

ANSI/IES LM-79-19

MEASUREMENT AND TEST REPORT

For

LEDVANCE LLC
200 Ballardvale Street Wilmington, MA 01887

Test Model: LEDMD6R3B1200ST9SC3WH

Report Type:	Electrical and Photometric tests including: Luminous Flux, Power Factor, Chromaticity, Luminous Intensity Distribution
Reviewed By:	
Report Number:	DG3230310-11395E-EE
Test Date:	2023-03-18 to 2023-03-20
Report Date:	
Approved by:	
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:

One test sample was in good condition and received on 2023-03-10, and used for testing.

Model Tested: LEDMD6R3B1200ST9SC3WH
Manufacturer: LEDVANCE LLC
Brand Name: SYLVANIA; LEDVANCE
Product Designation: LED Recessed luminaires
Burning Time Before Test: 0hour(For New Products)

Rated Values:

Rated Voltage/Frequency: 120 V AC 60Hz
Rated Power: 14 W
Nominal CCT: 2700K/3000K/3500K/4000K/5000K
Nominal Lumen Output: 1200 lm

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	2022-09-27	2023-09-26
High-precision rapid spectral analysis system	EVERFINE	HAAS-2000	M112048CA1361125	2022-09-27	2023-09-26
Digital power meter	YOKOGAWA	WT310	13398	2022-11-18	2023-11-17
Programmable Precision DC Power Supply	EVERFINE	WY5015	11060010	2022-11-18	2023-11-17
thermometer	SENSING	NA	NA	2022-11-18	2023-11-17
Standard Light Source	EVERFINE	D204	N/A	2021-10-15	2023-10-14
Precision frequency power supply	ALL Power	APW-105N	970613	2022-11-18	2023-11-17
AC POWER SUPPLY	EVERFINE	VPS1030 PWM	1012017	2022-11-18	2023-11-17
Digital CC&CV DC Power Supply	EVERFINE	WY12010	1009009	2022-11-18	2023-11-17
Digital power meter	YOKOGAWA	WT-210	91j926132	2022-11-18	2023-11-17
full-field speed goniophotometer	EVERFINE	GO-R5000	YG108492N10120001	2022-10-26	2023-10-25

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
wireless remote thermohygrometer	N/A	433MHz	N/A	2022-11-18	2023-11-17
Standard Light Source	EVERFINE	D908	1012003	2021-10-15	2023-10-14

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 $U=22\text{K}$ ($K=2$), 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.

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]

The Stabilization time: **30 minutes**

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

Test orientation: **Downward**

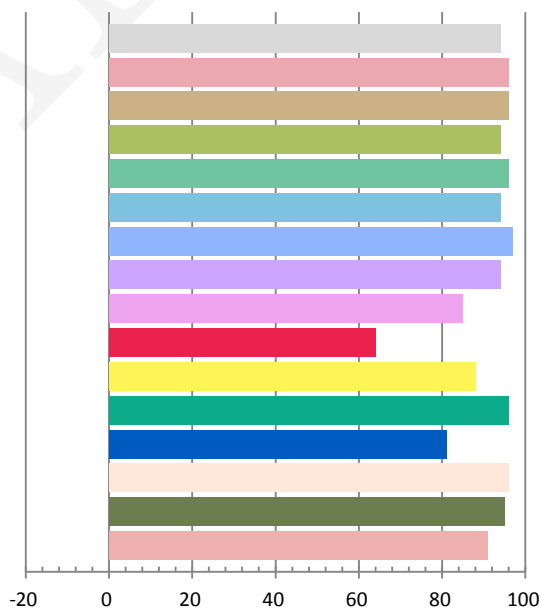
Photometric and Electrical Measurement Result

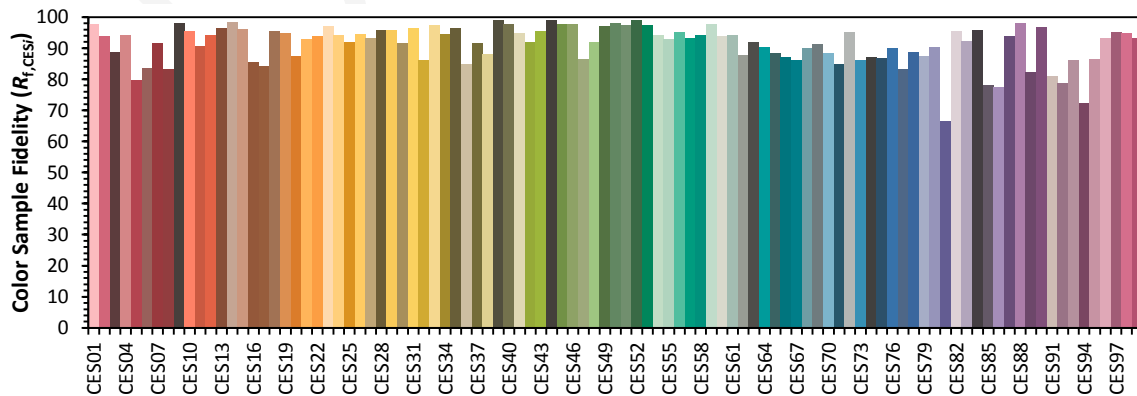
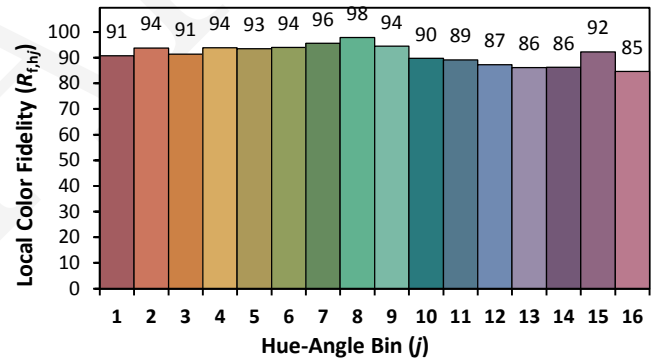
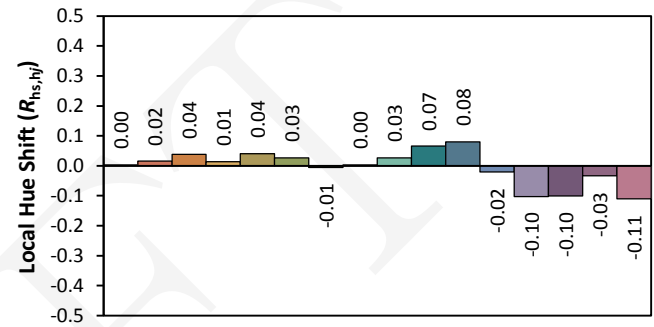
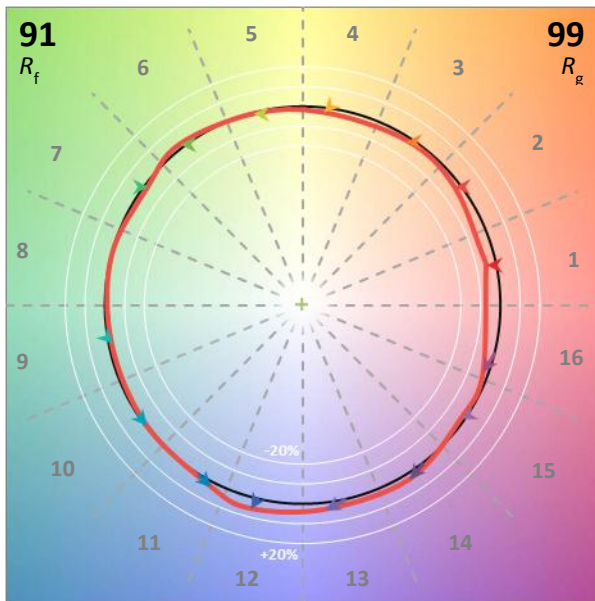
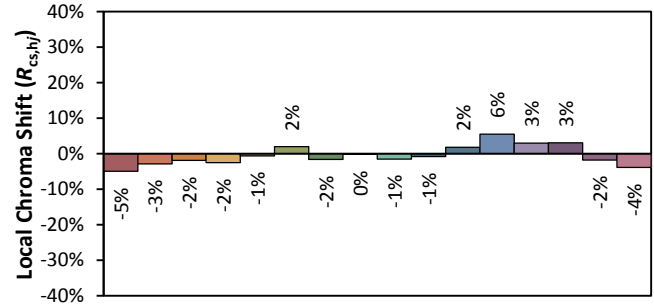
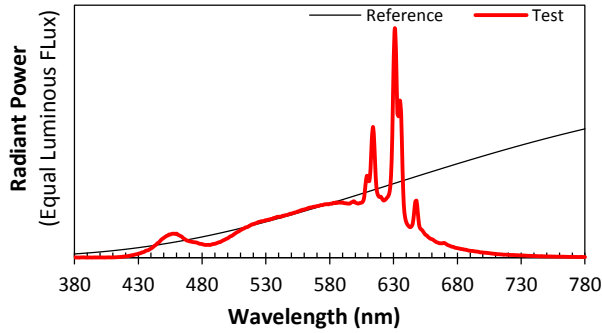
Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
119.9	60	0.1111	12.96	0.9727	1207.7	93.19

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
3.5439	2709	0.00151	0.4617	0.4151	0.2617	0.5293

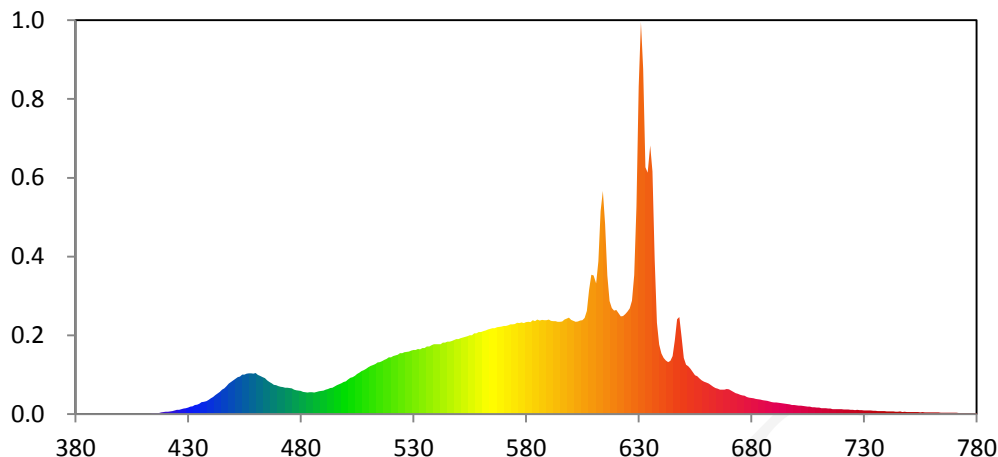
Color Rendering Index

Ra			
93.9			
R1	R2	R3	R4
96	96	94	96
R5	R6	R7	R8
94	97	94	85
R9	R10	R11	R12
64	88	96	81
R13	R14	R15	
96	95	91	





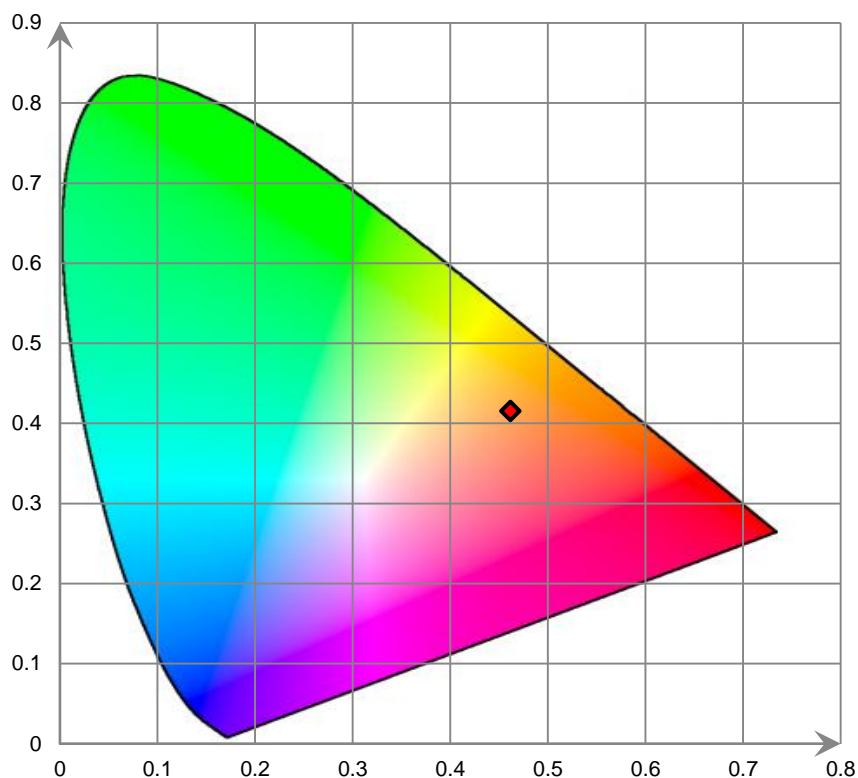
Relative Spectral Power Distribution



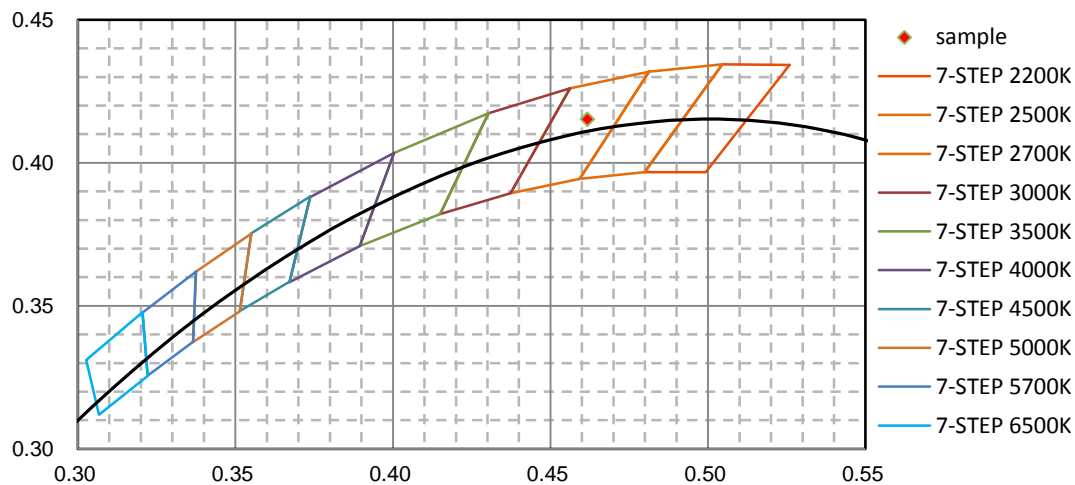
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	6.332E-02	421	4.463E-01	462	7.802E+00	503	7.549E+00	544	1.464E+01
381	2.492E-02	422	5.225E-01	463	7.548E+00	504	7.809E+00	545	1.480E+01
382	1.750E-02	423	5.876E-01	464	7.338E+00	505	8.160E+00	546	1.484E+01
383	8.079E-04	424	6.913E-01	465	6.883E+00	506	8.456E+00	547	1.497E+01
384	0.000E+00	425	8.119E-01	466	6.547E+00	507	8.774E+00	548	1.513E+01
385	4.380E-02	426	8.633E-01	467	6.278E+00	508	9.010E+00	549	1.535E+01
386	3.525E-02	427	9.963E-01	468	5.953E+00	509	9.254E+00	550	1.534E+01
387	7.529E-02	428	1.097E+00	469	5.870E+00	510	9.547E+00	551	1.552E+01
388	2.981E-02	429	1.176E+00	470	5.692E+00	511	9.814E+00	552	1.569E+01
389	0.000E+00	430	1.308E+00	471	5.594E+00	512	1.004E+01	553	1.581E+01
390	0.000E+00	431	1.470E+00	472	5.517E+00	513	1.023E+01	554	1.591E+01
391	1.509E-02	432	1.567E+00	473	5.394E+00	514	1.055E+01	555	1.615E+01
392	3.324E-02	433	1.810E+00	474	5.374E+00	515	1.062E+01	556	1.616E+01
393	8.983E-03	434	1.876E+00	475	5.284E+00	516	1.080E+01	557	1.651E+01
394	0.000E+00	435	2.095E+00	476	5.226E+00	517	1.109E+01	558	1.654E+01
395	2.596E-02	436	2.414E+00	477	4.997E+00	518	1.130E+01	559	1.679E+01
396	5.961E-02	437	2.472E+00	478	4.825E+00	519	1.162E+01	560	1.677E+01
397	3.207E-03	438	2.633E+00	479	4.786E+00	520	1.162E+01	561	1.696E+01
398	5.618E-02	439	2.900E+00	480	4.712E+00	521	1.189E+01	562	1.712E+01
399	1.109E-02	440	3.187E+00	481	4.526E+00	522	1.198E+01	563	1.730E+01
400	5.258E-02	441	3.467E+00	482	4.474E+00	523	1.215E+01	564	1.742E+01
401	2.848E-02	442	3.872E+00	483	4.396E+00	524	1.244E+01	565	1.755E+01
402	1.506E-02	443	4.189E+00	484	4.430E+00	525	1.248E+01	566	1.759E+01
403	2.026E-02	444	4.540E+00	485	4.457E+00	526	1.266E+01	567	1.775E+01
404	7.270E-03	445	5.000E+00	486	4.402E+00	527	1.274E+01	568	1.782E+01
405	5.946E-02	446	5.258E+00	487	4.486E+00	528	1.276E+01	569	1.789E+01
406	3.212E-02	447	5.716E+00	488	4.675E+00	529	1.294E+01	570	1.801E+01
407	8.085E-02	448	6.251E+00	489	4.737E+00	530	1.309E+01	571	1.806E+01
408	3.905E-02	449	6.568E+00	490	4.811E+00	531	1.310E+01	572	1.818E+01
409	3.656E-02	450	6.910E+00	491	4.961E+00	532	1.331E+01	573	1.838E+01
410	6.417E-02	451	7.200E+00	492	5.133E+00	533	1.327E+01	574	1.834E+01
411	6.528E-02	452	7.548E+00	493	5.339E+00	534	1.353E+01	575	1.844E+01
412	9.316E-02	453	7.672E+00	494	5.401E+00	535	1.353E+01	576	1.867E+01
413	8.734E-02	454	8.070E+00	495	5.627E+00	536	1.386E+01	577	1.861E+01
414	1.619E-01	455	8.043E+00	496	5.900E+00	537	1.385E+01	578	1.874E+01
415	1.578E-01	456	8.233E+00	497	6.098E+00	538	1.411E+01	579	1.859E+01
416	2.157E-01	457	8.354E+00	498	6.313E+00	539	1.426E+01	580	1.881E+01
417	2.091E-01	458	8.338E+00	499	6.564E+00	540	1.427E+01	581	1.886E+01
418	3.306E-01	459	8.260E+00	500	6.719E+00	541	1.431E+01	582	1.884E+01
419	3.566E-01	460	8.392E+00	501	7.060E+00	542	1.427E+01	583	1.920E+01
420	4.240E-01	461	7.988E+00	502	7.378E+00	543	1.461E+01	584	1.904E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.933E+01	626	2.166E+01	667	5.005E+00	708	1.366E+00	749	4.050E-01
586	1.912E+01	627	2.323E+01	668	4.962E+00	709	1.286E+00	750	3.856E-01
587	1.927E+01	628	2.847E+01	669	5.088E+00	710	1.289E+00	751	3.922E-01
588	1.924E+01	629	4.253E+01	670	5.067E+00	711	1.178E+00	752	3.673E-01
589	1.919E+01	630	6.713E+01	671	4.785E+00	712	1.178E+00	753	3.670E-01
590	1.935E+01	631	8.035E+01	672	4.497E+00	713	1.148E+00	754	3.739E-01
591	1.909E+01	632	7.074E+01	673	4.272E+00	714	1.105E+00	755	3.337E-01
592	1.902E+01	633	5.055E+01	674	4.128E+00	715	1.096E+00	756	3.531E-01
593	1.899E+01	634	4.945E+01	675	3.907E+00	716	9.824E-01	757	3.102E-01
594	1.889E+01	635	5.500E+01	676	3.772E+00	717	1.007E+00	758	3.129E-01
595	1.889E+01	636	4.971E+01	677	3.731E+00	718	1.002E+00	759	3.013E-01
596	1.896E+01	637	3.163E+01	678	3.457E+00	719	9.816E-01	760	3.033E-01
597	1.932E+01	638	1.872E+01	679	3.363E+00	720	1.003E+00	761	2.978E-01
598	1.951E+01	639	1.425E+01	680	3.288E+00	721	9.104E-01	762	2.947E-01
599	1.971E+01	640	1.236E+01	681	3.203E+00	722	8.925E-01	763	3.109E-01
600	1.927E+01	641	1.148E+01	682	3.106E+00	723	9.070E-01	764	2.825E-01
601	1.907E+01	642	1.093E+01	683	2.982E+00	724	8.700E-01	765	2.620E-01
602	1.891E+01	643	1.062E+01	684	2.962E+00	725	8.743E-01	766	2.392E-01
603	1.898E+01	644	1.091E+01	685	2.822E+00	726	7.873E-01	767	2.253E-01
604	1.914E+01	645	1.185E+01	686	2.766E+00	727	8.407E-01	768	2.358E-01
605	1.923E+01	646	1.514E+01	687	2.678E+00	728	7.703E-01	769	2.222E-01
606	1.964E+01	647	1.943E+01	688	2.553E+00	729	7.715E-01	770	2.427E-01
607	2.110E+01	648	1.988E+01	689	2.444E+00	730	7.424E-01	771	2.848E-01
608	2.544E+01	649	1.579E+01	690	2.375E+00	731	7.295E-01	772	1.933E-01
609	2.854E+01	650	1.149E+01	691	2.325E+00	732	7.102E-01	773	2.106E-01
610	2.842E+01	651	1.012E+01	692	2.318E+00	733	6.903E-01	774	2.038E-01
611	2.677E+01	652	9.770E+00	693	2.201E+00	734	6.352E-01	775	1.627E-01
612	3.131E+01	653	9.209E+00	694	2.150E+00	735	6.279E-01	776	2.135E-01
613	4.161E+01	654	8.576E+00	695	2.093E+00	736	6.149E-01	777	2.201E-01
614	4.569E+01	655	7.963E+00	696	2.053E+00	737	5.871E-01	778	1.967E-01
615	3.897E+01	656	7.732E+00	697	1.950E+00	738	5.841E-01	779	1.742E-01
616	2.838E+01	657	7.249E+00	698	1.802E+00	739	5.641E-01	780	1.662E-01
617	2.317E+01	658	6.884E+00	699	1.843E+00	740	5.391E-01		
618	2.169E+01	659	6.586E+00	700	1.750E+00	741	5.299E-01		
619	2.121E+01	660	6.429E+00	701	1.702E+00	742	5.044E-01		
620	2.131E+01	661	6.227E+00	702	1.693E+00	743	4.946E-01		
621	2.064E+01	662	5.872E+00	703	1.618E+00	744	4.697E-01		
622	2.000E+01	663	5.550E+00	704	1.580E+00	745	4.494E-01		
623	2.007E+01	664	5.316E+00	705	1.530E+00	746	5.148E-01		
624	2.047E+01	665	5.194E+00	706	1.469E+00	747	3.778E-01		
625	2.101E+01	666	4.985E+00	707	1.394E+00	748	4.418E-01		

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: **Downward**

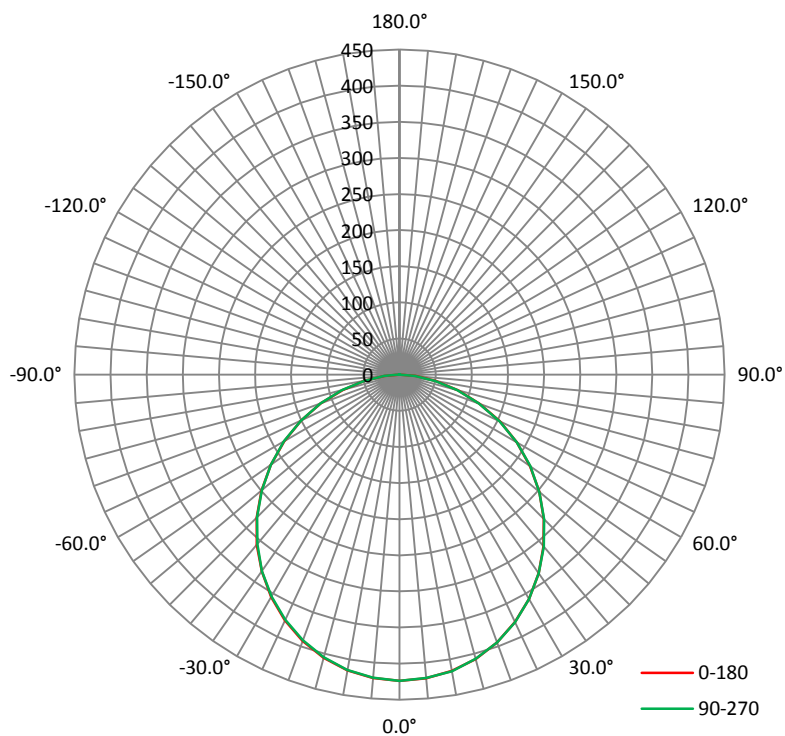
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.0	60	0.1111	12.97	0.9729

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I _{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
1213.04	93.53	424.2	1.26	1.26

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I _{max}):	112.2	112.2	112.2	112.3	112.2
Field Angle (10% I _{max}):	162.5	162.5	162.5	162.6	162.5

Luminous Intensity (cd) Distribution Data

$\begin{matrix} \text{C} \\ \backslash \\ \gamma \end{matrix}$	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0°	424	424	424	424	424	424	424	424
1°	424	423	424	423	423	423	423	424
2°	424	423	423	424	423	423	424	424
3°	423	423	423	423	423	423	423	424
4°	422	422	422	422	422	423	423	423
5°	422	421	421	421	421	421	422	423
6°	421	420	420	420	420	421	422	422
7°	420	419	419	419	419	420	421	421
8°	418	418	418	418	418	418	419	420
9°	417	417	417	417	417	417	418	419
10°	415	415	415	415	415	416	416	417
11°	414	413	413	413	413	414	415	416
12°	412	412	411	411	412	412	413	414
13°	410	410	409	409	409	410	411	412
14°	408	408	407	407	407	409	409	410
15°	406	405	405	404	405	406	407	408
16°	403	403	402	402	402	404	405	406
17°	401	400	400	401	400	401	402	403
18°	398	397	397	397	397	398	399	401
19°	395	394	394	394	394	396	397	398
20°	392	392	391	391	391	393	394	395
21°	389	388	388	388	388	389	391	392
22°	386	385	385	385	385	386	388	389
23°	383	382	381	381	382	383	384	386
24°	379	378	377	378	378	380	381	382
25°	375	374	374	374	374	376	377	379
26°	371	370	370	370	371	372	373	376
27°	368	367	367	366	367	368	370	371
28°	364	363	363	362	363	364	366	368
29°	359	359	359	358	359	360	361	363
30°	356	354	354	354	355	356	357	359
31°	351	350	350	350	350	352	353	355
32°	346	345	345	345	346	347	349	351
33°	342	341	341	341	341	343	344	346
34°	337	336	336	336	336	338	340	342
35°	332	331	331	331	332	333	335	337
36°	327	326	326	326	327	328	330	332
37°	323	322	321	322	322	323	325	327
38°	318	316	316	316	317	318	320	322
39°	312	311	310	311	311	313	315	317
40°	307	306	305	306	306	308	310	311
41°	302	300	300	300	301	303	304	306
42°	296	295	294	295	295	297	299	300
43°	291	289	289	289	290	291	293	295
44°	285	284	283	283	284	286	288	290
45°	279	278	278	278	279	280	282	284
46°	273	272	272	272	273	274	276	278
47°	267	266	266	266	267	268	270	272
48°	261	260	260	260	261	263	264	266

Luminous Intensity (cd) Distribution Data

$\gamma \backslash C$	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
49°	255	254	254	254	255	256	259	260
50°	249	248	248	248	249	251	252	254
51°	243	242	242	242	243	244	246	248
52°	237	236	235	236	237	238	240	242
53°	230	229	229	229	230	232	233	236
54°	224	223	222	223	224	226	227	229
55°	218	216	216	217	217	219	221	223
56°	211	210	210	210	211	212	214	216
57°	204	204	203	204	204	206	207	210
58°	198	197	197	197	198	200	201	203
59°	191	190	190	190	191	193	194	196
60°	184	183	183	184	185	186	188	189
61°	178	177	176	177	178	179	181	183
62°	171	170	170	170	171	173	174	176
63°	164	163	163	163	164	166	167	169
64°	157	156	156	157	157	159	160	162
65°	150	149	149	150	151	152	154	155
66°	143	142	142	143	144	145	147	148
67°	136	135	135	136	137	138	140	141
68°	129	129	129	129	130	132	133	134
69°	122	122	122	122	123	125	126	127
70°	115	115	115	115	116	118	119	121
71°	109	108	108	108	109	111	112	113
72°	102	101	101	102	102	104	105	106
73°	95	94	94	95	96	97	98	100
74°	88	88	88	88	89	90	91	93
75°	81	81	81	81	82	83	85	86
76°	75	74	74	75	76	77	78	79
77°	68	68	68	68	69	70	72	73
78°	62	61	61	62	63	64	65	66
79°	55	55	55	56	56	58	59	60
80°	49	49	49	49	50	51	52	53
81°	43	43	43	43	44	45	46	47
82°	37	37	37	37	38	39	40	41
83°	31	31	31	32	32	33	34	35
84°	26	25	26	26	27	28	29	30
85°	20	20	20	21	22	22	23	24
86°	15	15	15	16	16	17	18	19
87°	10	10	10	11	12	12	13	14
88°	6	6	6	6	7	8	8	9
89°	3	3	3	3	5	5	6	6
90°	0	0	0	0	2	3	3	3
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	1	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	1	1	1	1	0	0
148°	0	1	1	1	1	1	1	0
149°	0	1	1	1	1	1	1	0
150°	1	1	1	1	1	1	1	1
151°	1	1	1	1	1	1	1	1
152°	1	1	1	1	1	1	1	1
153°	1	1	1	1	1	1	1	1
154°	1	1	1	1	1	1	1	1
155°	1	1	1	1	1	1	1	1
156°	1	1	1	1	1	1	1	1
157°	1	1	1	1	1	1	1	1
158°	1	1	1	1	1	1	1	1
159°	1	1	1	1	1	1	1	1
160°	1	1	1	1	1	1	1	1
161°	1	1	1	1	1	1	1	1
162°	1	1	1	1	1	1	1	1
163°	1	1	1	1	1	1	1	1
164°	1	1	1	1	1	1	1	1
165°	1	1	1	1	1	1	1	1
166°	1	1	1	1	1	1	1	1
167°	1	1	1	1	1	1	1	1
168°	1	1	1	1	1	1	1	1
169°	1	1	1	1	1	1	1	1
170°	1	1	1	1	1	1	1	1
171°	1	1	1	1	1	1	1	1
172°	1	1	1	1	1	1	1	1
173°	1	1	1	1	1	1	1	1
174°	1	1	1	1	1	1	1	1
175°	1	1	1	1	1	1	1	1
176°	1	1	1	1	1	1	1	1
177°	1	1	1	1	1	1	1	1
178°	1	1	1	1	1	1	1	1
179°	1	1	1	0	0	1	1	1
180°	1	1	0	0	0	0	1	1

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°
0°	424	424	424	424	424	424	424	424
1°	424	424	424	424	424	424	424	424
2°	424	424	424	424	424	424	424	424
3°	424	423	423	423	423	424	424	423
4°	423	423	423	423	422	423	423	423
5°	422	422	423	423	421	422	422	422
6°	421	422	422	422	421	421	422	421
7°	421	420	421	421	420	420	420	420
8°	419	419	420	420	419	420	419	419
9°	418	418	418	419	418	418	418	417
10°	416	418	417	417	417	416	416	416
11°	415	415	416	416	415	415	415	414
12°	413	414	414	414	413	413	412	412
13°	412	412	412	412	412	412	411	410
14°	410	410	410	410	410	409	408	408
15°	407	408	408	408	407	407	406	406
16°	405	406	406	406	405	405	404	403
17°	403	403	404	404	402	402	401	401
18°	400	400	401	401	400	400	399	399
19°	397	398	398	398	398	397	397	395
20°	394	395	395	395	395	394	393	392
21°	392	393	392	392	392	391	390	389
22°	388	389	389	389	388	388	387	386
23°	385	386	386	386	385	385	384	383
24°	382	382	383	382	382	381	380	379
25°	378	379	379	379	378	378	377	376
26°	375	375	375	375	375	374	373	371
27°	371	371	372	372	371	370	369	368
28°	366	368	368	368	367	366	365	364
29°	362	364	364	364	363	362	361	359
30°	358	359	360	359	359	357	356	355
31°	354	355	355	355	354	354	352	351
32°	350	350	351	351	350	349	347	346
33°	345	346	347	346	346	345	344	342
34°	341	342	342	342	341	340	338	337
35°	335	337	337	337	336	335	334	332
36°	331	332	332	332	331	330	329	327
37°	326	327	327	327	326	325	324	322
38°	321	322	323	322	321	320	319	317
39°	316	317	318	317	316	315	314	312
40°	310	311	312	312	311	310	308	306
41°	305	306	307	306	305	304	302	301
42°	299	301	301	301	300	299	297	296
43°	294	295	296	295	295	293	292	290
44°	288	289	290	290	289	287	286	284
45°	282	284	284	284	283	282	280	278
46°	277	278	278	278	277	276	274	273
47°	271	272	273	272	271	270	268	267
48°	265	266	267	266	265	264	262	260

Luminous Intensity (cd) Distribution Data (cont.)

C y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
49°	259	260	261	260	259	258	256	255
50°	252	254	254	254	253	251	250	248
51°	246	247	248	248	247	246	244	242
52°	240	241	242	241	240	239	238	236
53°	234	235	235	235	234	232	231	229
54°	227	228	229	229	227	226	225	223
55°	221	222	222	222	221	220	218	216
56°	215	215	216	215	215	213	212	210
57°	208	209	209	209	207	207	205	203
58°	201	202	202	202	201	200	198	197
59°	194	196	196	195	194	193	191	190
60°	188	189	189	188	188	186	184	183
61°	181	182	182	182	181	179	178	176
62°	174	175	175	175	174	172	171	170
63°	167	168	168	168	167	166	164	162
64°	160	161	161	161	160	159	157	156
65°	153	154	154	154	153	152	150	149
66°	147	147	147	147	146	145	143	141
67°	139	140	140	140	139	137	135	134
68°	132	133	133	132	131	130	128	127
69°	125	125	125	125	124	123	121	120
70°	118	118	118	118	117	116	114	113
71°	111	111	111	111	110	109	107	106
72°	104	104	105	104	103	102	100	99
73°	97	98	98	97	96	95	94	93
74°	90	91	91	90	89	88	87	86
75°	84	84	84	83	82	81	80	79
76°	77	77	77	77	76	75	74	73
77°	70	71	71	70	69	68	67	66
78°	64	64	64	64	63	62	61	60
79°	58	58	58	57	56	55	54	53
80°	51	52	51	51	50	49	48	47
81°	45	46	45	45	44	43	42	41
82°	39	40	39	39	38	37	36	35
83°	33	34	33	33	32	31	30	30
84°	28	28	28	27	27	26	25	24
85°	23	23	22	22	21	20	20	19
86°	18	18	17	17	16	15	15	14
87°	12	12	12	12	11	11	10	9
88°	7	7	7	7	6	6	5	5
89°	3	3	3	2	2	2	1	1
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 γ	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.)

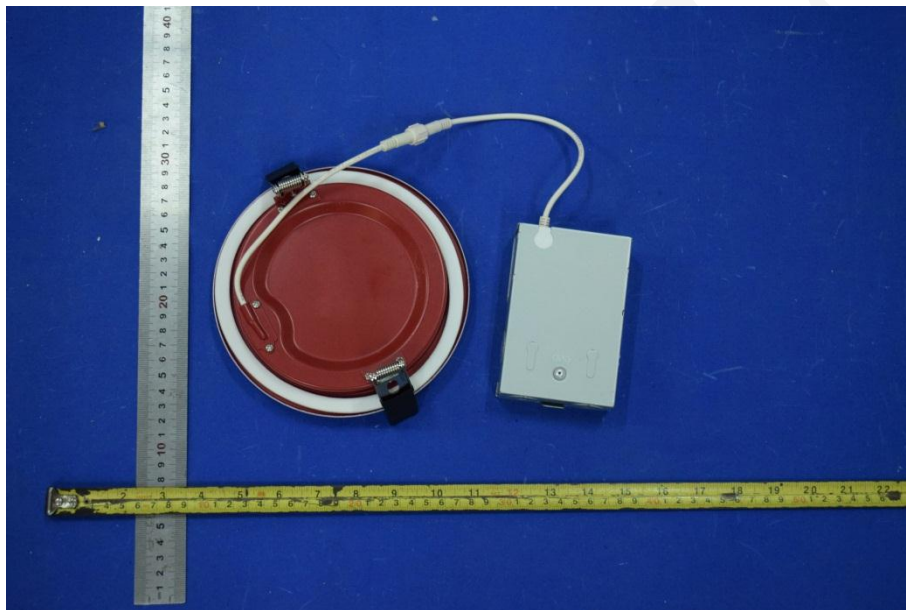
C y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
147°	0	0	0	0	0	0	0	0
148°	0	0	0	0	0	0	0	0
149°	0	0	0	0	0	0	0	0
150°	0	0	0	0	0	0	0	0
151°	0	0	0	0	0	0	0	0
152°	0	0	0	0	0	0	0	0
153°	0	0	0	0	0	0	0	0
154°	0	0	0	0	0	0	0	0
155°	0	0	0	0	0	0	0	0
156°	0	0	0	0	0	0	0	0
157°	0	0	0	0	0	0	0	0
158°	0	0	0	0	0	0	0	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°	1	1	0	0	0	0	0	1
180°	1	1	1	0	0	0	0	1

Zonal Lumen Density Measurement

Deg	Flux (lm)	%
0-5	10.1	0.83
5-10	30.0	2.48
10-15	48.8	4.02
15-20	65.9	5.43
20-25	80.8	6.66
25-30	92.8	7.65
30-35	101.8	8.39
35-40	107.3	8.84
40-45	109.1	9.00
45-50	107.5	8.86
50-55	102.2	8.43
55-60	93.7	7.72
60-65	82.1	6.77
65-70	67.9	5.60
70-75	51.9	4.28
75-80	35.4	2.91
80-85	19.2	1.59
85-90	5.3	0.44
90-95	0.1	0.00
95-100	0.0	0.01
100-105	0.0	0.00
105-110	0.0	0.00
110-115	0.1	0.01
115-120	0.1	0.00
120-125	0.1	0.01
125-130	0.1	0.01
130-135	0.1	0.00
135-140	0.1	0.01
140-145	0.1	0.01
145-150	0.1	0.01
150-155	0.1	0.01
155-160	0.1	0.00
160-165	0.1	0.01
165-170	0.1	0.01
170-175	0.0	0.00
175-180	0.0	0.00

Deg	Flux (lm)	%
0-5	10.1	0.83
0-10	40.1	3.31
0-15	88.9	7.33
0-20	154.8	12.76
0-25	235.6	19.42
0-30	328.4	27.07
0-35	430.2	35.46
0-40	537.4	44.30
0-45	646.6	53.30
0-50	754.0	62.16
0-55	856.3	70.59
0-60	950.0	78.31
0-65	1032.1	85.08
0-70	1100.0	90.68
0-75	1151.9	94.96
0-80	1187.3	97.87
0-85	1206.5	99.46
0-90	1211.8	99.90
0-95	1211.9	99.90
0-100	1211.9	99.91
0-105	1212.0	99.91
0-110	1212.0	99.91
0-115	1212.1	99.92
0-120	1212.1	99.92
0-125	1212.2	99.93
0-130	1212.3	99.94
0-135	1212.3	99.94
0-140	1212.4	99.95
0-145	1212.5	99.96
0-150	1212.6	99.97
0-155	1212.8	99.98
0-160	1212.8	99.98
0-165	1212.9	99.99
0-170	1213.0	100.00
0-175	1213.0	100.00
0-180	1213.0	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.
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*****END OF REPORT*****