



ANSI/IES LM-79-19

MEASUREMENT AND TEST REPORT

For

GREEN CREATIVE LTD

Room 3603, Level 36, Tower 1, Enterprise Square Five, 38 Wang Chiu Road, Kowloon Bay, Kowloon, Hong Kong, China

Test Model: 11PAR30SNDIM/950FL40/SL

Report Type:	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution, THD
Reviewed By:	Hill Liu 
Report Number:	KS2230727-43662E-EE
Test Date:	2023-07-26 to 2023-07-27
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. One was tested in integrating sphere and the other was tested in goniophotometer

Model Tested: 11PAR30SNDIM/950FL40/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: 120V AC 60Hz

Rated Power: 11W

Nominal CCT: 5000K

Nominal Lumen Output: 1030lm

2. Standards Used

- ANSI/IES LM-79-19: Approved method: Optical and Electrical Measurements 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
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 ANSI/IES LM-79-19. The product was operated at rated voltage or at voltage required by manufacturer. The ambient temperature of the sample was maintained at $25^{\circ}\text{C} \pm 1.2^{\circ}\text{C}$ during measurement. And relative humidity is maintained between 10% and 65%. The air flow around the SSL product is less than 0.2m/s.

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 $U=22K$ ($K=2$), 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 (y) 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 ANSI/IES LM-79-2019. Additional test including power factor, off-state power and THD, was measured by Digital Power Meter after stabilized at $25^{\circ}\text{C} \pm 1.2^{\circ}\text{C}$. 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**

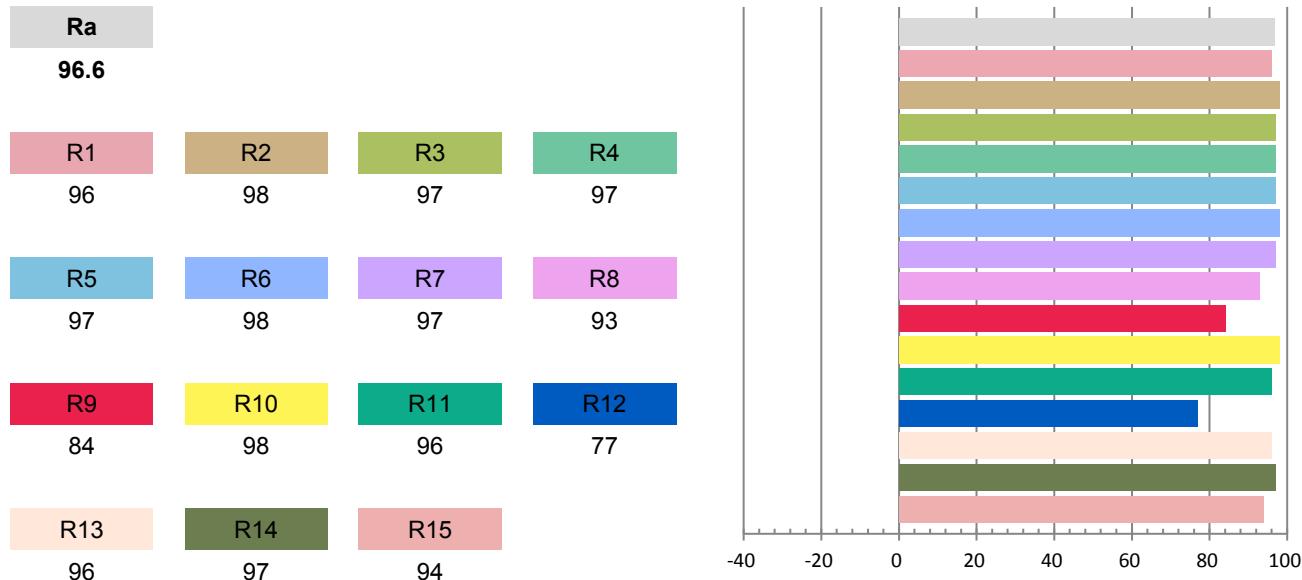
Test orientation: **Base Up**

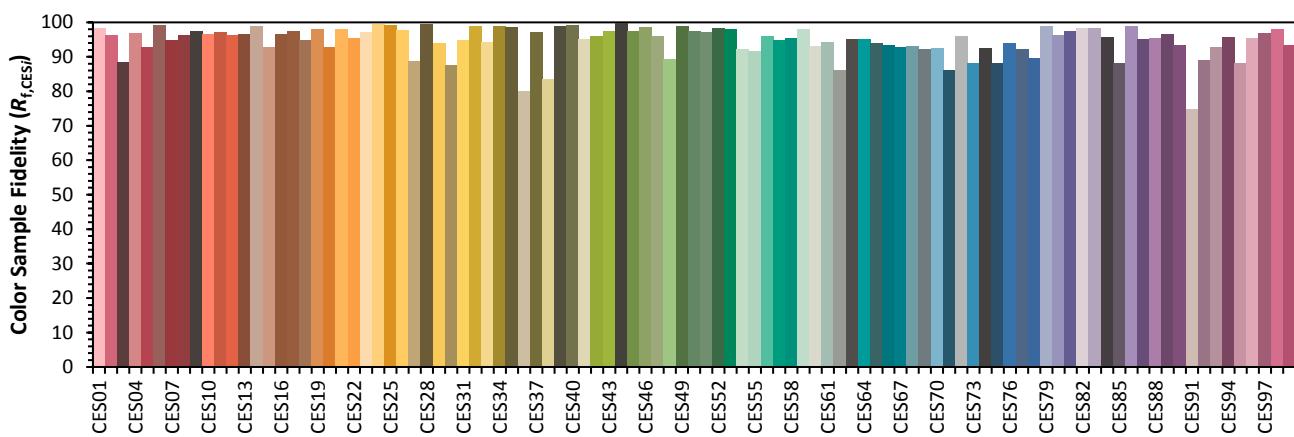
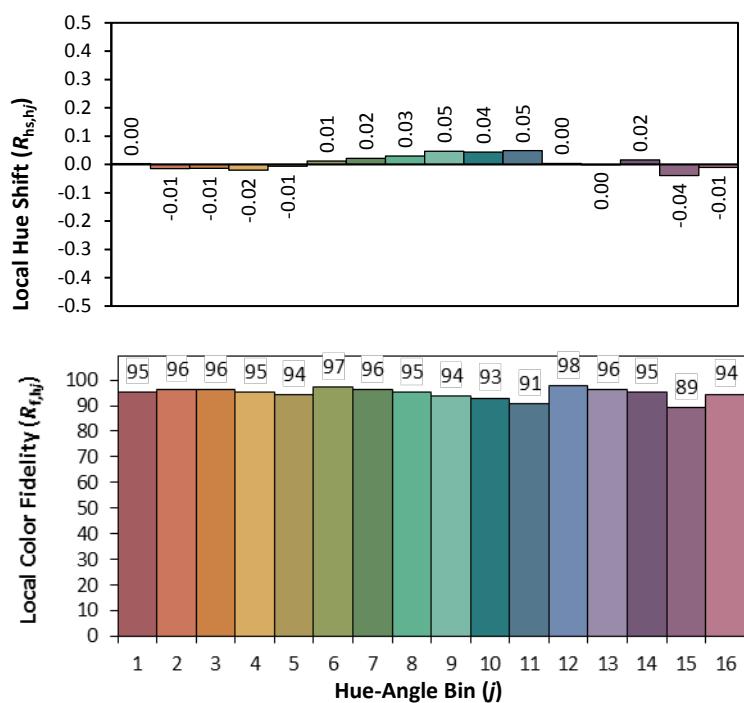
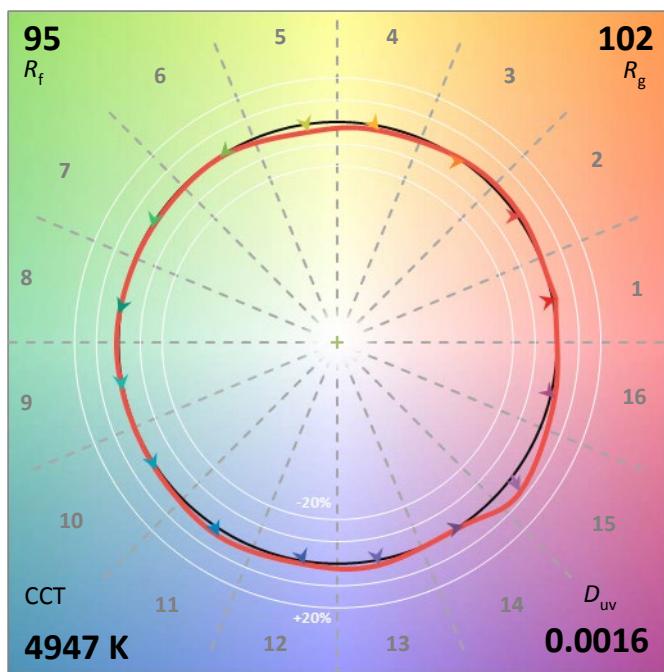
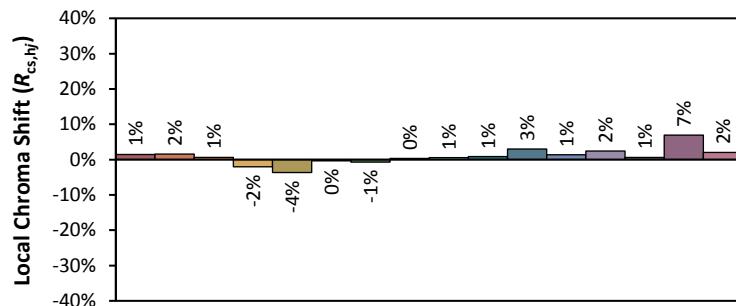
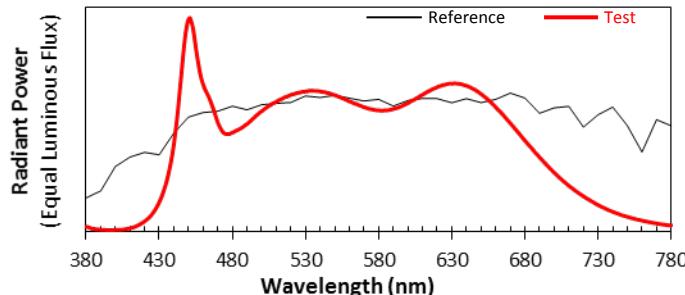
Photometric and Electrical Measurement Result

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.0	60	0.09187	10.51	0.9531	1032.3	98.26

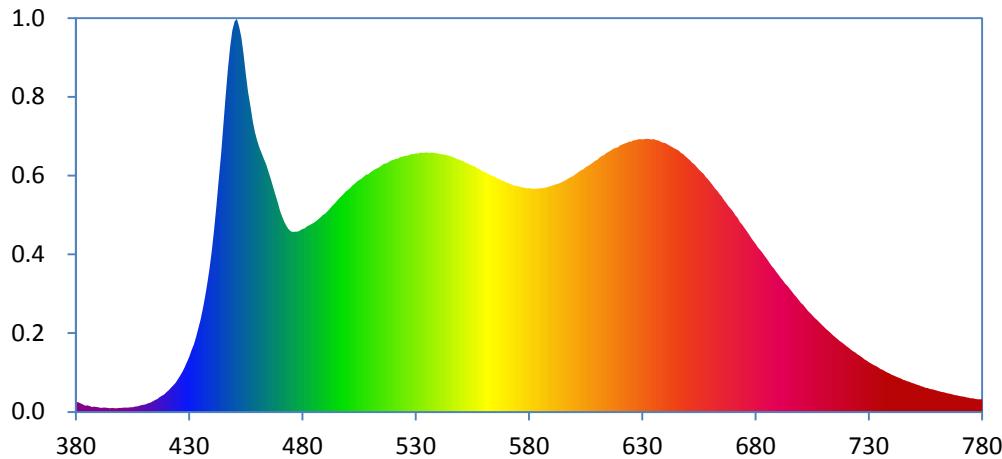
Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
3.863	4945	0.00161	0.3470	0.3564	0.2109	0.4873

Color Rendering Index





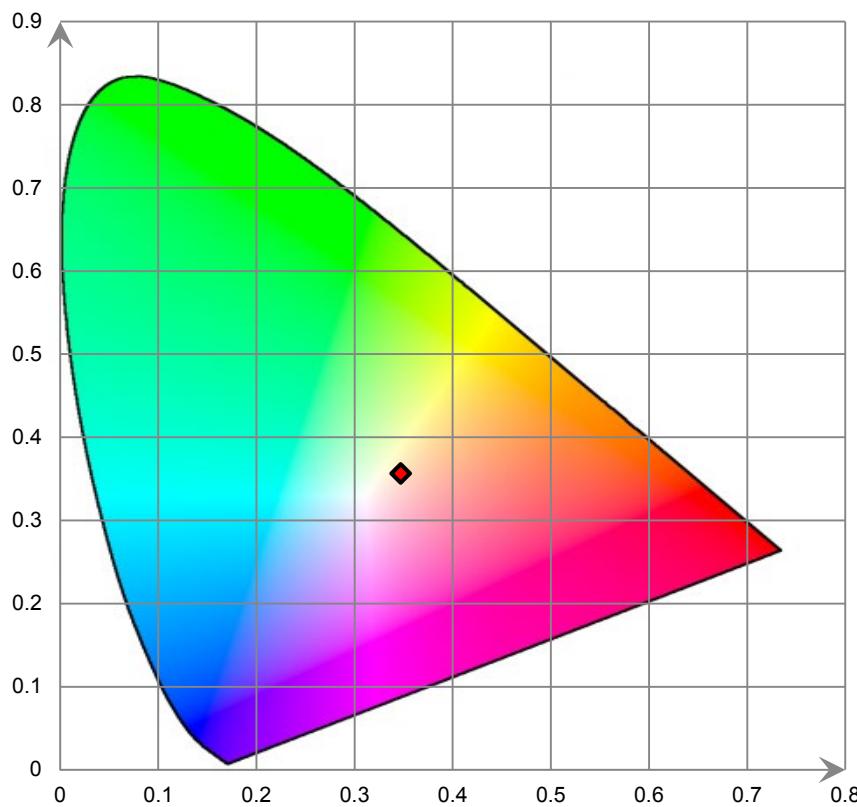
Relative Spectral Power Distribution



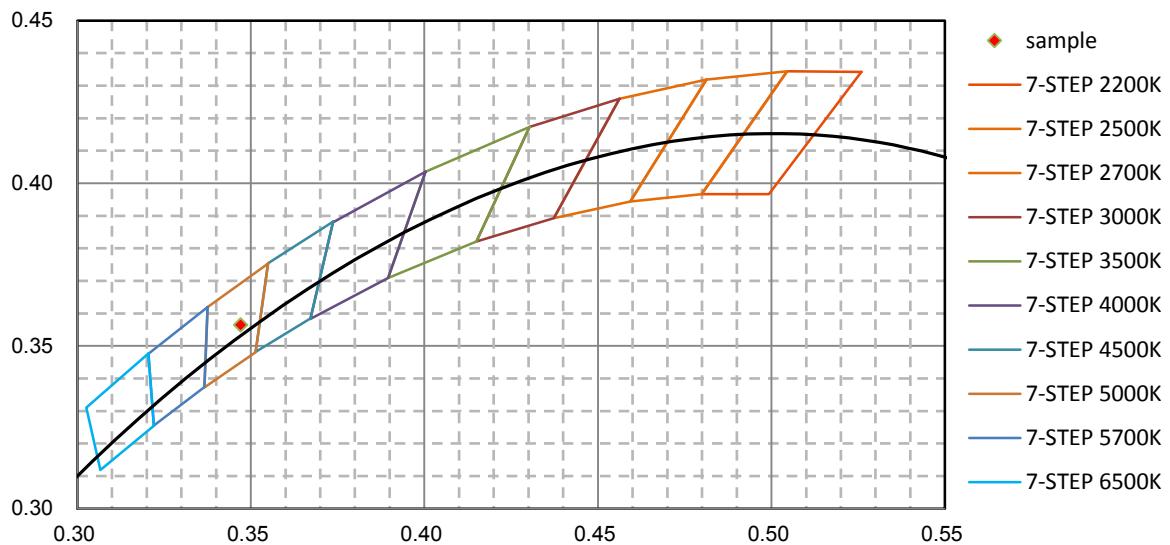
nm	mW								
380	5.783E-01	421	1.287E+00	462	1.512E+01	503	1.334E+01	544	1.500E+01
381	5.637E-01	422	1.423E+00	463	1.478E+01	504	1.346E+01	545	1.496E+01
382	4.990E-01	423	1.558E+00	464	1.445E+01	505	1.356E+01	546	1.493E+01
383	4.387E-01	424	1.717E+00	465	1.405E+01	506	1.363E+01	547	1.488E+01
384	3.630E-01	425	1.913E+00	466	1.364E+01	507	1.376E+01	548	1.480E+01
385	3.836E-01	426	2.130E+00	467	1.319E+01	508	1.387E+01	549	1.476E+01
386	3.471E-01	427	2.359E+00	468	1.273E+01	509	1.390E+01	550	1.471E+01
387	2.869E-01	428	2.614E+00	469	1.225E+01	510	1.403E+01	551	1.467E+01
388	3.141E-01	429	2.912E+00	470	1.177E+01	511	1.410E+01	552	1.458E+01
389	2.853E-01	430	3.210E+00	471	1.141E+01	512	1.420E+01	553	1.453E+01
390	2.626E-01	431	3.586E+00	472	1.110E+01	513	1.426E+01	554	1.446E+01
391	2.366E-01	432	3.951E+00	473	1.085E+01	514	1.433E+01	555	1.440E+01
392	2.532E-01	433	4.415E+00	474	1.067E+01	515	1.442E+01	556	1.436E+01
393	2.479E-01	434	4.907E+00	475	1.056E+01	516	1.451E+01	557	1.425E+01
394	2.270E-01	435	5.425E+00	476	1.053E+01	517	1.453E+01	558	1.421E+01
395	2.123E-01	436	6.062E+00	477	1.054E+01	518	1.460E+01	559	1.411E+01
396	2.389E-01	437	6.761E+00	478	1.054E+01	519	1.469E+01	560	1.404E+01
397	2.180E-01	438	7.543E+00	479	1.063E+01	520	1.474E+01	561	1.400E+01
398	2.245E-01	439	8.441E+00	480	1.070E+01	521	1.480E+01	562	1.391E+01
399	2.271E-01	440	9.461E+00	481	1.074E+01	522	1.482E+01	563	1.385E+01
400	2.409E-01	441	1.067E+01	482	1.086E+01	523	1.489E+01	564	1.379E+01
401	2.442E-01	442	1.202E+01	483	1.093E+01	524	1.493E+01	565	1.375E+01
402	2.511E-01	443	1.350E+01	484	1.099E+01	525	1.497E+01	566	1.366E+01
403	2.521E-01	444	1.512E+01	485	1.108E+01	526	1.499E+01	567	1.361E+01
404	2.735E-01	445	1.681E+01	486	1.117E+01	527	1.503E+01	568	1.355E+01
405	2.793E-01	446	1.848E+01	487	1.127E+01	528	1.507E+01	569	1.348E+01
406	3.035E-01	447	2.003E+01	488	1.139E+01	529	1.508E+01	570	1.342E+01
407	3.201E-01	448	2.134E+01	489	1.152E+01	530	1.511E+01	571	1.338E+01
408	3.712E-01	449	2.232E+01	490	1.160E+01	531	1.512E+01	572	1.332E+01
409	3.951E-01	450	2.285E+01	491	1.174E+01	532	1.516E+01	573	1.326E+01
410	4.178E-01	451	2.299E+01	492	1.189E+01	533	1.516E+01	574	1.323E+01
411	4.641E-01	452	2.255E+01	493	1.202E+01	534	1.516E+01	575	1.321E+01
412	5.141E-01	453	2.192E+01	494	1.218E+01	535	1.518E+01	576	1.316E+01
413	5.515E-01	454	2.094E+01	495	1.232E+01	536	1.516E+01	577	1.314E+01
414	6.240E-01	455	1.979E+01	496	1.247E+01	537	1.517E+01	578	1.311E+01
415	7.041E-01	456	1.873E+01	497	1.261E+01	538	1.515E+01	579	1.308E+01
416	7.664E-01	457	1.782E+01	498	1.273E+01	539	1.514E+01	580	1.310E+01
417	8.653E-01	458	1.699E+01	499	1.288E+01	540	1.512E+01	581	1.306E+01
418	9.541E-01	459	1.634E+01	500	1.298E+01	541	1.508E+01	582	1.306E+01
419	1.041E+00	460	1.585E+01	501	1.310E+01	542	1.505E+01	583	1.305E+01
420	1.170E+00	461	1.543E+01	502	1.324E+01	543	1.504E+01	584	1.308E+01

nm	mW								
585	1.307E+01	626	1.587E+01	667	1.223E+01	708	5.253E+00	749	1.698E+00
586	1.309E+01	627	1.590E+01	668	1.205E+01	709	5.113E+00	750	1.657E+00
587	1.311E+01	628	1.595E+01	669	1.188E+01	710	4.984E+00	751	1.606E+00
588	1.315E+01	629	1.596E+01	670	1.170E+01	711	4.856E+00	752	1.558E+00
589	1.318E+01	630	1.594E+01	671	1.150E+01	712	4.746E+00	753	1.511E+00
590	1.323E+01	631	1.596E+01	672	1.134E+01	713	4.624E+00	754	1.479E+00
591	1.328E+01	632	1.597E+01	673	1.112E+01	714	4.499E+00	755	1.418E+00
592	1.332E+01	633	1.596E+01	674	1.096E+01	715	4.384E+00	756	1.389E+00
593	1.336E+01	634	1.594E+01	675	1.078E+01	716	4.281E+00	757	1.348E+00
594	1.342E+01	635	1.595E+01	676	1.059E+01	717	4.166E+00	758	1.326E+00
595	1.349E+01	636	1.589E+01	677	1.039E+01	718	4.066E+00	759	1.276E+00
596	1.355E+01	637	1.588E+01	678	1.019E+01	719	3.957E+00	760	1.249E+00
597	1.363E+01	638	1.581E+01	679	1.001E+01	720	3.839E+00	761	1.207E+00
598	1.372E+01	639	1.576E+01	680	9.832E+00	721	3.751E+00	762	1.173E+00
599	1.377E+01	640	1.573E+01	681	9.640E+00	722	3.638E+00	763	1.145E+00
600	1.386E+01	641	1.566E+01	682	9.454E+00	723	3.553E+00	764	1.110E+00
601	1.395E+01	642	1.558E+01	683	9.293E+00	724	3.470E+00	765	1.079E+00
602	1.405E+01	643	1.552E+01	684	9.104E+00	725	3.360E+00	766	1.055E+00
603	1.414E+01	644	1.542E+01	685	8.934E+00	726	3.282E+00	767	1.015E+00
604	1.419E+01	645	1.535E+01	686	8.739E+00	727	3.192E+00	768	9.843E-01
605	1.430E+01	646	1.528E+01	687	8.541E+00	728	3.079E+00	769	9.628E-01
606	1.439E+01	647	1.515E+01	688	8.398E+00	729	3.008E+00	770	9.305E-01
607	1.447E+01	648	1.507E+01	689	8.215E+00	730	2.903E+00	771	9.101E-01
608	1.458E+01	649	1.495E+01	690	8.037E+00	731	2.841E+00	772	8.829E-01
609	1.469E+01	650	1.483E+01	691	7.863E+00	732	2.750E+00	773	8.565E-01
610	1.474E+01	651	1.472E+01	692	7.707E+00	733	2.680E+00	774	8.344E-01
611	1.486E+01	652	1.457E+01	693	7.517E+00	734	2.616E+00	775	8.011E-01
612	1.496E+01	653	1.447E+01	694	7.368E+00	735	2.524E+00	776	7.953E-01
613	1.503E+01	654	1.432E+01	695	7.192E+00	736	2.466E+00	777	7.512E-01
614	1.513E+01	655	1.418E+01	696	7.036E+00	737	2.384E+00	778	7.408E-01
615	1.520E+01	656	1.405E+01	697	6.856E+00	738	2.318E+00	779	7.422E-01
616	1.528E+01	657	1.391E+01	698	6.718E+00	739	2.255E+00	780	7.436E-01
617	1.537E+01	658	1.374E+01	699	6.545E+00	740	2.188E+00		
618	1.544E+01	659	1.360E+01	700	6.378E+00	741	2.132E+00		
619	1.548E+01	660	1.342E+01	701	6.253E+00	742	2.070E+00		
620	1.557E+01	661	1.326E+01	702	6.097E+00	743	2.012E+00		
621	1.565E+01	662	1.307E+01	703	5.926E+00	744	1.955E+00		
622	1.569E+01	663	1.295E+01	704	5.801E+00	745	1.888E+00		
623	1.573E+01	664	1.276E+01	705	5.662E+00	746	1.835E+00		
624	1.581E+01	665	1.261E+01	706	5.512E+00	747	1.787E+00		
625	1.582E+01	666	1.240E+01	707	5.379E+00	748	1.751E+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**

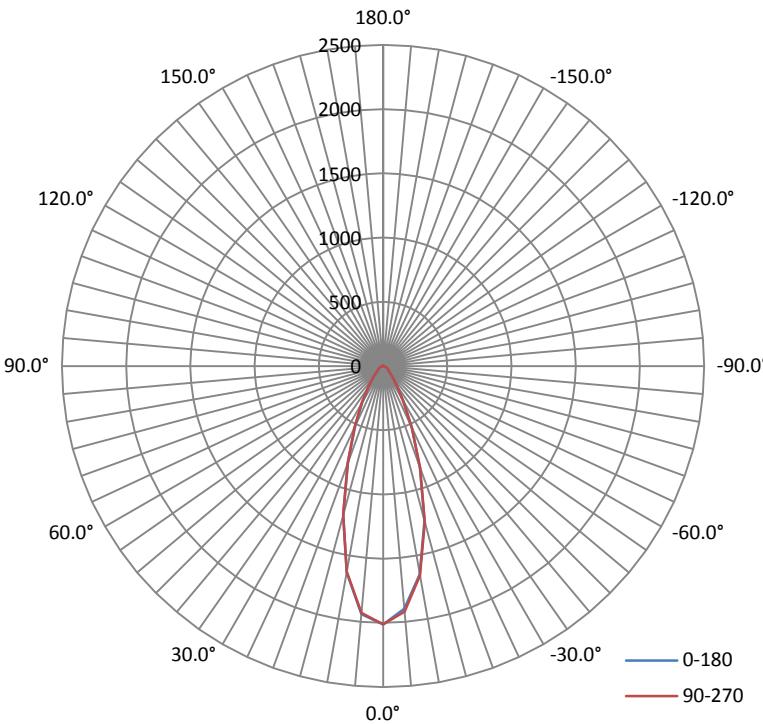
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.07	60	0.0920	10.520	0.9523

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I_{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
1034.02	98.29	2028	0.59	0.59

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I_{max}):	35.0	34.8	35.0	35.4	35.1
Field Angle (10% I_{max}):	69.1	68.9	69.2	69.2	69.1

Luminous Intensity (cd) Distribution Data

$\gamma \backslash C$	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	2012	2012	2012	2012	2012	2012	2012	2012
5.0°	1938	1937	1933	1928	1929	1973	1965	1935
10.0°	1632	1628	1621	1622	1625	1717	1707	1697
15.0°	1199	1196	1191	1191	1194	1282	1295	1287
20.0°	797	796	798	799	805	879	876	872
25.0°	511	516	519	526	529	576	570	562
30.0°	315	319	323	328	330	361	352	342
35.0°	193	193	195	199	201	220	214	207
40.0°	121	121	123	126	127	136	132	129
45.0°	79	81	82	83	82	89	87	85
50.0°	57	57	58	58	58	62	62	61
55.0°	45	45	45	46	46	48	47	47
60.0°	35	36	36	36	36	38	38	38
65.0°	26	26	27	27	27	28	28	28
70.0°	20	20	20	20	20	21	21	21
75.0°	14	14	14	14	14	15	15	15
80.0°	8	8	9	9	9	10	10	10
85.0°	4	4	4	4	4	5	5	5
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°	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°	2	2	2	2	2	2	2	2
165.0°	2	2	2	2	2	2	2	2
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.)

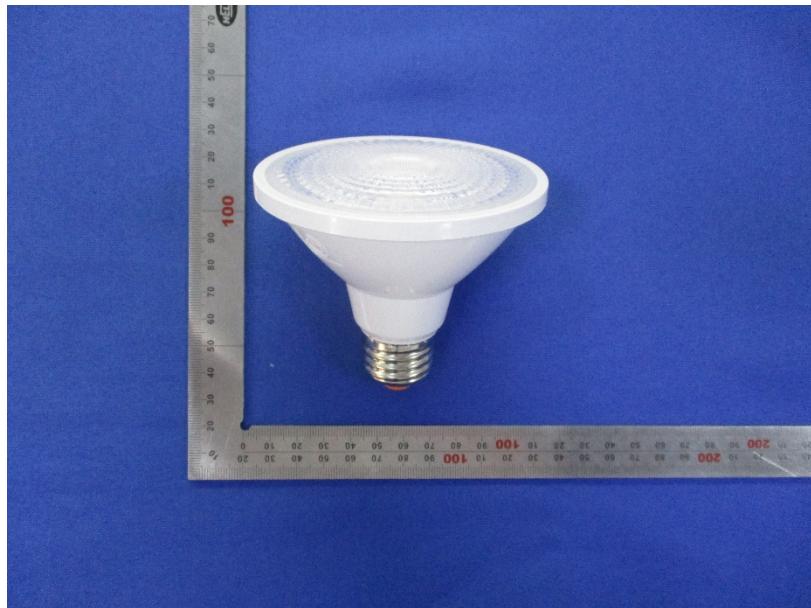
C γ \ C	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	2012	2012	2012	2012	2012	2012	2012	2012
5.0°	1896	1874	1872	1886	1920	1911	1923	1915
10.0°	1649	1638	1636	1640	1656	1599	1607	1600
15.0°	1250	1248	1247	1248	1257	1184	1185	1175
20.0°	845	845	841	839	839	775	782	781
25.0°	535	534	530	526	528	482	487	494
30.0°	321	318	314	313	314	286	292	297
35.0°	195	193	190	189	188	173	176	180
40.0°	122	122	119	119	118	110	111	112
45.0°	81	81	81	80	80	75	75	74
50.0°	58	59	59	59	59	56	55	54
55.0°	46	47	47	47	46	45	44	44
60.0°	36	37	37	37	38	35	34	34
65.0°	27	27	28	28	28	26	26	26
70.0°	20	20	20	20	20	19	19	19
75.0°	14	14	14	14	14	14	14	13
80.0°	9	9	9	9	10	8	8	8
85.0°	5	5	5	5	5	4	4	4
90.0°	1	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	0	0	0	0
145.0°	0	0	0	0	0	0	0	0
150.0°	0	0	0	0	0	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	2	2	2

Zonal Lumen Density Measurement

Deg	Flux (lm)	%	Deg	Flux (lm)	%
0-5	47.1	4.55	0-5	47.1	4.55
5-10	127.4	12.32	0-10	174.5	16.87
10-15	169.3	16.37	0-15	343.7	33.24
15-20	166.2	16.08	0-20	509.9	49.32
20-25	138.7	13.41	0-25	648.6	62.73
25-30	104.7	10.12	0-30	753.3	72.85
30-35	73.8	7.14	0-35	827.1	79.99
35-40	51.4	4.98	0-40	878.6	84.97
40-45	36.7	3.55	0-45	915.3	88.52
45-50	27.6	2.67	0-50	942.9	91.19
50-55	22.4	2.16	0-55	965.3	93.35
55-60	19.2	1.86	0-60	984.5	95.21
60-65	15.3	1.48	0-65	999.8	96.69
65-70	11.8	1.14	0-70	1011.6	97.83
70-75	8.9	0.86	0-75	1020.5	98.69
75-80	6.1	0.59	0-80	1026.6	99.28
80-85	3.6	0.35	0-85	1030.2	99.63
85-90	1.5	0.14	0-90	1031.7	99.77
90-95	0.3	0.03	0-95	1032.0	99.80
95-100	0.0	0.00	0-100	1032.0	99.80
100-105	0.0	0.00	0-105	1032.0	99.80
105-110	0.0	0.00	0-110	1032.0	99.80
110-115	0.0	0.00	0-115	1032.0	99.80
115-120	0.0	0.01	0-120	1032.0	99.81
120-125	0.0	0.00	0-125	1032.0	99.81
125-130	0.0	0.00	0-130	1032.1	99.81
130-135	0.1	0.01	0-135	1032.2	99.82
135-140	0.1	0.01	0-140	1032.3	99.83
140-145	0.2	0.02	0-145	1032.5	99.85
145-150	0.3	0.03	0-150	1032.8	99.88
150-155	0.3	0.03	0-155	1033.1	99.91
155-160	0.3	0.03	0-160	1033.4	99.94
160-165	0.3	0.03	0-165	1033.7	99.97
165-170	0.2	0.02	0-170	1033.9	99.99
170-175	0.1	0.01	0-175	1034.0	100.00
175-180	0.0	0.00	0-180	1034.0	100.00

Test Item	Test Voltage (V)	Frequency (Hz)	Test Result
Total Harmonic Distortion:	120.0	60	17.11%

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*****