

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, China

Test Model: 11PAR30SNDIM/940FL40/SL

Report Type:	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution, THD
Reviewed By:	Hill Liu <i>Hill Liu</i>
Report Number:	KS2230727-43659E-EE-1
Test Date:	2023-08-11 to 2023-08-16
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 2023-07-27, and used for testing. One was tested in integrating sphere and the other was tested in goniophotometer

Model Tested: 11PAR30SNDIM/940FL40/SL
 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: AC 120V 60Hz
 Rated Power: 11 W
 Nominal CCT: 4000K
 Nominal Lumen Output: 1030 lm

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	2022-11-10	2023-11-09
spectroradiometer	EVERFINE	HAAS-2000	G112048TS81331121	2022-11-10	2023-11-09
Digital Power Meter	EVERFINE	PF2010A	1011004	2022-11-10	2023-11-09
Digital CC&CV DC Power Supply	EVERFINE	WY305-V1	1101047	2022-11-10	2023-11-09
Standard Light Source	EVERFINE	D204	N/A	2023-05-12	2025-05-11
Special zero-voltage synchronous switching AC	EVERFINE	DPS1010-YF	1011001T	2022-11-10	2023-11-09
AC POWER SUPPLY	EVERFINE	VPS1030 PWM	1012017	2022-11-16	2023-11-15
Digital CC&CV DC Power Supply	EVERFINE	WY12010	1009009	2022-11-10	2023-11-09
Digital power meter	YOKOGAWA	WT-210	91j926132	2022-11-10	2023-11-09
full-field speed goniophotometer	EVERFINE	GO-R5000	YG108492N10120001	2022-11-10	2023-11-09
wireless remote thermohygrometer	N/A	AOK-5017B	N/A	2022-11-10	2023-11-09

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
Standard Light Source	EVERFINE	D908	1012003	2023-05-12	2025-05-11

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 $U=0.18\%$ of rdg, Power $U=0.46\%$ ($K=2$), at the 95% confidence level.

Fidelity Index and Gamut Index Calculation

The R_f , 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**

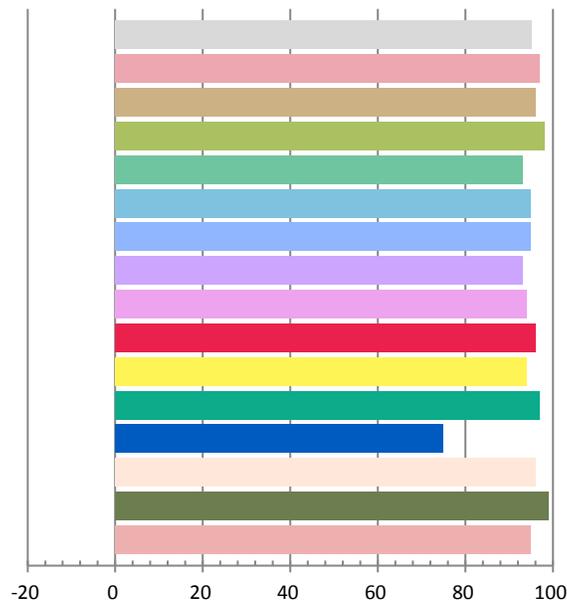
Photometric and Electrical Measurement Result

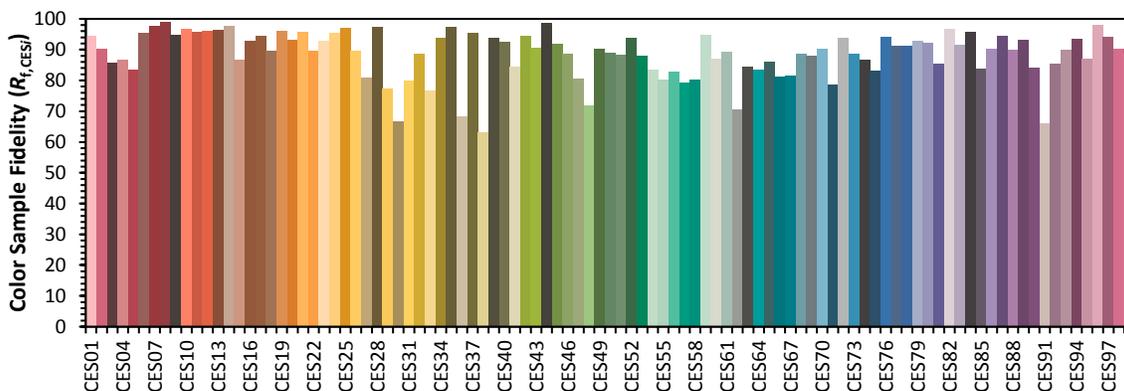
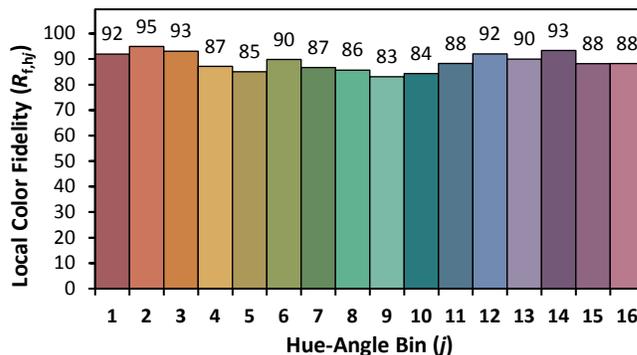
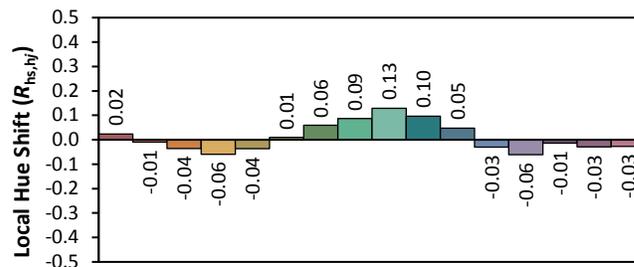
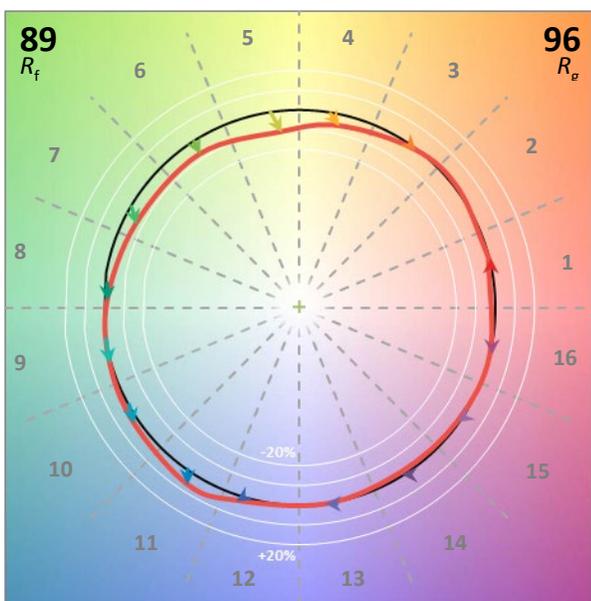
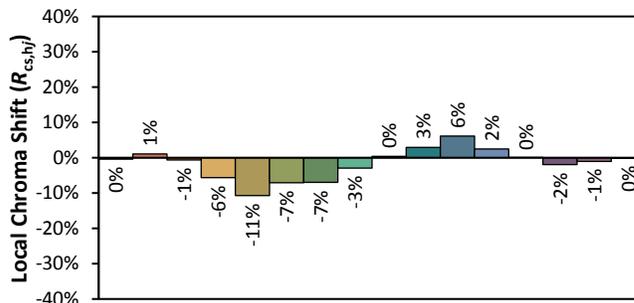
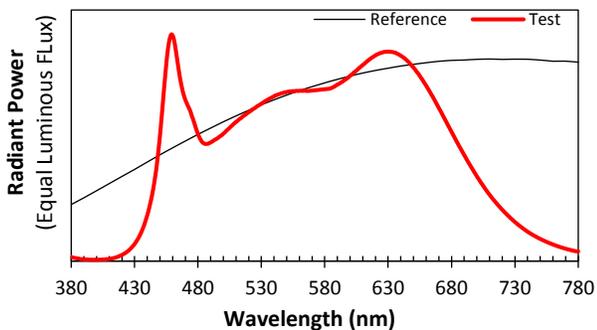
Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.0	60	0.09068	10.37	0.9523	1074.2	103.63

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
3.9589	4014	0.000329	0.3801	0.3772	0.2247	0.5017

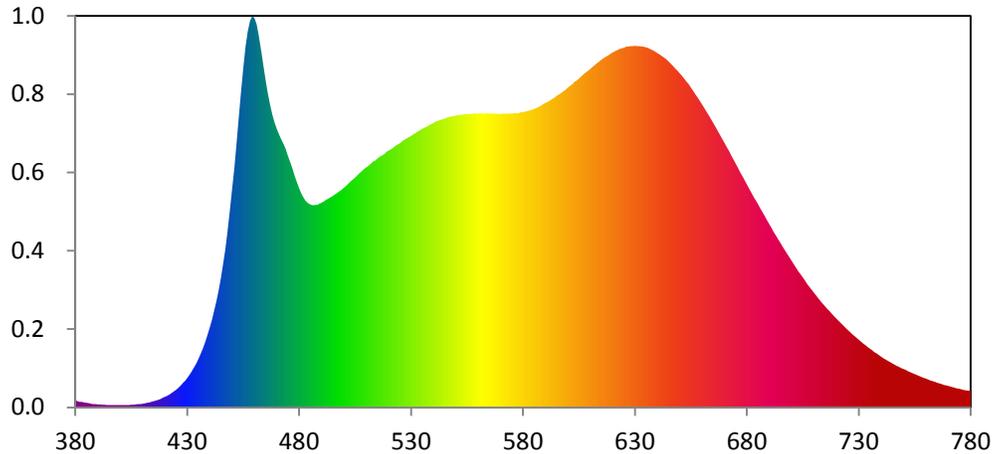
Color Rendering Index

Ra			
95.1			
R1	R2	R3	R4
97	96	98	93
R5	R6	R7	R8
95	95	93	94
R9	R10	R11	R12
96	94	97	75
R13	R14	R15	
96	99	95	





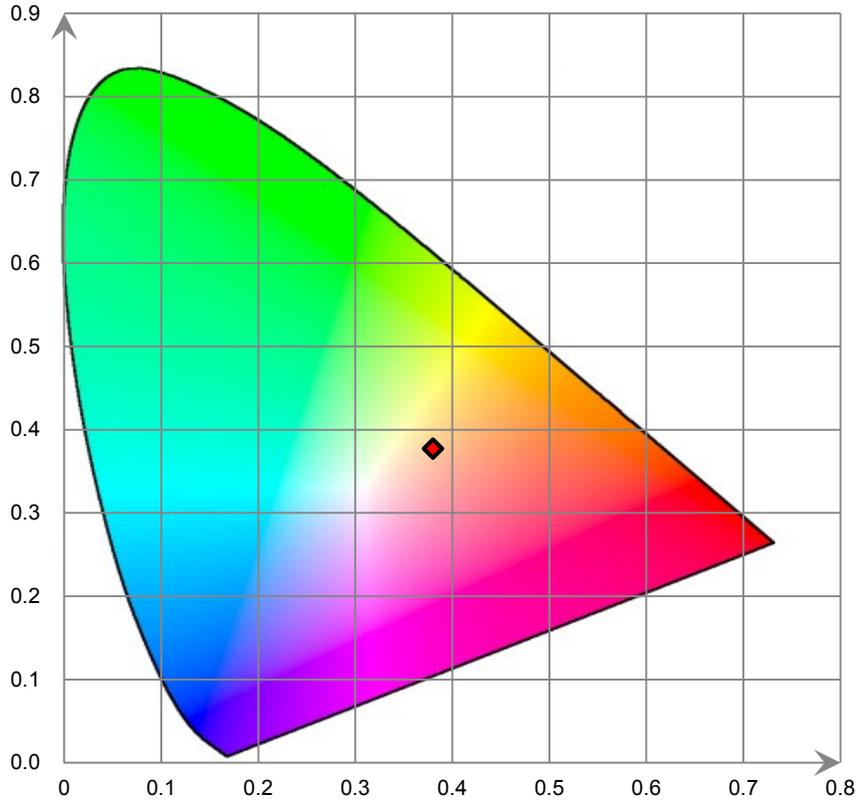
Relative Spectral Power Distribution



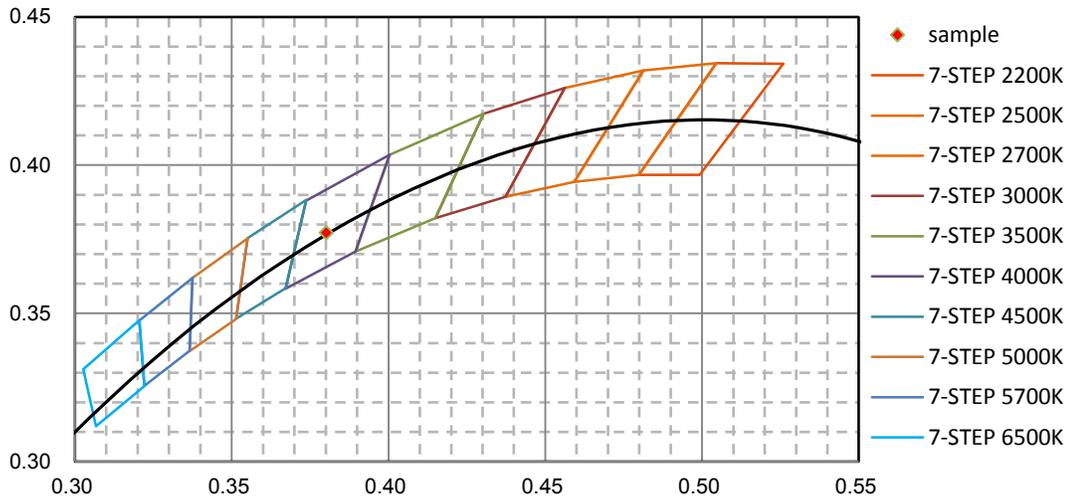
nm	mW								
380	3.794E-01	421	5.969E-01	462	1.885E+01	503	1.149E+01	544	1.464E+01
381	3.156E-01	422	6.606E-01	463	1.812E+01	504	1.158E+01	545	1.467E+01
382	2.836E-01	423	7.320E-01	464	1.737E+01	505	1.169E+01	546	1.472E+01
383	2.762E-01	424	8.121E-01	465	1.663E+01	506	1.180E+01	547	1.474E+01
384	2.488E-01	425	9.013E-01	466	1.595E+01	507	1.190E+01	548	1.478E+01
385	2.271E-01	426	1.001E+00	467	1.539E+01	508	1.201E+01	549	1.480E+01
386	2.165E-01	427	1.109E+00	468	1.488E+01	509	1.211E+01	550	1.483E+01
387	1.834E-01	428	1.235E+00	469	1.448E+01	510	1.220E+01	551	1.485E+01
388	1.665E-01	429	1.357E+00	470	1.415E+01	511	1.228E+01	552	1.487E+01
389	1.666E-01	430	1.498E+00	471	1.388E+01	512	1.238E+01	553	1.487E+01
390	1.546E-01	431	1.664E+00	472	1.362E+01	513	1.248E+01	554	1.489E+01
391	1.485E-01	432	1.836E+00	473	1.339E+01	514	1.254E+01	555	1.491E+01
392	1.339E-01	433	2.022E+00	474	1.314E+01	515	1.265E+01	556	1.490E+01
393	1.405E-01	434	2.227E+00	475	1.278E+01	516	1.273E+01	557	1.492E+01
394	1.204E-01	435	2.458E+00	476	1.248E+01	517	1.281E+01	558	1.493E+01
395	1.209E-01	436	2.720E+00	477	1.214E+01	518	1.288E+01	559	1.492E+01
396	1.192E-01	437	3.005E+00	478	1.178E+01	519	1.298E+01	560	1.493E+01
397	1.159E-01	438	3.310E+00	479	1.145E+01	520	1.305E+01	561	1.494E+01
398	1.184E-01	439	3.663E+00	480	1.114E+01	521	1.313E+01	562	1.493E+01
399	1.171E-01	440	4.028E+00	481	1.087E+01	522	1.320E+01	563	1.493E+01
400	1.152E-01	441	4.424E+00	482	1.067E+01	523	1.330E+01	564	1.494E+01
401	1.181E-01	442	4.890E+00	483	1.048E+01	524	1.336E+01	565	1.493E+01
402	1.225E-01	443	5.366E+00	484	1.037E+01	525	1.343E+01	566	1.492E+01
403	1.242E-01	444	5.913E+00	485	1.030E+01	526	1.352E+01	567	1.492E+01
404	1.279E-01	445	6.527E+00	486	1.027E+01	527	1.360E+01	568	1.493E+01
405	1.347E-01	446	7.233E+00	487	1.028E+01	528	1.366E+01	569	1.492E+01
406	1.445E-01	447	7.980E+00	488	1.029E+01	529	1.373E+01	570	1.492E+01
407	1.497E-01	448	8.896E+00	489	1.035E+01	530	1.380E+01	571	1.492E+01
408	1.680E-01	449	9.894E+00	490	1.040E+01	531	1.388E+01	572	1.491E+01
409	1.773E-01	450	1.098E+01	491	1.047E+01	532	1.394E+01	573	1.493E+01
410	1.893E-01	451	1.220E+01	492	1.054E+01	533	1.403E+01	574	1.493E+01
411	2.076E-01	452	1.347E+01	493	1.062E+01	534	1.408E+01	575	1.492E+01
412	2.270E-01	453	1.480E+01	494	1.068E+01	535	1.415E+01	576	1.495E+01
413	2.498E-01	454	1.607E+01	495	1.074E+01	536	1.422E+01	577	1.495E+01
414	2.821E-01	455	1.728E+01	496	1.082E+01	537	1.427E+01	578	1.495E+01
415	3.123E-01	456	1.833E+01	497	1.091E+01	538	1.433E+01	579	1.499E+01
416	3.506E-01	457	1.911E+01	498	1.099E+01	539	1.440E+01	580	1.501E+01
417	3.877E-01	458	1.963E+01	499	1.106E+01	540	1.444E+01	581	1.503E+01
418	4.356E-01	459	1.988E+01	500	1.117E+01	541	1.453E+01	582	1.506E+01
419	4.871E-01	460	1.979E+01	501	1.126E+01	542	1.455E+01	583	1.509E+01
420	5.387E-01	461	1.945E+01	502	1.138E+01	543	1.460E+01	584	1.512E+01

nm	mW								
585	1.517E+01	626	1.832E+01	667	1.405E+01	708	6.118E+00	749	1.998E+00
586	1.522E+01	627	1.834E+01	668	1.384E+01	709	5.966E+00	750	1.943E+00
587	1.527E+01	628	1.835E+01	669	1.364E+01	710	5.821E+00	751	1.891E+00
588	1.533E+01	629	1.836E+01	670	1.343E+01	711	5.674E+00	752	1.836E+00
589	1.541E+01	630	1.837E+01	671	1.323E+01	712	5.533E+00	753	1.784E+00
590	1.548E+01	631	1.836E+01	672	1.303E+01	713	5.394E+00	754	1.734E+00
591	1.553E+01	632	1.835E+01	673	1.281E+01	714	5.265E+00	755	1.683E+00
592	1.560E+01	633	1.834E+01	674	1.260E+01	715	5.134E+00	756	1.637E+00
593	1.568E+01	634	1.832E+01	675	1.239E+01	716	5.003E+00	757	1.589E+00
594	1.573E+01	635	1.829E+01	676	1.218E+01	717	4.873E+00	758	1.543E+00
595	1.583E+01	636	1.826E+01	677	1.196E+01	718	4.750E+00	759	1.502E+00
596	1.590E+01	637	1.819E+01	678	1.176E+01	719	4.623E+00	760	1.456E+00
597	1.597E+01	638	1.815E+01	679	1.155E+01	720	4.503E+00	761	1.414E+00
598	1.605E+01	639	1.808E+01	680	1.134E+01	721	4.386E+00	762	1.373E+00
599	1.614E+01	640	1.801E+01	681	1.113E+01	722	4.273E+00	763	1.332E+00
600	1.625E+01	641	1.794E+01	682	1.092E+01	723	4.163E+00	764	1.295E+00
601	1.633E+01	642	1.786E+01	683	1.071E+01	724	4.050E+00	765	1.254E+00
602	1.642E+01	643	1.778E+01	684	1.050E+01	725	3.942E+00	766	1.219E+00
603	1.654E+01	644	1.768E+01	685	1.030E+01	726	3.835E+00	767	1.185E+00
604	1.661E+01	645	1.758E+01	686	1.009E+01	727	3.726E+00	768	1.149E+00
605	1.671E+01	646	1.747E+01	687	9.898E+00	728	3.632E+00	769	1.117E+00
606	1.681E+01	647	1.736E+01	688	9.707E+00	729	3.528E+00	770	1.085E+00
607	1.692E+01	648	1.722E+01	689	9.500E+00	730	3.429E+00	771	1.052E+00
608	1.701E+01	649	1.710E+01	690	9.306E+00	731	3.339E+00	772	1.023E+00
609	1.710E+01	650	1.697E+01	691	9.112E+00	732	3.243E+00	773	9.966E-01
610	1.720E+01	651	1.684E+01	692	8.905E+00	733	3.153E+00	774	9.661E-01
611	1.728E+01	652	1.669E+01	693	8.720E+00	734	3.068E+00	775	9.389E-01
612	1.738E+01	653	1.654E+01	694	8.528E+00	735	2.979E+00	776	9.119E-01
613	1.748E+01	654	1.641E+01	695	8.345E+00	736	2.896E+00	777	8.863E-01
614	1.757E+01	655	1.623E+01	696	8.160E+00	737	2.813E+00	778	8.616E-01
615	1.766E+01	656	1.607E+01	697	7.979E+00	738	2.734E+00	779	8.544E-01
616	1.774E+01	657	1.591E+01	698	7.795E+00	739	2.656E+00	780	8.561E-01
617	1.783E+01	658	1.573E+01	699	7.620E+00	740	2.579E+00		
618	1.789E+01	659	1.556E+01	700	7.440E+00	741	2.504E+00		
619	1.797E+01	660	1.539E+01	701	7.262E+00	742	2.436E+00		
620	1.803E+01	661	1.520E+01	702	7.096E+00	743	2.370E+00		
621	1.811E+01	662	1.502E+01	703	6.919E+00	744	2.302E+00		
622	1.815E+01	663	1.483E+01	704	6.764E+00	745	2.239E+00		
623	1.820E+01	664	1.463E+01	705	6.596E+00	746	2.176E+00		
624	1.825E+01	665	1.445E+01	706	6.438E+00	747	2.116E+00		
625	1.827E+01	666	1.425E+01	707	6.271E+00	748	2.057E+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: **1.0hour**

Test orientation: **Base Up**

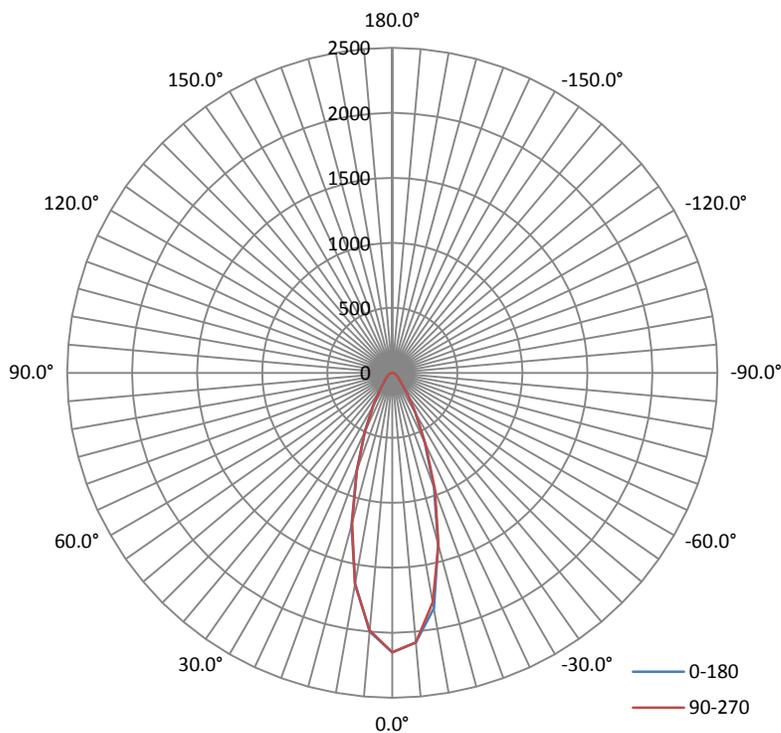
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.10	60	0.0907	10.380	0.9529

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I _{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
1075.5	103.61	2177.0	0.60	0.60

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I _{max}):	34.9	34.5	34.8	34.8	34.8
Field Angle (10% I _{max}):	67.6	67.4	67.5	67.7	67.6

Luminous Intensity (cd) Distribution Data

C \ γ	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	2151	2151	2151	2151	2151	2151	2151	2151
5.0°	1998	1967	1958	1966	1988	2007	2027	2046
10.0°	1645	1610	1598	1611	1653	1691	1727	1770
15.0°	1215	1169	1150	1168	1196	1222	1256	1287
20.0°	806	766	755	774	798	816	839	866
25.0°	501	472	464	479	499	512	530	547
30.0°	294	277	272	285	298	307	319	328
35.0°	170	162	159	168	175	181	189	195
40.0°	105	102	101	106	109	112	116	118
45.0°	74	71	71	73	75	76	78	80
50.0°	58	56	55	56	57	58	59	60
55.0°	48	47	46	47	47	48	48	48
60.0°	37	35	35	36	36	37	38	38
65.0°	27	26	26	26	27	27	28	28
70.0°	20	19	19	19	19	20	20	21
75.0°	14	13	13	13	13	14	14	15
80.0°	8	8	8	8	8	9	9	9
85.0°	4	3	3	3	4	4	4	4
90.0°	1	1	1	1	1	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°	1	1	1	1	1	1	1	1
145.0°	1	1	1	1	1	1	1	1
150.0°	2	2	2	2	2	2	2	2
155.0°	2	2	2	2	2	2	2	2
160.0°	3	3	3	3	3	3	3	3
165.0°	3	3	3	3	3	3	3	3
170.0°	2	2	2	2	2	2	2	2
175.0°	2	2	2	2	2	2	2	2
180.0°	1	1	1	1	1	2	2	2

Luminous Intensity (cd) Distribution Data (cont.)

C y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	2151	2151	2151	2151	2151	2151	2151	2151
5.0°	2082	2107	2128	2116	2084	2069	2035	2014
10.0°	1839	1877	1894	1865	1793	1755	1719	1686
15.0°	1364	1405	1431	1418	1374	1350	1314	1280
20.0°	937	969	993	993	956	936	901	867
25.0°	592	618	641	634	601	591	560	535
30.0°	357	376	387	379	356	347	330	316
35.0°	209	221	227	223	207	200	192	183
40.0°	127	133	139	134	126	122	118	112
45.0°	84	86	88	86	82	81	79	76
50.0°	62	63	64	64	62	61	60	59
55.0°	51	52	52	52	50	49	48	49
60.0°	41	42	42	41	40	39	39	38
65.0°	30	31	31	31	30	29	29	28
70.0°	22	23	23	23	22	22	21	21
75.0°	16	16	16	16	16	15	15	14
80.0°	10	11	11	11	10	10	10	9
85.0°	5	6	6	6	5	5	5	5
90.0°	2	2	2	2	2	2	2	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	0	0	0	0
145.0°	0	0	0	0	0	0	0	0
150.0°	1	0	0	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	2	2

Zonal Lumen Density Measurement

Deg	Flux (lm)	%
0-5	50.0	4.65
5-10	135.1	12.56
10-15	177.7	16.53
15-20	175.7	16.33
20-25	146.3	13.60
25-30	108.1	10.05
30-35	74.1	6.89
35-40	50.2	4.67
40-45	35.4	3.29
45-50	27.6	2.56
50-55	23.4	2.17
55-60	20.2	1.88
60-65	16.1	1.50
65-70	12.4	1.15
70-75	9.2	0.86
75-80	6.3	0.59
80-85	3.7	0.34
85-90	1.5	0.14
90-95	0.3	0.03
95-100	0.0	0.00
100-105	0.0	0.00
105-110	0.0	0.01
110-115	0.0	0.00
115-120	0.0	0.00
120-125	0.0	0.00
125-130	0.1	0.01
130-135	0.1	0.00
135-140	0.2	0.02
140-145	0.2	0.02
145-150	0.3	0.03
150-155	0.3	0.03
155-160	0.3	0.03
160-165	0.3	0.03
165-170	0.2	0.02
170-175	0.1	0.01
175-180	0.0	0.00

Deg	Flux (lm)	%
0-5	50.0	4.65
0-10	185.1	17.21
0-15	362.8	33.74
0-20	538.5	50.07
0-25	684.8	63.67
0-30	792.8	73.72
0-35	867.0	80.61
0-40	917.2	85.28
0-45	952.5	88.57
0-50	980.1	91.13
0-55	1003.5	93.30
0-60	1023.7	95.18
0-65	1039.8	96.68
0-70	1052.2	97.83
0-75	1061.4	98.69
0-80	1067.7	99.28
0-85	1071.4	99.62
0-90	1072.9	99.76
0-95	1073.3	99.79
0-100	1073.3	99.79
0-105	1073.3	99.79
0-110	1073.3	99.80
0-115	1073.3	99.80
0-120	1073.3	99.80
0-125	1073.4	99.80
0-130	1073.4	99.81
0-135	1073.5	99.81
0-140	1073.6	99.83
0-145	1073.9	99.85
0-150	1074.2	99.88
0-155	1074.5	99.91
0-160	1074.9	99.94
0-165	1075.2	99.97
0-170	1075.4	99.99
0-175	1075.5	100.00
0-180	1075.5	100.00

[Additional Test]

Test Item	Test Voltage (V)	Frequency (Hz)	Test Result
Total Harmonic Distortion:	120.0	60	16.96%

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.
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*****END OF REPORT*****