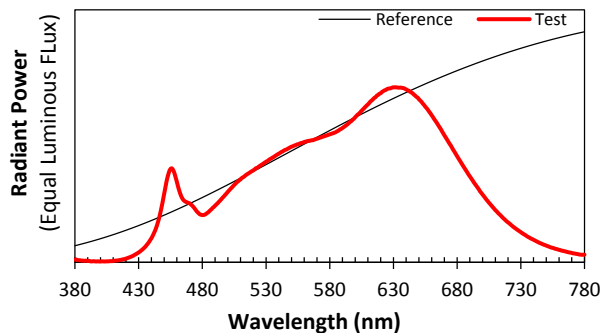
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
12.0	60	0.5682	6.289	0.9224	537.99	85.54

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
1.9567	3122	0.001820	0.4310	0.4064	0.2458	0.5214

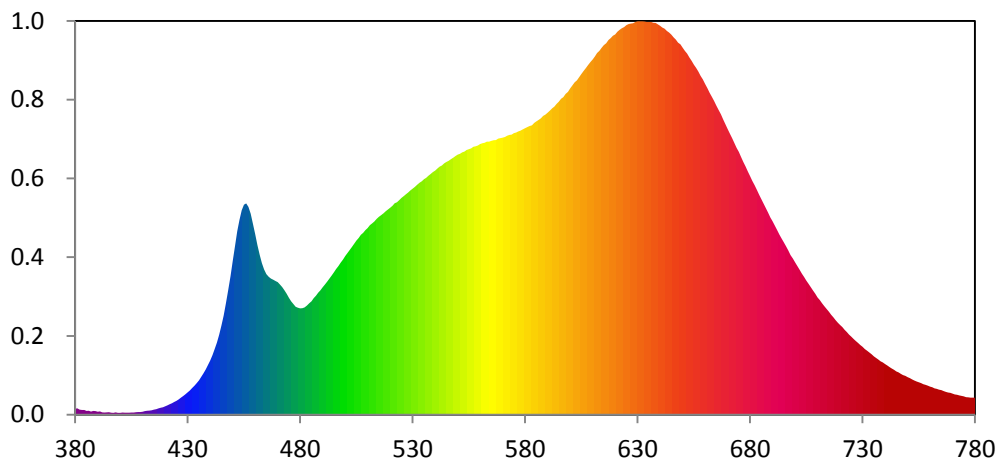
Color Rendering Index

Ra			
97.4			
R1	R2	R3	R4
99	99	97	98
R5	R6	R7	R8
97	98	97	95
R9	R10	R11	R12
88	95	99	81
R13	R14	R15	
99	97	97	





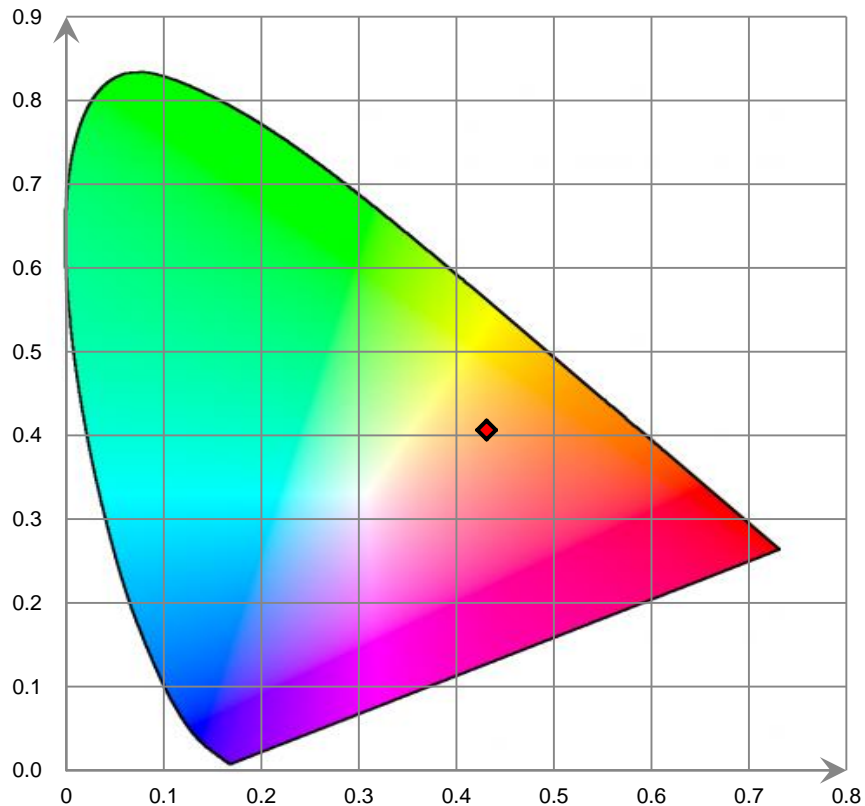
Relative Spectral Power Distribution



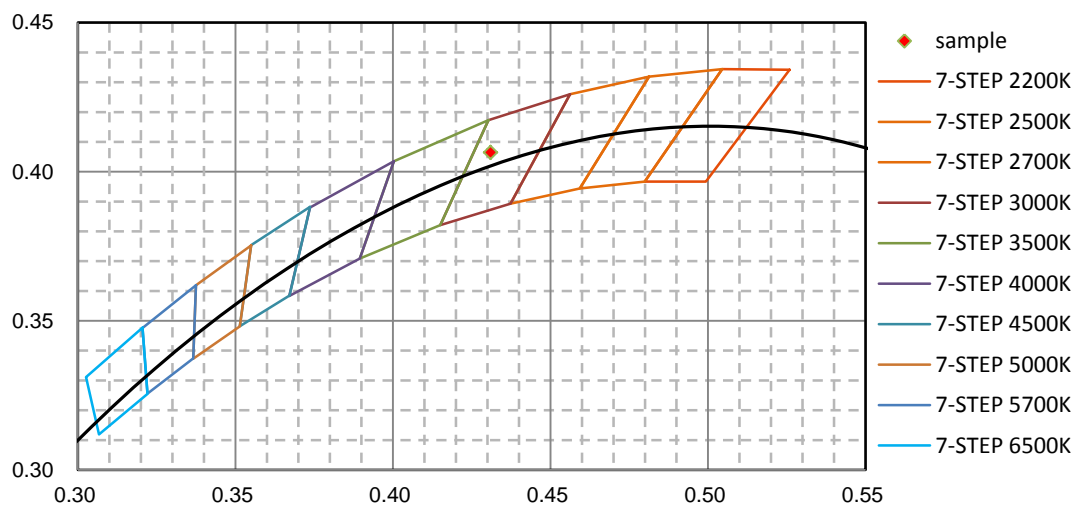
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	1.688E-01	421	2.592E-01	462	4.442E+00	503	4.658E+00	544	6.975E+00
381	1.753E-01	422	2.920E-01	463	4.207E+00	504	4.744E+00	545	7.015E+00
382	1.418E-01	423	3.183E-01	464	4.029E+00	505	4.832E+00	546	7.044E+00
383	1.310E-01	424	3.529E-01	465	3.903E+00	506	4.905E+00	547	7.088E+00
384	1.320E-01	425	3.839E-01	466	3.829E+00	507	4.993E+00	548	7.131E+00
385	1.071E-01	426	4.266E-01	467	3.776E+00	508	5.049E+00	549	7.177E+00
386	1.109E-01	427	4.756E-01	468	3.745E+00	509	5.123E+00	550	7.216E+00
387	8.870E-02	428	5.191E-01	469	3.709E+00	510	5.181E+00	551	7.240E+00
388	1.036E-01	429	5.673E-01	470	3.680E+00	511	5.261E+00	552	7.283E+00
389	1.021E-01	430	6.194E-01	471	3.614E+00	512	5.312E+00	553	7.304E+00
390	8.273E-02	431	6.717E-01	472	3.543E+00	513	5.364E+00	554	7.347E+00
391	9.429E-02	432	7.405E-01	473	3.453E+00	514	5.435E+00	555	7.369E+00
392	6.626E-02	433	8.049E-01	474	3.355E+00	515	5.492E+00	556	7.393E+00
393	5.867E-02	434	8.800E-01	475	3.244E+00	516	5.541E+00	557	7.435E+00
394	6.729E-02	435	9.549E-01	476	3.146E+00	517	5.591E+00	558	7.447E+00
395	6.915E-02	436	1.051E+00	477	3.071E+00	518	5.645E+00	559	7.472E+00
396	5.691E-02	437	1.149E+00	478	2.997E+00	519	5.694E+00	560	7.511E+00
397	5.389E-02	438	1.255E+00	479	2.970E+00	520	5.743E+00	561	7.531E+00
398	6.657E-02	439	1.380E+00	480	2.951E+00	521	5.796E+00	562	7.548E+00
399	5.161E-02	440	1.503E+00	481	2.958E+00	522	5.871E+00	563	7.577E+00
400	5.198E-02	441	1.652E+00	482	2.979E+00	523	5.896E+00	564	7.578E+00
401	6.194E-02	442	1.826E+00	483	3.031E+00	524	5.954E+00	565	7.602E+00
402	5.769E-02	443	2.003E+00	484	3.092E+00	525	6.013E+00	566	7.619E+00
403	5.736E-02	444	2.218E+00	485	3.149E+00	526	6.063E+00	567	7.623E+00
404	5.458E-02	445	2.472E+00	486	3.237E+00	527	6.117E+00	568	7.660E+00
405	6.342E-02	446	2.750E+00	487	3.301E+00	528	6.167E+00	569	7.675E+00
406	6.042E-02	447	3.084E+00	488	3.389E+00	529	6.226E+00	570	7.690E+00
407	7.007E-02	448	3.446E+00	489	3.456E+00	530	6.275E+00	571	7.706E+00
408	7.595E-02	449	3.844E+00	490	3.536E+00	531	6.321E+00	572	7.743E+00
409	7.540E-02	450	4.272E+00	491	3.613E+00	532	6.378E+00	573	7.765E+00
410	8.253E-02	451	4.680E+00	492	3.692E+00	533	6.439E+00	574	7.775E+00
411	9.937E-02	452	5.092E+00	493	3.777E+00	534	6.475E+00	575	7.813E+00
412	1.093E-01	453	5.408E+00	494	3.862E+00	535	6.533E+00	576	7.833E+00
413	1.125E-01	454	5.675E+00	495	3.949E+00	536	6.574E+00	577	7.861E+00
414	1.248E-01	455	5.828E+00	496	4.042E+00	537	6.632E+00	578	7.886E+00
415	1.400E-01	456	5.863E+00	497	4.124E+00	538	6.682E+00	579	7.921E+00
416	1.538E-01	457	5.766E+00	498	4.218E+00	539	6.736E+00	580	7.951E+00
417	1.743E-01	458	5.579E+00	499	4.304E+00	540	6.777E+00	581	7.983E+00
418	1.920E-01	459	5.302E+00	500	4.403E+00	541	6.831E+00	582	8.013E+00
419	2.072E-01	460	5.016E+00	501	4.487E+00	542	6.885E+00	583	8.029E+00
420	2.331E-01	461	4.708E+00	502	4.575E+00	543	6.916E+00	584	8.096E+00

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	8.140E+00	626	1.084E+01	667	8.335E+00	708	3.447E+00	749	1.078E+00
586	8.183E+00	627	1.085E+01	668	8.195E+00	709	3.354E+00	750	1.041E+00
587	8.227E+00	628	1.087E+01	669	8.062E+00	710	3.256E+00	751	1.017E+00
588	8.292E+00	629	1.090E+01	670	7.927E+00	711	3.183E+00	752	9.824E-01
589	8.327E+00	630	1.092E+01	671	7.798E+00	712	3.093E+00	753	9.491E-01
590	8.384E+00	631	1.092E+01	672	7.673E+00	713	3.014E+00	754	9.216E-01
591	8.441E+00	632	1.092E+01	673	7.540E+00	714	2.939E+00	755	9.017E-01
592	8.501E+00	633	1.091E+01	674	7.407E+00	715	2.857E+00	756	8.790E-01
593	8.553E+00	634	1.090E+01	675	7.292E+00	716	2.772E+00	757	8.456E-01
594	8.624E+00	635	1.090E+01	676	7.150E+00	717	2.701E+00	758	8.302E-01
595	8.687E+00	636	1.090E+01	677	7.014E+00	718	2.624E+00	759	8.058E-01
596	8.767E+00	637	1.088E+01	678	6.889E+00	719	2.553E+00	760	7.799E-01
597	8.815E+00	638	1.087E+01	679	6.753E+00	720	2.489E+00	761	7.631E-01
598	8.900E+00	639	1.083E+01	680	6.623E+00	721	2.430E+00	762	7.324E-01
599	8.962E+00	640	1.079E+01	681	6.491E+00	722	2.357E+00	763	7.184E-01
600	9.055E+00	641	1.074E+01	682	6.367E+00	723	2.292E+00	764	6.964E-01
601	9.141E+00	642	1.071E+01	683	6.237E+00	724	2.222E+00	765	6.820E-01
602	9.223E+00	643	1.065E+01	684	6.104E+00	725	2.166E+00	766	6.576E-01
603	9.277E+00	644	1.060E+01	685	5.980E+00	726	2.105E+00	767	6.365E-01
604	9.367E+00	645	1.055E+01	686	5.857E+00	727	2.048E+00	768	6.178E-01
605	9.455E+00	646	1.047E+01	687	5.730E+00	728	1.991E+00	769	6.064E-01
606	9.539E+00	647	1.041E+01	688	5.607E+00	729	1.937E+00	770	5.843E-01
607	9.620E+00	648	1.033E+01	689	5.475E+00	730	1.885E+00	771	5.634E-01
608	9.703E+00	649	1.028E+01	690	5.366E+00	731	1.825E+00	772	5.529E-01
609	9.786E+00	650	1.018E+01	691	5.246E+00	732	1.776E+00	773	5.371E-01
610	9.857E+00	651	1.010E+01	692	5.128E+00	733	1.725E+00	774	5.241E-01
611	9.943E+00	652	1.002E+01	693	5.005E+00	734	1.677E+00	775	5.101E-01
612	1.004E+01	653	9.912E+00	694	4.891E+00	735	1.619E+00	776	4.883E-01
613	1.010E+01	654	9.823E+00	695	4.783E+00	736	1.575E+00	777	4.806E-01
614	1.018E+01	655	9.714E+00	696	4.673E+00	737	1.532E+00	778	4.735E-01
615	1.026E+01	656	9.625E+00	697	4.559E+00	738	1.482E+00	779	4.741E-01
616	1.031E+01	657	9.524E+00	698	4.430E+00	739	1.450E+00	780	4.747E-01
617	1.040E+01	658	9.404E+00	699	4.332E+00	740	1.406E+00		
618	1.045E+01	659	9.304E+00	700	4.227E+00	741	1.366E+00		
619	1.052E+01	660	9.180E+00	701	4.124E+00	742	1.324E+00		
620	1.055E+01	661	9.068E+00	702	4.022E+00	743	1.283E+00		
621	1.063E+01	662	8.936E+00	703	3.914E+00	744	1.245E+00		
622	1.068E+01	663	8.825E+00	704	3.823E+00	745	1.201E+00		
623	1.073E+01	664	8.711E+00	705	3.719E+00	746	1.175E+00		
624	1.076E+01	665	8.581E+00	706	3.630E+00	747	1.137E+00		
625	1.081E+01	666	8.455E+00	707	3.538E+00	748	1.102E+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**

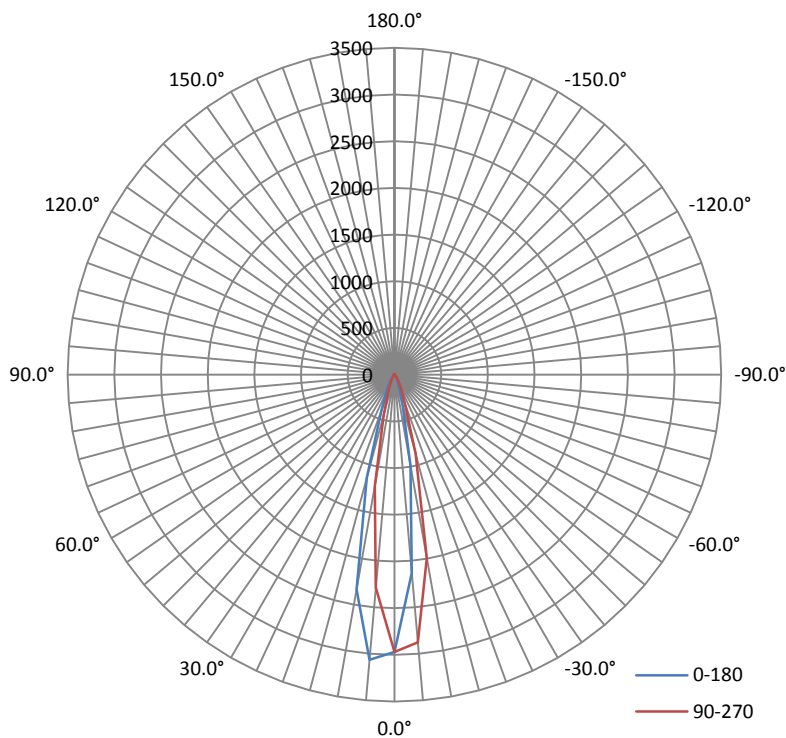
Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
12.00	60	0.5621	6.263	0.9282

Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	I _{max} (cd)	S/MH(C0/180)	S/MH(C90/270)
538.198	85.93	3166.0	0.27	0.39

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50%I _{max}):	20.7	20.8	20.7	20.5	20.7
Field Angle(10%I _{max}):	36.9	37.2	37.1	37.0	37.1

Luminous Intensity (cd) Distribution Data

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	2970	2970	2970	2970	2970	2970	2970	2970
5.0°	3064	2895	2687	2473	2288	2159	2095	2113
10.0°	2336	2085	1777	1465	1212	1047	966	975
15.0°	1142	917	697	550	444	356	333	336
20.0°	405	334	271	220	191	164	154	157
25.0°	206	177	146	118	99	87	80	77
30.0°	117	98	76	61	49	43	39	39
35.0°	59	48	36	29	26	25	24	24
40.0°	28	24	22	20	19	19	19	19
45.0°	18	17	16	14	13	13	13	13
50.0°	12	10	10	9	9	9	9	8
55.0°	8	8	7	7	6	7	7	6
60.0°	6	6	6	6	6	6	6	5
65.0°	5	5	5	4	4	4	4	4
70.0°	4	4	4	3	4	3	3	3
75.0°	4	3	3	2	3	2	2	2
80.0°	2	2	2	2	1	1	1	1
85.0°	1	1	1	1	1	1	1	1
90.0°	1	1	0	0	1	0	0	0
95.0°	0	0	0	0	0	0	0	0
100.0°	0	0	0	0	1	0	0	0
105.0°	0	1	0	0	1	0	0	0
110.0°	1	1	0	0	0	0	0	0
115.0°	1	0	0	0	0	0	0	1
120.0°	1	4	0	2	4	0	0	1
125.0°	0	1	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	1	1	1	1	1
145.0°	1	1	1	1	1	1	1	1
150.0°	1	1	1	1	2	2	2	2
155.0°	2	2	2	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°	2	2	1	1	1	1	1	1
175.0°	1	1	1	1	1	1	1	1
180.0°	1	1	1	1	0	0	0	1

Luminous Intensity (cd) Distribution Data (cont.)

C y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	2970	2970	2970	2970	2970	2970	2970	2970
5.0°	2133	2276	2471	2687	2878	3012	3088	3071
10.0°	987	1169	1416	1695	1995	2200	2316	2307
15.0°	340	403	517	675	873	1058	1184	1169
20.0°	162	181	221	261	322	385	427	422
25.0°	84	96	114	145	176	203	211	213
30.0°	40	46	57	77	98	112	120	116
35.0°	25	28	31	38	47	56	61	58
40.0°	18	19	21	23	24	28	31	29
45.0°	12	12	13	15	16	17	19	18
50.0°	9	9	9	10	10	11	12	12
55.0°	6	6	7	7	8	8	9	8
60.0°	5	5	6	6	6	6	7	6
65.0°	4	4	4	5	5	5	5	5
70.0°	3	3	3	4	4	4	4	4
75.0°	2	2	2	3	3	3	3	3
80.0°	1	1	1	2	2	2	2	2
85.0°	1	1	1	1	1	1	1	1
90.0°	0	0	0	0	1	1	1	1
95.0°	0	0	0	0	0	0	0	0
100.0°	1	1	0	0	0	0	0	0
105.0°	1	1	0	0	1	1	0	0
110.0°	1	1	0	0	1	1	0	0
115.0°	0	0	0	0	1	1	0	0
120.0°	2	3	0	0	2	2	0	1
125.0°	0	0	0	0	1	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	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	1
160.0°	0	0	0	0	0	0	0	1
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	0	0	0

Zonal Lumen Density Measurement

Deg	Flux (lm)	%
0-5	66.5	12.35
5-10	148.8	27.66
10-15	129.6	24.08
15-20	70.6	13.13
20-25	40.2	7.48
25-30	26.2	4.87
30-35	15.8	2.94
35-40	9.8	1.82
40-45	6.8	1.26
45-50	5.0	0.93
50-55	3.6	0.68
55-60	3.0	0.56
60-65	2.5	0.46
65-70	2.1	0.38
70-75	1.6	0.31
75-80	1.2	0.21
80-85	0.7	0.13
85-90	0.4	0.07
90-95	0.2	0.05
95-100	0.2	0.03
100-105	0.3	0.06
105-110	0.3	0.04
110-115	0.2	0.04
115-120	0.5	0.10
120-125	0.4	0.07
125-130	0.1	0.01
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	0.3	0.05
155-160	0.3	0.05
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	66.5	12.35
0-10	215.3	40.01
0-15	344.9	64.09
0-20	415.6	77.22
0-25	455.8	84.70
0-30	482.1	89.57
0-35	497.9	92.51
0-40	507.7	94.33
0-45	514.5	95.59
0-50	519.5	96.52
0-55	523.1	97.20
0-60	526.1	97.76
0-65	528.6	98.22
0-70	530.7	98.60
0-75	532.3	98.91
0-80	533.5	99.12
0-85	534.2	99.25
0-90	534.6	99.32
0-95	534.8	99.37
0-100	535.0	99.40
0-105	535.3	99.46
0-110	535.5	99.50
0-115	535.7	99.54
0-120	536.2	99.64
0-125	536.6	99.71
0-130	536.7	99.72
0-135	536.8	99.74
0-140	536.9	99.76
0-145	537.1	99.79
0-150	537.3	99.83
0-155	537.6	99.88
0-160	537.8	99.93
0-165	538.0	99.96
0-170	538.1	99.99
0-175	538.2	100.00
0-180	538.2	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*****