



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: 34HID/840/277V/E26/DIM

Report Type:	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution
Reviewed By:	George Chen <i>George Chen</i>
Report Number:	KS2210909-47104E-10-1
Test Date:	2021-11-10
Report Date:	2021-12-10
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 test samples were in good condition and received on 2021-09-09. One was tested in integrating sphere and the other was tested in goniophotometer

Model Tested: 34HID/840/277V/E26/DIM
Manufacturer: GREEN CREATIVE LTD
Product Designation: Omnidirectional LED Lamp
Burning Time Before Test: 0hour(For New Products)

#Rated Values:

Rated Voltage/Frequency: 120-277V AC, 50/60Hz
Rated Power: 34W
Nominal CCT: 4000K
Nominal Lumen Output: 5000lm

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
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	2021-09-27	2022-09-26
Digital CC&CV DC Power Supply	EVERFINE	WY305-V1	1101047	2021-06-30	2022-06-29
Standard Light Source	EVERFINE	D204	N/A	2021-10-15	2022-10-14
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
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 thermohygrometer	N/A	433MHz	N/A	2021-04-27	2022-04-26
Standard Light Source	EVERFINE	D908	1012003	2021-10-15	2022-10-14

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.

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 $U=22\text{K}$ ($K=2$), 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 (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**

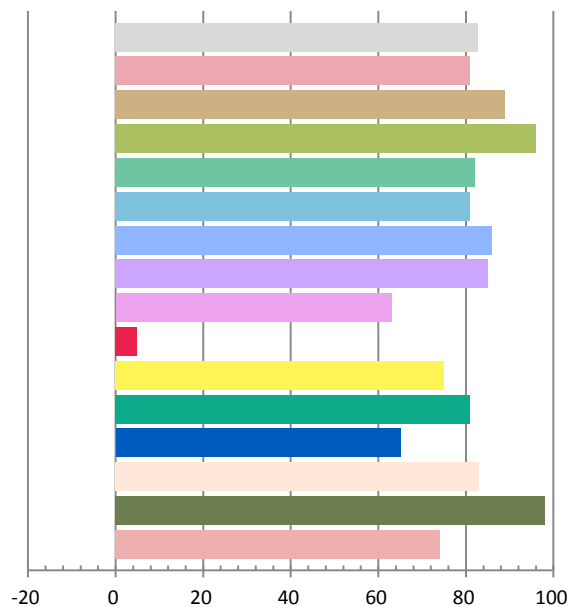
Photometric and Electrical Measurement Result

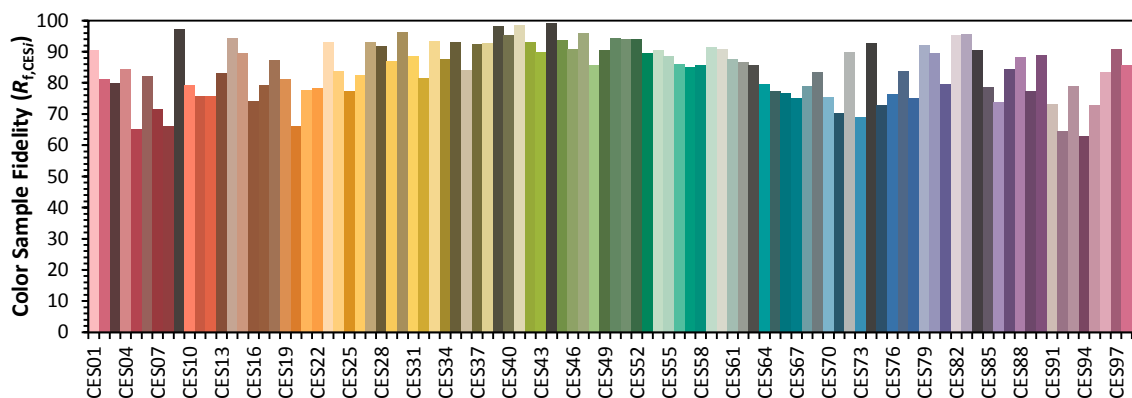
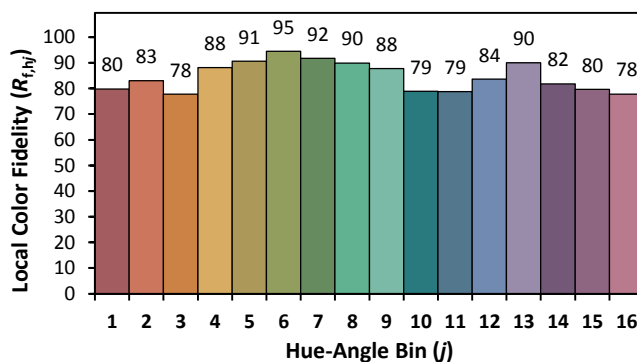
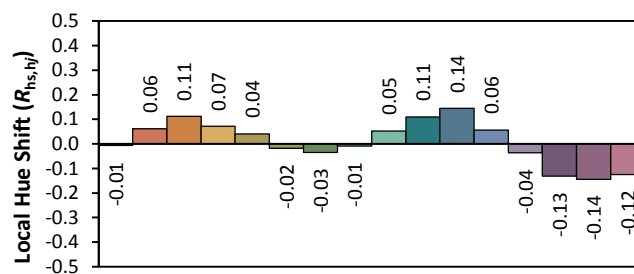
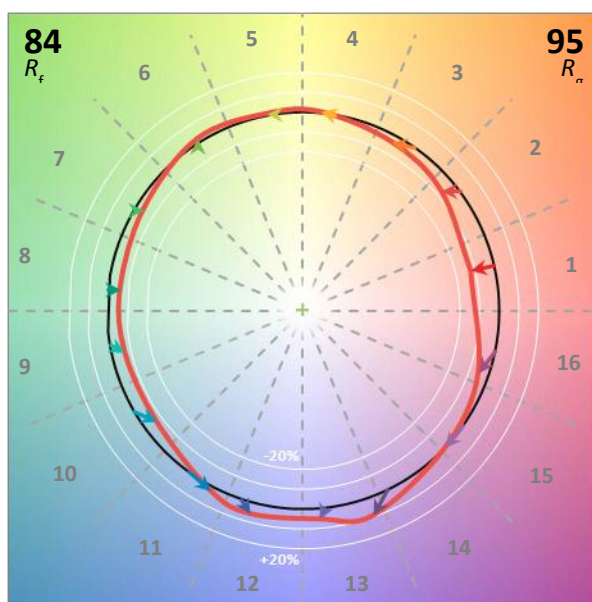
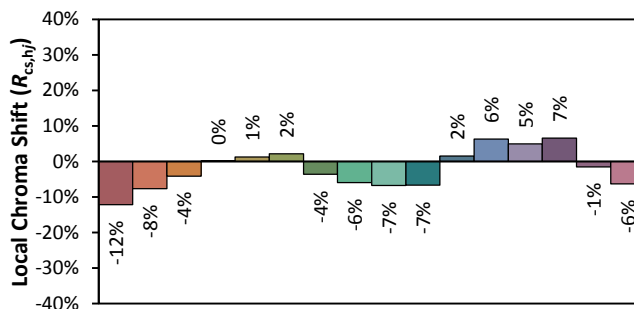
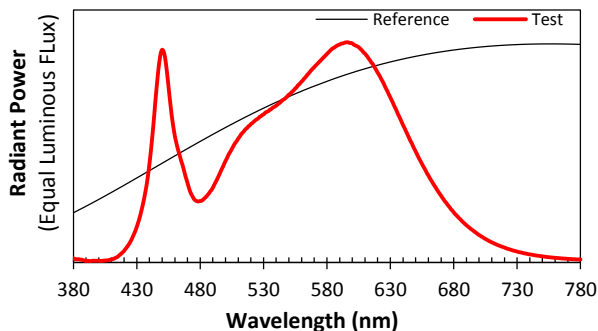
Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.1	60	0.2812	33.69	0.9978	5004.0	148.53

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
15.083	3832	0.000730	0.3887	0.3833	0.2279	0.5057

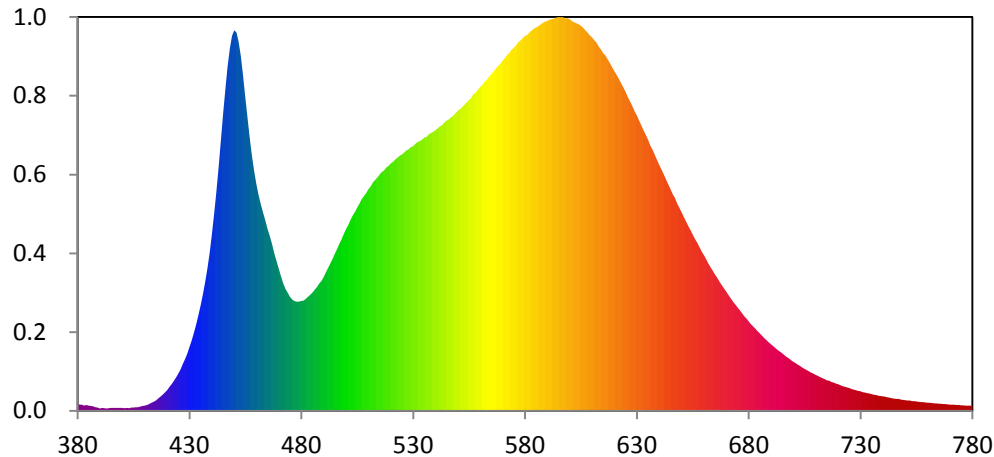
Color Rendering Index

Ra			
82.8			
R1	R2	R3	R4
81	89	96	82
R5	R6	R7	R8
81	86	85	63
R9	R10	R11	R12
5	75	81	65
R13	R14	R15	
83	98	74	





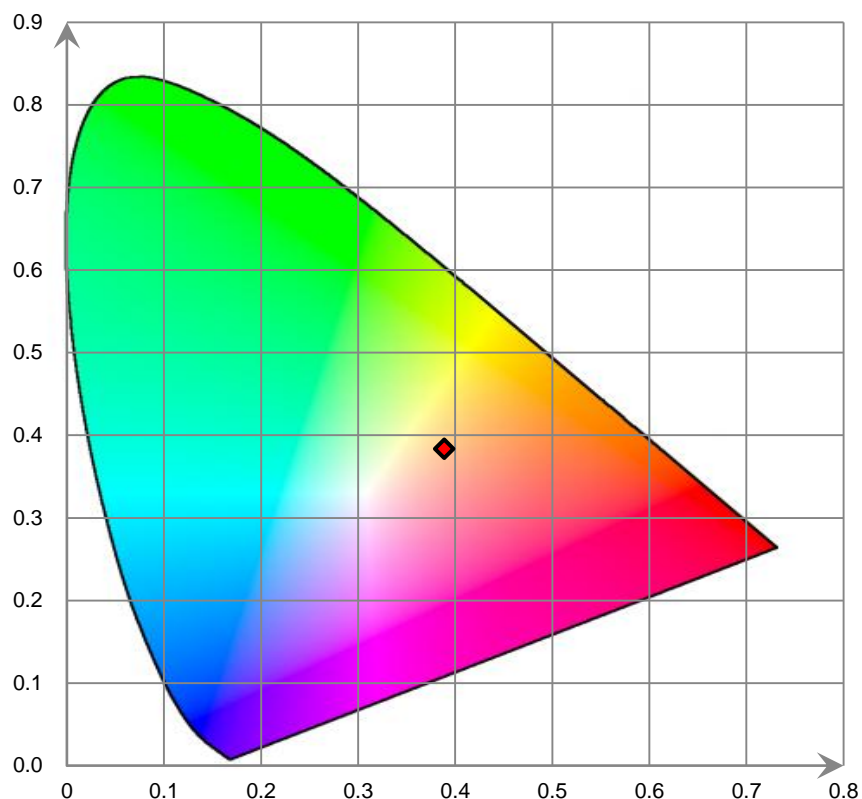
Relative Spectral Power Distribution



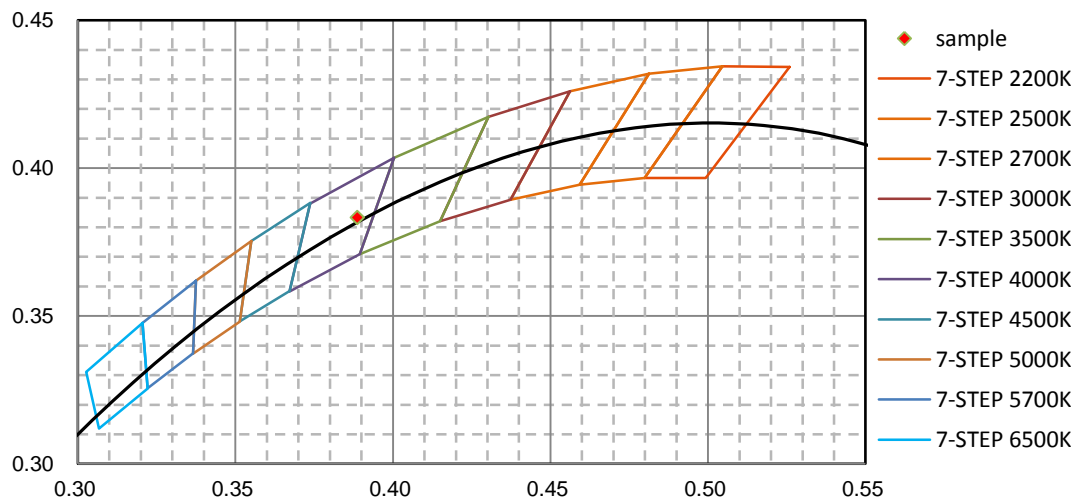
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	1.674E+00	421	5.378E+00	462	4.686E+01	503	4.432E+01	544	6.542E+01
381	1.349E+00	422	6.013E+00	463	4.496E+01	504	4.510E+01	545	6.588E+01
382	1.343E+00	423	6.750E+00	464	4.318E+01	505	4.610E+01	546	6.619E+01
383	1.188E+00	424	7.522E+00	465	4.128E+01	506	4.698E+01	547	6.658E+01
384	1.285E+00	425	8.418E+00	466	3.967E+01	507	4.799E+01	548	6.705E+01
385	1.146E+00	426	9.375E+00	467	3.787E+01	508	4.872E+01	549	6.759E+01
386	1.100E+00	427	1.058E+01	468	3.577E+01	509	4.941E+01	550	6.816E+01
387	1.023E+00	428	1.172E+01	469	3.401E+01	510	5.030E+01	551	6.848E+01
388	8.214E-01	429	1.294E+01	470	3.227E+01	511	5.091E+01	552	6.903E+01
389	6.917E-01	430	1.442E+01	471	3.048E+01	512	5.178E+01	553	6.949E+01
390	5.234E-01	431	1.601E+01	472	2.891E+01	513	5.241E+01	554	7.003E+01
391	6.301E-01	432	1.768E+01	473	2.770E+01	514	5.294E+01	555	7.062E+01
392	5.771E-01	433	1.960E+01	474	2.677E+01	515	5.359E+01	556	7.107E+01
393	5.135E-01	434	2.170E+01	475	2.584E+01	516	5.421E+01	557	7.188E+01
394	5.555E-01	435	2.395E+01	476	2.529E+01	517	5.457E+01	558	7.223E+01
395	6.298E-01	436	2.646E+01	477	2.494E+01	518	5.523E+01	559	7.285E+01
396	6.753E-01	437	2.919E+01	478	2.475E+01	519	5.558E+01	560	7.342E+01
397	6.212E-01	438	3.225E+01	479	2.478E+01	520	5.616E+01	561	7.394E+01
398	6.456E-01	439	3.581E+01	480	2.495E+01	521	5.653E+01	562	7.465E+01
399	6.574E-01	440	4.003E+01	481	2.498E+01	522	5.701E+01	563	7.515E+01
400	6.714E-01	441	4.468E+01	482	2.532E+01	523	5.748E+01	564	7.582E+01
401	5.566E-01	442	4.972E+01	483	2.584E+01	524	5.788E+01	565	7.646E+01
402	6.249E-01	443	5.522E+01	484	2.626E+01	525	5.820E+01	566	7.700E+01
403	5.830E-01	444	6.122E+01	485	2.684E+01	526	5.859E+01	567	7.765E+01
404	7.288E-01	445	6.736E+01	486	2.742E+01	527	5.916E+01	568	7.827E+01
405	7.298E-01	446	7.284E+01	487	2.806E+01	528	5.935E+01	569	7.877E+01
406	7.896E-01	447	7.807E+01	488	2.885E+01	529	5.988E+01	570	7.949E+01
407	8.266E-01	448	8.217E+01	489	2.944E+01	530	6.010E+01	571	8.000E+01
408	9.315E-01	449	8.512E+01	490	3.031E+01	531	6.061E+01	572	8.073E+01
409	1.067E+00	450	8.635E+01	491	3.140E+01	532	6.102E+01	573	8.125E+01
410	1.158E+00	451	8.585E+01	492	3.240E+01	533	6.124E+01	574	8.190E+01
411	1.321E+00	452	8.401E+01	493	3.339E+01	534	6.149E+01	575	8.240E+01
412	1.497E+00	453	8.077E+01	494	3.444E+01	535	6.201E+01	576	8.290E+01
413	1.777E+00	454	7.641E+01	495	3.557E+01	536	6.221E+01	577	8.364E+01
414	2.007E+00	455	7.152E+01	496	3.669E+01	537	6.273E+01	578	8.405E+01
415	2.300E+00	456	6.678E+01	497	3.785E+01	538	6.304E+01	579	8.454E+01
416	2.781E+00	457	6.209E+01	498	3.888E+01	539	6.333E+01	580	8.504E+01
417	3.191E+00	458	5.795E+01	499	4.007E+01	540	6.370E+01	581	8.531E+01
418	3.655E+00	459	5.451E+01	500	4.118E+01	541	6.411E+01	582	8.586E+01
419	4.125E+00	460	5.144E+01	501	4.215E+01	542	6.459E+01	583	8.628E+01
420	4.672E+00	461	4.898E+01	502	4.332E+01	543	6.485E+01	584	8.676E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	8.702E+01	626	7.120E+01	667	2.934E+01	708	8.628E+00	749	2.486E+00
586	8.735E+01	627	7.019E+01	668	2.858E+01	709	8.392E+00	750	2.426E+00
587	8.771E+01	628	6.913E+01	669	2.779E+01	710	8.103E+00	751	2.339E+00
588	8.805E+01	629	6.801E+01	670	2.709E+01	711	7.924E+00	752	2.298E+00
589	8.831E+01	630	6.702E+01	671	2.627E+01	712	7.631E+00	753	2.199E+00
590	8.848E+01	631	6.589E+01	672	2.559E+01	713	7.412E+00	754	2.142E+00
591	8.878E+01	632	6.484E+01	673	2.482E+01	714	7.181E+00	755	2.093E+00
592	8.892E+01	633	6.364E+01	674	2.422E+01	715	6.932E+00	756	2.041E+00
593	8.902E+01	634	6.259E+01	675	2.351E+01	716	6.786E+00	757	1.978E+00
594	8.926E+01	635	6.152E+01	676	2.285E+01	717	6.551E+00	758	1.935E+00
595	8.934E+01	636	6.021E+01	677	2.221E+01	718	6.380E+00	759	1.876E+00
596	8.940E+01	637	5.925E+01	678	2.147E+01	719	6.181E+00	760	1.832E+00
597	8.936E+01	638	5.810E+01	679	2.098E+01	720	5.998E+00	761	1.783E+00
598	8.909E+01	639	5.692E+01	680	2.030E+01	721	5.789E+00	762	1.765E+00
599	8.911E+01	640	5.580E+01	681	1.966E+01	722	5.593E+00	763	1.694E+00
600	8.892E+01	641	5.476E+01	682	1.916E+01	723	5.439E+00	764	1.670E+00
601	8.850E+01	642	5.366E+01	683	1.865E+01	724	5.264E+00	765	1.609E+00
602	8.820E+01	643	5.252E+01	684	1.806E+01	725	5.120E+00	766	1.557E+00
603	8.799E+01	644	5.142E+01	685	1.760E+01	726	4.935E+00	767	1.519E+00
604	8.773E+01	645	5.031E+01	686	1.704E+01	727	4.788E+00	768	1.518E+00
605	8.741E+01	646	4.918E+01	687	1.648E+01	728	4.619E+00	769	1.448E+00
606	8.693E+01	647	4.828E+01	688	1.604E+01	729	4.523E+00	770	1.404E+00
607	8.639E+01	648	4.709E+01	689	1.555E+01	730	4.401E+00	771	1.374E+00
608	8.589E+01	649	4.603E+01	690	1.507E+01	731	4.193E+00	772	1.341E+00
609	8.519E+01	650	4.502E+01	691	1.465E+01	732	4.119E+00	773	1.313E+00
610	8.480E+01	651	4.395E+01	692	1.422E+01	733	4.011E+00	774	1.286E+00
611	8.413E+01	652	4.290E+01	693	1.378E+01	734	3.877E+00	775	1.256E+00
612	8.351E+01	653	4.189E+01	694	1.340E+01	735	3.741E+00	776	1.242E+00
613	8.269E+01	654	4.096E+01	695	1.303E+01	736	3.618E+00	777	1.182E+00
614	8.205E+01	655	3.994E+01	696	1.262E+01	737	3.563E+00	778	1.178E+00
615	8.117E+01	656	3.896E+01	697	1.222E+01	738	3.425E+00	779	1.156E+00
616	8.066E+01	657	3.811E+01	698	1.187E+01	739	3.303E+00	780	1.158E+00
617	7.976E+01	658	3.714E+01	699	1.145E+01	740	3.241E+00		
618	7.891E+01	659	3.612E+01	700	1.109E+01	741	3.155E+00		
619	7.799E+01	660	3.531E+01	701	1.080E+01	742	3.074E+00		
620	7.709E+01	661	3.434E+01	702	1.044E+01	743	2.963E+00		
621	7.624E+01	662	3.350E+01	703	1.017E+01	744	2.861E+00		
622	7.534E+01	663	3.264E+01	704	9.769E+00	745	2.778E+00		
623	7.428E+01	664	3.180E+01	705	9.514E+00	746	2.712E+00		
624	7.340E+01	665	3.097E+01	706	9.211E+00	747	2.644E+00		
625	7.237E+01	666	3.020E+01	707	8.931E+00	748	2.571E+00		

CIE 1931 x y Chromaticity Diagram



7-Step Chromaticity Quadrangles



[Goniophotometer System]

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

Test orientation: **Base up**

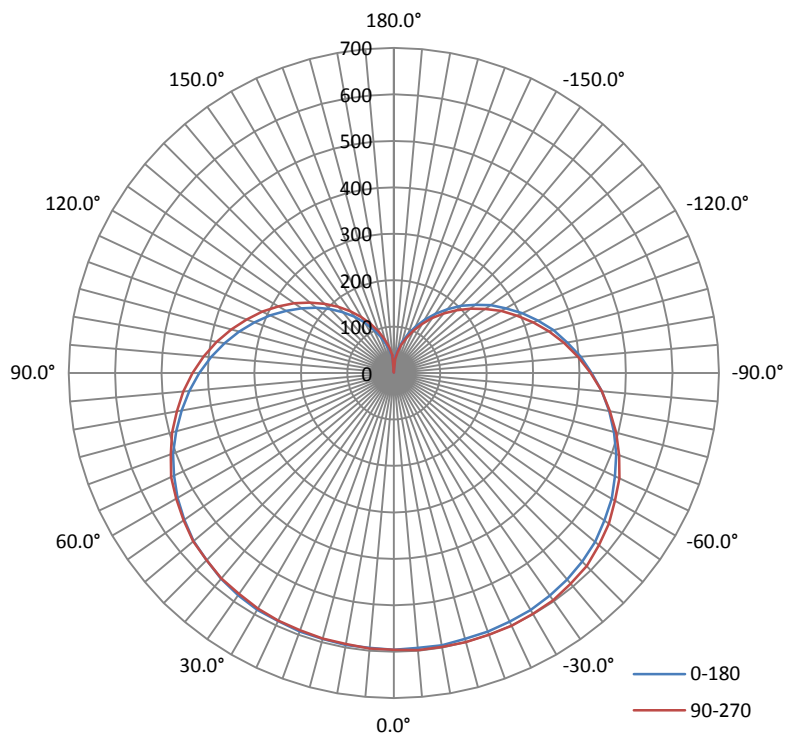
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.0	60	0.2815	33.70	0.9979

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I _{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
5009.16	148.62	601.3	1.51	1.53

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I _{max}):	230.7	231.8	230.8	230.6	231.0
Field Angle (10% I _{max}):	334.3	335.1	334.7	334.4	334.6

Luminous Intensity (cd) Distribution Data

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	596	596	596	596	596	596	596	596
5.0°	594	596	594	593	595	596	594	596
10.0°	595	596	591	591	592	593	593	594
15.0°	593	593	591	591	592	592	592	594
20.0°	592	591	589	588	589	590	589	591
25.0°	589	589	588	587	589	587	588	590
30.0°	588	587	585	584	585	585	586	585
35.0°	584	583	580	581	581	582	580	584
40.0°	578	579	577	576	578	576	577	579
45.0°	570	571	571	571	570	570	570	573
50.0°	562	563	563	563	563	563	561	564
55.0°	550	552	552	552	552	554	552	554
60.0°	537	540	540	541	541	541	539	542
65.0°	522	525	526	527	529	528	526	528
70.0°	505	507	509	511	511	512	510	511
75.0°	485	489	492	494	494	495	494	495
80.0°	464	469	472	474	475	475	473	474
85.0°	442	447	451	453	455	456	454	454
90.0°	419	425	428	430	434	434	432	432
95.0°	395	401	406	409	411	412	410	409
100.0°	370	377	381	385	387	388	386	386
105.0°	345	351	356	360	362	364	363	362
110.0°	320	326	331	335	337	339	337	336
115.0°	294	300	307	309	313	314	312	312
120.0°	268	275	280	284	287	289	287	286
125.0°	243	250	255	259	262	263	262	261
130.0°	219	225	230	233	236	238	237	236
135.0°	195	201	205	209	211	213	212	211
140.0°	171	176	181	184	187	188	188	187
145.0°	148	153	157	160	163	164	164	163
150.0°	126	130	134	137	140	141	140	140
155.0°	104	108	112	114	117	118	117	117
160.0°	84	87	90	93	95	96	96	95
165.0°	65	68	71	73	75	76	75	75
170.0°	48	50	53	55	56	58	57	57
175.0°	33	34	36	38	39	39	40	40
180.0°	0	0	0	0	0	0	0	0

Luminous Intensity (cd) Distribution Data (cont.)

$\begin{matrix} C \\ \backslash \\ \gamma \end{matrix}$	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	596	596	596	596	596	596	596	596
5.0°	594	598	597	597	599	599	597	597
10.0°	595	597	597	597	599	599	596	596
15.0°	593	597	597	599	600	600	597	596
20.0°	593	597	597	599	600	600	596	595
25.0°	590	596	598	599	601	599	596	594
30.0°	589	594	596	599	599	598	593	589
35.0°	585	592	594	596	597	595	590	587
40.0°	580	587	590	593	592	589	584	581
45.0°	574	581	583	585	587	583	577	574
50.0°	566	572	574	576	577	573	568	564
55.0°	554	560	563	564	566	560	555	551
60.0°	542	547	551	552	550	545	540	536
65.0°	526	533	535	534	536	529	524	519
70.0°	509	515	517	518	517	511	506	502
75.0°	491	496	497	497	496	491	484	482
80.0°	471	475	477	475	472	469	463	461
85.0°	450	453	453	451	449	445	440	438
90.0°	426	430	429	428	424	421	415	414
95.0°	404	407	405	402	398	394	390	388
100.0°	380	381	380	377	373	369	365	365
105.0°	356	357	354	350	346	343	338	338
110.0°	330	330	327	324	320	316	313	313
115.0°	305	304	302	297	293	290	287	287
120.0°	279	278	276	272	267	264	261	262
125.0°	255	254	250	244	240	238	236	237
130.0°	229	228	224	220	216	213	211	212
135.0°	204	203	199	195	191	188	187	188
140.0°	180	178	175	171	168	165	164	164
145.0°	156	155	151	147	145	142	140	141
150.0°	132	131	128	124	122	119	118	119
155.0°	110	109	106	103	100	98	97	97
160.0°	89	89	86	83	81	79	78	77
165.0°	69	69	67	65	63	61	60	60
170.0°	52	52	50	48	47	45	44	44
175.0°	35	35	33	31	30	29	28	27
180.0°	1	0	0	0	1	1	1	1

Zonal Lumen Density Measurement

Deg	Flux (lm)	%
0-5	14.3	0.28
5-10	42.6	0.86
10-15	70.6	1.40
15-20	97.9	1.96
20-25	124.4	2.48
25-30	149.6	2.99
30-35	173.3	3.46
35-40	195.1	3.89
40-45	214.4	4.28
45-50	230.9	4.61
50-55	244.2	4.88
55-60	254.0	5.07
60-65	260.3	5.20
65-70	263.0	5.25
70-75	262.1	5.23
75-80	257.7	5.14
80-85	250.2	5.00
85-90	239.9	4.79
90-95	227.0	4.53
95-100	212.1	4.23
100-105	195.5	3.91
105-110	177.8	3.55
110-115	159.2	3.17
115-120	140.5	2.81
120-125	121.8	2.43
125-130	103.6	2.07
130-135	86.2	1.72
135-140	69.9	1.39
140-145	55.1	1.10
145-150	41.7	0.84
150-155	30.2	0.60
155-160	20.5	0.41
160-165	12.9	0.26
165-170	7.1	0.14
170-175	3.1	0.06
175-180	0.5	0.01

Deg	Flux (lm)	%
0-5	14.3	0.28
0-10	56.9	1.14
0-15	127.5	2.54
0-20	225.4	4.50
0-25	349.8	6.98
0-30	499.4	9.97
0-35	672.7	13.43
0-40	867.8	17.32
0-45	1082.2	21.60
0-50	1313.1	26.21
0-55	1557.3	31.09
0-60	1811.3	36.16
0-65	2071.6	41.36
0-70	2334.6	46.61
0-75	2596.7	51.84
0-80	2854.4	56.98
0-85	3104.6	61.98
0-90	3344.5	66.77
0-95	3571.5	71.30
0-100	3783.6	75.53
0-105	3979.1	79.44
0-110	4156.9	82.99
0-115	4316.1	86.16
0-120	4456.6	88.97
0-125	4578.4	91.40
0-130	4682.0	93.47
0-135	4768.2	95.19
0-140	4838.1	96.58
0-145	4893.2	97.68
0-150	4934.9	98.52
0-155	4965.0	99.12
0-160	4985.6	99.53
0-165	4998.4	99.79
0-170	5005.5	99.93
0-175	5008.6	99.99
0-180	5009.2	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*****