

ANSI/IES LM-79-19

MEASUREMENT AND TEST REPORT

For

LEDVANCE LLC
200 Ballardvale Street Wilmington, MA 01887

Test Model: LEDMD4R3B800ST9SC3WH

Report Type:	Electrical and Photometric tests including: Luminous Flux, Power Factor, Chromaticity, Luminous Intensity Distribution
Reviewed By:	
Report Number:	DG3230310-11394E-EE
Test Date:	2023-03-14 to 2023-03-18
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: LEDMD4R3B800ST9SC3WH
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: 10 W
Nominal CCT: 2700K/3000K/3500K/4000K/5000K
Nominal Lumen Output: 800 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**

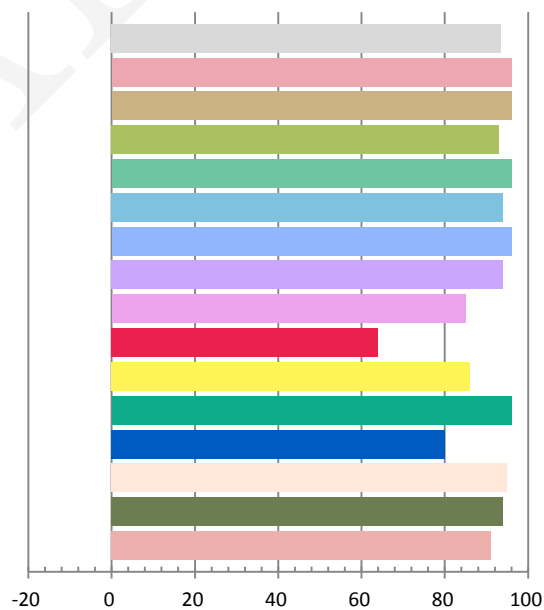
Photometric and Electrical Measurement Result

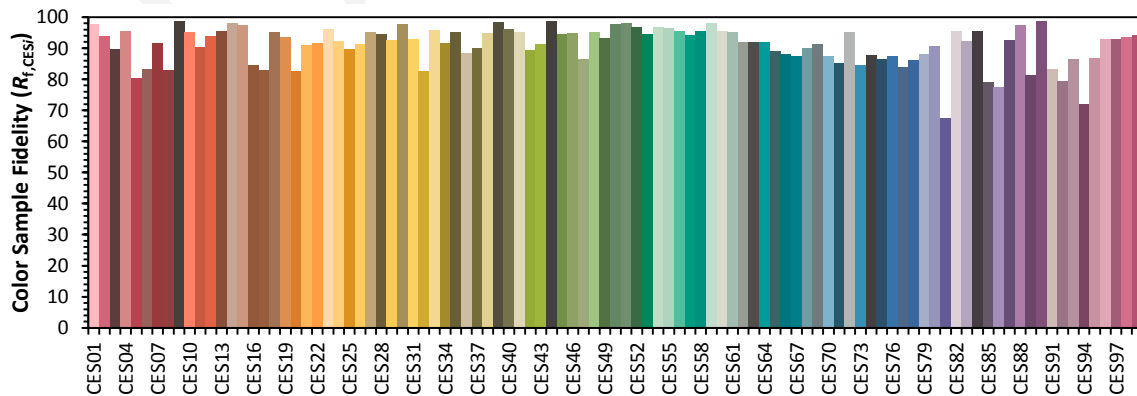
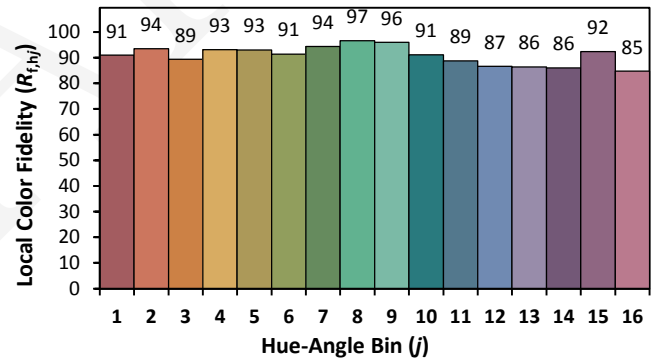
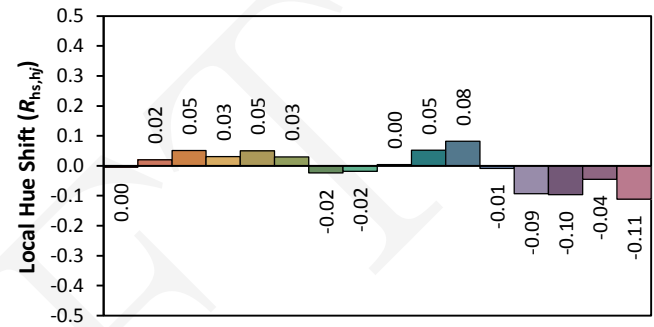
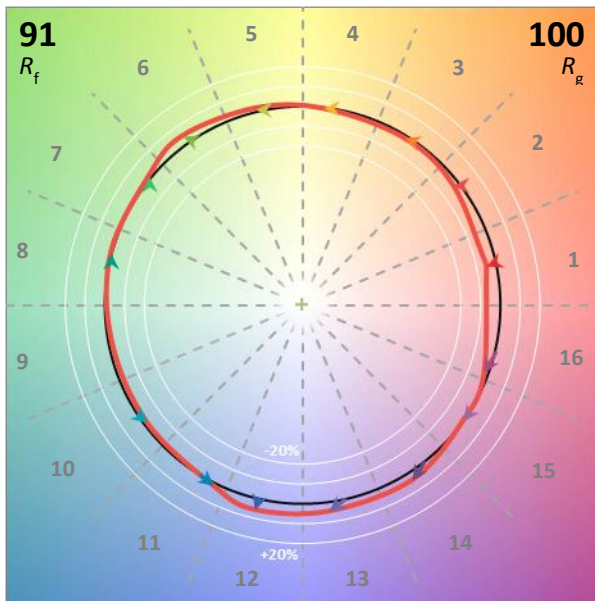
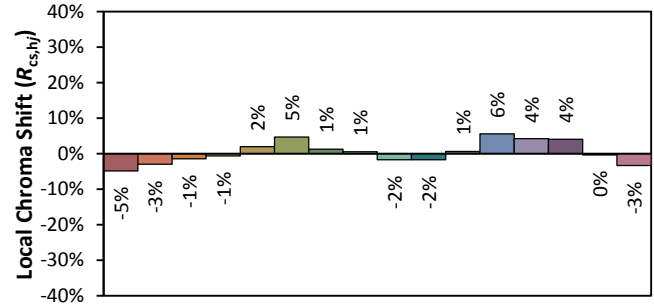
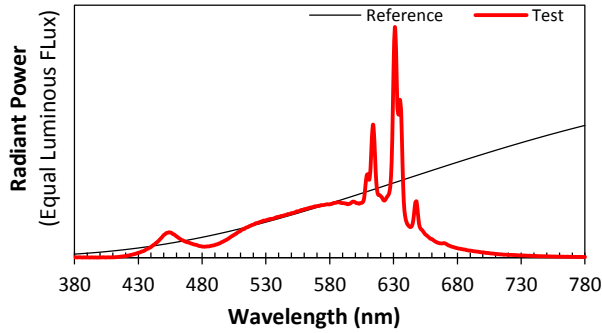
Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.0	60	0.085	9.82	0.9627	814.99	82.99

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
2.3948	2681	0.00093	0.4631	0.4138	0.2631	0.5291

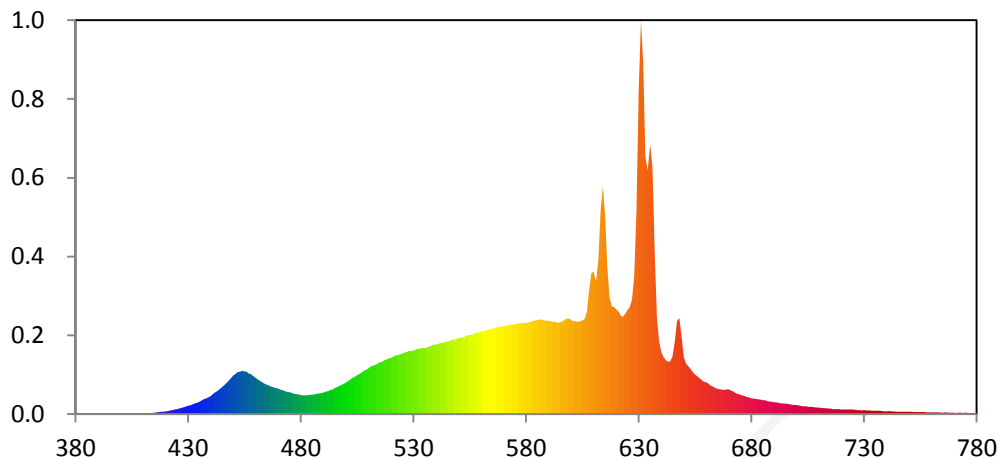
Color Rendering Index

Ra			
93.5			
R1	R2	R3	R4
96	96	93	96
R5	R6	R7	R8
94	96	94	85
R9	R10	R11	R12
64	86	96	80
R13	R14	R15	
95	94	91	





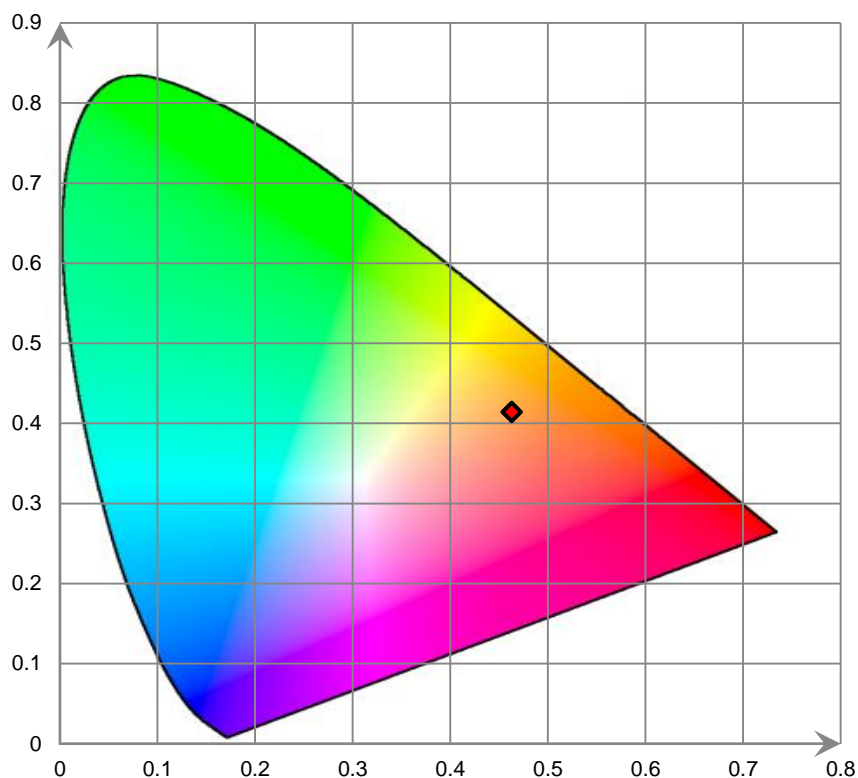
Relative Spectral Power Distribution



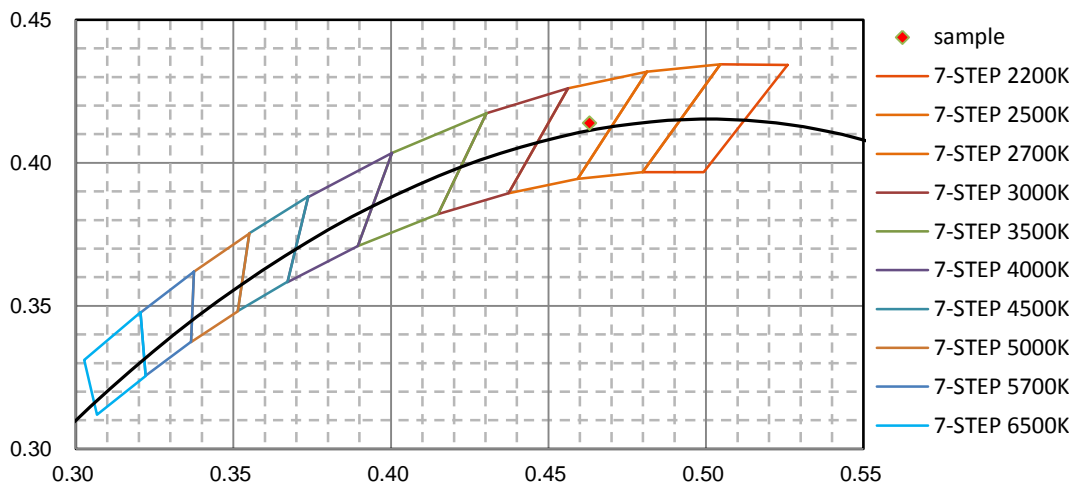
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	3.869E-02	421	4.003E-01	462	4.553E+00	503	4.991E+00	544	9.946E+00
381	8.271E-02	422	4.824E-01	463	4.349E+00	504	5.151E+00	545	1.004E+01
382	2.481E-02	423	5.184E-01	464	4.167E+00	505	5.362E+00	546	1.008E+01
383	4.387E-02	424	6.163E-01	465	4.041E+00	506	5.548E+00	547	1.027E+01
384	6.239E-02	425	6.602E-01	466	3.886E+00	507	5.713E+00	548	1.025E+01
385	4.386E-02	426	7.552E-01	467	3.754E+00	508	5.975E+00	549	1.035E+01
386	0.000E+00	427	8.264E-01	468	3.652E+00	509	6.122E+00	550	1.050E+01
387	4.390E-02	428	9.096E-01	469	3.581E+00	510	6.286E+00	551	1.052E+01
388	3.229E-02	429	1.017E+00	470	3.485E+00	511	6.528E+00	552	1.061E+01
389	2.000E-02	430	1.127E+00	471	3.352E+00	512	6.677E+00	553	1.071E+01
390	3.687E-02	431	1.193E+00	472	3.269E+00	513	6.758E+00	554	1.089E+01
391	2.573E-02	432	1.315E+00	473	3.157E+00	514	6.997E+00	555	1.093E+01
392	3.419E-03	433	1.442E+00	474	3.064E+00	515	7.142E+00	556	1.095E+01
393	3.314E-02	434	1.524E+00	475	3.014E+00	516	7.211E+00	557	1.114E+01
394	4.044E-02	435	1.686E+00	476	2.941E+00	517	7.418E+00	558	1.126E+01
395	1.550E-03	436	1.872E+00	477	2.806E+00	518	7.518E+00	559	1.124E+01
396	3.925E-02	437	2.031E+00	478	2.719E+00	519	7.695E+00	560	1.144E+01
397	8.606E-04	438	2.176E+00	479	2.687E+00	520	7.761E+00	561	1.145E+01
398	1.615E-02	439	2.333E+00	480	2.589E+00	521	7.919E+00	562	1.154E+01
399	1.399E-02	440	2.492E+00	481	2.578E+00	522	8.095E+00	563	1.166E+01
400	1.678E-02	441	2.772E+00	482	2.557E+00	523	8.142E+00	564	1.171E+01
401	3.938E-02	442	2.988E+00	483	2.589E+00	524	8.268E+00	565	1.183E+01
402	3.862E-02	443	3.188E+00	484	2.641E+00	525	8.334E+00	566	1.186E+01
403	6.888E-02	444	3.468E+00	485	2.636E+00	526	8.487E+00	567	1.195E+01
404	1.276E-02	445	3.701E+00	486	2.678E+00	527	8.528E+00	568	1.207E+01
405	4.923E-02	446	3.992E+00	487	2.773E+00	528	8.724E+00	569	1.211E+01
406	3.673E-02	447	4.301E+00	488	2.822E+00	529	8.730E+00	570	1.213E+01
407	6.415E-02	448	4.624E+00	489	2.872E+00	530	8.786E+00	571	1.223E+01
408	2.025E-02	449	4.968E+00	490	2.965E+00	531	8.914E+00	572	1.220E+01
409	7.123E-02	450	5.332E+00	491	3.082E+00	532	8.985E+00	573	1.238E+01
410	5.352E-02	451	5.522E+00	492	3.149E+00	533	9.096E+00	574	1.237E+01
411	5.941E-02	452	5.793E+00	493	3.302E+00	534	9.134E+00	575	1.241E+01
412	1.020E-01	453	5.846E+00	494	3.377E+00	535	9.142E+00	576	1.245E+01
413	8.097E-02	454	5.970E+00	495	3.595E+00	536	9.228E+00	577	1.253E+01
414	1.445E-01	455	5.905E+00	496	3.703E+00	537	9.356E+00	578	1.259E+01
415	1.538E-01	456	5.827E+00	497	3.856E+00	538	9.493E+00	579	1.256E+01
416	2.055E-01	457	5.564E+00	498	4.042E+00	539	9.594E+00	580	1.257E+01
417	2.479E-01	458	5.469E+00	499	4.172E+00	540	9.617E+00	581	1.264E+01
418	2.844E-01	459	5.227E+00	500	4.356E+00	541	9.703E+00	582	1.273E+01
419	3.176E-01	460	4.984E+00	501	4.565E+00	542	9.834E+00	583	1.287E+01
420	3.539E-01	461	4.785E+00	502	4.774E+00	543	9.814E+00	584	1.291E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.296E+01	626	1.480E+01	667	3.352E+00	708	9.431E-01	749	2.977E-01
586	1.306E+01	627	1.581E+01	668	3.333E+00	709	8.950E-01	750	2.862E-01
587	1.306E+01	628	1.910E+01	669	3.386E+00	710	8.636E-01	751	2.892E-01
588	1.299E+01	629	2.816E+01	670	3.384E+00	711	8.377E-01	752	2.604E-01
589	1.290E+01	630	4.466E+01	671	3.248E+00	712	7.839E-01	753	2.595E-01
590	1.286E+01	631	5.441E+01	672	3.074E+00	713	7.783E-01	754	2.502E-01
591	1.285E+01	632	4.878E+01	673	2.863E+00	714	7.328E-01	755	2.428E-01
592	1.277E+01	633	3.559E+01	674	2.786E+00	715	7.469E-01	756	2.406E-01
593	1.277E+01	634	3.375E+01	675	2.638E+00	716	6.681E-01	757	2.372E-01
594	1.257E+01	635	3.730E+01	676	2.543E+00	717	6.783E-01	758	2.149E-01
595	1.269E+01	636	3.413E+01	677	2.471E+00	718	6.661E-01	759	2.032E-01
596	1.275E+01	637	2.238E+01	678	2.342E+00	719	6.586E-01	760	2.131E-01
597	1.300E+01	638	1.335E+01	679	2.295E+00	720	6.311E-01	761	2.139E-01
598	1.319E+01	639	9.954E+00	680	2.188E+00	721	6.192E-01	762	2.040E-01
599	1.320E+01	640	8.532E+00	681	2.127E+00	722	6.329E-01	763	2.086E-01
600	1.304E+01	641	7.823E+00	682	2.086E+00	723	6.093E-01	764	1.813E-01
601	1.286E+01	642	7.450E+00	683	2.022E+00	724	5.946E-01	765	1.568E-01
602	1.284E+01	643	7.205E+00	684	1.980E+00	725	6.022E-01	766	2.187E-01
603	1.270E+01	644	7.318E+00	685	1.906E+00	726	5.631E-01	767	1.762E-01
604	1.286E+01	645	8.041E+00	686	1.883E+00	727	5.463E-01	768	1.748E-01
605	1.294E+01	646	1.011E+01	687	1.771E+00	728	5.333E-01	769	1.545E-01
606	1.314E+01	647	1.288E+01	688	1.715E+00	729	4.960E-01	770	1.600E-01
607	1.411E+01	648	1.327E+01	689	1.657E+00	730	5.072E-01	771	1.435E-01
608	1.707E+01	649	1.067E+01	690	1.640E+00	731	4.876E-01	772	1.501E-01
609	1.946E+01	650	7.893E+00	691	1.609E+00	732	4.898E-01	773	1.522E-01
610	1.969E+01	651	6.932E+00	692	1.545E+00	733	4.709E-01	774	1.319E-01
611	1.839E+01	652	6.586E+00	693	1.477E+00	734	4.494E-01	775	1.529E-01
612	2.124E+01	653	6.247E+00	694	1.463E+00	735	4.261E-01	776	1.428E-01
613	2.816E+01	654	5.814E+00	695	1.406E+00	736	4.175E-01	777	1.332E-01
614	3.143E+01	655	5.439E+00	696	1.394E+00	737	4.372E-01	778	1.459E-01
615	2.743E+01	656	5.223E+00	697	1.328E+00	738	3.926E-01	779	1.170E-01
616	2.027E+01	657	4.940E+00	698	1.271E+00	739	3.723E-01	780	1.403E-01
617	1.608E+01	658	4.699E+00	699	1.235E+00	740	3.704E-01		
618	1.482E+01	659	4.412E+00	700	1.234E+00	741	3.762E-01		
619	1.478E+01	660	4.365E+00	701	1.193E+00	742	3.646E-01		
620	1.449E+01	661	4.150E+00	702	1.118E+00	743	3.315E-01		
621	1.415E+01	662	3.912E+00	703	1.081E+00	744	3.252E-01		
622	1.359E+01	663	3.744E+00	704	1.075E+00	745	3.245E-01		
623	1.347E+01	664	3.582E+00	705	1.025E+00	746	3.071E-01		
624	1.387E+01	665	3.473E+00	706	9.770E-01	747	3.041E-01		
625	1.439E+01	666	3.383E+00	707	9.542E-01	748	3.066E-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**

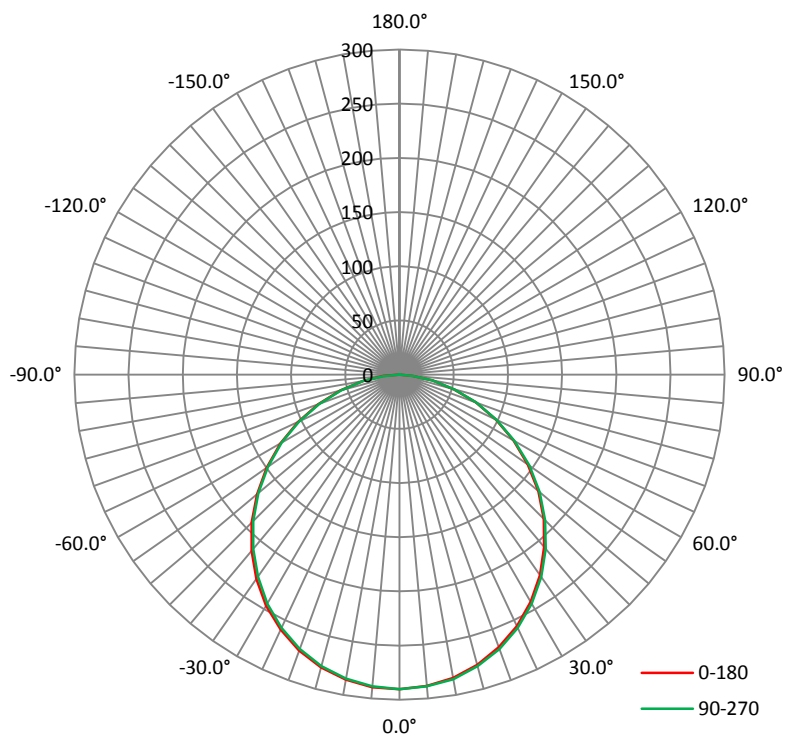
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.0	60	0.0854	9.850	0.9612

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I _{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
819.174	83.16	290.7	1.24	1.25

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I _{max}):	110.9	111.0	110.9	110.8	110.9
Field Angle (10% I _{max}):	161.8	161.8	161.8	161.7	161.8

Luminous Intensity (cd) Distribution Data

C γ	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0°	290	290	290	290	290	290	290	290
1°	290	290	291	290	290	290	290	290
2°	290	291	290	290	290	290	290	290
3°	290	291	290	290	289	290	290	289
4°	290	290	289	289	289	290	289	289
5°	289	289	289	289	289	289	289	289
6°	289	289	289	289	288	289	288	288
7°	288	288	288	287	287	288	287	287
8°	287	288	288	287	286	287	287	286
9°	286	287	286	286	286	286	286	285
10°	286	286	285	285	285	284	285	284
11°	285	285	284	284	284	283	283	283
12°	283	284	283	283	282	283	282	282
13°	282	283	282	281	281	282	281	281
14°	281	281	281	280	280	280	279	279
15°	280	280	279	279	278	278	278	278
16°	278	278	278	277	277	277	276	276
17°	276	276	276	275	275	275	274	274
18°	275	275	274	273	272	273	272	272
19°	273	273	272	272	271	271	271	271
20°	271	271	270	269	269	269	269	269
21°	269	268	268	268	267	267	266	266
22°	267	266	266	265	265	265	264	264
23°	264	264	264	263	262	262	262	262
24°	262	262	261	261	260	260	259	259
25°	260	259	259	258	258	257	257	257
26°	257	257	256	256	255	255	254	254
27°	254	254	254	253	252	252	252	251
28°	252	252	251	250	249	250	249	249
29°	249	249	248	247	247	247	246	246
30°	246	246	245	244	244	244	243	243
31°	243	243	242	242	241	241	240	240
32°	240	240	239	238	238	237	237	237
33°	237	236	236	235	235	234	234	234
34°	234	233	233	232	231	231	230	230
35°	230	230	229	229	228	228	227	227
36°	227	227	226	225	225	224	224	223
37°	223	223	223	222	221	221	220	220
38°	219	220	219	218	217	217	216	216
39°	216	216	215	214	214	213	213	213
40°	212	212	212	211	210	210	209	209
41°	208	209	208	207	206	206	206	206
42°	205	205	204	203	203	202	202	202
43°	201	201	200	199	199	198	198	198
44°	197	197	196	195	195	194	194	194
45°	193	193	192	192	191	191	190	190
46°	189	189	188	187	187	186	186	186
47°	185	185	184	183	183	182	182	181
48°	180	180	180	179	179	178	178	177

Luminous Intensity (cd) Distribution Data

C γ	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
49°	176	176	176	175	174	174	173	173
50°	172	172	171	171	170	170	169	169
51°	168	168	167	167	166	165	165	165
52°	163	163	163	162	162	161	161	160
53°	159	159	158	158	157	157	156	156
54°	154	154	154	153	153	152	151	151
55°	150	150	150	149	148	148	147	147
56°	145	145	145	144	144	143	143	142
57°	141	141	141	140	139	139	138	138
58°	136	136	136	135	135	134	134	133
59°	131	132	131	131	130	130	129	129
60°	127	127	127	126	125	125	124	124
61°	122	122	122	121	121	121	120	119
62°	118	118	117	117	116	116	115	115
63°	113	113	113	112	112	111	111	110
64°	108	108	108	107	107	106	106	105
65°	103	103	103	103	102	102	101	101
66°	98	99	99	98	98	97	96	96
67°	94	94	94	93	93	92	92	91
68°	89	89	89	89	88	88	87	87
69°	84	85	84	84	84	83	82	82
70°	80	80	80	79	79	78	78	77
71°	75	75	75	75	74	74	73	73
72°	70	70	70	70	70	69	69	68
73°	65	66	66	66	65	64	64	63
74°	61	61	61	61	60	60	59	59
75°	56	56	57	56	56	55	55	54
76°	51	52	52	52	51	51	50	50
77°	47	48	48	47	47	46	46	45
78°	43	43	43	43	43	42	42	41
79°	39	39	39	39	38	38	37	37
80°	34	35	35	35	34	34	33	33
81°	30	31	31	31	30	30	29	29
82°	26	27	27	27	26	26	25	25
83°	22	23	23	23	23	22	21	21
84°	19	19	19	19	19	18	18	17
85°	15	15	16	16	15	15	14	14
86°	11	12	12	12	12	11	11	10
87°	8	8	9	9	8	8	7	7
88°	5	6	6	6	6	5	5	4
89°	3	3	3	3	3	3	3	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

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 y	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.)

$\begin{matrix} C \\ \backslash \\ \gamma \end{matrix}$	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0°	290	290	290	290	290	290	290	290
1°	290	290	290	290	290	291	290	291
2°	290	290	290	290	290	291	290	290
3°	289	290	290	290	289	290	290	290
4°	289	289	290	289	289	290	290	290
5°	288	289	289	289	289	289	289	289
6°	288	288	288	288	288	289	289	288
7°	287	287	288	288	287	288	288	288
8°	287	287	287	287	287	288	287	287
9°	285	286	286	286	286	287	286	286
10°	284	284	285	285	285	285	285	285
11°	283	283	284	284	284	284	284	284
12°	282	282	282	283	283	283	283	283
13°	280	281	281	281	281	282	282	281
14°	279	279	280	280	280	281	281	280
15°	277	278	278	278	279	279	279	279
16°	276	276	277	277	277	278	278	277
17°	274	274	275	275	275	276	276	276
18°	272	272	273	273	273	274	274	274
19°	270	271	271	271	272	272	272	272
20°	268	269	269	269	270	270	270	270
21°	266	266	266	267	267	268	268	268
22°	263	264	264	265	265	266	266	266
23°	261	262	262	262	263	263	264	263
24°	259	259	260	260	261	261	261	261
25°	256	257	257	257	258	259	259	259
26°	254	254	254	255	255	256	256	256
27°	251	251	251	252	253	253	253	253
28°	247	248	249	249	249	250	251	250
29°	245	245	246	246	247	248	248	248
30°	242	242	243	243	244	245	245	245
31°	239	239	240	240	241	242	242	242
32°	236	236	237	237	237	239	239	239
33°	232	233	233	234	234	235	235	235
34°	229	230	230	231	231	232	232	232
35°	226	226	227	227	228	228	229	228
36°	222	223	223	224	224	225	226	225
37°	219	219	220	220	221	221	222	222
38°	215	215	216	216	217	218	218	218
39°	211	212	213	213	214	214	214	215
40°	208	208	209	209	210	211	211	211
41°	204	204	205	206	206	207	207	207
42°	200	200	201	202	202	203	203	203
43°	196	196	197	197	198	199	199	199
44°	192	193	193	193	194	195	195	195
45°	188	189	189	189	190	191	191	191
46°	184	184	185	185	186	187	187	187
47°	180	180	181	181	182	182	183	183
48°	176	176	177	177	178	178	179	179

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°	171	172	172	173	173	174	174	175
50°	167	168	168	168	169	170	170	170
51°	163	163	163	164	164	165	166	166
52°	158	159	159	159	160	161	161	161
53°	154	154	155	155	156	156	157	157
54°	150	150	150	151	151	152	152	153
55°	145	145	145	146	146	147	147	148
56°	139	139	141	141	141	142	142	143
57°	135	135	136	136	136	137	137	138
58°	130	131	131	131	132	133	133	133
59°	126	126	126	127	127	128	128	128
60°	121	122	122	122	122	123	124	124
61°	117	117	117	117	118	118	119	119
62°	112	112	112	113	113	114	114	114
63°	107	107	108	108	108	109	109	110
64°	103	103	103	103	104	104	105	105
65°	98	98	98	99	99	100	100	100
66°	93	93	94	94	94	95	95	96
67°	89	89	89	89	89	90	91	91
68°	84	84	84	84	85	85	86	86
69°	79	79	79	80	80	81	81	81
70°	75	75	75	75	75	76	76	77
71°	70	70	70	70	71	71	72	72
72°	66	65	65	66	66	67	67	67
73°	61	61	61	61	61	62	62	63
74°	56	56	56	56	57	57	58	58
75°	52	52	52	52	52	53	53	54
76°	48	47	47	48	48	48	49	49
77°	43	43	43	43	44	44	44	45
78°	39	39	39	39	39	40	40	41
79°	35	35	35	35	35	35	36	36
80°	31	31	31	31	31	31	32	32
81°	27	27	27	27	27	27	28	28
82°	23	23	23	23	23	23	24	24
83°	19	19	19	19	19	20	20	20
84°	16	16	16	16	16	16	16	17
85°	12	12	12	12	12	12	13	13
86°	9	8	8	8	8	9	9	10
87°	5	5	5	5	5	5	6	6
88°	2	2	2	2	2	2	3	3
89°	0	0	0	0	0	0	0	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.)

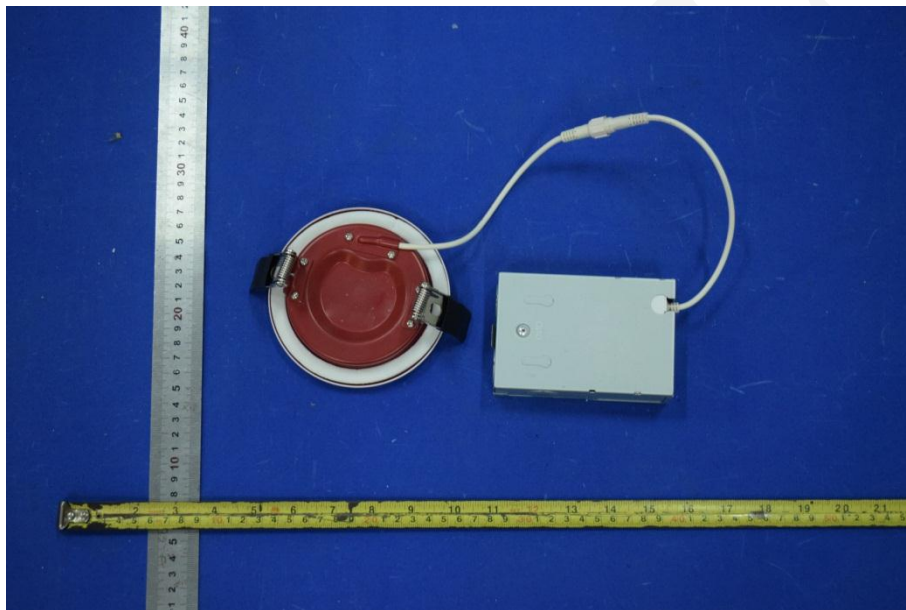
C Y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
147°	0	0	0	0	0	0	0	0
148°	0	0	0	0	0	0	0	0
149°	0	0	0	0	0	0	0	0
150°	0	0	0	0	0	0	0	0
151°	0	0	0	0	0	0	0	0
152°	0	0	0	0	0	0	0	0
153°	0	0	0	0	0	0	0	0
154°	0	0	0	0	0	0	0	0
155°	0	0	0	0	0	0	0	0
156°	0	0	0	0	0	0	0	0
157°	0	0	0	0	0	0	0	0
158°	0	0	0	0	0	0	0	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°	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	6.9	0.85
5-10	20.5	2.50
10-15	33.4	4.08
15-20	45.2	5.52
20-25	55.3	6.75
25-30	63.5	7.75
30-35	69.5	8.48
35-40	73.1	8.92
40-45	74.1	9.05
45-50	72.8	8.88
50-55	68.9	8.42
55-60	62.7	7.64
60-65	54.6	6.67
65-70	45.0	5.49
70-75	34.2	4.18
75-80	23.1	2.82
80-85	12.4	1.52
85-90	3.2	0.38
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	0.01
120-125	0.0	0.00
125-130	0.0	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	0.0	0.01
170-175	0.0	0.00
175-180	0.0	0.00

Deg	Flux (lm)	%
0-5	6.9	0.85
0-10	27.5	3.35
0-15	60.9	7.43
0-20	106.1	12.95
0-25	161.4	19.70
0-30	224.9	27.45
0-35	294.3	35.93
0-40	367.4	44.85
0-45	441.5	53.90
0-50	514.3	62.78
0-55	583.2	71.20
0-60	645.9	78.84
0-65	700.5	85.51
0-70	745.5	91.00
0-75	779.7	95.18
0-80	802.8	98.00
0-85	815.2	99.52
0-90	818.4	99.90
0-95	818.4	99.91
0-100	818.4	99.91
0-105	818.5	99.91
0-110	818.5	99.92
0-115	818.5	99.92
0-120	818.6	99.93
0-125	818.6	99.93
0-130	818.7	99.94
0-135	818.7	99.94
0-140	818.8	99.95
0-145	818.8	99.96
0-150	818.9	99.97
0-155	819.0	99.98
0-160	819.0	99.98
0-165	819.1	99.99
0-170	819.1	100.00
0-175	819.2	100.00
0-180	819.2	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.
7. This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

*****END OF REPORT*****