



ANSI/IES LM-79-19

MEASUREMENT AND TEST REPORT

For

LED One Corporation

12437 Bellegrave Ave, Eastvale, CA 91752

Test Model: LOC-4RDL-7WMCCT(27/30/35/40/50)D

Report Type:	Electrical and Photometric tests including: Luminous Flux, Power Factor, Chromaticity, Luminous Intensity Distribution
Reviewed By:	Hexy He <i>Hexy He</i>
Report Number:	KS2230315-12394E-EE
Test Date:	2022-05-12 to 2022-05-13
Report Date:	2023-03-20
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:

One test sample was in good condition and received on 2022-04-26, and used for testing. All tests and evaluations were performed at the least efficient white light setting.

Model Tested: LOC-4RDL-7WMCCT(27/30/35/40/50)D
 Manufacturer: LED One Corporation
 Brand Name: TOSPO
 Product Designation: Downlight retrofits
 Burning Time Before Test: 0hour(For New Products)

Rated Values:

Rated Voltage/Frequency: 120 V AC 60Hz
 Rated Power: 7 W
 Nominal CCT: 2700K/3000K/3500K/4000K/5000K
 Nominal Lumen Output: 650lm

Note:

- 1、 The applicant LED One Corporation declare that their products with model LOC-4RDL-7WMCCT(27/30/35/40/50)D are the same to the products in report# KS2220426-16627E-10-1
- 2、 All the data in previous report (KS2220426-16627E-10-1) is shared in this report.

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	2021-09-27	2022-09-26
High-precision rapid spectral analysis system	EVERFINE	HAAS-2000	M112048CA1361125	2021-09-27	2022-09-26
Digital power meter	YOKOGAWA	WT310	13398	2022-01-05	2023-01-04
Programmable Precision DC Power Supply	EVERFINE	WY5015	11060010	2022-01-05	2023-01-04
thermometer	SENSING	NA	NA	2022-02-14	2023-02-13
Standard Light Source	EVERFINE	D204	N/A	2021-10-15	2022-10-14
Precision frequency power supply	ALL Power	APW-105N	970613	2022-01-05	2023-01-04

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
AC POWER SUPPLY	EVERFINE	VPS1030 PWM	1012017	2022-01-06	2023-01-05
Digital CC&CV DC Power Supply	EVERFINE	WY12010	1009009	2022-01-06	2023-01-05
Digital power meter	YOKOGAWA	WT-210	91j926132	2022-01-06	2023-01-05
full-field speed goniophotometer	EVERFINE	GO-R5000	YG108492N10120001	2021-10-26	2022-10-25
wireless remote thermohygrometer	N/A	433MHz	N/A	2022-01-10	2023-01-09
Standard Light Source	EVERFINE	D908	1012003	2021-10-15	2022-10-14

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**

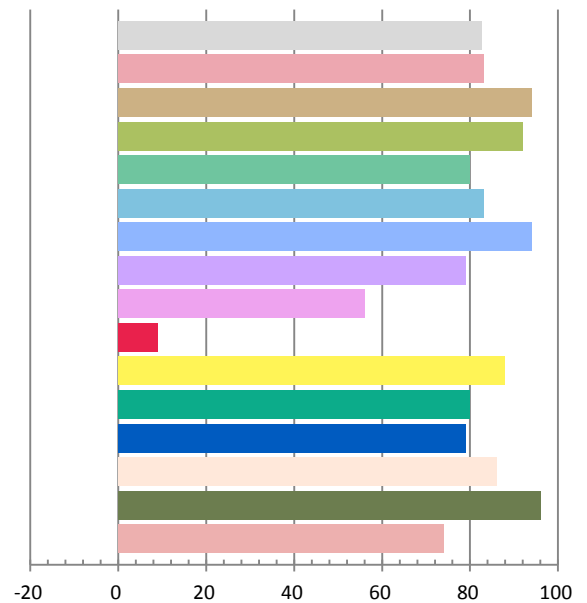
Photometric and Electrical Measurement Result

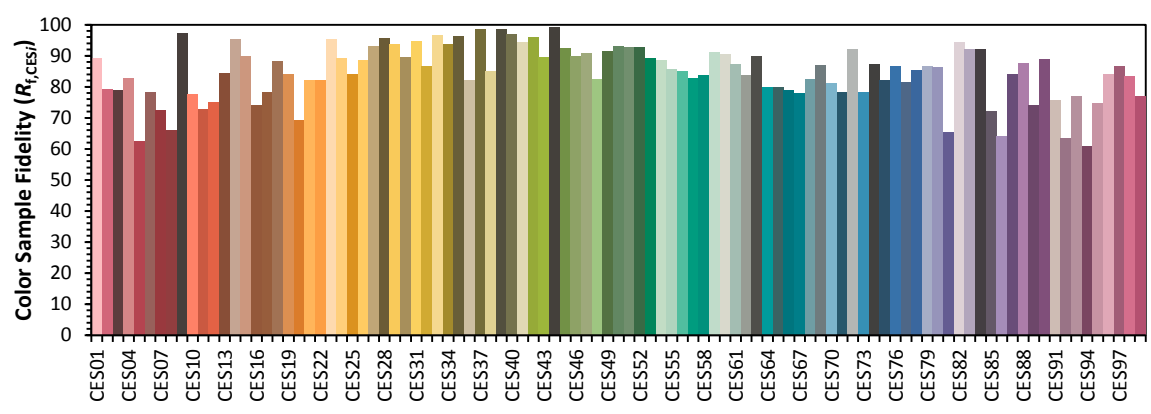
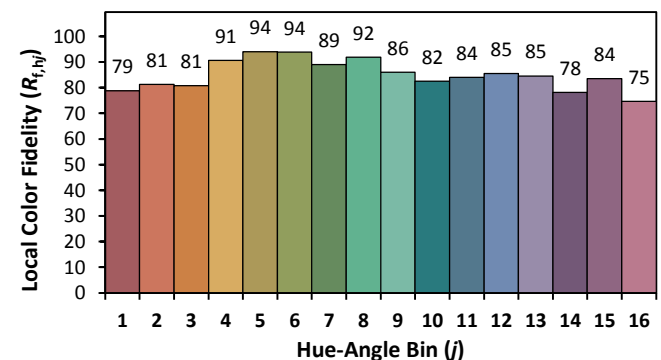
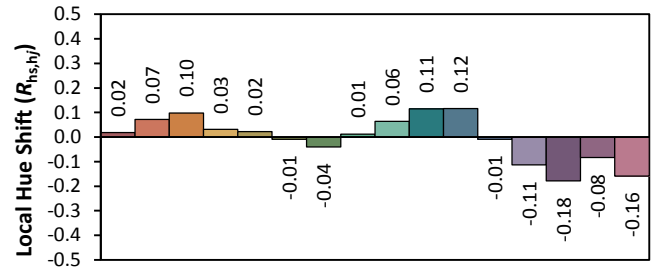
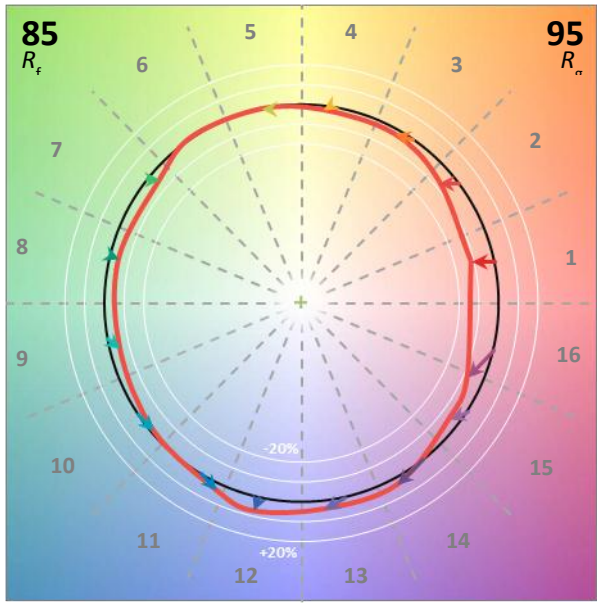
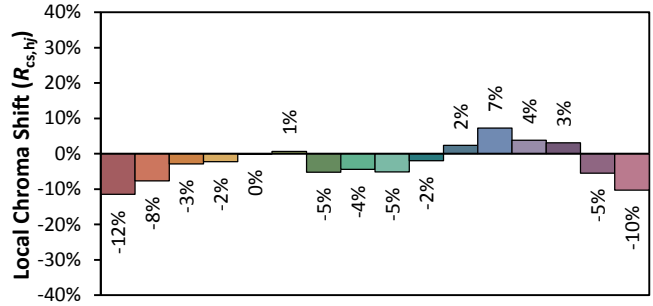
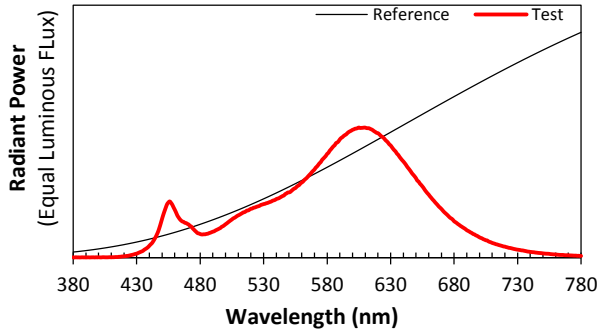
Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120	60	0.068	6.706	0.8217	669.49	99.84

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
2.0827	2662	-0.00171	0.4600	0.4060	0.2647	0.5256

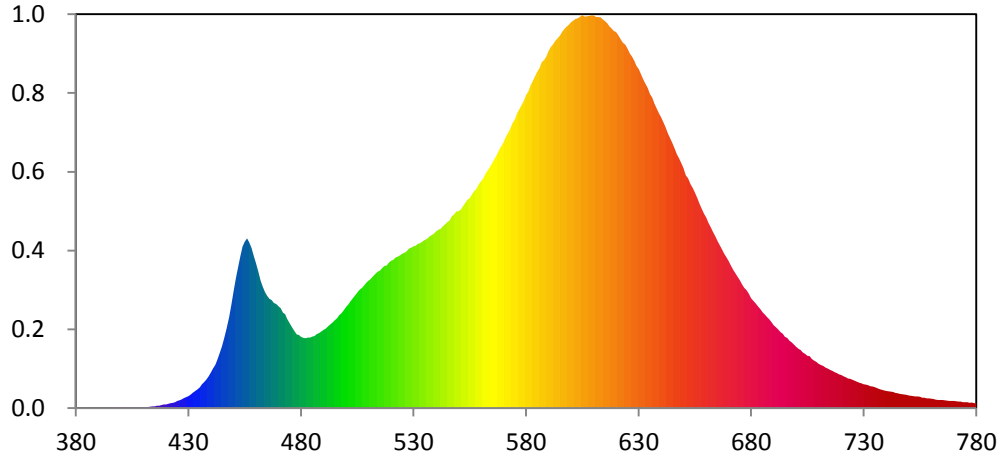
Color Rendering Index

Ra			
82.7			
R1	R2	R3	R4
83	94	92	80
R5	R6	R7	R8
83	94	79	56
R9	R10	R11	R12
9	88	80	79
R13	R14	R15	
86	96	74	





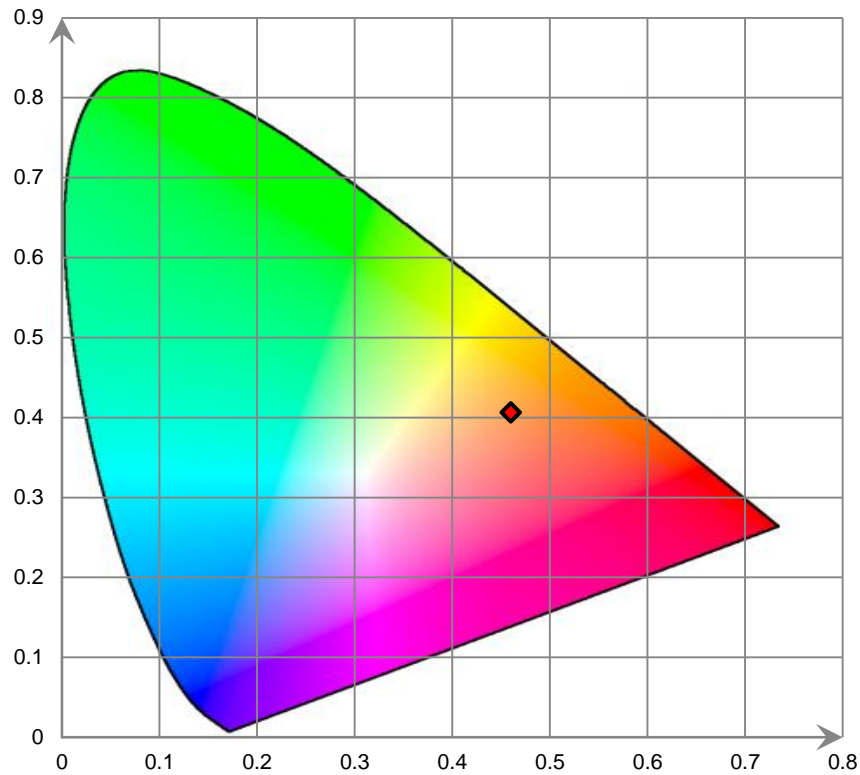
Relative Spectral Power Distribution



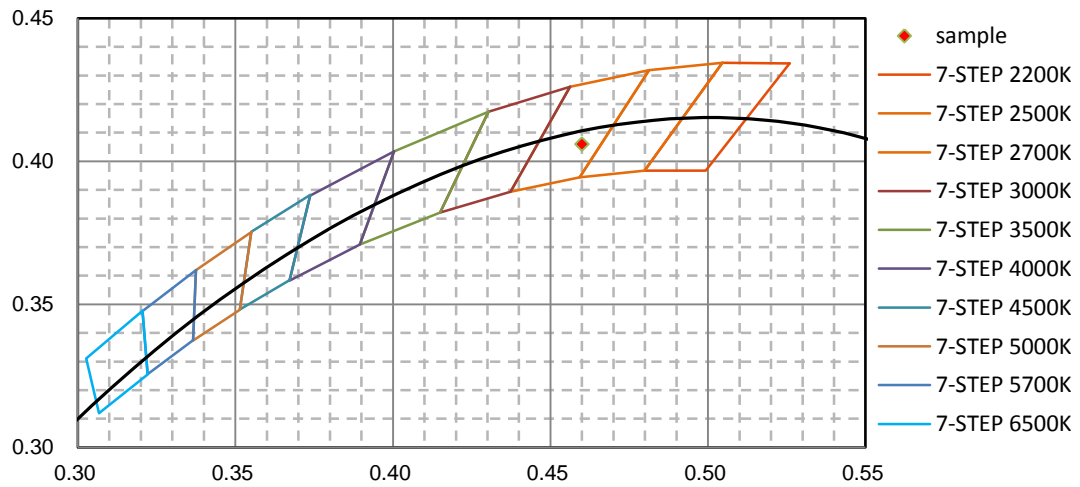
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	2.987E-02	421	1.479E-01	462	4.573E+00	503	3.921E+00	544	6.586E+00
381	2.991E-03	422	1.708E-01	463	4.350E+00	504	4.024E+00	545	6.667E+00
382	3.285E-02	423	1.832E-01	464	4.153E+00	505	4.122E+00	546	6.724E+00
383	1.591E-02	424	2.099E-01	465	4.009E+00	506	4.235E+00	547	6.872E+00
384	2.105E-02	425	2.460E-01	466	3.906E+00	507	4.299E+00	548	6.940E+00
385	1.172E-02	426	2.788E-01	467	3.858E+00	508	4.390E+00	549	7.042E+00
386	1.325E-02	427	3.086E-01	468	3.759E+00	509	4.490E+00	550	7.056E+00
387	2.636E-02	428	3.491E-01	469	3.731E+00	510	4.568E+00	551	7.107E+00
388	1.865E-02	429	3.927E-01	470	3.642E+00	511	4.635E+00	552	7.235E+00
389	1.935E-02	430	4.252E-01	471	3.574E+00	512	4.720E+00	553	7.349E+00
390	1.116E-02	431	4.836E-01	472	3.421E+00	513	4.798E+00	554	7.461E+00
391	1.656E-02	432	5.465E-01	473	3.363E+00	514	4.888E+00	555	7.520E+00
392	2.416E-02	433	6.062E-01	474	3.181E+00	515	4.918E+00	556	7.662E+00
393	1.035E-02	434	6.628E-01	475	3.040E+00	516	5.009E+00	557	7.773E+00
394	1.944E-02	435	7.309E-01	476	2.897E+00	517	5.091E+00	558	7.851E+00
395	2.317E-02	436	8.454E-01	477	2.770E+00	518	5.107E+00	559	8.021E+00
396	2.542E-02	437	9.292E-01	478	2.642E+00	519	5.200E+00	560	8.124E+00
397	1.535E-02	438	1.022E+00	479	2.609E+00	520	5.278E+00	561	8.225E+00
398	2.773E-02	439	1.132E+00	480	2.546E+00	521	5.307E+00	562	8.390E+00
399	1.871E-02	440	1.277E+00	481	2.506E+00	522	5.388E+00	563	8.510E+00
400	3.264E-02	441	1.425E+00	482	2.502E+00	523	5.418E+00	564	8.630E+00
401	2.044E-02	442	1.552E+00	483	2.522E+00	524	5.470E+00	565	8.792E+00
402	1.487E-02	443	1.752E+00	484	2.517E+00	525	5.526E+00	566	8.941E+00
403	3.094E-02	444	1.982E+00	485	2.562E+00	526	5.560E+00	567	9.083E+00
404	3.508E-02	445	2.229E+00	486	2.579E+00	527	5.621E+00	568	9.251E+00
405	2.553E-02	446	2.520E+00	487	2.644E+00	528	5.706E+00	569	9.395E+00
406	2.340E-02	447	2.841E+00	488	2.686E+00	529	5.742E+00	570	9.531E+00
407	2.437E-02	448	3.258E+00	489	2.744E+00	530	5.791E+00	571	9.726E+00
408	3.223E-02	449	3.706E+00	490	2.800E+00	531	5.817E+00	572	9.858E+00
409	3.640E-02	450	4.184E+00	491	2.841E+00	532	5.878E+00	573	1.003E+01
410	2.684E-02	451	4.642E+00	492	2.928E+00	533	5.908E+00	574	1.021E+01
411	3.862E-02	452	5.041E+00	493	2.997E+00	534	5.967E+00	575	1.034E+01
412	3.618E-02	453	5.432E+00	494	3.061E+00	535	6.019E+00	576	1.057E+01
413	4.944E-02	454	5.786E+00	495	3.135E+00	536	6.067E+00	577	1.071E+01
414	5.649E-02	455	5.957E+00	496	3.207E+00	537	6.150E+00	578	1.086E+01
415	5.288E-02	456	6.080E+00	497	3.329E+00	538	6.194E+00	579	1.101E+01
416	7.978E-02	457	5.933E+00	498	3.396E+00	539	6.244E+00	580	1.122E+01
417	8.347E-02	458	5.735E+00	499	3.494E+00	540	6.332E+00	581	1.134E+01
418	1.056E-01	459	5.451E+00	500	3.606E+00	541	6.382E+00	582	1.156E+01
419	1.221E-01	460	5.183E+00	501	3.701E+00	542	6.425E+00	583	1.172E+01
420	1.290E-01	461	4.890E+00	502	3.815E+00	543	6.510E+00	584	1.189E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.205E+01	626	1.271E+01	667	5.689E+00	708	1.694E+00	749	4.710E-01
586	1.217E+01	627	1.259E+01	668	5.523E+00	709	1.650E+00	750	4.513E-01
587	1.239E+01	628	1.244E+01	669	5.398E+00	710	1.583E+00	751	4.359E-01
588	1.246E+01	629	1.226E+01	670	5.266E+00	711	1.539E+00	752	4.207E-01
589	1.259E+01	630	1.214E+01	671	5.105E+00	712	1.498E+00	753	4.149E-01
590	1.279E+01	631	1.196E+01	672	4.949E+00	713	1.441E+00	754	4.114E-01
591	1.294E+01	632	1.177E+01	673	4.822E+00	714	1.414E+00	755	3.979E-01
592	1.303E+01	633	1.161E+01	674	4.698E+00	715	1.364E+00	756	3.712E-01
593	1.316E+01	634	1.147E+01	675	4.569E+00	716	1.325E+00	757	3.617E-01
594	1.326E+01	635	1.125E+01	676	4.425E+00	717	1.287E+00	758	3.433E-01
595	1.334E+01	636	1.112E+01	677	4.296E+00	718	1.244E+00	759	3.449E-01
596	1.348E+01	637	1.091E+01	678	4.214E+00	719	1.199E+00	760	3.257E-01
597	1.359E+01	638	1.073E+01	679	4.095E+00	720	1.183E+00	761	3.167E-01
598	1.367E+01	639	1.056E+01	680	3.930E+00	721	1.133E+00	762	2.993E-01
599	1.374E+01	640	1.041E+01	681	3.839E+00	722	1.104E+00	763	2.876E-01
600	1.383E+01	641	1.024E+01	682	3.743E+00	723	1.055E+00	764	2.822E-01
601	1.388E+01	642	1.006E+01	683	3.631E+00	724	1.041E+00	765	2.826E-01
602	1.395E+01	643	9.844E+00	684	3.539E+00	725	1.009E+00	766	2.785E-01
603	1.397E+01	644	9.672E+00	685	3.430E+00	726	9.724E-01	767	2.572E-01
604	1.402E+01	645	9.493E+00	686	3.346E+00	727	9.337E-01	768	2.519E-01
605	1.408E+01	646	9.299E+00	687	3.253E+00	728	9.082E-01	769	2.515E-01
606	1.403E+01	647	9.098E+00	688	3.170E+00	729	8.761E-01	770	2.454E-01
607	1.404E+01	648	8.941E+00	689	3.076E+00	730	8.525E-01	771	2.356E-01
608	1.405E+01	649	8.776E+00	690	2.961E+00	731	8.327E-01	772	2.274E-01
609	1.407E+01	650	8.587E+00	691	2.887E+00	732	8.120E-01	773	2.227E-01
610	1.407E+01	651	8.335E+00	692	2.810E+00	733	7.783E-01	774	2.108E-01
611	1.402E+01	652	8.234E+00	693	2.720E+00	734	7.700E-01	775	2.043E-01
612	1.401E+01	653	8.020E+00	694	2.655E+00	735	7.402E-01	776	2.067E-01
613	1.400E+01	654	7.872E+00	695	2.549E+00	736	7.109E-01	777	1.851E-01
614	1.393E+01	655	7.708E+00	696	2.511E+00	737	6.806E-01	778	1.923E-01
615	1.387E+01	656	7.526E+00	697	2.412E+00	738	6.474E-01	779	1.767E-01
616	1.379E+01	657	7.314E+00	698	2.356E+00	739	6.354E-01	780	1.724E-01
617	1.368E+01	658	7.132E+00	699	2.276E+00	740	6.103E-01		
618	1.360E+01	659	6.964E+00	700	2.190E+00	741	5.983E-01		
619	1.350E+01	660	6.817E+00	701	2.126E+00	742	5.796E-01		
620	1.347E+01	661	6.630E+00	702	2.076E+00	743	5.728E-01		
621	1.336E+01	662	6.474E+00	703	1.988E+00	744	5.409E-01		
622	1.322E+01	663	6.302E+00	704	1.940E+00	745	5.298E-01		
623	1.310E+01	664	6.158E+00	705	1.868E+00	746	5.080E-01		
624	1.302E+01	665	5.989E+00	706	1.854E+00	747	4.954E-01		
625	1.288E+01	666	5.838E+00	707	1.755E+00	748	4.860E-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: **1.5 hour**

Test orientation: **Downward**

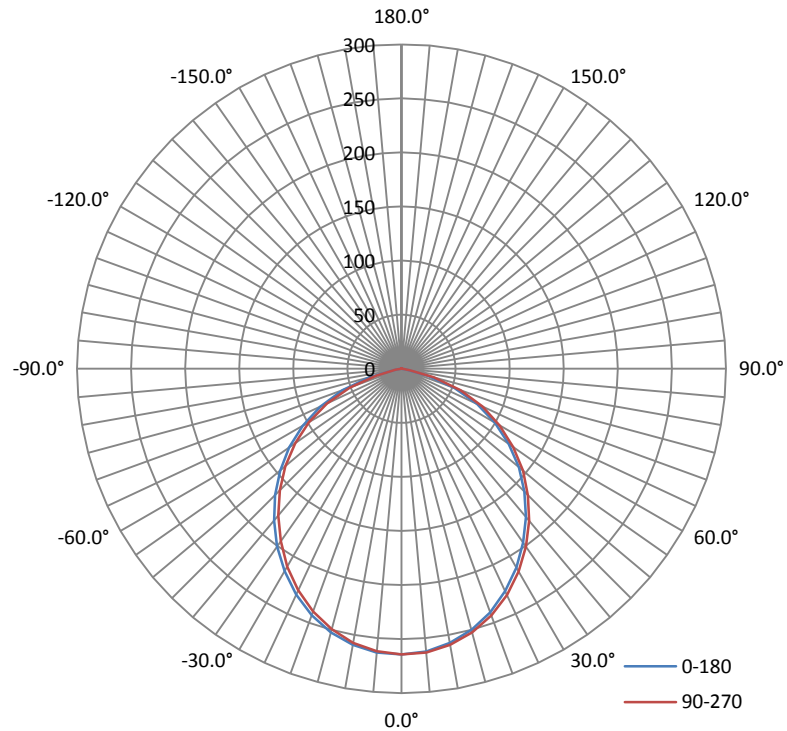
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.0	60	0.0681	6.710	0.8210

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I _{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
671.97	100.14	264.5	1.20	1.22

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I _{max}):	105.9	105.6	105.5	105.7	105.7
Field Angle (10% I _{max}):	150.5	150.4	150.4	150.5	150.5

Luminous Intensity (cd) Distribution Data

C Y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0°	264	264	264	264	264	264	264	264
1°	264	264	264	264	264	264	264	264
2°	264	264	264	264	264	264	264	264
3°	264	264	264	264	264	263	263	264
4°	264	263	263	263	263	263	263	263
5°	263	263	263	263	262	262	262	263
6°	263	262	262	262	262	262	261	262
7°	262	262	261	261	261	261	261	261
8°	261	261	260	260	260	260	260	260
9°	260	260	259	259	259	258	258	259
10°	259	258	258	258	257	257	257	258
11°	258	257	257	256	256	256	256	257
12°	257	256	255	255	255	254	255	255
13°	255	255	254	253	253	253	253	254
14°	254	253	252	252	251	251	251	252
15°	252	252	250	250	249	249	249	250
16°	250	250	248	248	247	248	248	249
17°	249	248	247	246	245	246	246	247
18°	247	246	245	244	243	244	243	245
19°	245	244	242	242	241	241	241	242
20°	243	241	240	240	239	239	239	240
21°	240	239	238	237	237	236	237	238
22°	238	237	235	235	234	234	234	236
23°	236	234	233	232	231	232	232	233
24°	233	232	230	230	229	229	229	230
25°	231	229	228	227	226	226	226	228
26°	228	226	225	224	223	224	224	225
27°	225	224	222	221	220	221	221	222
28°	222	221	219	218	218	217	218	219
29°	219	218	216	215	214	214	215	216
30°	216	215	213	212	211	211	212	213
31°	213	212	210	209	208	208	209	210
32°	210	209	207	206	205	205	205	207
33°	207	205	204	203	202	202	202	204
34°	204	202	200	199	198	198	199	201
35°	201	199	197	196	195	195	195	197
36°	197	195	194	193	192	192	192	194
37°	194	192	190	189	188	188	189	190
38°	190	188	187	186	185	185	185	187
39°	187	185	183	182	181	181	182	183
40°	183	182	180	179	177	178	178	180
41°	180	178	176	175	174	174	174	176
42°	176	174	172	171	170	170	171	173
43°	173	171	169	168	166	167	167	169
44°	169	167	165	164	163	163	163	165
45°	165	164	162	160	159	159	160	162
46°	162	160	158	157	155	155	156	158
47°	158	156	154	153	151	152	152	154
48°	154	152	150	149	148	148	149	150

Luminous Intensity (cd) Distribution Data

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
49°	150	148	146	145	144	144	145	147
50°	147	145	143	141	140	140	141	143
51°	143	141	139	137	136	136	137	139
52°	139	137	135	133	132	132	133	135
53°	135	133	131	129	128	128	129	131
54°	131	129	127	125	124	124	125	127
55°	127	125	123	121	120	120	121	123
56°	123	120	118	117	116	116	117	119
57°	118	116	114	113	112	112	112	114
58°	114	112	110	108	107	107	108	110
59°	110	108	106	104	103	103	104	106
60°	105	104	101	100	99	99	100	101
61°	101	99	97	95	94	94	95	97
62°	97	95	92	91	90	90	91	92
63°	92	90	88	86	85	86	86	88
64°	88	86	83	82	81	81	82	83
65°	83	81	79	77	76	76	77	79
66°	78	76	74	72	71	71	72	74
67°	73	71	69	67	66	66	67	69
68°	68	66	64	62	62	61	62	64
69°	63	61	59	57	56	56	57	59
70°	58	56	53	52	51	51	52	53
71°	53	50	48	46	46	46	46	48
72°	47	45	43	41	40	40	41	42
73°	42	39	37	36	35	35	36	37
74°	36	34	32	30	30	30	30	32
75°	31	29	27	25	24	24	25	26
76°	25	23	21	20	19	19	20	21
77°	20	18	16	15	15	15	15	16
78°	16	14	12	11	10	10	11	12
79°	11	10	8	8	7	7	7	8
80°	8	7	7	6	5	6	6	6
81°	6	5	5	4	3	4	4	5
82°	4	3	3	3	3	3	3	3
83°	3	3	3	2	2	2	2	3
84°	2	2	2	2	2	2	2	2
85°	2	2	2	2	2	2	2	2
86°	2	1	1	1	1	1	1	1
87°	1	1	1	1	1	1	1	1
88°	1	1	1	0	0	0	0	0
89°	0	0	0	0	0	0	0	0
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

C \ γ	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	1	0	0	0	0	0	0
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	0	0	0	0	0
173°	1	1	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°	264	264	264	264	264	264	264	264
1°	264	264	264	264	264	264	264	264
2°	264	264	264	264	264	264	264	264
3°	264	264	264	264	264	264	264	264
4°	263	263	264	264	264	264	263	264
5°	262	263	263	263	263	263	263	263
6°	262	262	262	263	263	263	262	263
7°	261	261	262	262	262	262	262	262
8°	260	260	261	261	261	261	261	261
9°	259	259	260	260	261	260	260	260
10°	258	258	259	259	259	259	259	259
11°	256	257	258	258	258	258	258	258
12°	255	255	256	256	257	257	257	257
13°	253	254	255	255	255	255	255	255
14°	252	252	253	254	254	254	254	254
15°	250	251	252	252	252	252	252	252
16°	248	249	250	250	251	250	250	250
17°	246	247	248	249	249	249	249	248
18°	244	245	246	247	247	246	247	247
19°	242	243	244	245	245	245	245	244
20°	240	241	241	242	243	243	242	242
21°	237	238	239	240	241	240	240	240
22°	235	236	237	238	238	238	238	238
23°	232	233	234	236	236	236	235	235
24°	230	231	232	233	233	233	233	233
25°	227	228	229	230	231	231	230	230
26°	224	225	227	227	228	228	228	227
27°	221	222	224	225	225	225	225	225
28°	219	220	221	222	222	222	222	222
29°	216	217	218	219	220	219	219	219
30°	212	214	215	216	216	216	216	216
31°	209	210	212	213	213	213	213	213
32°	206	207	209	210	210	210	210	210
33°	203	204	206	207	207	207	207	206
34°	200	201	202	203	204	204	204	203
35°	196	197	199	200	201	201	200	200
36°	193	194	196	197	197	197	197	197
37°	189	191	192	193	194	194	194	193
38°	186	187	189	190	190	190	190	190
39°	183	184	185	186	187	187	187	186
40°	179	180	182	183	184	184	183	183
41°	175	177	178	179	180	180	180	179
42°	172	173	175	176	176	176	176	176
43°	168	169	171	172	173	173	173	172
44°	165	166	167	168	169	169	169	169
45°	161	162	163	165	165	166	165	165
46°	157	159	160	161	162	162	161	161
47°	153	155	156	157	158	158	158	157
48°	150	151	152	154	154	154	154	153

Luminous Intensity (cd) Distribution Data (cont.)

C y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
49°	146	147	149	150	151	151	150	150
50°	142	143	145	146	147	147	147	146
51°	137	139	141	142	143	143	142	142
52°	133	135	136	137	138	139	138	137
53°	129	131	132	133	134	134	134	133
54°	125	127	128	129	130	130	130	129
55°	121	122	124	125	126	126	126	125
56°	117	118	120	121	122	122	122	121
57°	113	114	116	117	118	118	118	117
58°	108	110	112	113	114	114	113	113
59°	104	106	107	109	109	110	109	108
60°	100	101	103	104	105	105	105	104
61°	95	97	99	100	101	101	100	100
62°	91	93	94	96	96	96	96	95
63°	86	88	90	91	92	92	92	91
64°	82	84	85	87	87	87	87	86
65°	77	79	81	82	83	83	82	81
66°	72	74	76	77	78	78	78	77
67°	67	69	71	72	73	73	73	72
68°	62	64	66	67	68	68	68	67
69°	57	59	61	62	63	63	63	62
70°	52	54	56	57	58	58	57	56
71°	46	49	51	52	53	53	52	51
72°	41	43	45	47	47	47	47	46
73°	36	38	40	41	42	42	41	40
74°	30	32	34	36	36	36	36	35
75°	25	27	29	30	31	31	30	29
76°	20	22	24	25	25	26	25	24
77°	16	17	19	20	20	20	20	19
78°	12	13	15	16	16	16	16	15
79°	7	9	11	12	12	12	12	11
80°	5	6	7	7	8	8	7	7
81°	4	4	4	5	5	5	5	5
82°	3	3	3	3	4	4	3	3
83°	2	2	3	3	3	3	3	3
84°	2	2	2	2	2	2	2	2
85°	2	2	2	2	2	2	2	2
86°	1	1	1	2	2	2	2	1
87°	1	1	1	1	1	1	1	1
88°	0	0	1	1	1	1	1	1
89°	0	0	0	0	0	0	0	0
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.)

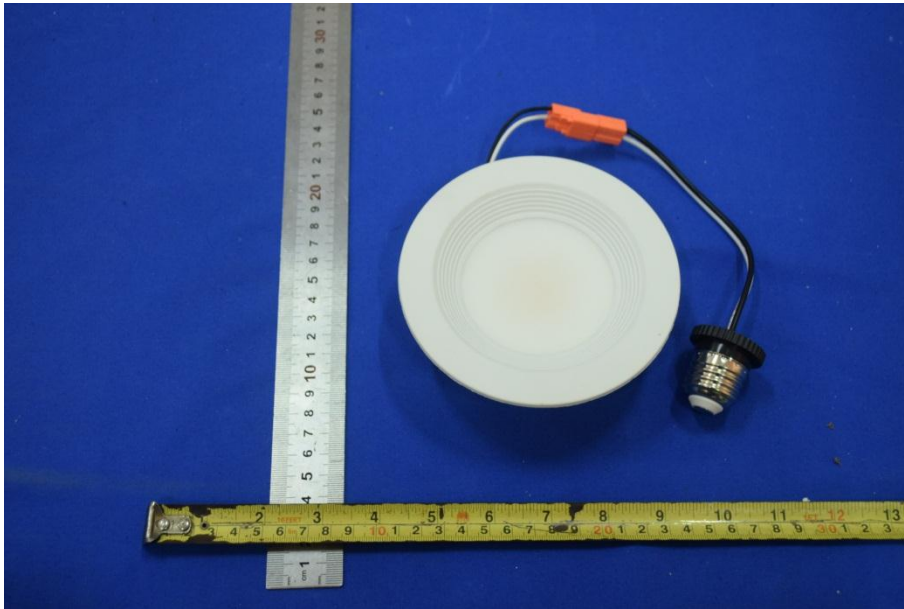
$\gamma \backslash C$	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
147°	0	0	0	0	0	0	0	0
148°	0	0	0	0	0	0	0	0
149°	0	0	0	0	0	0	0	0
150°	0	0	0	0	0	0	0	0
151°	0	0	0	0	0	0	0	0
152°	0	0	0	0	0	0	0	0
153°	0	0	0	0	0	0	0	0
154°	0	0	0	0	0	0	0	0
155°	0	0	0	0	0	0	0	0
156°	0	0	0	0	0	0	0	0
157°	0	0	0	0	0	0	0	0
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	6.3	0.94
5-10	18.6	2.77
10-15	30.2	4.50
15-20	40.5	6.03
20-25	49.2	7.33
25-30	56.0	8.33
30-35	60.7	9.03
35-40	63.2	9.41
40-45	63.6	9.46
45-50	61.9	9.21
50-55	58.0	8.64
55-60	52.2	7.76
60-65	44.3	6.58
65-70	34.1	5.08
70-75	21.5	3.20
75-80	8.5	1.27
80-85	1.8	0.27
85-90	0.4	0.06
90-95	0.0	0.01
95-100	0.0	0.00
100-105	0.0	0.00
105-110	0.0	0.01
110-115	0.0	0.00
115-120	0.0	0.00
120-125	0.0	0.01
125-130	0.1	0.01
130-135	0.1	0.01
135-140	0.1	0.01
140-145	0.1	0.01
145-150	0.1	0.01
150-155	0.1	0.02
155-160	0.1	0.01
160-165	0.1	0.01
165-170	0.0	0.00
170-175	0.0	0.01
175-180	0.0	0.00

Deg	Flux (lm)	%
0-5	6.3	0.94
0-10	24.9	3.71
0-15	55.2	8.21
0-20	95.7	14.24
0-25	144.9	21.57
0-30	200.9	29.90
0-35	261.6	38.93
0-40	324.8	48.34
0-45	388.4	57.80
0-50	450.3	67.01
0-55	508.3	75.65
0-60	560.5	83.41
0-65	604.7	89.99
0-70	638.8	95.07
0-75	660.3	98.27
0-80	668.9	99.54
0-85	670.7	99.81
0-90	671.1	99.87
0-95	671.1	99.88
0-100	671.2	99.88
0-105	671.2	99.88
0-110	671.2	99.89
0-115	671.2	99.89
0-120	671.3	99.89
0-125	671.3	99.90
0-130	671.4	99.91
0-135	671.4	99.92
0-140	671.5	99.93
0-145	671.6	99.94
0-150	671.7	99.95
0-155	671.7	99.97
0-160	671.8	99.98
0-165	671.9	99.99
0-170	671.9	99.99
0-175	672.0	100.00
0-180	672.0	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*****