

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: 11PAR30/927FL40/277V/SL

Report Type:	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution, THD
Reviewed By:	Hill Liu 
Report Number:	KS2230727-43634E-EE-1
Test Date:	2023-08-12 to 2023-08-23
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 sample was in good condition and received on date,2023-07-27 and used for testing. One was tested in integrating sphere and the other was tested in goniophotometer

Model Tested: 11PAR30/927FL40/277V/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 120-277V 60Hz
Rated Power: 11W
Nominal CCT: 2700K
Nominal Lumen Output: 950 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
1.5m temperature integrating sphere	SENSING	SPR-600	S09008	2022-11-10	2023-11-09
High-precision rapid spectral analysis system	EVERFINE	HAAS-2000	M112048CA1361125	2022-11-10	2023-11-09
Digital power meter	YOKOGAWA	WT310	13398	2022-11-10	2023-11-09
Programmable Precision DC Power Supply	EVERFINE	WY5015	11060010	2022-11-10	2023-11-09
thermometer	SENSING	NA	NA	2022-11-10	2023-11-09
Standard Light Source	EVERFINE	D204	N/A	2023-05-12	2025-05-11
Precision frequency power supply	ALL Power	APW-105N	970613	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

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
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 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 $U=0.39\%$ of rdg, AC Voltage $U=0.25\%$ of rdg, Power $U=0.42\%$ ($K=2$), 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_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**

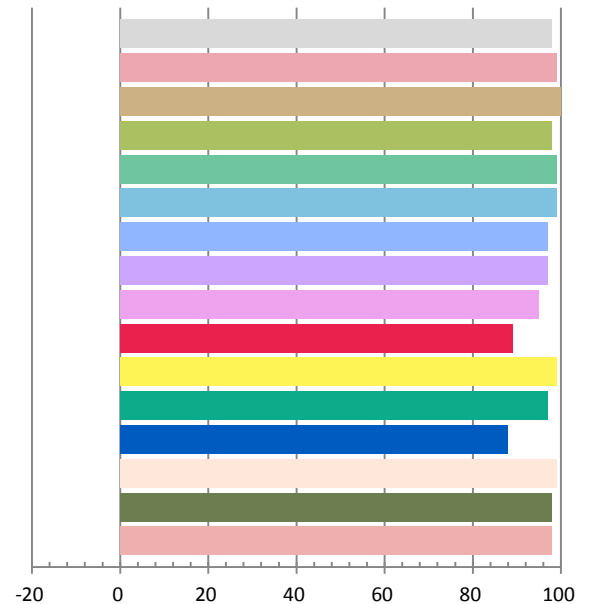
Photometric and Electrical Measurement Result

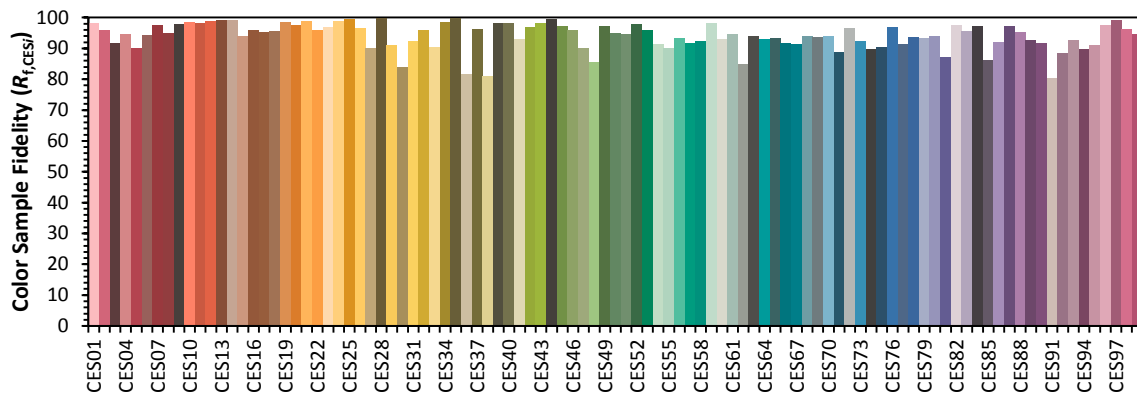
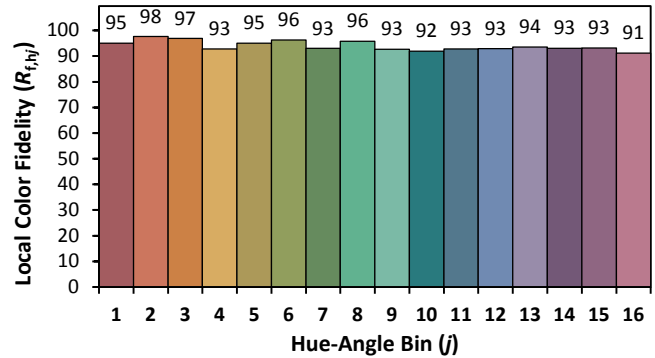
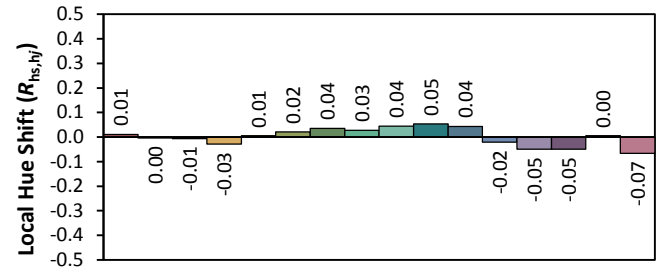
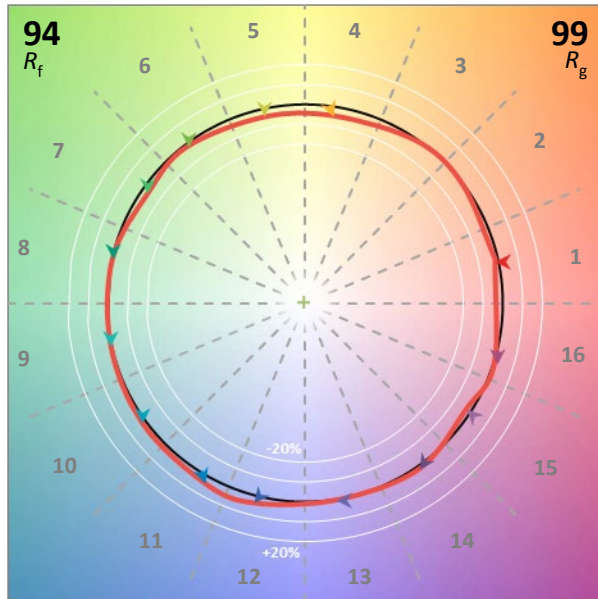
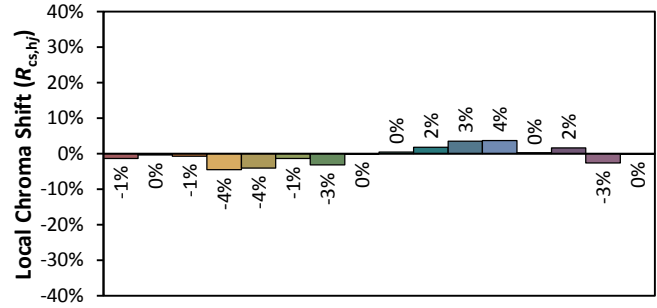
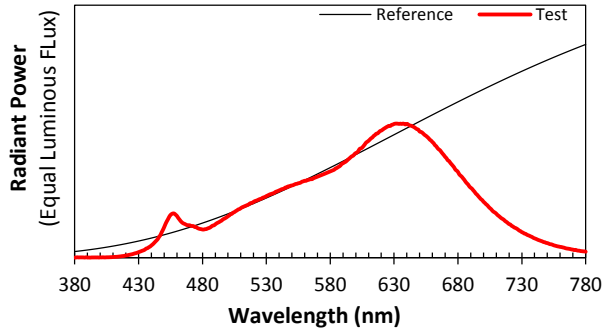
Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.0	60	0.09134	10.58	0.9657	961.61	90.88

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
3.6797	2716	0.00053	0.4595	0.4120	0.2617	0.5278

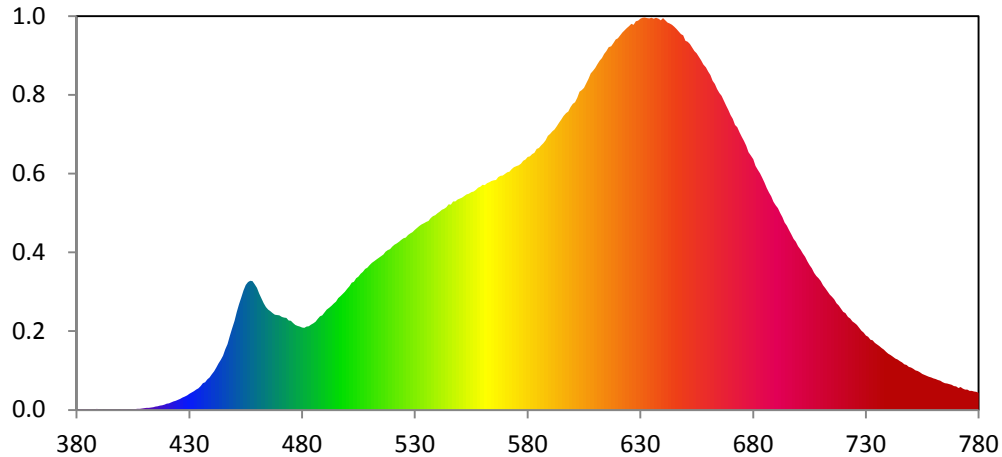
Color Rendering Index

Ra			
97.9			
R1	R2	R3	R4
99	100	98	99
R5	R6	R7	R8
99	97	97	95
R9	R10	R11	R12
89	99	97	88
R13	R14	R15	
99	98	98	





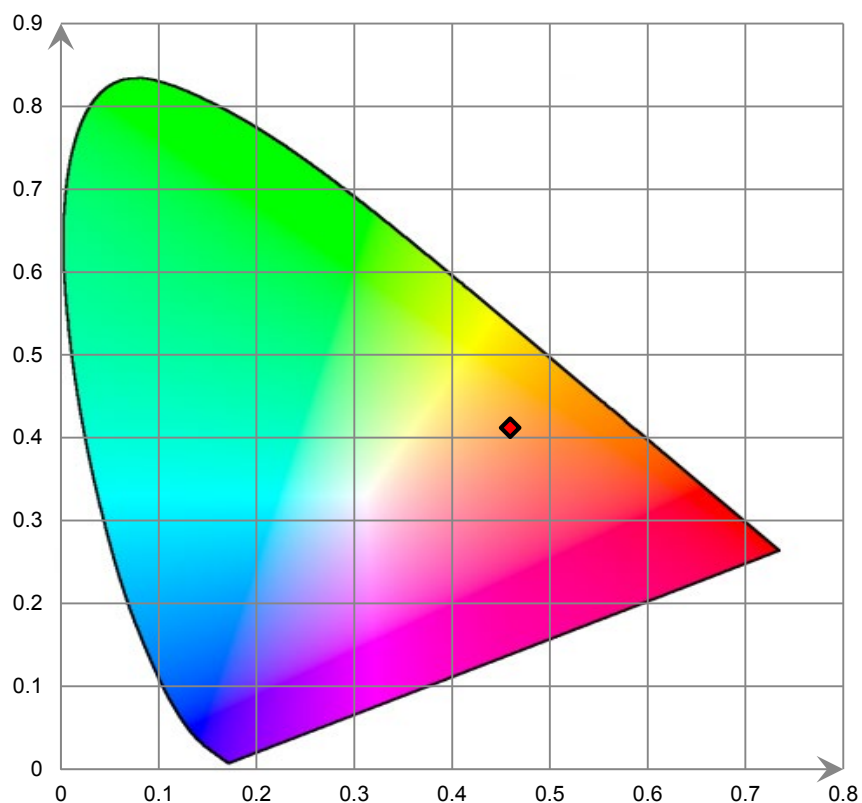
Relative Spectral Power Distribution



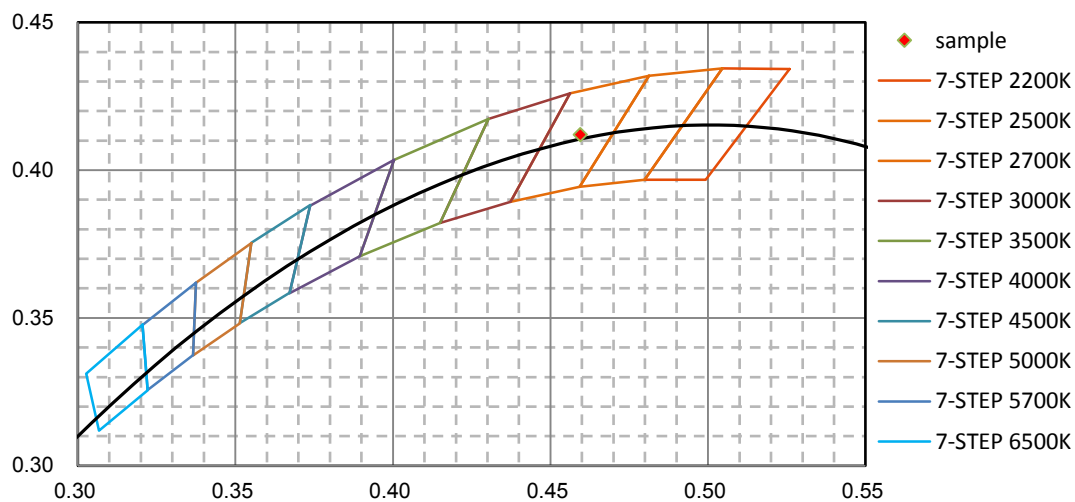
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	0.000E+00	421	3.804E-01	462	6.369E+00	503	7.325E+00	544	1.158E+01
381	1.934E-02	422	4.348E-01	463	6.091E+00	504	7.522E+00	545	1.174E+01
382	5.381E-02	423	4.805E-01	464	5.881E+00	505	7.613E+00	546	1.173E+01
383	2.708E-02	424	5.246E-01	465	5.729E+00	506	7.777E+00	547	1.192E+01
384	3.983E-02	425	5.705E-01	466	5.641E+00	507	7.895E+00	548	1.191E+01
385	3.652E-02	426	6.351E-01	467	5.528E+00	508	8.057E+00	549	1.203E+01
386	3.837E-02	427	7.075E-01	468	5.435E+00	509	8.125E+00	550	1.207E+01
387	2.808E-02	428	7.556E-01	469	5.414E+00	510	8.273E+00	551	1.213E+01
388	1.217E-02	429	8.290E-01	470	5.407E+00	511	8.411E+00	552	1.223E+01
389	5.634E-02	430	9.156E-01	471	5.307E+00	512	8.501E+00	553	1.232E+01
390	8.857E-03	431	9.947E-01	472	5.284E+00	513	8.598E+00	554	1.235E+01
391	2.145E-02	432	1.074E+00	473	5.264E+00	514	8.686E+00	555	1.244E+01
392	0.000E+00	433	1.163E+00	474	5.109E+00	515	8.782E+00	556	1.248E+01
393	2.460E-02	434	1.235E+00	475	5.099E+00	516	8.873E+00	557	1.257E+01
394	2.865E-02	435	1.355E+00	476	4.957E+00	517	9.043E+00	558	1.271E+01
395	2.813E-02	436	1.523E+00	477	4.858E+00	518	9.136E+00	559	1.276E+01
396	3.305E-02	437	1.583E+00	478	4.796E+00	519	9.184E+00	560	1.286E+01
397	2.818E-02	438	1.740E+00	479	4.760E+00	520	9.330E+00	561	1.284E+01
398	3.544E-02	439	1.853E+00	480	4.704E+00	521	9.451E+00	562	1.296E+01
399	1.433E-02	440	2.042E+00	481	4.699E+00	522	9.519E+00	563	1.300E+01
400	4.639E-02	441	2.211E+00	482	4.757E+00	523	9.603E+00	564	1.309E+01
401	3.618E-02	442	2.423E+00	483	4.778E+00	524	9.712E+00	565	1.312E+01
402	5.283E-02	443	2.652E+00	484	4.877E+00	525	9.801E+00	566	1.314E+01
403	3.567E-02	444	2.868E+00	485	4.953E+00	526	9.853E+00	567	1.331E+01
404	3.482E-02	445	3.107E+00	486	5.043E+00	527	1.000E+01	568	1.337E+01
405	5.392E-02	446	3.464E+00	487	5.208E+00	528	1.008E+01	569	1.339E+01
406	5.401E-02	447	3.752E+00	488	5.351E+00	529	1.016E+01	570	1.349E+01
407	6.086E-02	448	4.211E+00	489	5.400E+00	530	1.029E+01	571	1.357E+01
408	7.307E-02	449	4.628E+00	490	5.561E+00	531	1.039E+01	572	1.362E+01
409	7.981E-02	450	5.089E+00	491	5.724E+00	532	1.050E+01	573	1.376E+01
410	1.030E-01	451	5.601E+00	492	5.841E+00	533	1.060E+01	574	1.386E+01
411	1.116E-01	452	6.040E+00	493	5.945E+00	534	1.066E+01	575	1.393E+01
412	1.263E-01	453	6.423E+00	494	6.083E+00	535	1.074E+01	576	1.397E+01
413	1.365E-01	454	6.835E+00	495	6.195E+00	536	1.080E+01	577	1.408E+01
414	1.602E-01	455	7.137E+00	496	6.395E+00	537	1.097E+01	578	1.423E+01
415	1.877E-01	456	7.305E+00	497	6.500E+00	538	1.106E+01	579	1.430E+01
416	2.107E-01	457	7.388E+00	498	6.625E+00	539	1.114E+01	580	1.446E+01
417	2.467E-01	458	7.355E+00	499	6.758E+00	540	1.124E+01	581	1.450E+01
418	2.654E-01	459	7.170E+00	500	6.925E+00	541	1.133E+01	582	1.463E+01
419	3.019E-01	460	6.968E+00	501	7.063E+00	542	1.144E+01	583	1.469E+01
420	3.631E-01	461	6.642E+00	502	7.263E+00	543	1.149E+01	584	1.491E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.497E+01	626	2.205E+01	667	1.766E+01	708	7.655E+00	749	2.465E+00
586	1.512E+01	627	2.201E+01	668	1.739E+01	709	7.530E+00	750	2.431E+00
587	1.524E+01	628	2.220E+01	669	1.714E+01	710	7.350E+00	751	2.346E+00
588	1.541E+01	629	2.225E+01	670	1.685E+01	711	7.120E+00	752	2.254E+00
589	1.567E+01	630	2.236E+01	671	1.663E+01	712	6.960E+00	753	2.228E+00
590	1.578E+01	631	2.241E+01	672	1.629E+01	713	6.772E+00	754	2.156E+00
591	1.592E+01	632	2.242E+01	673	1.616E+01	714	6.592E+00	755	2.062E+00
592	1.603E+01	633	2.240E+01	674	1.586E+01	715	6.465E+00	756	2.002E+00
593	1.621E+01	634	2.237E+01	675	1.561E+01	716	6.315E+00	757	1.944E+00
594	1.641E+01	635	2.241E+01	676	1.536E+01	717	6.105E+00	758	1.886E+00
595	1.659E+01	636	2.236E+01	677	1.509E+01	718	5.966E+00	759	1.849E+00
596	1.679E+01	637	2.242E+01	678	1.472E+01	719	5.791E+00	760	1.795E+00
597	1.696E+01	638	2.236E+01	679	1.455E+01	720	5.612E+00	761	1.770E+00
598	1.706E+01	639	2.227E+01	680	1.433E+01	721	5.536E+00	762	1.710E+00
599	1.731E+01	640	2.239E+01	681	1.394E+01	722	5.320E+00	763	1.665E+00
600	1.749E+01	641	2.227E+01	682	1.372E+01	723	5.214E+00	764	1.588E+00
601	1.759E+01	642	2.213E+01	683	1.353E+01	724	5.050E+00	765	1.532E+00
602	1.783E+01	643	2.208E+01	684	1.326E+01	725	4.959E+00	766	1.501E+00
603	1.818E+01	644	2.200E+01	685	1.300E+01	726	4.848E+00	767	1.469E+00
604	1.827E+01	645	2.190E+01	686	1.268E+01	727	4.696E+00	768	1.427E+00
605	1.840E+01	646	2.178E+01	687	1.243E+01	728	4.523E+00	769	1.365E+00
606	1.865E+01	647	2.162E+01	688	1.221E+01	729	4.420E+00	770	1.342E+00
607	1.892E+01	648	2.148E+01	689	1.189E+01	730	4.260E+00	771	1.253E+00
608	1.922E+01	649	2.140E+01	690	1.169E+01	731	4.170E+00	772	1.303E+00
609	1.938E+01	650	2.109E+01	691	1.152E+01	732	4.022E+00	773	1.218E+00
610	1.954E+01	651	2.103E+01	692	1.125E+01	733	3.975E+00	774	1.167E+00
611	1.975E+01	652	2.091E+01	693	1.101E+01	734	3.824E+00	775	1.155E+00
612	1.996E+01	653	2.071E+01	694	1.071E+01	735	3.736E+00	776	1.095E+00
613	2.010E+01	654	2.051E+01	695	1.052E+01	736	3.649E+00	777	1.080E+00
614	2.035E+01	655	2.037E+01	696	1.026E+01	737	3.540E+00	778	1.049E+00
615	2.050E+01	656	2.018E+01	697	1.002E+01	738	3.454E+00	779	1.040E+00
616	2.072E+01	657	1.998E+01	698	9.778E+00	739	3.312E+00	780	9.864E-01
617	2.077E+01	658	1.973E+01	699	9.618E+00	740	3.219E+00		
618	2.096E+01	659	1.957E+01	700	9.344E+00	741	3.140E+00		
619	2.117E+01	660	1.933E+01	701	9.155E+00	742	3.040E+00		
620	2.125E+01	661	1.913E+01	702	8.928E+00	743	2.944E+00		
621	2.140E+01	662	1.881E+01	703	8.756E+00	744	2.872E+00		
622	2.156E+01	663	1.863E+01	704	8.498E+00	745	2.789E+00		
623	2.169E+01	664	1.832E+01	705	8.283E+00	746	2.718E+00		
624	2.183E+01	665	1.811E+01	706	8.098E+00	747	2.607E+00		
625	2.194E+01	666	1.795E+01	707	7.839E+00	748	2.572E+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**

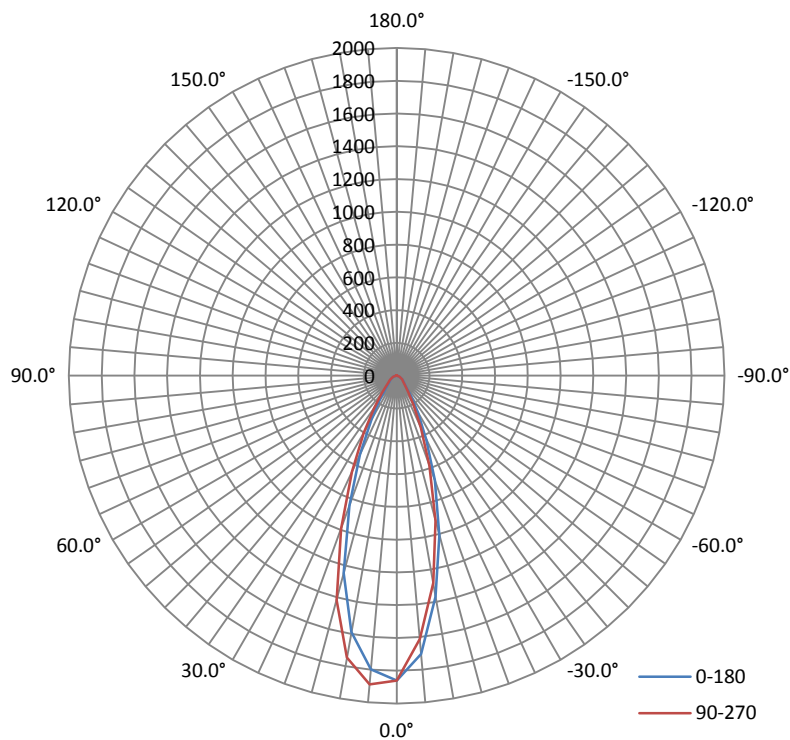
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.05	60	0.0914	10.600	0.9660

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I _{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
963.91	90.94	1931.0	0.53	0.49

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I _{max}):	34.8	34.9	34.9	34.9	34.9
Field Angle (10% I _{max}):	67.6	67.3	67.7	68.0	67.7

Luminous Intensity (cd) Distribution Data

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	1859	1859	1859	1859	1859	1859	1859	1859
5.0°	1798	1824	1904	1906	1890	1865	1828	1783
10.0°	1587	1643	1757	1770	1746	1698	1606	1508
15.0°	1246	1298	1442	1458	1418	1330	1226	1131
20.0°	843	889	1019	1030	992	935	857	781
25.0°	530	553	657	665	644	609	562	509
30.0°	307	328	396	406	401	380	348	312
35.0°	178	191	230	239	237	228	207	186
40.0°	109	117	138	142	145	140	129	116
45.0°	75	79	90	93	94	91	85	77
50.0°	59	61	67	68	68	67	63	59
55.0°	49	50	54	54	54	53	51	48
60.0°	39	40	44	45	44	43	41	38
65.0°	29	30	34	34	34	32	31	28
70.0°	22	23	25	26	25	24	23	21
75.0°	16	16	19	19	18	17	16	15
80.0°	10	11	13	13	13	12	11	10
85.0°	6	6	8	8	7	7	6	5
90.0°	2	2	3	3	3	3	2	2
95.0°	0	0	1	1	1	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	1	1	1	1	1	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	2	2	1	1	1	1

Luminous Intensity (cd) Distribution Data (cont.)

C Y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	1859	1859	1859	1859	1859	1859	1859	1859
5.0°	1704	1680	1613	1602	1613	1642	1682	1726
10.0°	1369	1339	1264	1261	1283	1321	1376	1445
15.0°	1010	987	905	897	916	955	1018	1094
20.0°	679	657	585	578	584	609	661	717
25.0°	429	406	351	346	348	364	397	433
30.0°	258	243	207	201	205	214	231	254
35.0°	155	148	125	123	124	131	138	151
40.0°	97	92	83	81	83	84	88	95
45.0°	68	66	62	61	62	64	66	68
50.0°	54	53	50	50	50	51	53	55
55.0°	44	43	40	40	41	42	44	46
60.0°	33	33	31	30	31	32	33	36
65.0°	25	24	23	23	23	24	25	27
70.0°	18	18	16	16	17	17	19	20
75.0°	13	12	11	11	11	12	13	14
80.0°	7	7	6	6	6	7	8	9
85.0°	3	3	2	2	2	3	3	4
90.0°	1	1	0	0	0	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	1	1	1	1	1	0	0
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	2	2	2	1	1	1

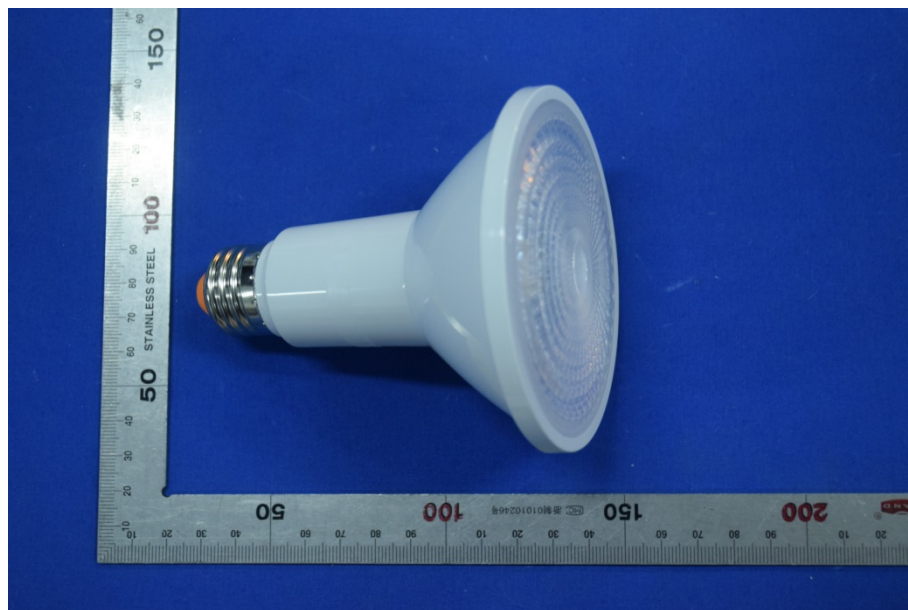
Zonal Lumen Density Measurement

Deg	Flux (lm)	%	Deg	Flux (lm)	%
0-5	43.2	4.48	0-5	43.2	4.48
5-10	116.0	12.03	0-10	159.2	16.51
10-15	156.3	16.21	0-15	315.4	32.72
15-20	156.3	16.22	0-20	471.7	48.94
20-25	129.9	13.47	0-25	601.6	62.41
25-30	96.4	10.00	0-30	698.0	72.41
30-35	67.0	6.95	0-35	765.0	79.36
35-40	45.9	4.76	0-40	810.9	84.12
40-45	33.3	3.45	0-45	844.1	87.57
45-50	26.5	2.76	0-50	870.7	90.33
50-55	22.7	2.36	0-55	893.4	92.69
55-60	19.4	2.01	0-60	912.8	94.70
60-65	15.7	1.62	0-65	928.5	96.32
65-70	12.2	1.27	0-70	940.7	97.59
70-75	9.2	0.95	0-75	949.8	98.54
75-80	6.4	0.66	0-80	956.2	99.20
80-85	3.7	0.38	0-85	959.9	99.58
85-90	1.6	0.17	0-90	961.6	99.75
90-95	0.4	0.05	0-95	962.0	99.80
95-100	0.0	0.00	0-100	962.0	99.80
100-105	0.0	0.00	0-105	962.0	99.80
105-110	0.0	0.01	0-110	962.0	99.81
110-115	0.0	0.00	0-115	962.1	99.81
115-120	0.0	0.00	0-120	962.1	99.81
120-125	0.0	0.00	0-125	962.1	99.81
125-130	0.0	0.01	0-130	962.1	99.82
130-135	0.1	0.00	0-135	962.2	99.82
135-140	0.1	0.02	0-140	962.3	99.84
140-145	0.2	0.02	0-145	962.5	99.86
145-150	0.3	0.02	0-150	962.8	99.88
150-155	0.3	0.03	0-155	963.1	99.91
155-160	0.3	0.03	0-160	963.3	99.94
160-165	0.3	0.03	0-165	963.6	99.97
165-170	0.2	0.02	0-170	963.8	99.99
170-175	0.1	0.01	0-175	963.9	100.00
175-180	0.0	0.00	0-180	963.9	100.00

[Additional Test]

Test Item	Test Voltage (V)	Frequency (Hz)	Test Result
Total Harmonic Distortion:	120.0	60	13.45%

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*****