



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:
15.5PAR38DIM/940FL40/SL+SL25D

Report Type:	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution, THD
Reviewed By:	Hill Liu 
Report Number:	KS2230727-43682E-EE-1
Test Date:	2023-08-08 to 2023-08-09
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: 15.5PAR38DIM/940FL40/SL+SL25D
 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: 15.5W
 Nominal CCT: 4000K
 Nominal Lumen Output: 1420lm

Family Declaration

The Model	Multiple Models	Difference s Items	Details
15.5PAR38DIM/940FL40/SL+SL 25D	15.5PAR38DIM/940NF25/ SL	Model Number	15.5PAR38DIM/940FL40/SL+SL 25D & 15.5PAR38DIM/940NF25/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	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

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
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 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 $U=22K$ ($K=2$), 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 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**

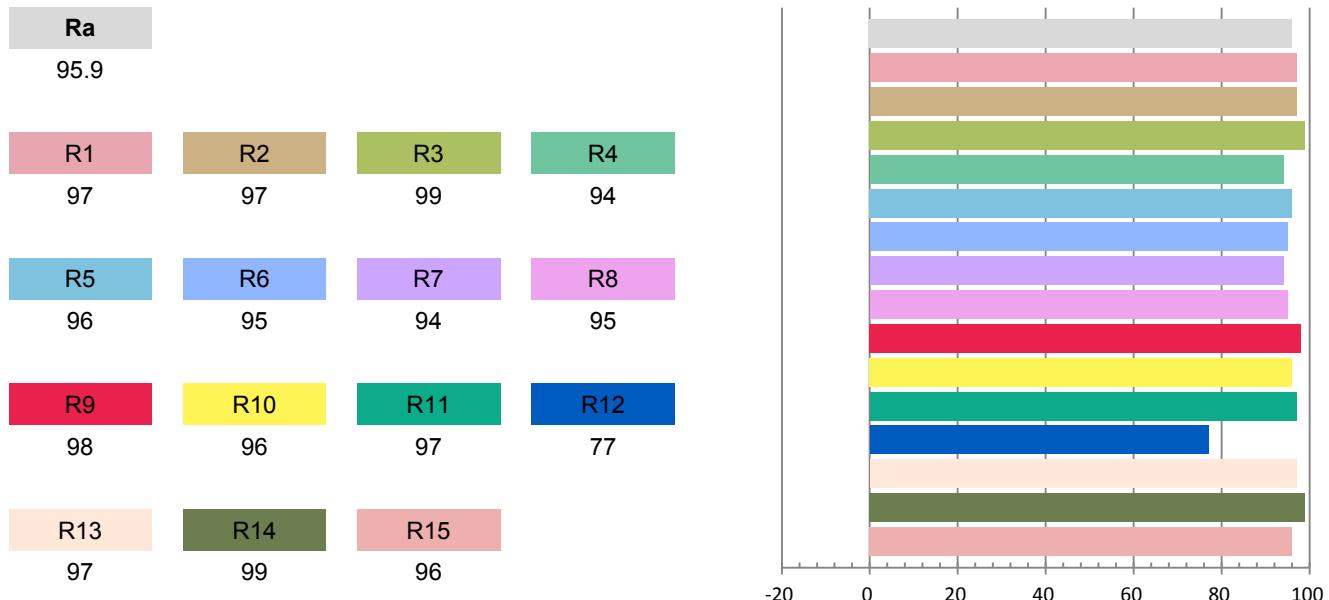
Test orientation: **Base Up**

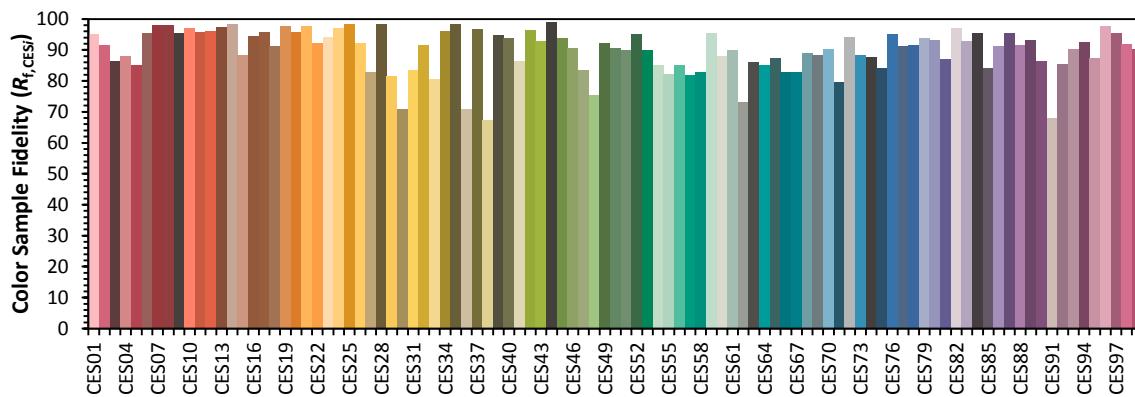
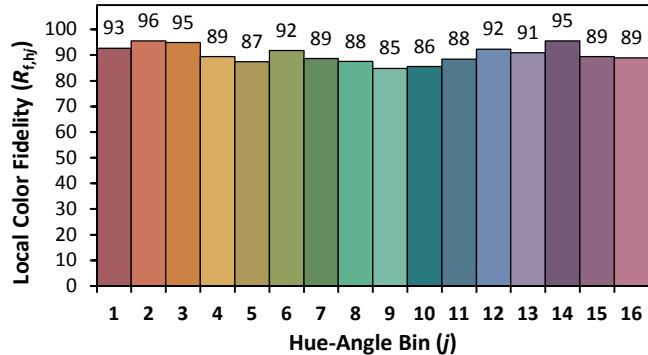
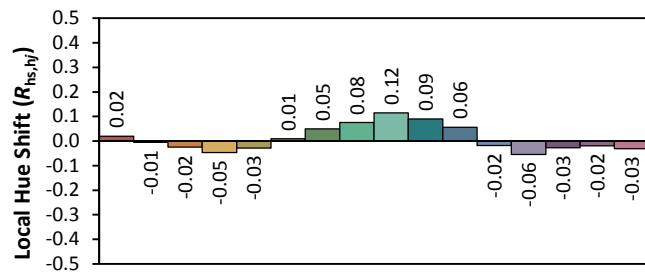
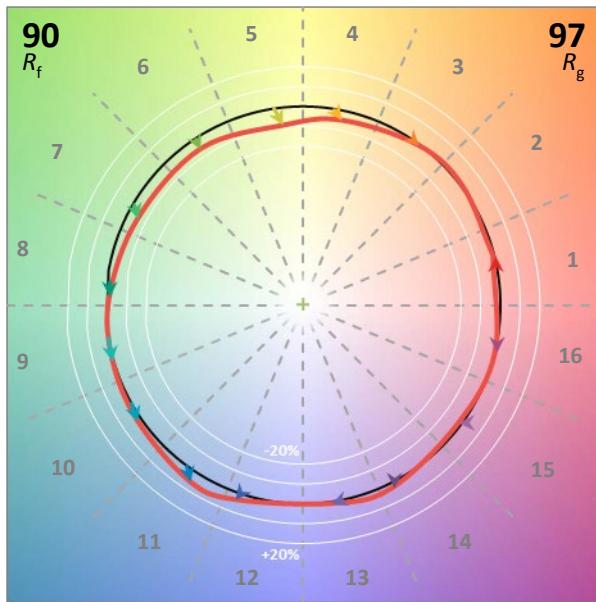
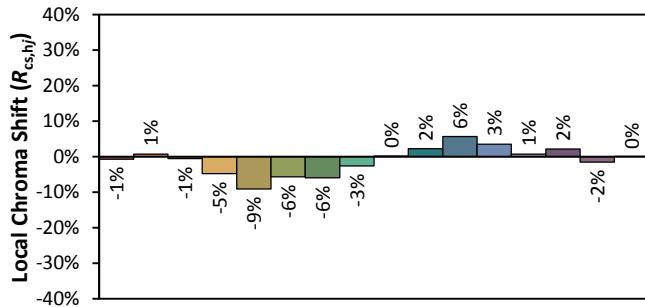
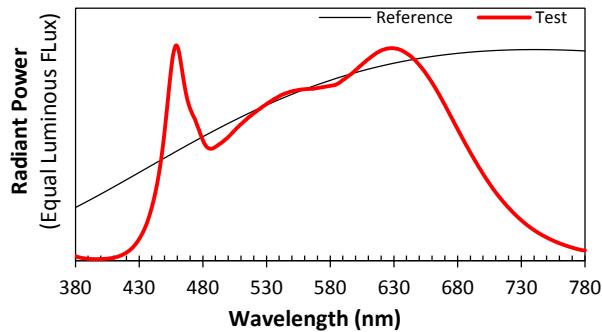
Photometric and Electrical Measurement Result

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.0	60	0.1312	15.15	0.962	1438.3	94.95

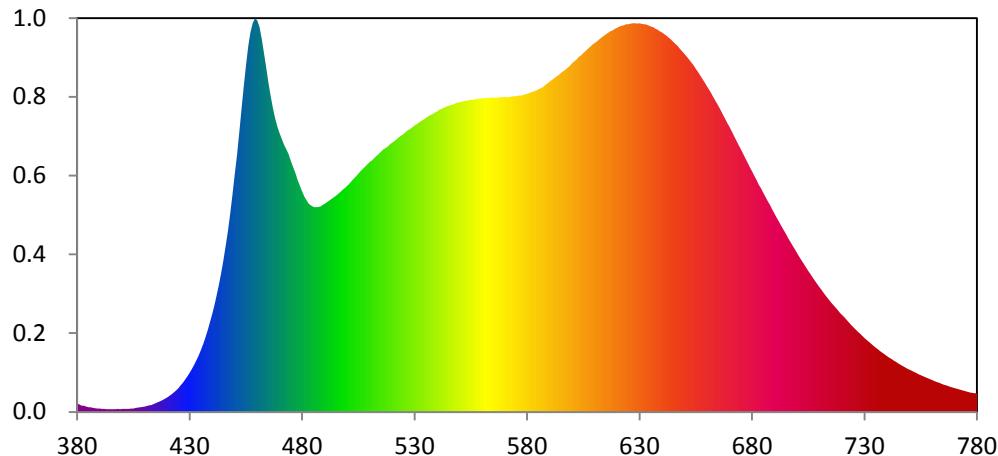
Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
5.3043	3914	-0.000606	0.3839	0.3776	0.2270	0.5024

Color Rendering Index





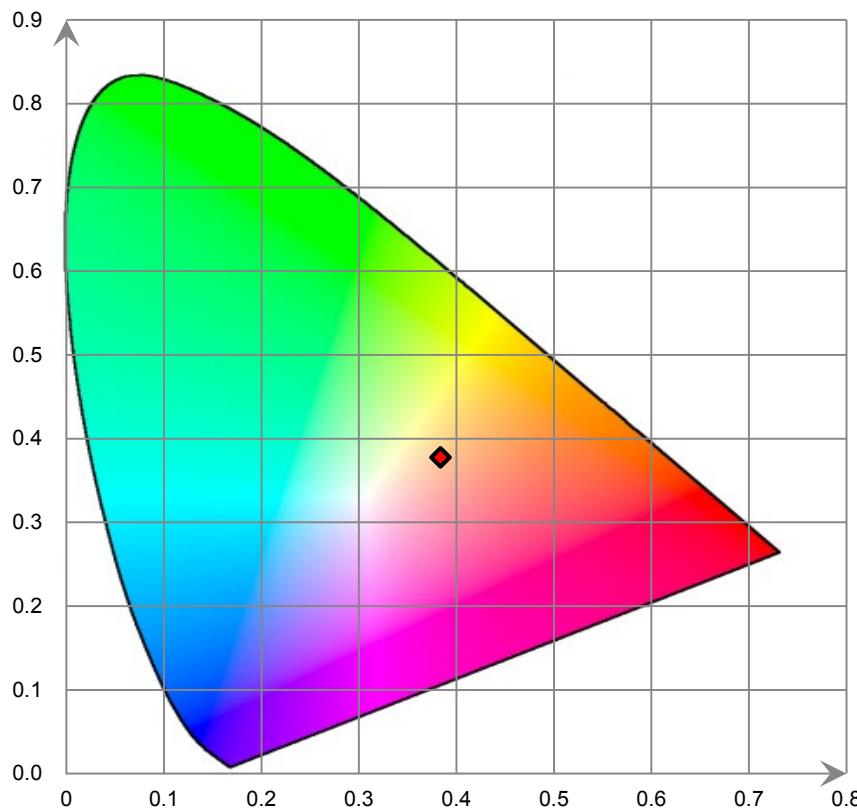
Relative Spectral Power Distribution



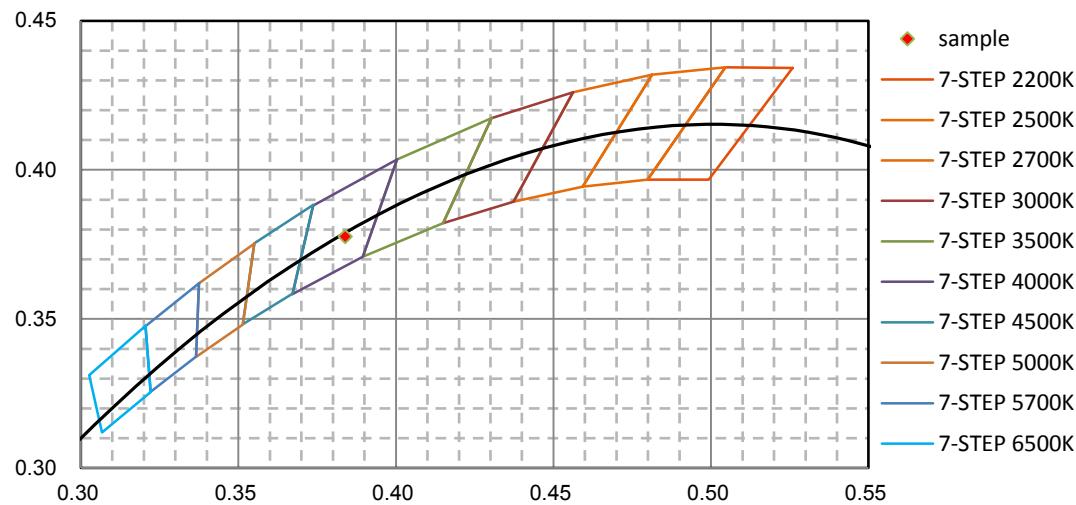
nm	mW								
380	5.371E-01	421	1.036E+00	462	2.382E+01	503	1.490E+01	544	1.947E+01
381	4.750E-01	422	1.138E+00	463	2.291E+01	504	1.505E+01	545	1.953E+01
382	4.012E-01	423	1.254E+00	464	2.198E+01	505	1.520E+01	546	1.958E+01
383	3.896E-01	424	1.388E+00	465	2.101E+01	506	1.536E+01	547	1.962E+01
384	3.474E-01	425	1.530E+00	466	2.017E+01	507	1.552E+01	548	1.968E+01
385	3.069E-01	426	1.702E+00	467	1.939E+01	508	1.565E+01	549	1.975E+01
386	2.859E-01	427	1.879E+00	468	1.874E+01	509	1.580E+01	550	1.975E+01
387	2.648E-01	428	2.070E+00	469	1.822E+01	510	1.594E+01	551	1.981E+01
388	2.400E-01	429	2.282E+00	470	1.777E+01	511	1.605E+01	552	1.984E+01
389	2.147E-01	430	2.502E+00	471	1.742E+01	512	1.620E+01	553	1.986E+01
390	2.152E-01	431	2.755E+00	472	1.705E+01	513	1.634E+01	554	1.989E+01
391	1.978E-01	432	3.017E+00	473	1.676E+01	514	1.645E+01	555	1.993E+01
392	1.934E-01	433	3.307E+00	474	1.646E+01	515	1.660E+01	556	1.994E+01
393	1.822E-01	434	3.613E+00	475	1.603E+01	516	1.674E+01	557	1.997E+01
394	1.841E-01	435	3.962E+00	476	1.564E+01	517	1.684E+01	558	1.999E+01
395	1.715E-01	436	4.329E+00	477	1.526E+01	518	1.695E+01	559	2.000E+01
396	1.689E-01	437	4.748E+00	478	1.482E+01	519	1.709E+01	560	2.001E+01
397	1.750E-01	438	5.209E+00	479	1.444E+01	520	1.719E+01	561	2.003E+01
398	1.862E-01	439	5.704E+00	480	1.408E+01	521	1.730E+01	562	2.004E+01
399	1.798E-01	440	6.225E+00	481	1.375E+01	522	1.741E+01	563	2.003E+01
400	1.864E-01	441	6.800E+00	482	1.350E+01	523	1.754E+01	564	2.006E+01
401	1.905E-01	442	7.422E+00	483	1.329E+01	524	1.764E+01	565	2.006E+01
402	1.968E-01	443	8.109E+00	484	1.317E+01	525	1.774E+01	566	2.005E+01
403	2.034E-01	444	8.833E+00	485	1.309E+01	526	1.786E+01	567	2.007E+01
404	2.121E-01	445	9.653E+00	486	1.307E+01	527	1.798E+01	568	2.010E+01
405	2.244E-01	446	1.055E+01	487	1.307E+01	528	1.807E+01	569	2.008E+01
406	2.485E-01	447	1.149E+01	488	1.311E+01	529	1.817E+01	570	2.010E+01
407	2.665E-01	448	1.258E+01	489	1.320E+01	530	1.828E+01	571	2.010E+01
408	2.882E-01	449	1.375E+01	490	1.328E+01	531	1.838E+01	572	2.009E+01
409	3.146E-01	450	1.504E+01	491	1.338E+01	532	1.848E+01	573	2.012E+01
410	3.379E-01	451	1.644E+01	492	1.349E+01	533	1.858E+01	574	2.014E+01
411	3.735E-01	452	1.786E+01	493	1.360E+01	534	1.866E+01	575	2.015E+01
412	4.092E-01	453	1.935E+01	494	1.369E+01	535	1.876E+01	576	2.019E+01
413	4.464E-01	454	2.081E+01	495	1.380E+01	536	1.887E+01	577	2.020E+01
414	4.976E-01	455	2.214E+01	496	1.392E+01	537	1.894E+01	578	2.021E+01
415	5.559E-01	456	2.336E+01	497	1.405E+01	538	1.901E+01	579	2.027E+01
416	6.205E-01	457	2.425E+01	498	1.418E+01	539	1.911E+01	580	2.029E+01
417	6.833E-01	458	2.483E+01	499	1.428E+01	540	1.917E+01	581	2.035E+01
418	7.621E-01	459	2.513E+01	500	1.444E+01	541	1.930E+01	582	2.042E+01
419	8.415E-01	460	2.499E+01	501	1.458E+01	542	1.934E+01	583	2.045E+01
420	9.340E-01	461	2.458E+01	502	1.473E+01	543	1.941E+01	584	2.051E+01

nm	mW								
585	2.060E+01	626	2.479E+01	667	1.899E+01	708	8.358E+00	749	2.773E+00
586	2.067E+01	627	2.480E+01	668	1.873E+01	709	8.162E+00	750	2.695E+00
587	2.075E+01	628	2.481E+01	669	1.844E+01	710	7.962E+00	751	2.621E+00
588	2.085E+01	629	2.480E+01	670	1.819E+01	711	7.766E+00	752	2.548E+00
589	2.097E+01	630	2.481E+01	671	1.790E+01	712	7.573E+00	753	2.474E+00
590	2.110E+01	631	2.476E+01	672	1.762E+01	713	7.385E+00	754	2.408E+00
591	2.118E+01	632	2.474E+01	673	1.734E+01	714	7.208E+00	755	2.338E+00
592	2.129E+01	633	2.472E+01	674	1.705E+01	715	7.023E+00	756	2.273E+00
593	2.141E+01	634	2.467E+01	675	1.677E+01	716	6.850E+00	757	2.208E+00
594	2.150E+01	635	2.461E+01	676	1.650E+01	717	6.675E+00	758	2.148E+00
595	2.163E+01	636	2.457E+01	677	1.620E+01	718	6.506E+00	759	2.085E+00
596	2.173E+01	637	2.447E+01	678	1.592E+01	719	6.331E+00	760	2.023E+00
597	2.185E+01	638	2.440E+01	679	1.564E+01	720	6.181E+00	761	1.970E+00
598	2.197E+01	639	2.429E+01	680	1.537E+01	721	6.027E+00	762	1.916E+00
599	2.210E+01	640	2.421E+01	681	1.508E+01	722	5.871E+00	763	1.861E+00
600	2.225E+01	641	2.410E+01	682	1.481E+01	723	5.710E+00	764	1.808E+00
601	2.237E+01	642	2.400E+01	683	1.452E+01	724	5.556E+00	765	1.754E+00
602	2.251E+01	643	2.389E+01	684	1.425E+01	725	5.410E+00	766	1.702E+00
603	2.266E+01	644	2.376E+01	685	1.397E+01	726	5.270E+00	767	1.656E+00
604	2.277E+01	645	2.363E+01	686	1.370E+01	727	5.123E+00	768	1.605E+00
605	2.290E+01	646	2.348E+01	687	1.342E+01	728	4.987E+00	769	1.560E+00
606	2.304E+01	647	2.335E+01	688	1.318E+01	729	4.848E+00	770	1.518E+00
607	2.316E+01	648	2.317E+01	689	1.290E+01	730	4.719E+00	771	1.474E+00
608	2.329E+01	649	2.301E+01	690	1.264E+01	731	4.594E+00	772	1.434E+00
609	2.343E+01	650	2.283E+01	691	1.237E+01	732	4.467E+00	773	1.391E+00
610	2.353E+01	651	2.265E+01	692	1.212E+01	733	4.345E+00	774	1.354E+00
611	2.364E+01	652	2.249E+01	693	1.185E+01	734	4.226E+00	775	1.314E+00
612	2.377E+01	653	2.229E+01	694	1.160E+01	735	4.106E+00	776	1.279E+00
613	2.389E+01	654	2.210E+01	695	1.136E+01	736	3.995E+00	777	1.242E+00
614	2.399E+01	655	2.188E+01	696	1.110E+01	737	3.882E+00	778	1.208E+00
615	2.410E+01	656	2.167E+01	697	1.085E+01	738	3.775E+00	779	1.198E+00
616	2.420E+01	657	2.146E+01	698	1.062E+01	739	3.669E+00	780	1.200E+00
617	2.430E+01	658	2.123E+01	699	1.038E+01	740	3.565E+00		
618	2.436E+01	659	2.101E+01	700	1.013E+01	741	3.464E+00		
619	2.446E+01	660	2.077E+01	701	9.901E+00	742	3.372E+00		
620	2.452E+01	661	2.053E+01	702	9.668E+00	743	3.275E+00		
621	2.460E+01	662	2.029E+01	703	9.445E+00	744	3.188E+00		
622	2.464E+01	663	2.004E+01	704	9.226E+00	745	3.104E+00		
623	2.468E+01	664	1.978E+01	705	9.003E+00	746	3.013E+00		
624	2.474E+01	665	1.953E+01	706	8.793E+00	747	2.934E+00		
625	2.475E+01	666	1.927E+01	707	8.576E+00	748	2.851E+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**

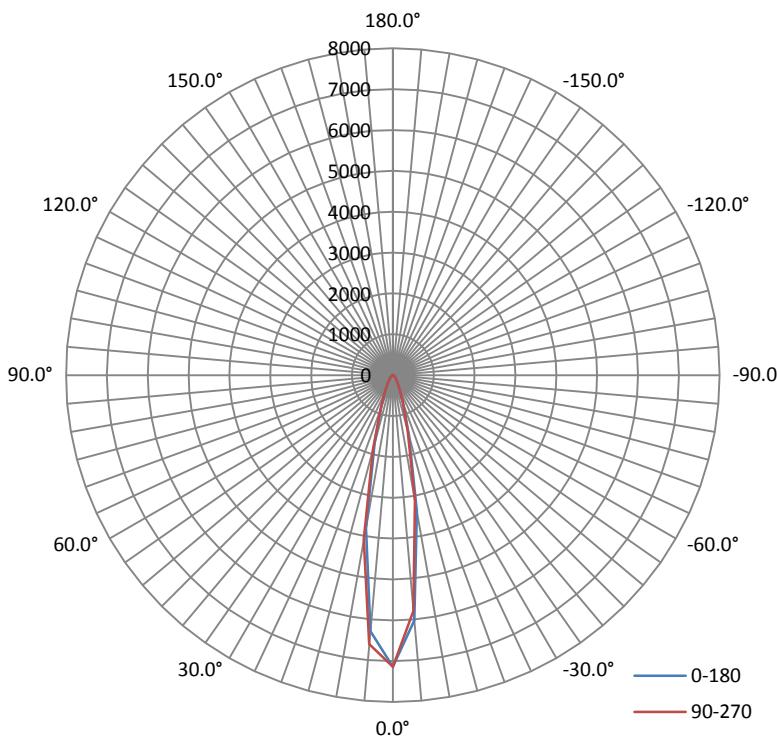
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.01	60	0.1315	15.160	0.9606

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I_{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
1442.88	95.18	7212.0	0.33	0.31

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I_{max}):	20.1	20.0	19.9	19.9	20.0
Field Angle (10% I_{max}):	41.2	41.1	41.2	41.2	41.2

Luminous Intensity (cd) Distribution Data

$\gamma \backslash C$	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	7141	7141	7141	7141	7141	7141	7141	7141
5.0°	6296	6478	6607	6625	6609	6465	6290	6066
10.0°	3802	4011	4146	4148	4085	3887	3647	3400
15.0°	1720	1842	1915	1914	1867	1772	1643	1529
20.0°	814	865	888	878	870	827	788	739
25.0°	460	475	483	484	477	464	450	422
30.0°	275	287	283	283	276	276	274	259
35.0°	172	178	176	173	172	177	177	170
40.0°	119	121	120	116	118	123	118	113
45.0°	81	83	84	84	84	83	80	78
50.0°	59	61	60	60	61	60	59	56
55.0°	43	44	44	44	44	43	43	42
60.0°	33	34	34	34	34	33	33	32
65.0°	25	26	26	26	26	25	25	24
70.0°	18	19	19	19	19	19	18	18
75.0°	12	12	13	13	13	12	12	11
80.0°	7	7	7	7	7	7	6	6
85.0°	2	3	3	3	3	3	2	2
90.0°	0	0	0	0	0	0	0	0
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°	2	2	2	2	2	2	2	2
150.0°	3	3	3	3	3	3	3	3
155.0°	4	4	4	4	4	4	4	4
160.0°	5	5	5	5	5	5	5	5
165.0°	5	5	5	5	5	5	4	4
170.0°	4	4	4	4	4	4	4	4
175.0°	3	3	3	3	3	3	3	3
180.0°	2	2	2	2	2	2	2	2

Luminous Intensity (cd) Distribution Data (cont.)

C γ	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	7141	7141	7141	7141	7141	7141	7141	7141
5.0°	6027	5890	5775	5751	5802	5926	6097	6284
10.0°	3384	3211	3119	3064	3123	3249	3461	3742
15.0°	1513	1431	1370	1356	1393	1454	1549	1682
20.0°	741	712	689	684	701	723	759	815
25.0°	418	408	401	404	408	422	436	453
30.0°	258	254	253	251	255	266	272	277
35.0°	167	165	166	162	165	174	176	176
40.0°	112	109	109	107	108	114	117	121
45.0°	77	75	75	75	75	77	80	82
50.0°	55	55	54	54	55	55	57	59
55.0°	42	42	42	41	41	41	42	43
60.0°	33	32	32	32	32	32	33	33
65.0°	25	24	24	24	24	24	25	25
70.0°	18	17	17	17	17	18	18	19
75.0°	11	11	11	11	11	11	12	12
80.0°	6	6	5	5	5	6	6	7
85.0°	2	2	2	2	2	2	2	2
90.0°	0	0	0	0	0	0	0	0
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	1	1	1	1	1
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	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°	2	2	2	2	2	2	2	2

Zonal Lumen Density Measurement

Deg	Flux (lm)	%	Deg	Flux (lm)	%
0-5	159.4	11.05	0-5	159.4	11.05
5-10	344.3	23.86	0-10	503.7	34.91
10-15	288.7	20.01	0-15	792.4	54.92
15-20	185.7	12.87	0-20	978.1	67.79
20-25	122.0	8.45	0-25	1100.1	76.24
25-30	87.3	6.06	0-30	1187.4	82.30
30-35	63.3	4.38	0-35	1250.8	86.68
35-40	47.0	3.26	0-40	1297.7	89.94
40-45	35.5	2.46	0-45	1333.2	92.40
45-50	27.3	1.89	0-50	1360.5	94.29
50-55	21.5	1.49	0-55	1382.0	95.78
55-60	17.3	1.20	0-60	1399.3	96.98
60-65	13.9	0.96	0-65	1413.2	97.94
65-70	10.9	0.76	0-70	1424.1	98.70
70-75	7.8	0.54	0-75	1431.9	99.24
75-80	4.7	0.33	0-80	1436.6	99.57
80-85	2.2	0.15	0-85	1438.9	99.72
85-90	0.6	0.04	0-90	1439.4	99.76
90-95	0.0	0.00	0-95	1439.5	99.76
95-100	0.0	0.00	0-100	1439.5	99.76
100-105	0.0	0.00	0-105	1439.5	99.76
105-110	0.0	0.00	0-110	1439.5	99.76
110-115	0.0	0.01	0-115	1439.5	99.77
115-120	0.0	0.00	0-120	1439.5	99.77
120-125	0.0	0.00	0-125	1439.5	99.77
125-130	0.0	0.00	0-130	1439.6	99.77
130-135	0.1	0.01	0-135	1439.7	99.78
135-140	0.2	0.01	0-140	1439.8	99.79
140-145	0.3	0.02	0-145	1440.2	99.81
145-150	0.5	0.04	0-150	1440.7	99.85
150-155	0.6	0.04	0-155	1441.3	99.89
155-160	0.6	0.04	0-160	1441.9	99.93
160-165	0.5	0.03	0-165	1442.4	99.96
165-170	0.3	0.03	0-170	1442.7	99.99
170-175	0.2	0.01	0-175	1442.8	100.00
175-180	0.0	0.00	0-180	1442.9	100.00

[Additional Test]

Test Item	Test Voltage (V)	Frequency (Hz)	Test Result
Total Harmonic Distortion:	120.0	60	15.87%

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*****