

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: 11PAR30/927FL40/277V/SL+SL15D

Report Type:	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution, THD
Reviewed By:	Hill Liu 
Report Number:	KS2220605-43632E-EE-1
Test Date:	2022-02-05 to 2022-02-22
Report Date:	2023-08-25
Approved by:	Blake Zhang / EE Engineer
Prepared By:	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
Test Facility:	Test facility was located at No.12, Pulong East 1 st 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#

General Information:

Two test samples were in good condition and received on 2022-02-21. One was tested in integrating sphere and the other was tested in goniophotometer

Model Tested: 11PAR30/927FL40/277V/SL+SL15D
Manufacturer: GREEN CREATIVE LTD
Product Designation: Directional LED Lamp
Burning Time Before Test: 0hour(For New Products)

Rated Values:

Rated Voltage/Frequency: AC 120-277V 60Hz
Rated Power: 11W
Nominal CCT: 2700K
Nominal Lumen Output: 950lm

Family Declaration

The Model	Multiple Models	Differences Items	Details
11PAR30/927FL40/277V/SL+SL15D	11PAR30/927SP15/277V/SL	Model Number	11PAR30/927FL40/277V/SL+SL15D & 11PAR30/927SP15/277V/SL are the same product except for the model number.

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

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
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.

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.

Additional Test

The Additional Test item may not be covered by IESNA LM-79-2008. Additional test including power factor, off-state power and THD, was measured by Digital Power Meter after stabilized at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. Test voltage for THD and power factor test would be equal to rated voltage or, in case of a voltage range, maximum value of that range.

The uncertainty of power meter AC current $U=0.19\%$ of rdg, AC Voltage $U=0.15\%$ of rdg, Power $U=0.46\%$ ($K=2$), 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**

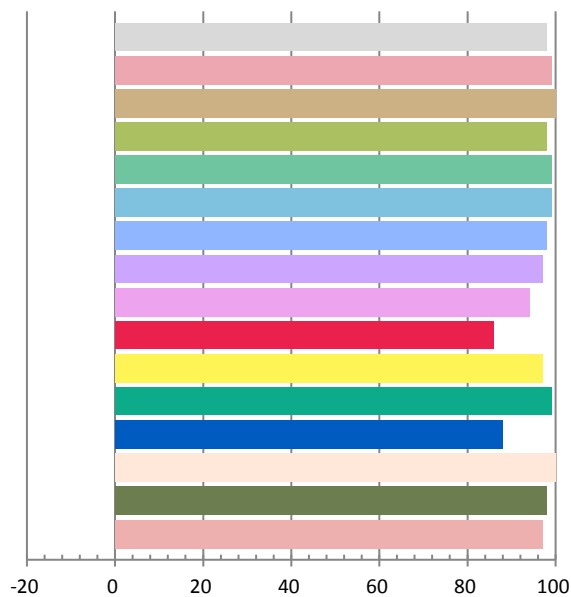
Photometric and Electrical Measurement Result

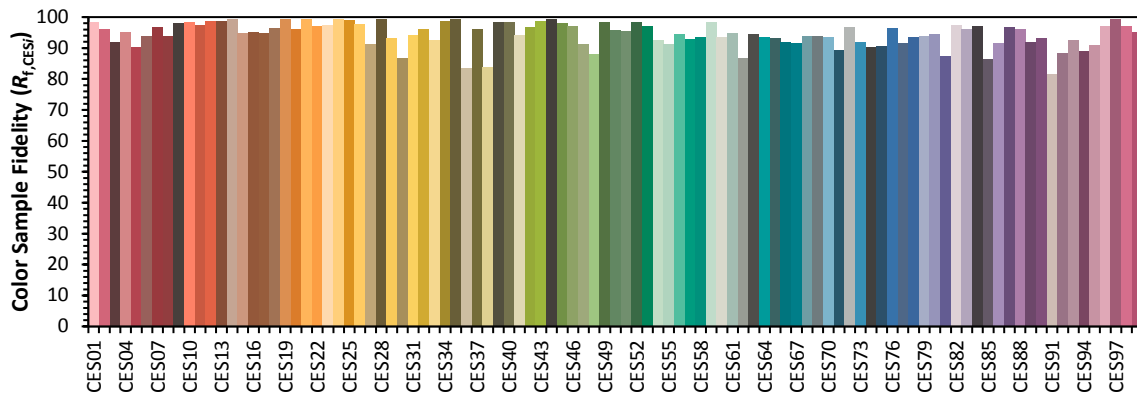
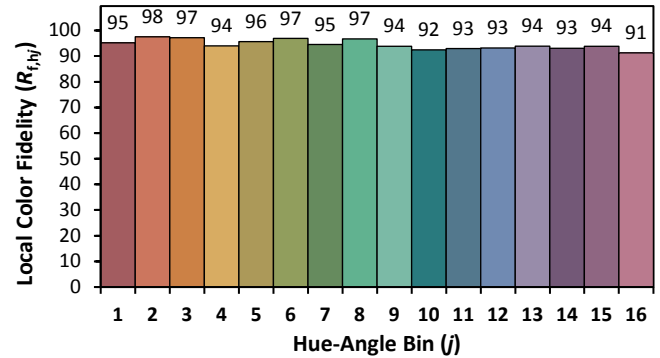
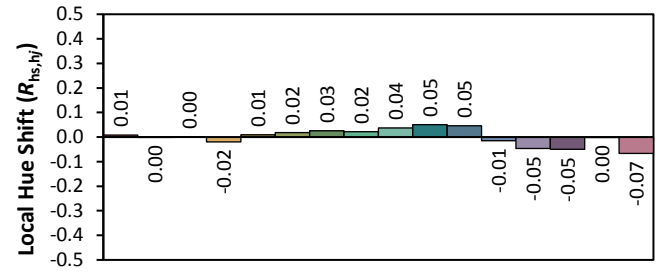
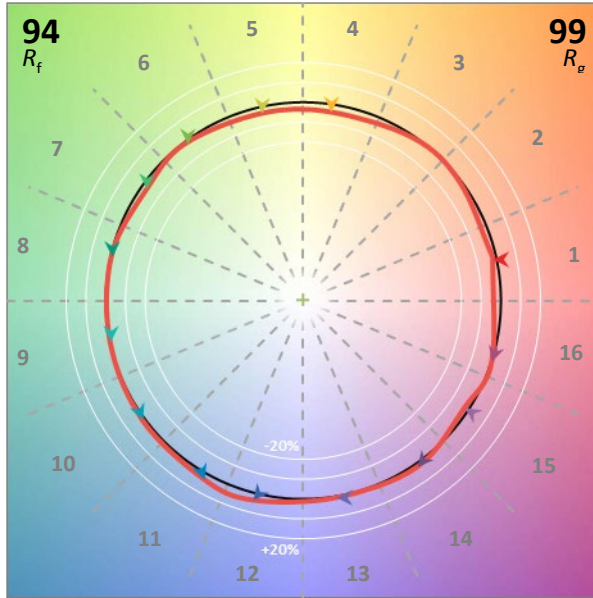
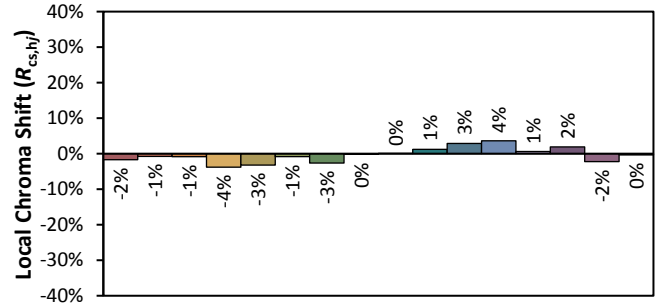
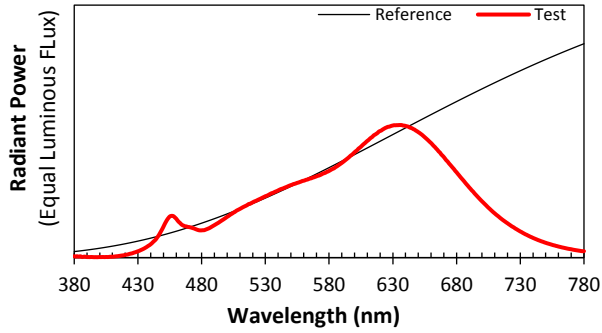
Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.1	60	0.09074	10.52	0.9659	961.68	91.39

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
3.6755	2712	0.000725	0.4602	0.4126	0.2618	0.5282

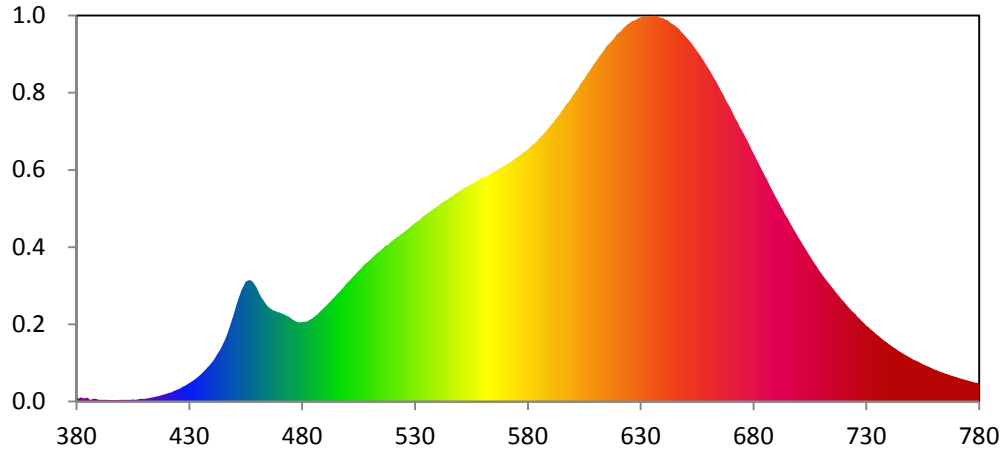
Color Rendering Index

Ra			
97.9			
R1	R2	R3	R4
99	100	98	99
R5	R6	R7	R8
99	98	97	94
R9	R10	R11	R12
86	97	99	88
R13	R14	R15	
100	98	97	





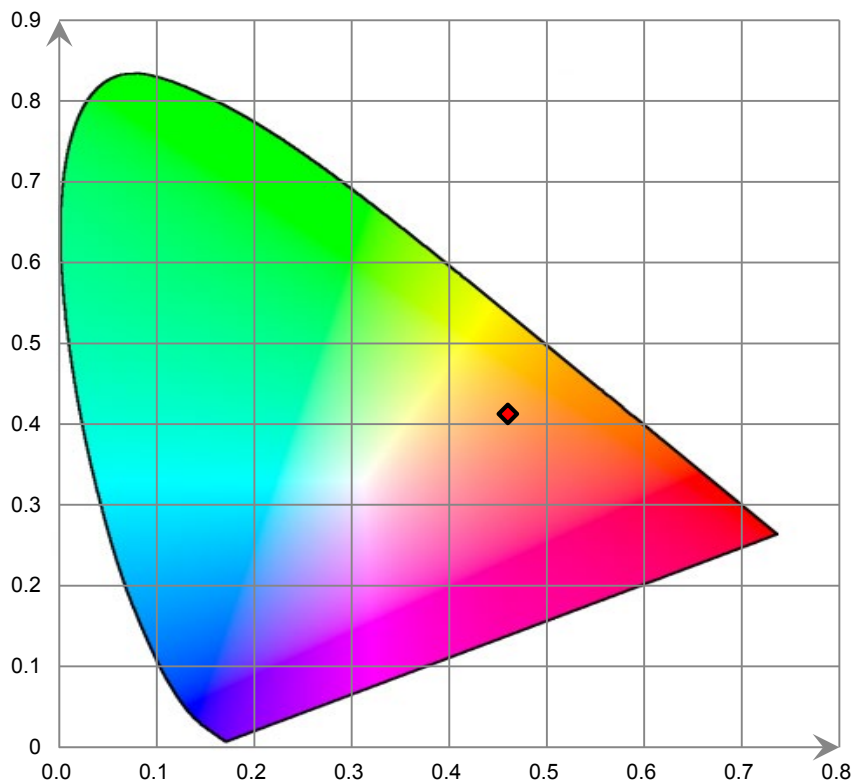
Relative Spectral Power Distribution



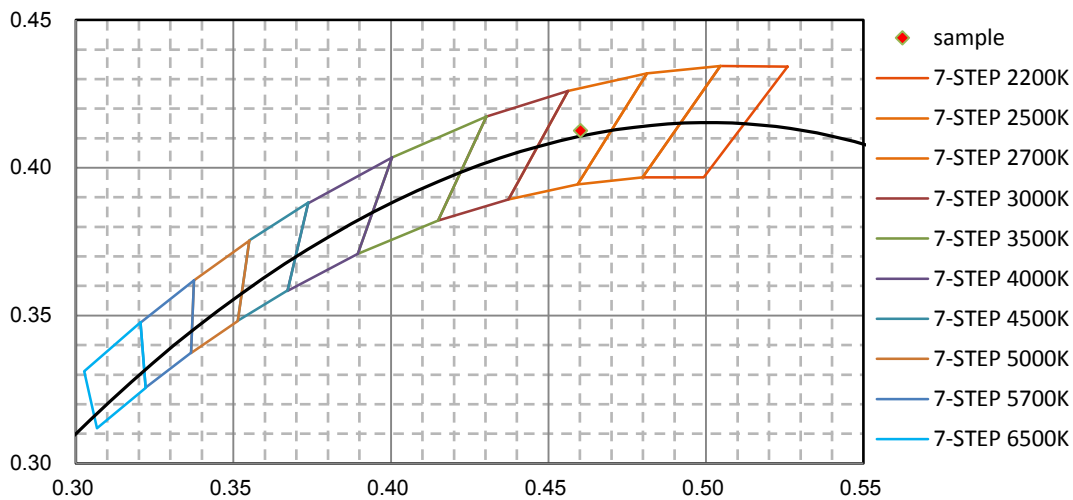
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	2.346E-01	421	4.940E-01	462	5.983E+00	503	7.255E+00	544	1.159E+01
381	1.649E-01	422	5.232E-01	463	5.798E+00	504	7.377E+00	545	1.169E+01
382	2.351E-01	423	5.962E-01	464	5.577E+00	505	7.529E+00	546	1.177E+01
383	1.812E-01	424	6.534E-01	465	5.427E+00	506	7.638E+00	547	1.186E+01
384	1.883E-01	425	6.932E-01	466	5.336E+00	507	7.806E+00	548	1.196E+01
385	2.176E-01	426	7.574E-01	467	5.239E+00	508	7.929E+00	549	1.205E+01
386	9.819E-02	427	8.424E-01	468	5.217E+00	509	8.033E+00	550	1.213E+01
387	1.265E-01	428	8.993E-01	469	5.135E+00	510	8.148E+00	551	1.220E+01
388	1.662E-01	429	9.837E-01	470	5.117E+00	511	8.264E+00	552	1.230E+01
389	1.310E-01	430	1.061E+00	471	5.067E+00	512	8.391E+00	553	1.235E+01
390	9.337E-02	431	1.137E+00	472	5.012E+00	513	8.499E+00	554	1.242E+01
391	9.856E-02	432	1.238E+00	473	4.939E+00	514	8.604E+00	555	1.251E+01
392	8.483E-02	433	1.332E+00	474	4.877E+00	515	8.702E+00	556	1.256E+01
393	1.008E-01	434	1.433E+00	475	4.790E+00	516	8.830E+00	557	1.265E+01
394	9.759E-02	435	1.545E+00	476	4.704E+00	517	8.972E+00	558	1.272E+01
395	8.133E-02	436	1.673E+00	477	4.628E+00	518	9.007E+00	559	1.282E+01
396	7.335E-02	437	1.801E+00	478	4.572E+00	519	9.133E+00	560	1.286E+01
397	8.018E-02	438	1.953E+00	479	4.555E+00	520	9.240E+00	561	1.293E+01
398	6.929E-02	439	2.078E+00	480	4.561E+00	521	9.359E+00	562	1.302E+01
399	8.547E-02	440	2.240E+00	481	4.583E+00	522	9.445E+00	563	1.306E+01
400	9.521E-02	441	2.423E+00	482	4.591E+00	523	9.534E+00	564	1.315E+01
401	9.104E-02	442	2.642E+00	483	4.676E+00	524	9.645E+00	565	1.323E+01
402	9.976E-02	443	2.831E+00	484	4.756E+00	525	9.747E+00	566	1.327E+01
403	9.687E-02	444	3.041E+00	485	4.843E+00	526	9.841E+00	567	1.337E+01
404	8.751E-02	445	3.345E+00	486	4.933E+00	527	9.951E+00	568	1.343E+01
405	1.041E-01	446	3.631E+00	487	5.052E+00	528	1.006E+01	569	1.351E+01
406	9.679E-02	447	3.982E+00	488	5.183E+00	529	1.016E+01	570	1.359E+01
407	1.046E-01	448	4.367E+00	489	5.309E+00	530	1.027E+01	571	1.368E+01
408	1.422E-01	449	4.751E+00	490	5.435E+00	531	1.034E+01	572	1.373E+01
409	1.416E-01	450	5.168E+00	491	5.561E+00	532	1.044E+01	573	1.382E+01
410	1.566E-01	451	5.612E+00	492	5.693E+00	533	1.056E+01	574	1.392E+01
411	1.644E-01	452	6.006E+00	493	5.812E+00	534	1.068E+01	575	1.404E+01
412	1.928E-01	453	6.363E+00	494	5.959E+00	535	1.078E+01	576	1.412E+01
413	2.213E-01	454	6.649E+00	495	6.099E+00	536	1.084E+01	577	1.419E+01
414	2.350E-01	455	6.881E+00	496	6.242E+00	537	1.095E+01	578	1.432E+01
415	2.725E-01	456	6.967E+00	497	6.374E+00	538	1.105E+01	579	1.440E+01
416	3.033E-01	457	6.981E+00	498	6.521E+00	539	1.113E+01	580	1.451E+01
417	3.408E-01	458	6.911E+00	499	6.669E+00	540	1.124E+01	581	1.463E+01
418	3.647E-01	459	6.716E+00	500	6.823E+00	541	1.135E+01	582	1.476E+01
419	3.982E-01	460	6.515E+00	501	6.951E+00	542	1.145E+01	583	1.486E+01
420	4.473E-01	461	6.232E+00	502	7.112E+00	543	1.152E+01	584	1.496E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.513E+01	626	2.187E+01	667	1.757E+01	708	7.762E+00	749	2.542E+00
586	1.525E+01	627	2.190E+01	668	1.727E+01	709	7.566E+00	750	2.477E+00
587	1.540E+01	628	2.197E+01	669	1.706E+01	710	7.392E+00	751	2.400E+00
588	1.555E+01	629	2.205E+01	670	1.683E+01	711	7.204E+00	752	2.340E+00
589	1.570E+01	630	2.210E+01	671	1.655E+01	712	7.038E+00	753	2.276E+00
590	1.585E+01	631	2.215E+01	672	1.627E+01	713	6.869E+00	754	2.212E+00
591	1.601E+01	632	2.214E+01	673	1.607E+01	714	6.683E+00	755	2.145E+00
592	1.618E+01	633	2.216E+01	674	1.578E+01	715	6.512E+00	756	2.077E+00
593	1.635E+01	634	2.216E+01	675	1.554E+01	716	6.347E+00	757	2.033E+00
594	1.652E+01	635	2.218E+01	676	1.529E+01	717	6.190E+00	758	1.963E+00
595	1.669E+01	636	2.218E+01	677	1.504E+01	718	6.041E+00	759	1.917E+00
596	1.688E+01	637	2.217E+01	678	1.480E+01	719	5.884E+00	760	1.852E+00
597	1.708E+01	638	2.210E+01	679	1.451E+01	720	5.743E+00	761	1.805E+00
598	1.722E+01	639	2.208E+01	680	1.428E+01	721	5.587E+00	762	1.749E+00
599	1.742E+01	640	2.203E+01	681	1.401E+01	722	5.442E+00	763	1.696E+00
600	1.763E+01	641	2.197E+01	682	1.376E+01	723	5.289E+00	764	1.653E+00
601	1.781E+01	642	2.192E+01	683	1.349E+01	724	5.159E+00	765	1.605E+00
602	1.797E+01	643	2.180E+01	684	1.324E+01	725	5.041E+00	766	1.558E+00
603	1.822E+01	644	2.171E+01	685	1.300E+01	726	4.881E+00	767	1.507E+00
604	1.838E+01	645	2.165E+01	686	1.275E+01	727	4.764E+00	768	1.466E+00
605	1.856E+01	646	2.151E+01	687	1.248E+01	728	4.630E+00	769	1.433E+00
606	1.877E+01	647	2.142E+01	688	1.223E+01	729	4.505E+00	770	1.398E+00
607	1.897E+01	648	2.126E+01	689	1.199E+01	730	4.374E+00	771	1.347E+00
608	1.914E+01	649	2.114E+01	690	1.173E+01	731	4.272E+00	772	1.304E+00
609	1.934E+01	650	2.099E+01	691	1.150E+01	732	4.136E+00	773	1.267E+00
610	1.953E+01	651	2.085E+01	692	1.124E+01	733	4.026E+00	774	1.232E+00
611	1.969E+01	652	2.069E+01	693	1.104E+01	734	3.903E+00	775	1.199E+00
612	1.990E+01	653	2.053E+01	694	1.077E+01	735	3.815E+00	776	1.162E+00
613	2.007E+01	654	2.034E+01	695	1.054E+01	736	3.698E+00	777	1.131E+00
614	2.022E+01	655	2.015E+01	696	1.031E+01	737	3.597E+00	778	1.090E+00
615	2.045E+01	656	1.996E+01	697	1.008E+01	738	3.488E+00	779	1.076E+00
616	2.057E+01	657	1.977E+01	698	9.853E+00	739	3.402E+00	780	1.078E+00
617	2.071E+01	658	1.957E+01	699	9.628E+00	740	3.296E+00		
618	2.086E+01	659	1.936E+01	700	9.413E+00	741	3.207E+00		
619	2.107E+01	660	1.917E+01	701	9.206E+00	742	3.116E+00		
620	2.118E+01	661	1.894E+01	702	8.992E+00	743	3.030E+00		
621	2.127E+01	662	1.870E+01	703	8.787E+00	744	2.935E+00		
622	2.143E+01	663	1.850E+01	704	8.566E+00	745	2.861E+00		
623	2.155E+01	664	1.825E+01	705	8.354E+00	746	2.774E+00		
624	2.168E+01	665	1.803E+01	706	8.163E+00	747	2.697E+00		
625	2.177E+01	666	1.776E+01	707	7.958E+00	748	2.631E+00		

CIE 1931 x y Chromaticity Diagram



7-Step Chromaticity Quadrangles



[Goniophotometer System]

The Stabilization time: **30 minutes**

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

Test orientation: **Base up**

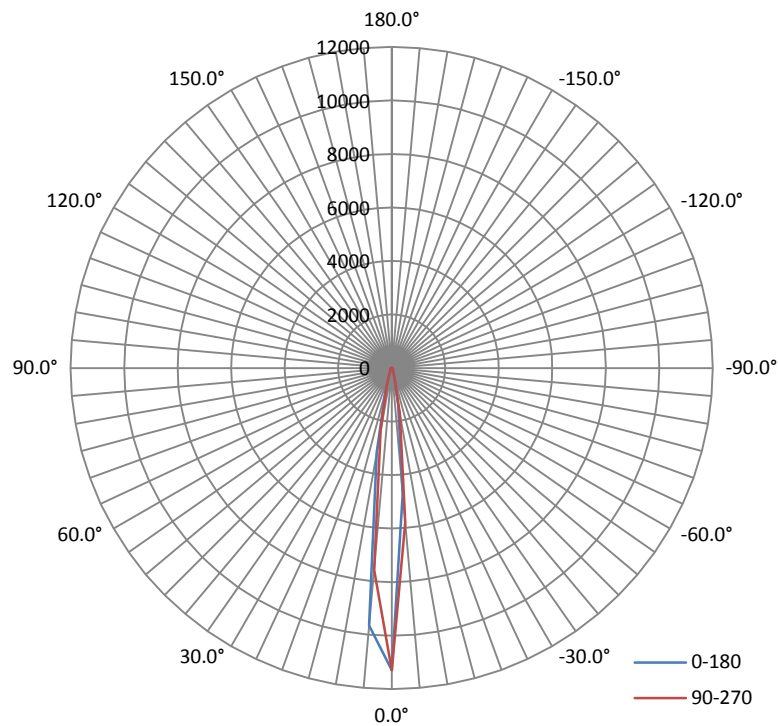
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.05	60	0.0908	10.530	0.9660

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I _{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
962.40	91.40	11952	0.15	0.18

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I _{max}):	11.6	11.6	11.5	11.5	11.6
Field Angle (10% I _{max}):	24.6	24.3	24.8	25.2	24.7

Luminous Intensity (cd) Distribution Data

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	11292	11292	11292	11292	11292	11292	11292	11292
5.0°	9654	9967	9599	8735	7576	6445	5533	4884
10.0°	3190	3321	3185	2789	2367	1989	1677	1428
15.0°	914	935	913	864	788	699	592	505
20.0°	316	319	317	311	305	282	245	203
25.0°	147	147	146	144	143	142	134	124
30.0°	109	106	106	105	107	111	110	107
35.0°	94	92	88	84	85	87	87	84
40.0°	77	73	72	72	73	73	72	71
45.0°	63	61	59	59	60	61	60	58
50.0°	52	50	50	50	51	49	48	47
55.0°	45	45	44	43	42	41	40	39
60.0°	36	36	35	35	34	33	31	30
65.0°	28	28	27	27	27	26	25	24
70.0°	21	22	21	21	20	19	19	18
75.0°	15	16	16	15	14	14	13	12
80.0°	10	11	11	10	9	9	8	8
85.0°	6	6	6	5	5	4	4	3
90.0°	2	2	2	2	2	1	1	1
95.0°	0	0	0	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	1	1	1	1
145.0°	1	1	1	1	1	2	2	2
150.0°	2	2	2	2	2	3	3	3
155.0°	3	3	3	3	3	3	3	3
160.0°	4	3	3	3	3	3	4	4
165.0°	4	3	3	3	3	3	3	3
170.0°	3	3	3	3	3	2	2	2
175.0°	2	2	2	2	2	1	1	1
180.0°	1	1	1	1	1	1	1	1

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°	11292	11292	11292	11292	11292	11292	11292	11292
5.0°	4739	4549	4652	5051	5795	6852	8151	9472
10.0°	1419	1346	1365	1462	1717	1988	2508	3097
15.0°	438	391	381	414	495	618	779	940
20.0°	177	156	151	158	177	221	278	329
25.0°	113	106	107	109	116	129	148	156
30.0°	98	92	93	95	100	106	112	116
35.0°	79	76	77	78	82	87	94	99
40.0°	66	65	65	67	70	73	77	82
45.0°	54	53	53	54	56	60	64	66
50.0°	46	45	46	47	48	50	52	55
55.0°	38	37	37	39	40	42	44	46
60.0°	29	29	29	30	31	33	35	37
65.0°	23	23	23	23	25	26	27	28
70.0°	17	17	17	18	19	20	21	22
75.0°	12	12	12	13	13	14	15	16
80.0°	7	7	7	8	9	9	10	11
85.0°	3	3	3	3	4	5	6	6
90.0°	1	1	1	1	1	2	2	2
95.0°	0	0	0	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	0	0	0	0	0
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	0	0	0	0	0
170.0°	1	1	0	0	0	0	0	0
175.0°	1	1	1	1	1	1	0	0
180.0°	1	1	1	1	1	1	1	1

Zonal Lumen Density Measurement

Deg	Flux (lm)	%	Deg	Flux (lm)	%
0-5	213.9	22.22	0-5	213.9	22.22
5-10	285.8	29.70	0-10	499.6	51.92
10-15	144.7	15.04	0-15	644.4	66.96
15-20	67.5	7.01	0-20	711.8	73.97
20-25	36.6	3.80	0-25	748.5	77.77
25-30	29.1	3.03	0-30	777.6	80.80
30-35	28.2	2.93	0-35	805.8	83.73
35-40	26.0	2.70	0-40	831.8	86.43
40-45	24.1	2.50	0-45	855.9	88.93
45-50	21.7	2.26	0-50	877.6	91.19
50-55	19.7	2.04	0-55	897.3	93.23
55-60	17.1	1.78	0-60	914.4	95.01
60-65	14.0	1.46	0-65	928.4	96.47
65-70	11.3	1.18	0-70	939.8	97.65
70-75	8.7	0.90	0-75	948.5	98.55
75-80	6.1	0.64	0-80	954.6	99.19
80-85	3.6	0.37	0-85	958.2	99.56
85-90	1.5	0.16	0-90	959.7	99.72
90-95	0.3	0.04	0-95	960.1	99.76
95-100	0.0	0.00	0-100	960.1	99.76
100-105	0.0	0.00	0-105	960.1	99.76
105-110	0.0	0.00	0-110	960.1	99.76
110-115	0.0	0.00	0-115	960.1	99.76
115-120	0.0	0.00	0-120	960.1	99.76
120-125	0.0	0.01	0-125	960.1	99.77
125-130	0.0	0.00	0-130	960.2	99.77
130-135	0.0	0.00	0-135	960.2	99.77
135-140	0.1	0.01	0-140	960.3	99.78
140-145	0.2	0.02	0-145	960.5	99.80
145-150	0.4	0.04	0-150	960.9	99.84
150-155	0.5	0.05	0-155	961.3	99.89
155-160	0.4	0.04	0-160	961.7	99.93
160-165	0.3	0.04	0-165	962.1	99.97
165-170	0.2	0.02	0-170	962.3	99.99
170-175	0.1	0.01	0-175	962.4	100.00
175-180	0.0	0.00	0-180	962.4	100.00

[Additional Test]

Test Item	Test Voltage (V)	Frequency (Hz)	Test Result
Total Harmonic Distortion:	120.0	60	13.21%

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.
6. This report cannot be reproduced except in full, without prior written approval of the Company.
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*****END OF REPORT*****