

ANSI/IES LM-79-19

MEASUREMENT AND TEST REPORT

For

P.Q.L., Inc.
2285 WARD AVE.SIMI VALLEY, CA 93065 United States

Test Model: SBT24453CUW

Report Type:	Electrical and Photometric tests including: Luminous Flux, Power Factor, Chromaticity, Luminous Intensity Distribution
Reviewed By:	Ezer Pan <i>Ezer Pan</i>
Report Number:	2502S03456E-EE-1
Test Date:	2025-05-07 to 2025-05-08
Report Date:	2025-05-20
Approved by:	Blake Zhang / EE Engineer <i>Blake Zhang</i>
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 5F (B-West), 6F, 7F, the 3rd Phase of Wan Li Industrial Building D Shihua Road, Futian Free Trade Zone Shenzhen 518038 China Tel: +86-755-33320018 Fax: +86-755-33320008
Test Location 1:	Test facility was located at No.12, Pulong East 1 st Road, Tangxia Town, Dongguan, Guangdong, China.
Test Location 2:	Test facility was located at Room 301, No.113, Pingkang Road, Dalang, 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. *This report contains data that are not covered by the NVLAP accreditation.

1. Product Description[#]

General Information:

One test sample was in good condition and received on 2025-04-29, and used for testing. All tests and evaluations were performed at the least efficient white light setting.

Model Tested: SBT24453CUW
Manufacturer: N/A
Brand Name: 
Product Designation: LED Luminaires
Burning Time Before Test: 0hour(For New Products)

Rated Values:

Rated Voltage/Frequency: AC 120-277V 50/60Hz
Rated Power: 45W
Nominal CCT: 3000K/3500K/4000K
Nominal Lumen Output: 6075lm/6255lm/6165lm

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
1.5m temperature integrating sphere	SENSING	SPR-600	S09008	2024-07-25	2025-07-24
High-precision rapid spectral analysis system	EVERFINE	HAAS-2000	M112048CA1361125	2024-07-25	2025-07-24
Digital power meter	YOKOGAWA	WT310	13398	2024-07-25	2025-07-24
Digital CC&CV DC Power Supply	EVERFINE	WY5015	11060010	2024-07-25	2025-07-24
thermometer	SENSING	N/A	N/A	2024-07-25	2025-07-24
Standard Light Source	EVERFINE	D204	N/A	2023-05-12	2025-05-11
Precision frequency power supply	ALL Power	APW-105N	970613	2024-07-25	2025-07-24
AC POWER SUPPLY	EVERFINE	VPS1030 PWM	1012017	2024-08-30	2025-08-29
Digital CC&CV DC Power Supply	EVERFINE	WY12010	1009009	2024-08-30	2025-08-29
Digital power meter	YOKOGAWA	WT-210	91J926132	2024-08-30	2025-08-29
full-field speed goniophotometer	EVERFINE	GO-R5000	YG108492N10120001	2024-07-25	2025-07-24

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
wireless remote thermohygrometer	N/A	AOK-5017B	N/A	2024-09-06	2025-09-05
Standard Light Source	EVERFINE	D908	N/A	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 $U=32\text{K}$ ($K=2$), 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.

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. For luminous intensity distribution, The vertical angle (γ) test intervals were set no more than 2.5 degree, The horizontal angle (C plane) test intervals were set no more than 22.5 degree. For color spatial uniformity, The vertical angle (γ) test intervals were set no more than 90 degree, The horizontal angle (C plane) test intervals were set no more than 10 degree.

The uncertainty of the luminous intensity is $U=2.00\%$ ($K=2$), 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]

Test facility was located at Room 301, No.113, Pingkang Road, Dalang, Dongguan, Guangdong, China.

The diameter of the sphere: **1.5m**

The coating reflectance of sphere: **98%**

The Stabilization time: **30 minutes**

Total operating time for integrating sphere test: **1.0 hour**

Test orientation: **Downward**

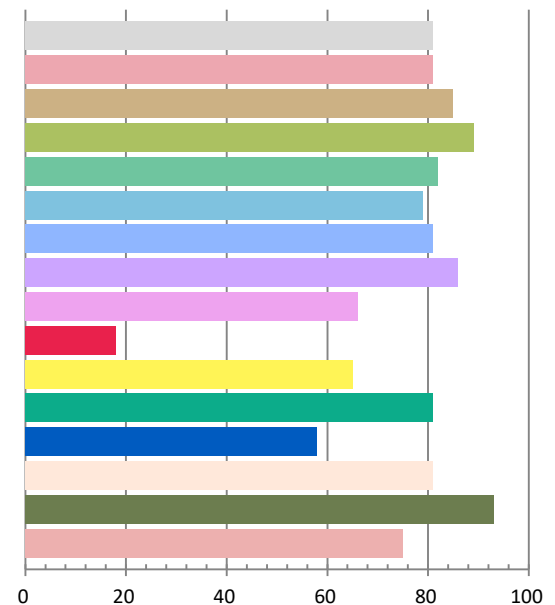
Photometric and Electrical Measurement Result

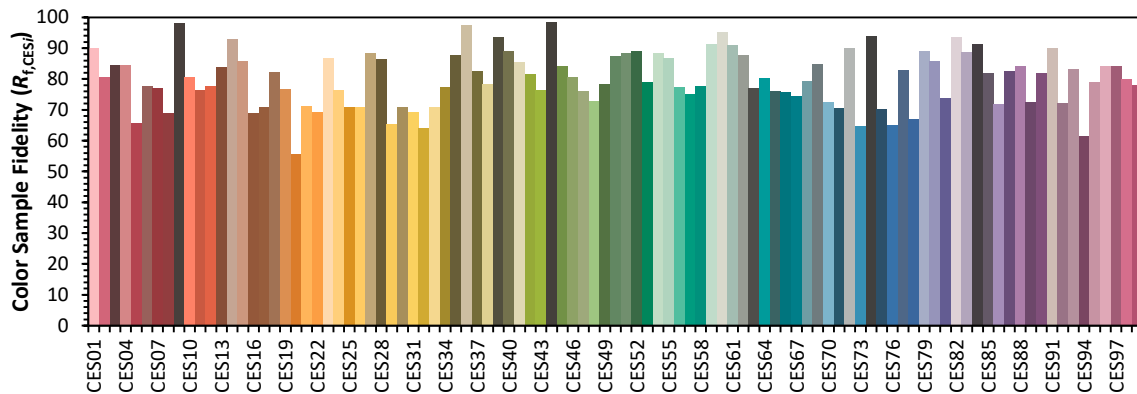
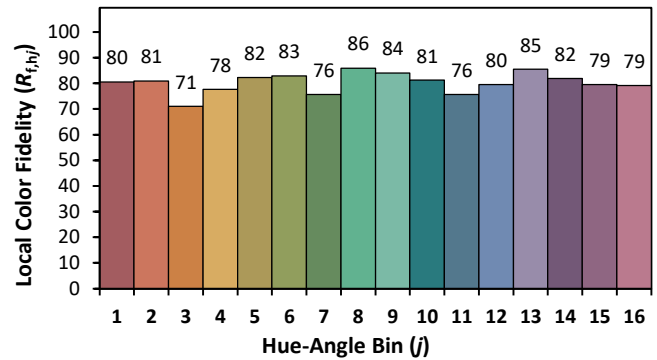
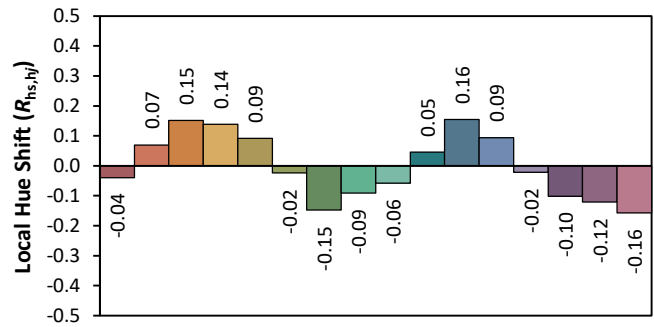
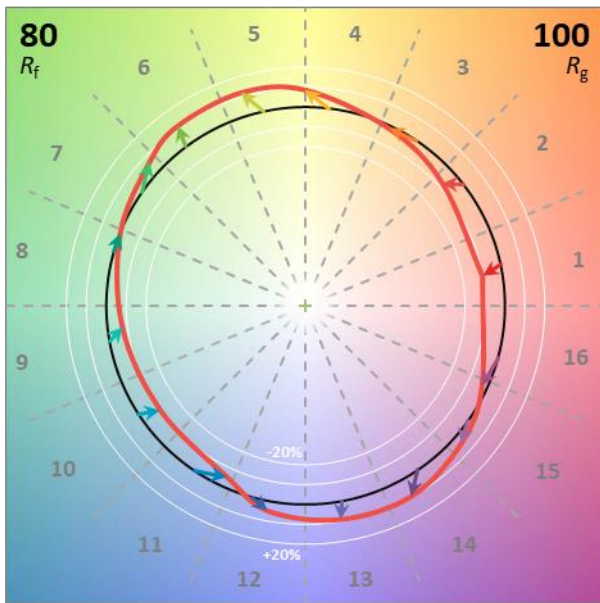
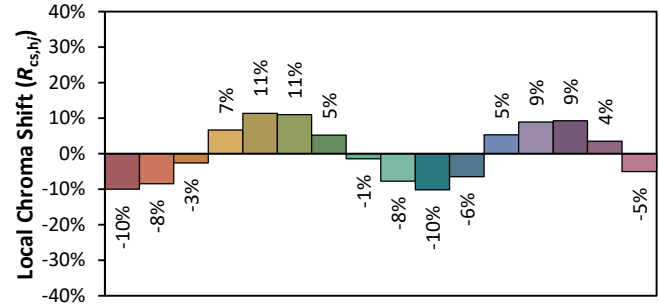
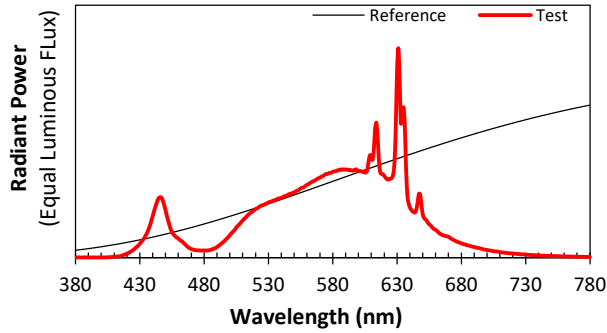
Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.0	60	0.3654	43.65	0.9952	5988.2	137.17

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
16.892	2928	0.00179	0.4449	0.4113	0.2526	0.5254

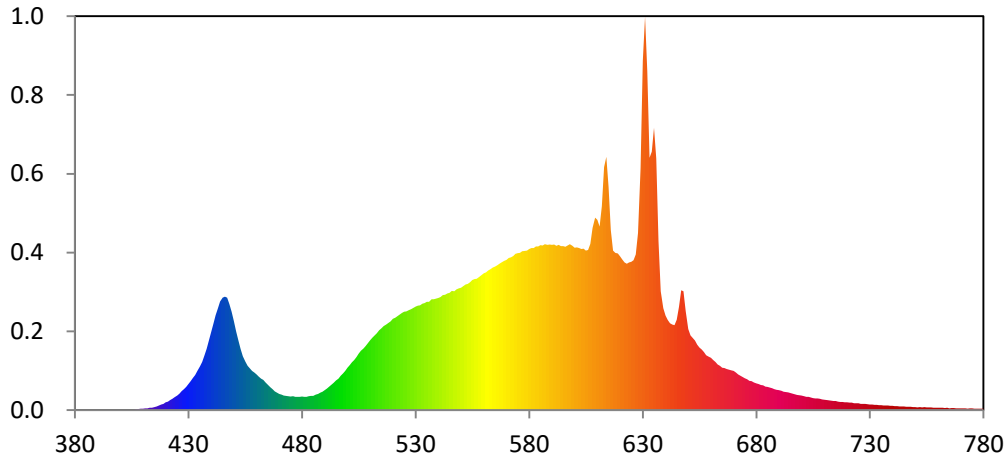
Color Rendering Index

Ra			
81.0			
R1	R2	R3	R4
81	85	89	82
R5	R6	R7	R8
79	81	86	66
R9	R10	R11	R12
18	65	81	58
R13	R14	R15	
81	93	75	





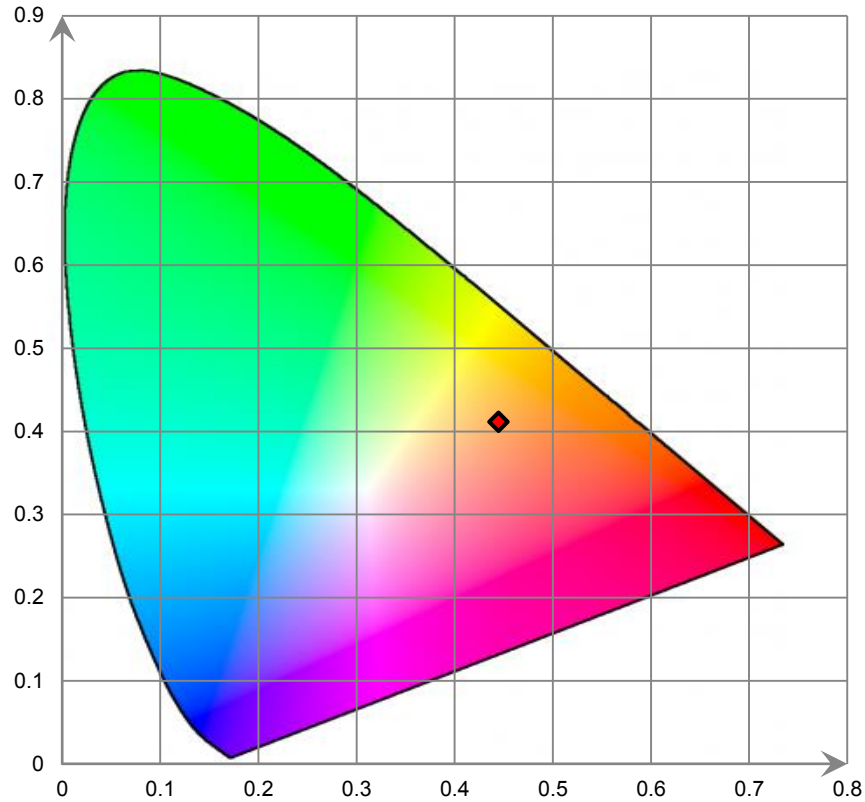
Relative Spectral Power Distribution



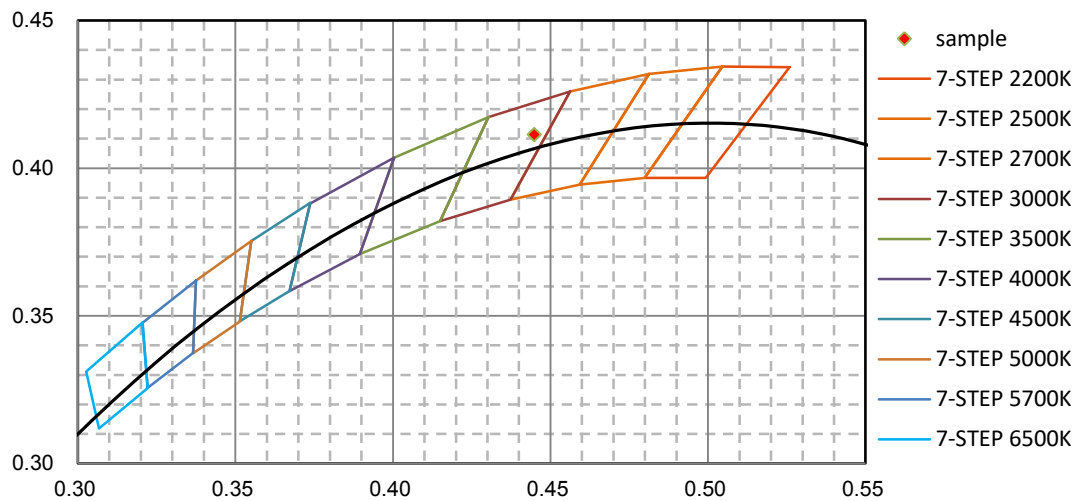
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	0.000E+00	421	5.316E+00	462	2.036E+01	503	3.232E+01	544	7.529E+01
381	8.077E-02	422	6.396E+00	463	1.951E+01	504	3.407E+01	545	7.578E+01
382	1.696E-01	423	7.158E+00	464	1.778E+01	505	3.646E+01	546	7.714E+01
383	2.861E-01	424	8.307E+00	465	1.636E+01	506	3.823E+01	547	7.673E+01
384	0.000E+00	425	9.368E+00	466	1.475E+01	507	3.970E+01	548	7.805E+01
385	1.443E-01	426	1.061E+01	467	1.336E+01	508	4.131E+01	549	7.858E+01
386	7.859E-02	427	1.210E+01	468	1.198E+01	509	4.335E+01	550	7.918E+01
387	3.132E-01	428	1.347E+01	469	1.118E+01	510	4.507E+01	551	8.015E+01
388	0.000E+00	429	1.488E+01	470	1.042E+01	511	4.674E+01	552	8.117E+01
389	2.843E-01	430	1.680E+01	471	9.918E+00	512	4.817E+01	553	8.149E+01
390	1.683E-02	431	1.859E+01	472	9.382E+00	513	4.979E+01	554	8.269E+01
391	6.728E-02	432	2.069E+01	473	9.135E+00	514	5.165E+01	555	8.399E+01
392	0.000E+00	433	2.263E+01	474	8.851E+00	515	5.281E+01	556	8.478E+01
393	1.815E-01	434	2.518E+01	475	8.635E+00	516	5.430E+01	557	8.497E+01
394	6.124E-02	435	2.809E+01	476	8.794E+00	517	5.528E+01	558	8.611E+01
395	2.378E-01	436	3.108E+01	477	8.517E+00	518	5.624E+01	559	8.725E+01
396	1.891E-02	437	3.521E+01	478	8.560E+00	519	5.745E+01	560	8.840E+01
397	3.512E-02	438	3.952E+01	479	8.377E+00	520	5.893E+01	561	8.897E+01
398	2.740E-01	439	4.496E+01	480	8.707E+00	521	5.971E+01	562	9.019E+01
399	5.850E-02	440	5.028E+01	481	8.545E+00	522	6.060E+01	563	9.118E+01
400	2.208E-01	441	5.578E+01	482	8.417E+00	523	6.176E+01	564	9.213E+01
401	1.383E-01	442	6.134E+01	483	8.816E+00	524	6.265E+01	565	9.280E+01
402	2.277E-01	443	6.572E+01	484	8.993E+00	525	6.346E+01	566	9.366E+01
403	2.290E-01	444	7.013E+01	485	9.146E+00	526	6.375E+01	567	9.458E+01
404	1.751E-01	445	7.273E+01	486	1.003E+01	527	6.454E+01	568	9.565E+01
405	2.942E-01	446	7.334E+01	487	1.038E+01	528	6.523E+01	569	9.646E+01
406	4.276E-01	447	7.259E+01	488	1.123E+01	529	6.599E+01	570	9.707E+01
407	4.977E-01	448	6.860E+01	489	1.175E+01	530	6.696E+01	571	9.828E+01
408	5.635E-01	449	6.356E+01	490	1.283E+01	531	6.753E+01	572	9.875E+01
409	7.109E-01	450	5.758E+01	491	1.389E+01	532	6.764E+01	573	9.960E+01
410	7.159E-01	451	5.093E+01	492	1.507E+01	533	6.879E+01	574	1.011E+02
411	1.009E+00	452	4.518E+01	493	1.630E+01	534	6.917E+01	575	1.014E+02
412	1.099E+00	453	3.964E+01	494	1.764E+01	535	6.993E+01	576	1.017E+02
413	1.402E+00	454	3.473E+01	495	1.901E+01	536	6.996E+01	577	1.026E+02
414	1.532E+00	455	3.121E+01	496	2.038E+01	537	7.154E+01	578	1.029E+02
415	1.786E+00	456	2.849E+01	497	2.214E+01	538	7.169E+01	579	1.032E+02
416	2.318E+00	457	2.680E+01	498	2.353E+01	539	7.207E+01	580	1.042E+02
417	2.923E+00	458	2.515E+01	499	2.516E+01	540	7.256E+01	581	1.047E+02
418	3.496E+00	459	2.424E+01	500	2.728E+01	541	7.300E+01	582	1.047E+02
419	3.971E+00	460	2.291E+01	501	2.889E+01	542	7.439E+01	583	1.057E+02
420	4.868E+00	461	2.156E+01	502	3.073E+01	543	7.446E+01	584	1.057E+02

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.067E+02	626	9.683E+01	667	2.642E+01	708	7.289E+00	749	1.918E+00
586	1.065E+02	627	1.007E+02	668	2.604E+01	709	6.847E+00	750	1.910E+00
587	1.073E+02	628	1.146E+02	669	2.570E+01	710	6.516E+00	751	1.717E+00
588	1.068E+02	629	1.564E+02	670	2.521E+01	711	6.438E+00	752	1.819E+00
589	1.071E+02	630	2.260E+02	671	2.429E+01	712	6.221E+00	753	1.713E+00
590	1.069E+02	631	2.545E+02	672	2.304E+01	713	5.983E+00	754	1.787E+00
591	1.070E+02	632	2.192E+02	673	2.219E+01	714	5.692E+00	755	1.615E+00
592	1.063E+02	633	1.631E+02	674	2.137E+01	715	5.813E+00	756	1.634E+00
593	1.068E+02	634	1.671E+02	675	2.046E+01	716	5.326E+00	757	1.543E+00
594	1.061E+02	635	1.827E+02	676	1.987E+01	717	5.246E+00	758	1.486E+00
595	1.059E+02	636	1.627E+02	677	1.892E+01	718	5.152E+00	759	1.512E+00
596	1.056E+02	637	1.094E+02	678	1.864E+01	719	5.020E+00	760	1.507E+00
597	1.064E+02	638	7.672E+01	679	1.789E+01	720	4.857E+00	761	1.349E+00
598	1.073E+02	639	6.592E+01	680	1.719E+01	721	4.722E+00	762	1.333E+00
599	1.062E+02	640	6.104E+01	681	1.678E+01	722	4.753E+00	763	1.189E+00
600	1.050E+02	641	5.824E+01	682	1.611E+01	723	4.388E+00	764	1.372E+00
601	1.052E+02	642	5.620E+01	683	1.594E+01	724	4.380E+00	765	1.103E+00
602	1.049E+02	643	5.530E+01	684	1.507E+01	725	4.220E+00	766	1.149E+00
603	1.042E+02	644	5.484E+01	685	1.484E+01	726	3.952E+00	767	1.126E+00
604	1.044E+02	645	5.832E+01	686	1.449E+01	727	3.852E+00	768	1.080E+00
605	1.032E+02	646	6.667E+01	687	1.397E+01	728	3.894E+00	769	1.106E+00
606	1.036E+02	647	7.747E+01	688	1.346E+01	729	3.695E+00	770	1.023E+00
607	1.074E+02	648	7.680E+01	689	1.310E+01	730	3.546E+00	771	9.214E-01
608	1.178E+02	649	6.400E+01	690	1.284E+01	731	3.441E+00	772	1.032E+00
609	1.244E+02	650	5.247E+01	691	1.241E+01	732	3.245E+00	773	8.202E-01
610	1.229E+02	651	4.820E+01	692	1.180E+01	733	3.225E+00	774	9.708E-01
611	1.188E+02	652	4.654E+01	693	1.167E+01	734	3.069E+00	775	9.268E-01
612	1.318E+02	653	4.495E+01	694	1.134E+01	735	3.028E+00	776	7.847E-01
613	1.572E+02	654	4.231E+01	695	1.091E+01	736	2.902E+00	777	7.866E-01
614	1.637E+02	655	4.040E+01	696	1.060E+01	737	2.927E+00	778	8.653E-01
615	1.443E+02	656	3.914E+01	697	1.007E+01	738	2.846E+00	779	8.491E-01
616	1.164E+02	657	3.745E+01	698	9.599E+00	739	2.762E+00	780	7.438E-01
617	1.032E+02	658	3.547E+01	699	9.444E+00	740	2.681E+00		
618	1.016E+02	659	3.455E+01	700	9.254E+00	741	2.470E+00		
619	1.013E+02	660	3.374E+01	701	8.950E+00	742	2.358E+00		
620	9.942E+01	661	3.227E+01	702	8.559E+00	743	2.342E+00		
621	9.731E+01	662	3.100E+01	703	8.381E+00	744	2.332E+00		
622	9.551E+01	663	2.928E+01	704	8.117E+00	745	2.241E+00		
623	9.465E+01	664	2.865E+01	705	7.714E+00	746	2.050E+00		
624	9.541E+01	665	2.739E+01	706	7.460E+00	747	2.092E+00		
625	9.578E+01	666	2.720E+01	707	7.394E+00	748	2.047E+00		

CIE 1931 x y Chromaticity Diagram



7-Step Chromaticity Quadrangles



[Goniophotometer System]

Test facility was located at No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China.

The photometric distance: **2.519m**

The Stabilization time: **30 minutes**

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

Test orientation: **Downward**

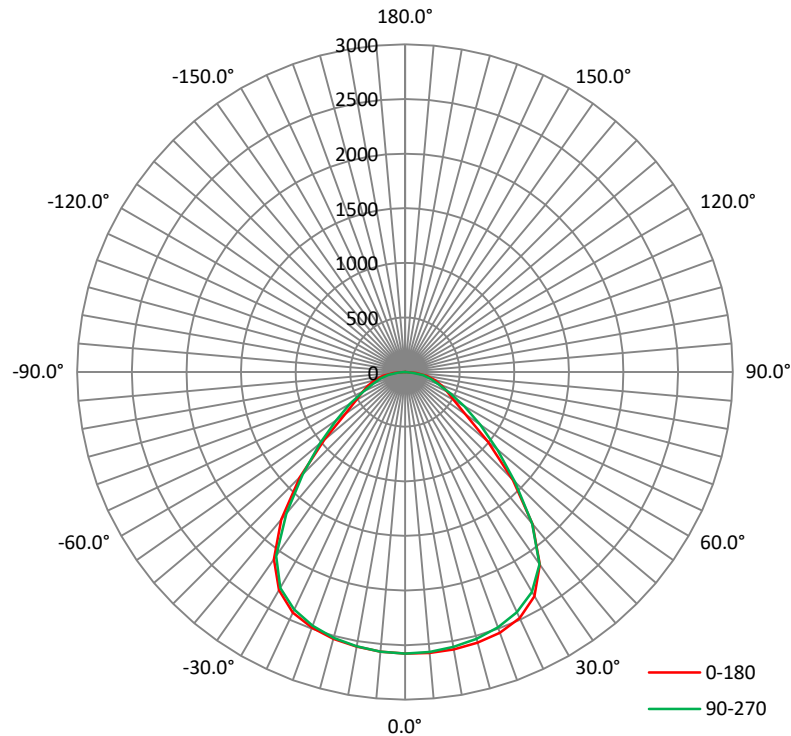
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.02	60	0.3655	43.660	0.9953

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I_{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
5989.5	137.19	2581	1.30	1.30

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I_{max}):	92.1	94.0	92.6	93.5	93.1
Field Angle (10% I_{max}):	153.6	150.8	147.8	150.5	150.7

Luminous Intensity (cd) Distribution Data

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0°	2578	2578	2578	2578	2578	2578	2578	2578
1°	2577	2577	2577	2577	2577	2578	2578	2579
2°	2575	2575	2576	2576	2576	2577	2578	2578
3°	2574	2573	2574	2573	2574	2575	2577	2577
4°	2571	2571	2571	2571	2571	2573	2575	2577
5°	2569	2569	2568	2568	2568	2570	2573	2575
6°	2566	2565	2565	2564	2565	2567	2571	2574
7°	2563	2562	2561	2560	2561	2564	2568	2572
8°	2560	2558	2557	2556	2557	2560	2565	2570
9°	2556	2555	2553	2552	2553	2557	2562	2568
10°	2552	2550	2548	2547	2548	2552	2558	2565
11°	2548	2546	2543	2542	2543	2548	2555	2562
12°	2543	2541	2538	2536	2538	2543	2551	2559
13°	2538	2536	2532	2530	2531	2537	2546	2555
14°	2533	2530	2526	2524	2525	2531	2541	2551
15°	2527	2525	2520	2517	2518	2524	2536	2547
16°	2521	2518	2513	2510	2511	2517	2530	2542
17°	2515	2511	2505	2501	2502	2510	2523	2537
18°	2508	2503	2497	2492	2493	2501	2516	2531
19°	2500	2495	2489	2482	2483	2492	2508	2524
20°	2491	2486	2479	2472	2472	2482	2499	2517
21°	2482	2477	2468	2460	2460	2470	2490	2508
22°	2471	2466	2457	2447	2447	2458	2479	2499
23°	2458	2454	2443	2433	2432	2444	2467	2488
24°	2445	2440	2430	2417	2416	2429	2453	2475
25°	2428	2425	2413	2400	2399	2412	2437	2461
26°	2410	2407	2396	2381	2380	2393	2420	2443
27°	2389	2388	2375	2359	2359	2372	2399	2424
28°	2364	2365	2352	2336	2336	2348	2376	2401
29°	2337	2339	2325	2308	2310	2321	2349	2376
30°	2306	2310	2296	2279	2281	2290	2318	2345
31°	2272	2278	2262	2245	2248	2255	2283	2312
32°	2234	2242	2224	2206	2209	2214	2244	2274
33°	2189	2202	2182	2162	2165	2169	2200	2232
34°	2143	2159	2137	2111	2113	2116	2152	2187
35°	2090	2112	2086	2056	2055	2058	2099	2137
36°	2034	2061	2033	1993	1989	1992	2043	2083
37°	1972	2007	1977	1925	1919	1920	1982	2026
38°	1906	1948	1915	1850	1844	1841	1917	1965
39°	1837	1888	1851	1770	1768	1757	1847	1901
40°	1763	1826	1782	1685	1691	1671	1776	1835
41°	1688	1759	1713	1594	1614	1579	1701	1764
42°	1608	1691	1638	1506	1537	1490	1622	1693
43°	1527	1621	1561	1416	1461	1401	1540	1618
44°	1443	1551	1482	1337	1391	1322	1457	1546
45°	1360	1480	1403	1259	1323	1243	1376	1470
46°	1275	1412	1320	1180	1256	1164	1292	1399
47°	1192	1351	1240	1104	1193	1088	1211	1338
48°	1111	1291	1160	1033	1131	1017	1130	1276

Luminous Intensity (cd) Distribution Data

$\begin{matrix} \text{C} \\ \backslash \\ \text{Y} \end{matrix}$	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
49°	1032	1230	1081	966	1070	951	1054	1215
50°	960	1172	1008	905	1014	890	981	1157
51°	890	1117	939	847	961	834	915	1104
52°	825	1064	874	795	910	782	852	1052
53°	765	1015	816	748	862	737	796	1003
54°	712	966	764	705	816	696	747	954
55°	665	918	716	667	772	659	701	907
56°	632	872	673	633	731	627	661	861
57°	599	824	629	602	690	597	627	815
58°	566	778	598	574	652	571	593	769
59°	540	732	567	548	615	547	559	724
60°	516	688	537	523	579	522	529	680
61°	495	645	507	500	543	499	500	636
62°	475	603	480	476	507	475	474	594
63°	457	564	456	453	474	452	450	554
64°	440	527	434	431	443	428	428	516
65°	424	493	413	410	415	406	408	480
66°	408	460	394	389	390	385	389	445
67°	394	430	376	371	367	366	372	412
68°	382	401	359	355	347	350	355	383
69°	369	376	343	339	328	334	340	355
70°	357	353	327	325	311	320	325	331
71°	344	332	312	311	295	307	311	310
72°	330	313	298	297	279	293	297	291
73°	316	295	284	283	265	279	283	275
74°	302	279	272	268	249	264	269	259
75°	287	264	261	253	234	249	256	245
76°	271	249	248	238	218	232	241	233
77°	256	235	235	221	202	215	226	221
78°	240	223	221	203	186	197	210	210
79°	222	210	204	185	170	178	193	198
80°	204	196	187	166	153	159	175	185
81°	184	181	168	145	136	139	156	169
82°	165	162	148	125	117	120	135	149
83°	145	143	126	105	97	101	114	130
84°	123	124	104	85	77	81	93	111
85°	102	105	82	64	62	61	74	91
86°	80	84	59	49	47	47	55	71
87°	59	62	42	36	32	35	37	50
88°	37	41	25	24	13	24	18	33
89°	15	21	5	12	9	12	12	17
90°	0	0	0	0	0	0	0	0
91°	0	0	0	0	0	0	0	0
92°	0	0	0	0	0	0	0	0
93°	0	0	0	0	0	0	0	0
94°	0	0	0	0	0	0	0	0
95°	0	0	0	0	0	0	0	0
96°	0	0	0	0	0	0	0	0
97°	0	0	0	0	0	0	0	0

Luminous Intensity (cd) Distribution Data

C γ	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
98°	0	0	0	0	0	0	0	0
99°	0	0	0	0	0	0	0	0
100°	0	0	0	0	0	0	0	0
101°	0	0	0	0	0	0	0	0
102°	0	0	0	0	0	0	0	0
103°	0	0	0	0	0	0	0	0
104°	0	0	0	0	0	0	0	0
105°	0	0	0	0	0	0	0	0
106°	0	0	0	0	0	0	0	0
107°	0	0	0	0	0	0	0	0
108°	0	0	0	0	0	0	0	0
109°	0	0	0	0	0	0	0	0
110°	0	0	0	0	0	0	0	0
111°	0	0	0	0	0	0	0	0
112°	0	0	0	0	0	0	0	0
113°	0	0	0	0	0	0	0	0
114°	0	0	0	0	0	0	0	0
115°	0	0	0	0	0	0	0	0
116°	0	0	0	0	0	0	0	0
117°	0	0	0	0	0	0	0	0
118°	0	0	0	0	0	0	0	0
119°	0	0	0	0	0	0	0	0
120°	0	0	0	0	0	0	0	0
121°	0	0	0	0	0	0	0	0
122°	0	0	0	0	0	0	0	0
123°	0	0	0	0	0	0	0	0
124°	0	0	0	0	0	0	0	0
125°	0	0	0	0	0	0	0	0
126°	0	0	0	0	0	0	0	0
127°	0	0	0	0	0	0	0	0
128°	0	0	0	0	0	0	0	0
129°	0	0	0	0	0	0	0	0
130°	0	0	0	0	0	0	0	0
131°	0	0	0	0	0	0	0	0
132°	0	0	0	0	0	0	0	0
133°	0	0	0	0	0	0	0	0
134°	0	0	0	0	0	0	0	0
135°	0	0	0	0	0	0	0	0
136°	0	0	0	0	0	0	0	0
137°	0	0	0	0	0	0	0	0
138°	0	0	0	0	0	0	0	0
139°	0	0	0	0	0	0	0	0
140°	0	0	0	0	0	0	0	0
141°	0	0	0	0	0	0	0	0
142°	0	0	0	0	0	0	0	0
143°	0	0	0	0	0	0	0	0
144°	0	0	0	0	0	0	0	0
145°	0	0	0	0	0	0	0	0
146°	0	0	0	0	0	0	0	0

Luminous Intensity (cd) Distribution Data

$\begin{matrix} C \\ \backslash \\ \gamma \end{matrix}$	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
147°	0	0	0	0	0	0	0	0
148°	0	0	0	0	0	0	0	0
149°	0	0	0	0	0	0	0	0
150°	0	0	0	0	0	0	0	0
151°	0	0	0	0	0	0	0	0
152°	0	0	0	0	0	0	0	0
153°	0	0	0	0	0	0	0	0
154°	0	0	0	0	0	0	0	0
155°	0	0	0	0	0	0	0	0
156°	0	0	0	0	0	0	0	0
157°	0	0	0	0	0	0	0	0
158°	0	0	0	0	0	0	0	0
159°	0	0	0	0	0	0	0	0
160°	0	0	0	0	0	0	0	0
161°	0	0	0	0	0	0	0	0
162°	0	0	0	0	0	0	0	0
163°	0	0	0	0	0	0	0	0
164°	0	0	0	0	0	0	0	0
165°	0	0	0	0	0	0	0	0
166°	0	0	0	0	0	0	0	0
167°	0	0	0	0	0	0	0	0
168°	0	0	0	0	0	0	0	0
169°	0	0	0	0	0	0	0	0
170°	0	0	0	0	0	0	0	0
171°	0	0	0	0	0	0	0	0
172°	0	0	0	0	0	0	0	0
173°	0	0	0	0	0	0	0	0
174°	0	0	0	0	0	0	0	0
175°	0	0	0	0	0	0	0	0
176°	0	0	0	0	0	0	0	0
177°	0	0	0	0	0	0	0	0
178°	0	0	0	0	0	0	0	0
179°	0	0	0	0	0	0	0	0
180°	0	0	0	0	0	0	0	0

Luminous Intensity (cd) Distribution Data (cont.)

C Y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0°	2578	2578	2578	2578	2578	2578	2578	2578
1°	2579	2579	2579	2578	2578	2578	2578	2578
2°	2580	2580	2580	2578	2578	2578	2578	2577
3°	2581	2580	2580	2577	2576	2576	2576	2576
4°	2581	2580	2579	2576	2574	2574	2575	2574
5°	2581	2580	2578	2574	2572	2572	2572	2572
6°	2581	2579	2576	2572	2569	2569	2570	2570
7°	2581	2579	2575	2569	2566	2566	2567	2568
8°	2580	2578	2572	2566	2563	2562	2563	2565
9°	2579	2576	2570	2563	2559	2558	2560	2562
10°	2578	2574	2567	2560	2555	2553	2556	2558
11°	2576	2571	2563	2555	2550	2549	2551	2555
12°	2574	2569	2560	2550	2545	2544	2547	2551
13°	2572	2566	2556	2546	2539	2539	2542	2546
14°	2569	2563	2552	2540	2534	2533	2536	2541
15°	2565	2559	2548	2535	2528	2527	2530	2536
16°	2562	2554	2542	2529	2521	2520	2524	2530
17°	2557	2549	2537	2522	2514	2513	2517	2523
18°	2552	2544	2531	2515	2506	2505	2510	2517
19°	2546	2539	2524	2508	2498	2496	2502	2510
20°	2540	2532	2517	2499	2488	2487	2494	2501
21°	2532	2524	2510	2490	2478	2476	2484	2492
22°	2523	2516	2500	2479	2467	2465	2474	2482
23°	2513	2506	2489	2466	2454	2453	2463	2471
24°	2501	2496	2477	2453	2441	2440	2450	2458
25°	2486	2483	2463	2438	2426	2425	2436	2444
26°	2469	2468	2448	2422	2409	2409	2421	2428
27°	2449	2450	2430	2404	2391	2390	2404	2409
28°	2426	2428	2410	2384	2372	2371	2384	2388
29°	2400	2403	2388	2361	2350	2348	2361	2364
30°	2369	2375	2361	2337	2325	2323	2335	2337
31°	2335	2344	2332	2308	2297	2295	2306	2307
32°	2296	2309	2297	2276	2269	2262	2273	2273
33°	2253	2270	2260	2238	2235	2225	2236	2235
34°	2205	2228	2217	2196	2194	2183	2194	2195
35°	2151	2181	2171	2148	2149	2136	2149	2151
36°	2093	2130	2120	2094	2094	2083	2100	2103
37°	2030	2075	2065	2034	2031	2022	2047	2049
38°	1963	2017	2006	1966	1963	1952	1990	1994
39°	1892	1955	1944	1889	1890	1876	1929	1933
40°	1817	1889	1876	1805	1812	1792	1862	1870
41°	1739	1821	1808	1718	1733	1706	1793	1804
42°	1656	1750	1734	1626	1652	1615	1718	1737
43°	1572	1677	1659	1531	1574	1522	1641	1667
44°	1485	1603	1581	1437	1498	1429	1563	1594
45°	1399	1527	1500	1347	1426	1339	1482	1521
46°	1318	1452	1419	1258	1362	1252	1401	1446
47°	1236	1379	1341	1175	1298	1171	1324	1374
48°	1152	1309	1263	1097	1234	1095	1246	1305

Luminous Intensity (cd) Distribution Data (cont.)

$\begin{matrix} \text{C} \\ \backslash \\ \gamma \end{matrix}$	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
49°	1070	1243	1186	1022	1171	1024	1169	1239
50°	993	1181	1106	955	1108	957	1090	1179
51°	919	1123	1029	891	1050	894	1014	1122
52°	851	1067	956	834	993	838	942	1067
53°	788	1015	888	780	940	785	876	1017
54°	731	965	827	733	889	739	816	968
55°	682	917	772	689	842	695	762	920
56°	639	870	722	651	795	657	714	875
57°	603	824	678	621	750	628	671	831
58°	572	779	641	591	708	598	635	787
59°	545	734	603	561	667	569	599	745
60°	519	691	566	534	627	542	562	702
61°	497	649	533	509	588	517	531	661
62°	476	612	504	486	551	493	502	624
63°	457	575	476	463	514	469	476	587
64°	440	538	451	441	481	447	451	550
65°	424	501	427	420	451	425	428	514
66°	409	469	405	401	421	405	407	480
67°	395	438	385	382	395	385	387	446
68°	382	409	365	365	371	367	368	415
69°	370	381	347	348	349	351	352	386
70°	358	357	330	333	330	335	337	359
71°	346	333	315	319	311	321	322	335
72°	332	312	301	305	295	307	308	312
73°	317	292	289	292	279	293	295	292
74°	302	274	277	277	263	279	281	274
75°	287	257	265	263	248	264	267	257
76°	270	242	254	248	232	249	254	242
77°	253	228	241	232	216	232	240	229
78°	236	216	226	215	201	215	226	217
79°	219	204	211	197	185	197	211	206
80°	201	191	194	179	170	179	195	195
81°	183	176	176	159	153	160	178	183
82°	163	159	156	139	135	141	159	168
83°	143	140	136	119	118	122	140	150
84°	123	121	115	100	98	104	122	131
85°	101	102	94	80	78	85	101	112
86°	80	82	72	59	59	65	81	93
87°	58	60	50	45	47	49	61	73
88°	38	36	33	31	35	33	42	50
89°	19	13	17	12	23	17	28	27
90°	0	0	0	0	0	0	0	0
91°	0	0	0	0	0	0	0	0
92°	0	0	0	0	0	0	0	0
93°	0	0	0	0	0	0	0	0
94°	0	0	0	0	0	0	0	0
95°	0	0	0	0	0	0	0	0
96°	0	0	0	0	0	0	0	0
97°	0	0	0	0	0	0	0	0

Luminous Intensity (cd) Distribution Data (cont.)

C y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
98°	0	0	0	0	0	0	0	0
99°	0	0	0	0	0	0	0	0
100°	0	0	0	0	0	0	0	0
101°	0	0	0	0	0	0	0	0
102°	0	0	0	0	0	0	0	0
103°	0	0	0	0	0	0	0	0
104°	0	0	0	0	0	0	0	0
105°	0	0	0	0	0	0	0	0
106°	0	0	0	0	0	0	0	0
107°	0	0	0	0	0	0	0	0
108°	0	0	0	0	0	0	0	0
109°	0	0	0	0	0	0	0	0
110°	0	0	0	0	0	0	0	0
111°	0	0	0	0	0	0	0	0
112°	0	0	0	0	0	0	0	0
113°	0	0	0	0	0	0	0	0
114°	0	0	0	0	0	0	0	0
115°	0	0	0	0	0	0	0	0
116°	0	0	0	0	0	0	0	0
117°	0	0	0	0	0	0	0	0
118°	0	0	0	0	0	0	0	0
119°	0	0	0	0	0	0	0	0
120°	0	0	0	0	0	0	0	0
121°	0	0	0	0	0	0	0	0
122°	0	0	0	0	0	0	0	0
123°	0	0	0	0	0	0	0	0
124°	0	0	0	0	0	0	0	0
125°	0	0	0	0	0	0	0	0
126°	0	0	0	0	0	0	0	0
127°	0	0	0	0	0	0	0	0
128°	0	0	0	0	0	0	0	0
129°	0	0	0	0	0	0	0	0
130°	0	0	0	0	0	0	0	0
131°	0	0	0	0	0	0	0	0
132°	0	0	0	0	0	0	0	0
133°	0	0	0	0	0	0	0	0
134°	0	0	0	0	0	0	0	0
135°	0	0	0	0	0	0	0	0
136°	0	0	0	0	0	0	0	0
137°	0	0	0	0	0	0	0	0
138°	0	0	0	0	0	0	0	0
139°	0	0	0	0	0	0	0	0
140°	0	0	0	0	0	0	0	0
141°	0	0	0	0	0	0	0	0
142°	0	0	0	0	0	0	0	0
143°	0	0	0	0	0	0	0	0
144°	0	0	0	0	0	0	0	0
145°	0	0	0	0	0	0	0	0
146°	0	0	0	0	0	0	0	0

Luminous Intensity (cd) Distribution Data (cont.)

$\begin{matrix} C \\ \backslash \\ Y \end{matrix}$	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
147°	0	0	0	0	0	0	0	0
148°	0	0	0	0	0	0	0	0
149°	0	0	0	0	0	0	0	0
150°	0	0	0	0	0	0	0	0
151°	0	0	0	0	0	0	0	0
152°	0	0	0	0	0	0	0	0
153°	0	0	0	0	0	0	0	0
154°	0	0	0	0	0	0	0	0
155°	0	0	0	0	0	0	0	0
156°	0	0	0	0	0	0	0	0
157°	0	0	0	0	0	0	0	0
158°	0	0	0	0	0	0	0	0
159°	0	0	0	0	0	0	0	0
160°	0	0	0	0	0	0	0	0
161°	0	0	0	0	0	0	0	0
162°	0	0	0	0	0	0	0	0
163°	0	0	0	0	0	0	0	0
164°	0	0	0	0	0	0	0	0
165°	0	0	0	0	0	0	0	0
166°	0	0	0	0	0	0	0	0
167°	0	0	0	0	0	0	0	0
168°	0	0	0	0	0	0	0	0
169°	0	0	0	0	0	0	0	0
170°	0	0	0	0	0	0	0	0
171°	0	0	0	0	0	0	0	0
172°	0	0	0	0	0	0	0	0
173°	0	0	0	0	0	0	0	0
174°	0	0	0	0	0	0	0	0
175°	0	0	0	0	0	0	0	0
176°	0	0	0	0	0	0	0	0
177°	0	0	0	0	0	0	0	0
178°	0	0	0	0	0	0	0	0
179°	0	0	0	0	0	0	0	0
180°	0	0	0	0	0	0	0	0

Zonal Lumen Density Measurement

Deg	Flux (lm)	%
0-5	61.6	1.03
5-10	183.5	3.06
10-15	302.0	5.04
15-20	414.7	6.93
20-25	517.8	8.64
25-30	603.5	10.08
30-35	656.6	10.96
35-40	655.7	10.95
40-45	591.9	9.88
45-50	490.8	8.19
50-55	389.0	6.50
55-60	309.8	5.17
60-65	246.8	4.12
65-70	194.9	3.26
70-75	155.4	2.59
75-80	118.9	1.98
80-85	73.9	1.24
85-90	22.9	0.38
90-95	0.0	0.00
95-100	0.0	0.00
100-105	0.0	0.00
105-110	0.0	0.00
110-115	0.0	0.00
115-120	0.0	0.00
120-125	0.0	0.00
125-130	0.0	0.00
130-135	0.0	0.00
135-140	0.0	0.00
140-145	0.0	0.00
145-150	0.0	0.00
150-155	0.0	0.00
155-160	0.0	0.00
160-165	0.0	0.00
165-170	0.0	0.00
170-175	0.0	0.00
175-180	0.0	0.00

Deg	Flux (lm)	%
0-5	61.6	1.03
0-10	245.1	4.09
0-15	547.1	9.13
0-20	961.8	16.06
0-25	1479.6	24.70
0-30	2083.1	34.78
0-35	2739.6	45.74
0-40	3395.3	56.69
0-45	3987.2	66.57
0-50	4478.0	74.76
0-55	4867.0	81.26
0-60	5176.8	86.43
0-65	5423.6	90.55
0-70	5618.5	93.81
0-75	5773.8	96.40
0-80	5892.7	98.38
0-85	5966.6	99.62
0-90	5989.5	100.00
0-95	5989.5	100.00
0-100	5989.5	100.00
0-105	5989.5	100.00
0-110	5989.5	100.00
0-115	5989.5	100.00
0-120	5989.5	100.00
0-125	5989.5	100.00
0-130	5989.5	100.00
0-135	5989.5	100.00
0-140	5989.5	100.00
0-145	5989.5	100.00
0-150	5989.5	100.00
0-155	5989.5	100.00
0-160	5989.5	100.00
0-165	5989.5	100.00
0-170	5989.5	100.00
0-175	5989.5	100.00
0-180	5989.5	100.00

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*****