IES LM-79-08

MEASUREMENT AND TEST REPORT

For

Overdrive Electronics Pvt. Ltd.

C-121 Hosiery Complex Phase-II Extension, Noida 201305 UP India.

#Test Model: L6WNA19/50K

Report Type:	Electrical and Photometric tests including: Luminous Flux, Power Factor, Chromaticity, Luminous Intensity Distribution
Test Engineer:	Hexy He
Report Number:	RSZ201022507-10
Test Date:	2017-11-08
Report Date:	2020-10-23
Reviewed By:	Blake Zhang / EE Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Dongguan). No.69,Pulongcun ,Puxinhu Industrial Area, Tangxia , Dongguan, Guangdong, China. Tel: +86-0769-86858888 Fax:+86-0769-86858588
Accreditation:	The IAS Accreditation Number TL-460.

1. Product Description

General Information:

One sample was received on 2017-11-03 and used for testing.

#Model Tested:	L6WNA19/50K
#Manufacturer:	Overdrive Electronics Pvt. Ltd.
#Product Code:	791G
#Brand Name:	Overdrive
#Product Designation:	LED Lamp
#Burning Time Before Test:	0hour(For New Products)

Rated Values:

#Rated Voltage/Frequency:	120 V AC 60Hz
#Rated Power:	6.5 W
#Nominal CCT:	5000K
#Nominal Lumen Output:	630Im

Note:

1. The applicant Overdrive Electronics Pvt. Ltd. declare that their products with model L6WNA19/50K are the same to the products in report#RSZ171103514-10 and is authorized by original applicant to use their test data.
2. All the data in previous report (RSZ171103514-10) is shared in this report.

2. Standards Used

- IES LM-79-08: Approved Method: Electrical & Photometric Measurement of Solid-state Lighting Products
- ANSI C82.77-2002: Harmonic Emission Limits – Related Power Quality Requirements for Lighting
- IES TM-30-15: IES Method for Evaluating Light Source Color Rendition (This method is not in IAS accreditation scope)

3. Description of Test Equipment

Device	Manufacture	Model No	Serial No	Test Range	Calibration date	Calibration due date
1.5m integrating sphere	SENSING	1.5m	NA	25℃	2017-03-09	2018-03-09
Digital power meter	EVERFINE	PF9811	G135717CN13 61159	N/A	2016-12-08	2017-12-08
High-precision rapid spectral radiometer	EVERFINE	HAAS-2000	N/A	N/A	2017-03-09	2018-03-09
Precision frequency power supply	ALL Power	APW-105N	970663	220V±10% 50HZ	2017-03-03	2018-03-03
Standard Light Source	EVERFINE	D204	G100283CA83 51158	24V/100W	2016-12-12	2017-12-12
thermometer	SENSING	NA	NA	25℃	2017-03-20	2018-03-20
Programmable Precision DC Power Supply	ITECH	IT6154	0061 0417 6471 0010 19	0~32V	2017-03-03	2018-03-03
AC POWER SUPPLY	EVERFINE	VPS1030 PWM	1012017	0-150V， 0-300V	2017-03-03	2018-03-03

Device	Manufacture	Model No	Serial No	Test Range	Calibration date	Calibration due date
Digital CC&CV DC Power Supply	EVERFINE	WY12010	1009009	30V/5A	2017-03-03	2018-03-03
Digital power meter	YOKOGAWA	WT-210	91j926132	15/30/60/150/300/600 V	2017-03-03	2018-03-03
full-field speed goniophotometer	EVERFINE	GO-R5000	YG108492N10120001	1600mm,3000W/10A	2017-03-09	2018-03-09
Wireless Remote Sensor	N/A	433MHz	N/A	0°C~50°C;-20°C~60°C	2017-03-20	2018-03-20
Standard Light Source	EVERFINE	D908	1012003	N/A	2016-12-17	2017-12-17

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attested that all calibration has been performed using suitable standards traceable to National Primary Standards and International System of Units (SI).

4. Test Method

Product was tested with no seasoning. All stabilization and measurements were made in compliance with IES LM-79-08. The product was operated at rated voltage or at voltage required by manufacturer. The ambient temperature of the sample was maintained at 25°C±1°C during measurement. And relative humidity is less than 65%.

Integrating Sphere System

The system includes AC power source, digital power meter, DC power supply, Spectroradiometer, and integrating sphere. The integrating sphere system is calibrated by standard spectrum light source before measurement.

4π geometry was used during measurement. The product was operated in its intended orientation in application and was recorded in this report.

The uncertainty of the light output (luminous flux) measurements is U=1.9% (K=2), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is U=24K (K=2), at the 95% confidence level. The uncertainty of the CRI is U=1.9(K=2), at the 95% confidence level.

The uncertainty of power meter AC current U=0.19 % of rdg, AC Voltage U=0.17% of rdg, Power U=0.48%) (K=2), at the 95% confidence level.

Goniophotometer System

The goniophotometer system is calibrated by standard light source before measurement.

Type C goniophotometer was used for measuring total luminous flux, luminous intensity distribution, and color spatial uniformity. The product was operated in its intended orientation in application and was recorded in this report. The vertical angle (γ) test intervals were set no more than 1 degree while data for 5 degree intervals is reported. The horizontal angle (C plane) test intervals were set no more than 22.5 degree.

The uncertainty of the luminous intensity is U=2.82% (K=2) , at the 95% confidence level.

Fidelity Index and Gamut Index Calculation

The R_f, R_g was calculated according to IES TM-30-15 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]

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

Test orientation: **Base up**

Photometric and Electrical Measurement Result

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.0	60	0.06344	6.475	0.8504	774.17	119.57

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
2.4428	5010	0.00260	0.3453	0.3569	0.2095	0.4872

Color Rendering Index

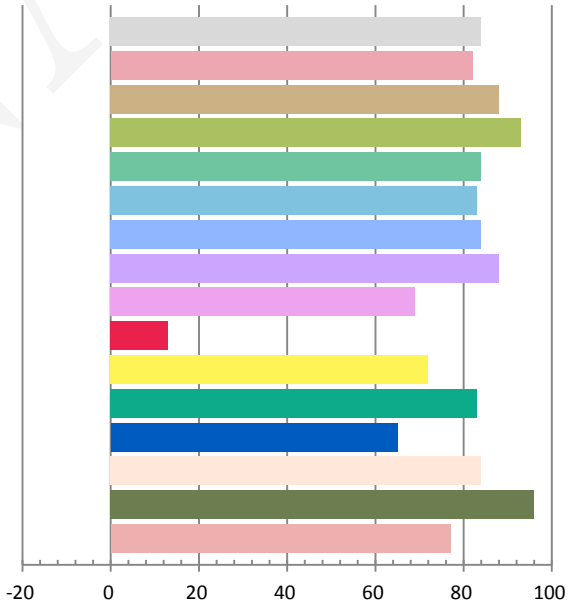
Ra
84.0

R1	R2	R3	R4
82	88	93	84

R5	R6	R7	R8
83	84	88	69

R9	R10	R11	R12
13	72	83	65

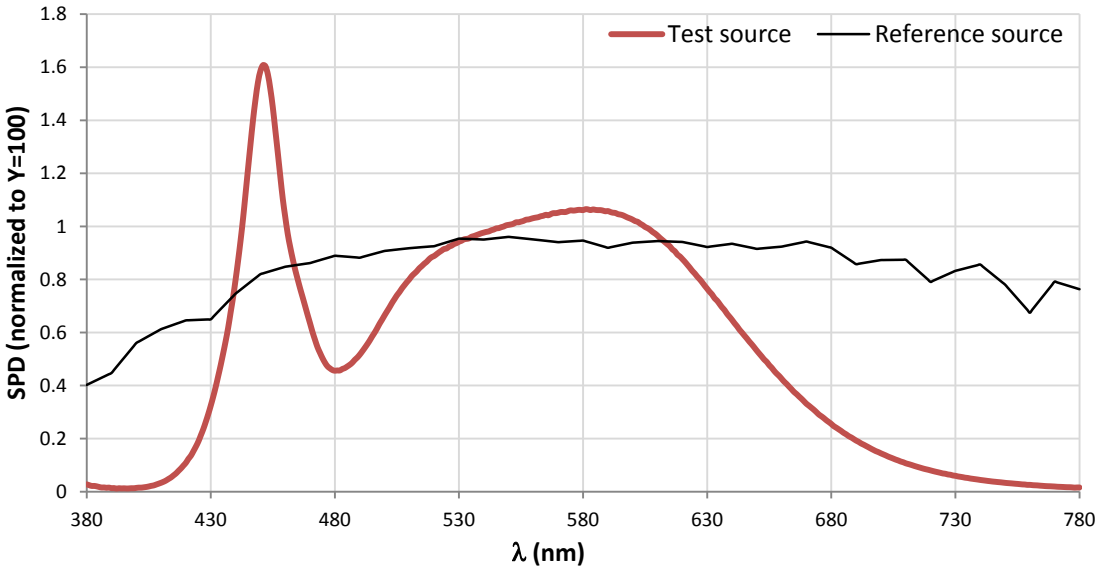
R13	R14	R15
84	96	77



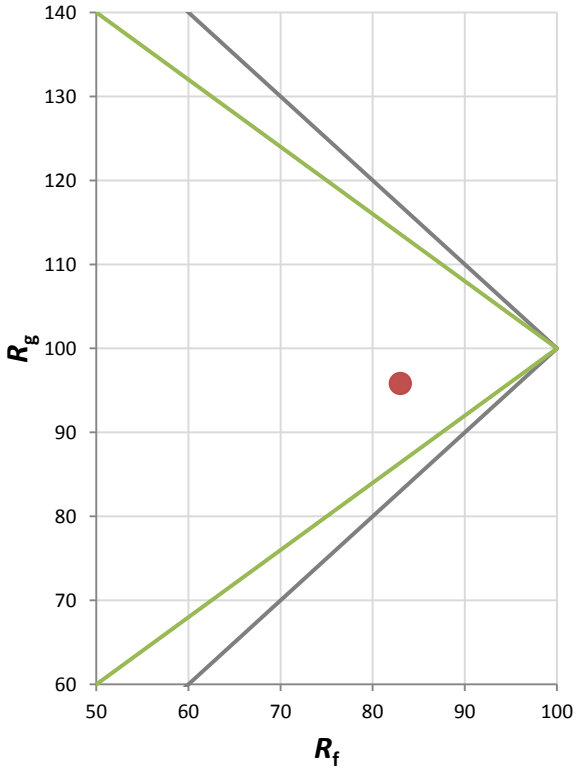
Fidelity Index and Gamut Index

Fidelity Index R_f	83
Gamut Index R_g	96

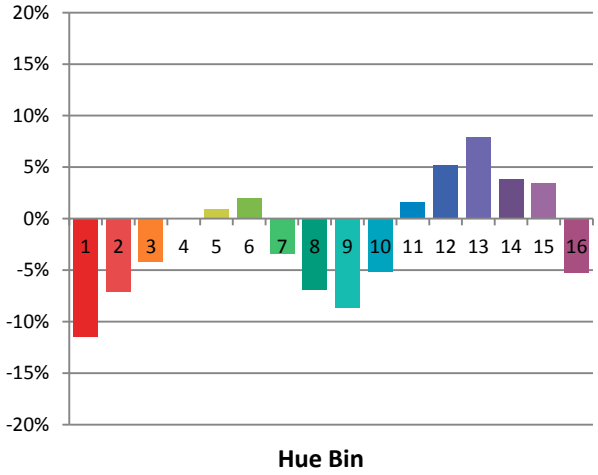
Spectral Power Distribution Comparison



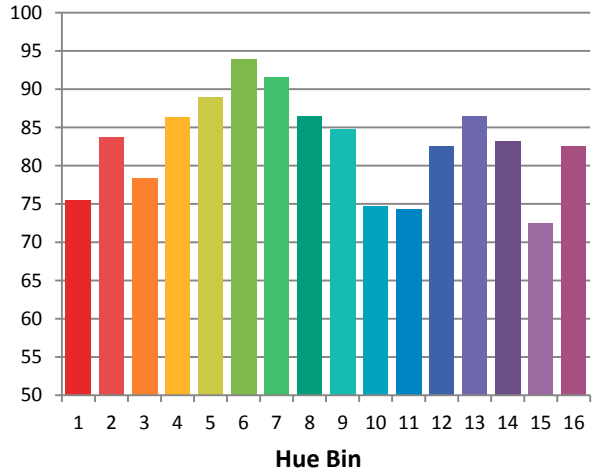
Plot of R_g versus R_f



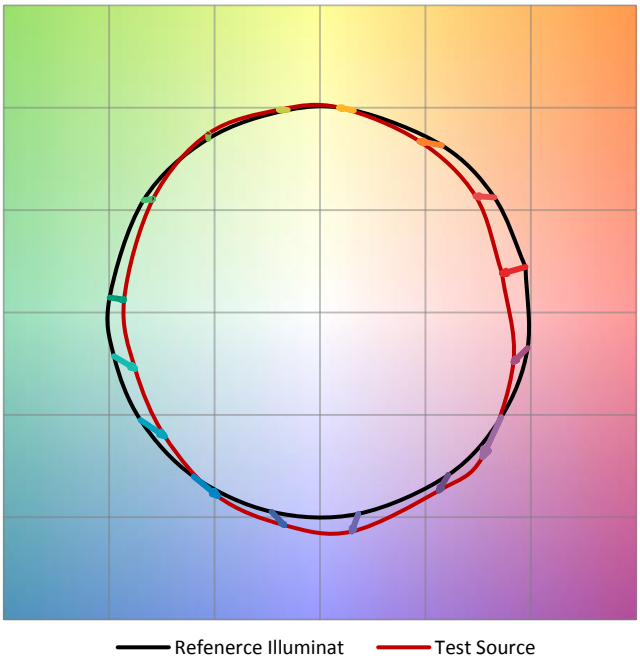
Chroma Shift by Hue



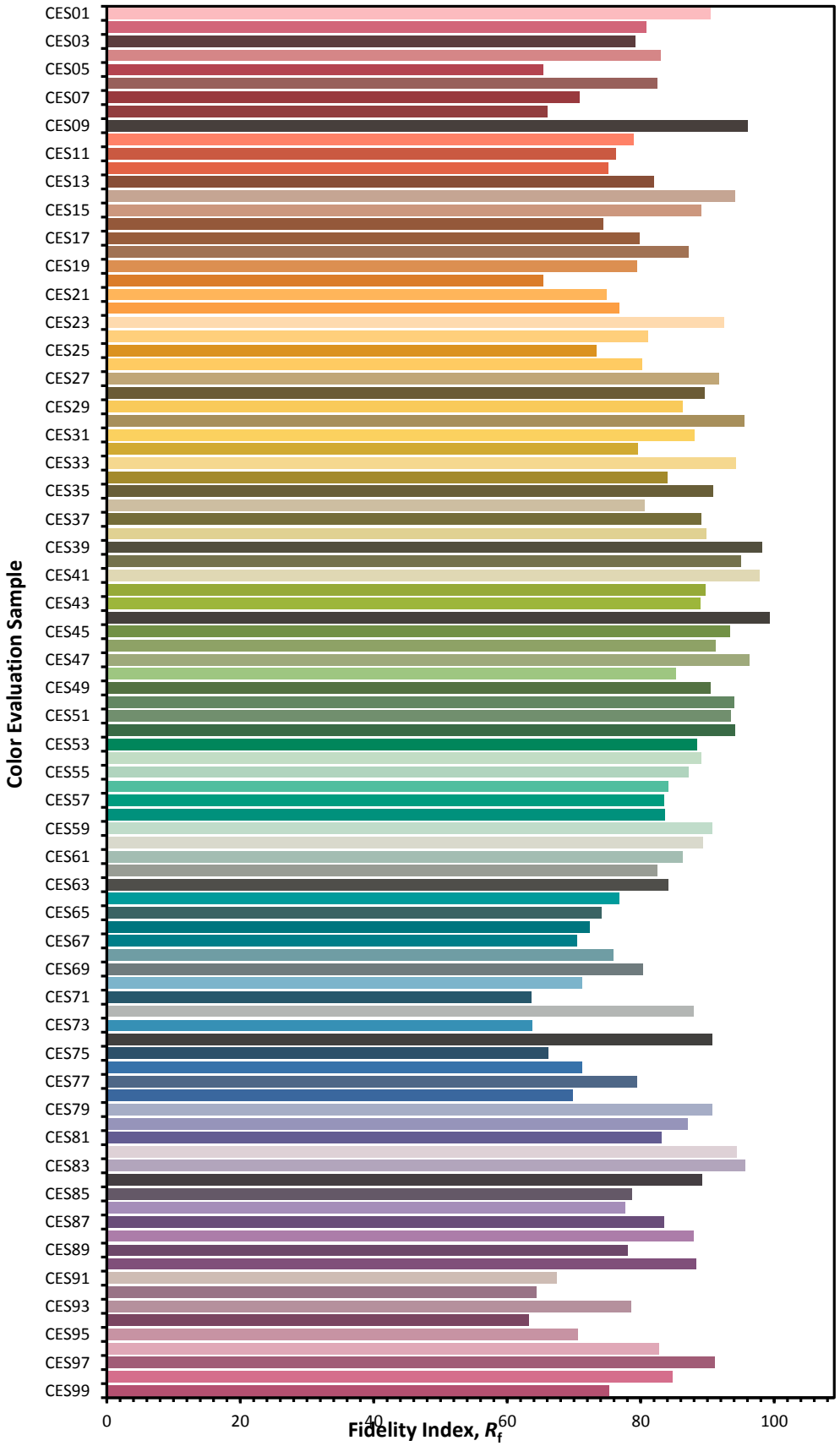
R_f by Hue



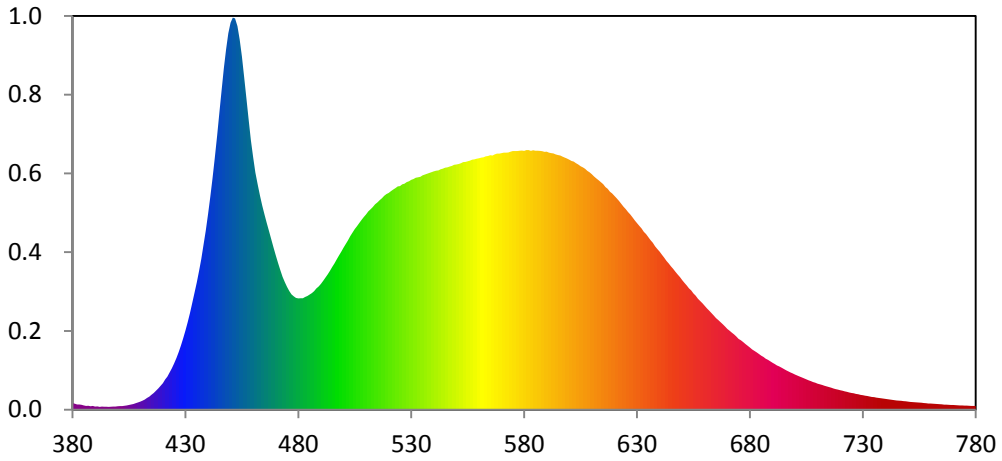
Color Vector Graphic



Color Fidelity by CES Sample



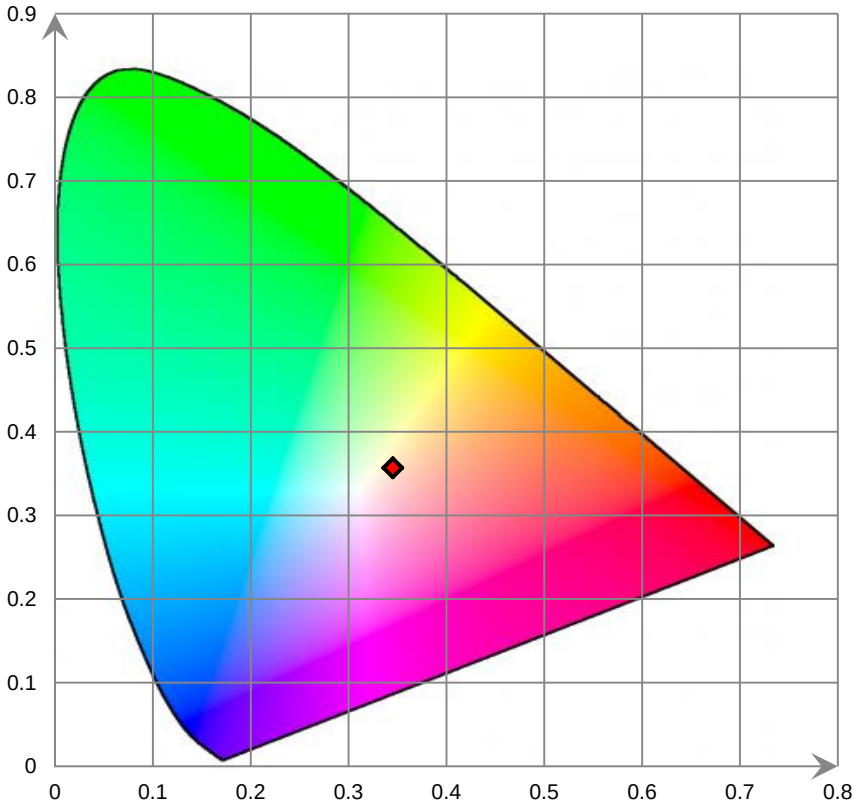
Relative Spectral Power Distribution



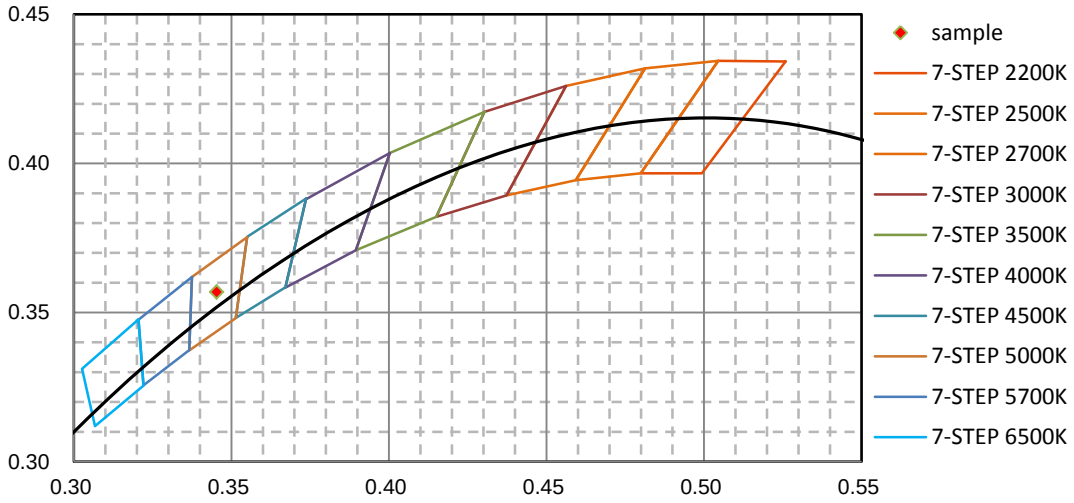
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	3.132E-01	421	1.402E+00	462	1.045E+01	503	8.061E+00	544	1.120E+01
381	2.778E-01	422	1.538E+00	463	9.945E+00	504	8.225E+00	545	1.125E+01
382	2.444E-01	423	1.730E+00	464	9.484E+00	505	8.390E+00	546	1.126E+01
383	2.445E-01	424	1.927E+00	465	9.077E+00	506	8.527E+00	547	1.130E+01
384	2.282E-01	425	2.144E+00	466	8.680E+00	507	8.684E+00	548	1.133E+01
385	2.005E-01	426	2.410E+00	467	8.310E+00	508	8.819E+00	549	1.138E+01
386	1.776E-01	427	2.678E+00	468	7.934E+00	509	8.953E+00	550	1.140E+01
387	1.803E-01	428	2.989E+00	469	7.555E+00	510	9.074E+00	551	1.142E+01
388	1.653E-01	429	3.320E+00	470	7.190E+00	511	9.215E+00	552	1.145E+01
389	1.736E-01	430	3.680E+00	471	6.815E+00	512	9.317E+00	553	1.151E+01
390	1.493E-01	431	4.065E+00	472	6.487E+00	513	9.418E+00	554	1.151E+01
391	1.540E-01	432	4.482E+00	473	6.174E+00	514	9.543E+00	555	1.154E+01
392	1.308E-01	433	4.941E+00	474	5.934E+00	515	9.636E+00	556	1.157E+01
393	1.464E-01	434	5.408E+00	475	5.706E+00	516	9.740E+00	557	1.162E+01
394	1.387E-01	435	5.917E+00	476	5.511E+00	517	9.824E+00	558	1.163E+01
395	1.434E-01	436	6.440E+00	477	5.358E+00	518	9.937E+00	559	1.166E+01
396	1.356E-01	437	7.005E+00	478	5.270E+00	519	1.002E+01	560	1.169E+01
397	1.389E-01	438	7.667E+00	479	5.198E+00	520	1.007E+01	561	1.171E+01
398	1.473E-01	439	8.318E+00	480	5.169E+00	521	1.015E+01	562	1.173E+01
399	1.463E-01	440	9.064E+00	481	5.180E+00	522	1.023E+01	563	1.177E+01
400	1.603E-01	441	9.869E+00	482	5.178E+00	523	1.030E+01	564	1.179E+01
401	1.714E-01	442	1.073E+01	483	5.241E+00	524	1.037E+01	565	1.183E+01
402	1.720E-01	443	1.167E+01	484	5.280E+00	525	1.039E+01	566	1.181E+01
403	1.860E-01	444	1.272E+01	485	5.350E+00	526	1.047E+01	567	1.186E+01
404	2.006E-01	445	1.379E+01	486	5.421E+00	527	1.051E+01	568	1.190E+01
405	2.211E-01	446	1.484E+01	487	5.510E+00	528	1.058E+01	569	1.190E+01
406	2.469E-01	447	1.586E+01	488	5.630E+00	529	1.062E+01	570	1.192E+01
407	2.664E-01	448	1.674E+01	489	5.729E+00	530	1.068E+01	571	1.195E+01
408	3.037E-01	449	1.749E+01	490	5.851E+00	531	1.072E+01	572	1.195E+01
409	3.421E-01	450	1.798E+01	491	5.991E+00	532	1.078E+01	573	1.195E+01
410	3.810E-01	451	1.822E+01	492	6.138E+00	533	1.080E+01	574	1.199E+01
411	4.251E-01	452	1.818E+01	493	6.291E+00	534	1.082E+01	575	1.202E+01
412	4.784E-01	453	1.783E+01	494	6.451E+00	535	1.089E+01	576	1.201E+01
413	5.458E-01	454	1.720E+01	495	6.630E+00	536	1.092E+01	577	1.202E+01
414	6.105E-01	455	1.641E+01	496	6.793E+00	537	1.096E+01	578	1.204E+01
415	6.960E-01	456	1.545E+01	497	6.976E+00	538	1.100E+01	579	1.204E+01
416	7.803E-01	457	1.448E+01	498	7.173E+00	539	1.104E+01	580	1.203E+01
417	8.900E-01	458	1.348E+01	499	7.346E+00	540	1.107E+01	581	1.207E+01
418	9.945E-01	459	1.252E+01	500	7.529E+00	541	1.110E+01	582	1.206E+01
419	1.116E+00	460	1.174E+01	501	7.703E+00	542	1.112E+01	583	1.203E+01
420	1.236E+00	461	1.102E+01	502	7.874E+00	543	1.117E+01	584	1.206E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.204E+01	626	9.188E+00	667	4.067E+00	708	1.288E+00	749	3.899E-01
586	1.203E+01	627	9.075E+00	668	3.970E+00	709	1.257E+00	750	3.771E-01
587	1.203E+01	628	8.943E+00	669	3.863E+00	710	1.212E+00	751	3.664E-01
588	1.201E+01	629	8.801E+00	670	3.755E+00	711	1.182E+00	752	3.591E-01
589	1.198E+01	630	8.670E+00	671	3.672E+00	712	1.151E+00	753	3.501E-01
590	1.199E+01	631	8.537E+00	672	3.585E+00	713	1.116E+00	754	3.393E-01
591	1.195E+01	632	8.420E+00	673	3.497E+00	714	1.082E+00	755	3.312E-01
592	1.192E+01	633	8.263E+00	674	3.399E+00	715	1.051E+00	756	3.211E-01
593	1.191E+01	634	8.161E+00	675	3.296E+00	716	1.020E+00	757	3.101E-01
594	1.186E+01	635	8.019E+00	676	3.222E+00	717	9.881E-01	758	3.049E-01
595	1.184E+01	636	7.877E+00	677	3.141E+00	718	9.603E-01	759	2.909E-01
596	1.181E+01	637	7.756E+00	678	3.051E+00	719	9.364E-01	760	2.908E-01
597	1.176E+01	638	7.600E+00	679	2.975E+00	720	9.083E-01	761	2.792E-01
598	1.171E+01	639	7.473E+00	680	2.893E+00	721	8.797E-01	762	2.717E-01
599	1.167E+01	640	7.342E+00	681	2.800E+00	722	8.537E-01	763	2.674E-01
600	1.162E+01	641	7.199E+00	682	2.734E+00	723	8.292E-01	764	2.570E-01
601	1.156E+01	642	7.071E+00	683	2.663E+00	724	8.041E-01	765	2.495E-01
602	1.153E+01	643	6.922E+00	684	2.592E+00	725	7.775E-01	766	2.405E-01
603	1.145E+01	644	6.799E+00	685	2.512E+00	726	7.637E-01	767	2.341E-01
604	1.139E+01	645	6.669E+00	686	2.451E+00	727	7.348E-01	768	2.312E-01
605	1.131E+01	646	6.545E+00	687	2.373E+00	728	7.219E-01	769	2.255E-01
606	1.126E+01	647	6.411E+00	688	2.319E+00	729	6.921E-01	770	2.198E-01
607	1.119E+01	648	6.291E+00	689	2.252E+00	730	6.778E-01	771	2.103E-01
608	1.110E+01	649	6.160E+00	690	2.183E+00	731	6.522E-01	772	2.064E-01
609	1.103E+01	650	6.024E+00	691	2.129E+00	732	6.356E-01	773	2.021E-01
610	1.094E+01	651	5.897E+00	692	2.061E+00	733	6.171E-01	774	1.963E-01
611	1.084E+01	652	5.772E+00	693	2.010E+00	734	5.961E-01	775	1.911E-01
612	1.075E+01	653	5.642E+00	694	1.953E+00	735	5.840E-01	776	1.900E-01
613	1.066E+01	654	5.543E+00	695	1.897E+00	736	5.626E-01	777	1.836E-01
614	1.057E+01	655	5.404E+00	696	1.838E+00	737	5.475E-01	778	1.731E-01
615	1.048E+01	656	5.295E+00	697	1.783E+00	738	5.328E-01	779	1.790E-01
616	1.035E+01	657	5.159E+00	698	1.730E+00	739	5.188E-01	780	1.793E-01
617	1.027E+01	658	5.044E+00	699	1.689E+00	740	5.008E-01		
618	1.013E+01	659	4.944E+00	700	1.637E+00	741	4.875E-01		
619	1.005E+01	660	4.823E+00	701	1.592E+00	742	4.740E-01		
620	9.938E+00	661	4.702E+00	702	1.546E+00	743	4.586E-01		
621	9.824E+00	662	4.602E+00	703	1.496E+00	744	4.466E-01		
622	9.698E+00	663	4.487E+00	704	1.454E+00	745	4.327E-01		
623	9.570E+00	664	4.375E+00	705	1.412E+00	746	4.225E-01		
624	9.433E+00	665	4.259E+00	706	1.368E+00	747	4.108E-01		
625	9.322E+00	666	4.170E+00	707	1.332E+00	748	4.023E-01		

CIE 1931 x y Chromaticity Diagram



7-Step Chromaticity Quadrangles



[Goniophotometer System]

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

Test orientation: **Base up**

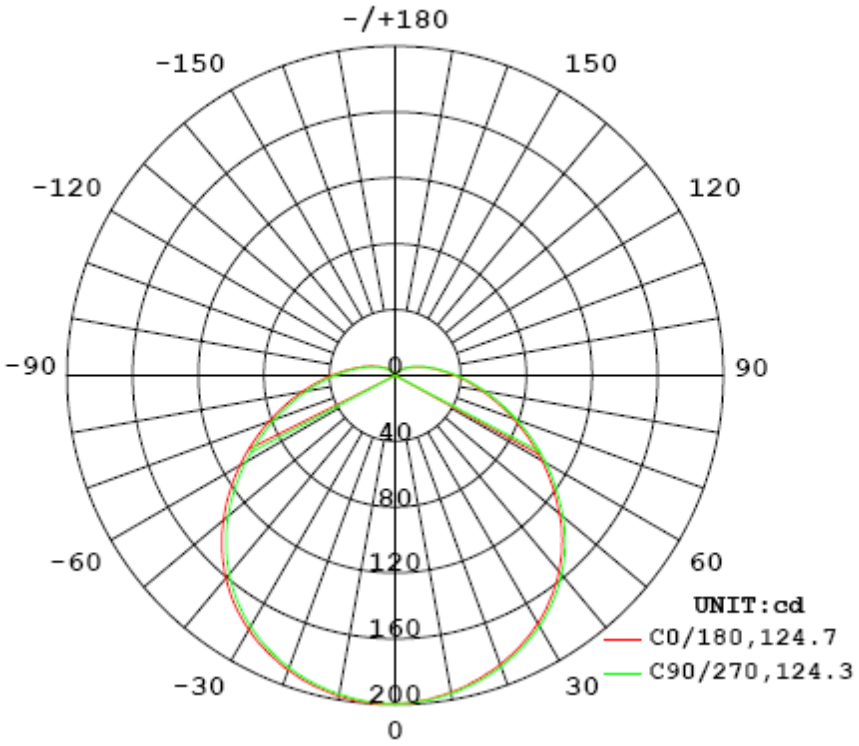
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.1	60	0.0632	6.483	0.8536

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I_{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
776.029	119.7	199.8	1.30	1.31

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I_{max}):	124.7	124.6	124.3	124.4	124.5
Field Angle (10% I_{max}):	210.1	210.1	209.6	210.0	210.0

Luminous Intensity (cd) Distribution Data

C / γ	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	199	199	199	199	199	199	199	199
5.0°	199	199	199	199	199	199	198	198
10.0°	198	198	197	197	197	196	196	195
15.0°	195	195	194	194	193	193	192	191
20.0°	190	190	190	189	189	188	187	187
25.0°	185	185	185	184	183	183	181	181
30.0°	178	178	178	177	176	175	174	174
35.0°	170	170	169	169	168	167	166	165
40.0°	161	160	160	159	157	156	155	155
45.0°	149	149	148	147	146	145	144	143
50.0°	137	137	136	134	133	132	131	130
55.0°	123	123	122	121	119	118	117	117
60.0°	109	109	108	107	105	104	103	103
65.0°	95	95	94	93	91	90	90	89
70.0°	82	82	81	80	78	77	77	76
75.0°	69	69	68	68	66	65	65	64
80.0°	58	58	57	56	55	53	54	53
85.0°	47	48	47	46	45	44	44	44
90.0°	39	39	38	38	37	36	36	36
95.0°	32	32	31	31	30	29	30	29
100.0°	26	26	25	25	24	24	24	24
105.0°	21	21	20	20	19	19	19	19
110.0°	17	17	16	16	16	15	15	15
115.0°	13	13	13	13	13	12	12	12
120.0°	11	11	10	10	10	10	10	10
125.0°	8	8	8	8	8	8	8	8
130.0°	7	7	6	6	6	6	6	6
135.0°	5	5	5	5	5	4	4	4
140.0°	4	4	4	4	3	3	3	3
145.0°	3	3	3	3	3	2	2	2
150.0°	2	2	2	2	2	2	2	2
155.0°	1	1	1	1	1	1	1	1
160.0°	1	1	1	1	1	1	1	1
165.0°	1	1	1	1	0	0	0	0
170.0°	0	0	0	0	0	0	0	0
175.0°	0	0	0	0	0	0	0	0
180.0°	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°
0.0°	199	199	199	199	199	199	199	199
5.0°	198	198	198	198	198	199	199	199
10.0°	195	195	195	196	196	197	197	198
15.0°	192	192	192	192	193	194	194	195
20.0°	187	187	187	188	188	189	190	190
25.0°	181	181	181	182	183	184	185	185
30.0°	174	174	174	175	176	177	178	178
35.0°	165	166	166	167	168	169	170	170
40.0°	155	156	156	157	158	159	160	161
45.0°	144	144	144	146	146	148	149	150
50.0°	131	131	132	133	134	135	136	137
55.0°	117	117	118	119	120	121	122	123
60.0°	103	103	104	105	106	107	108	109
65.0°	90	90	91	91	92	93	94	95
70.0°	77	77	78	78	79	79	81	82
75.0°	65	64	66	66	67	67	69	69
80.0°	54	54	55	55	56	56	57	58
85.0°	44	44	45	46	46	46	47	48
90.0°	36	36	37	37	38	37	39	39
95.0°	30	29	30	30	31	30	32	32
100.0°	24	24	24	25	25	25	26	26
105.0°	19	19	20	20	20	20	21	21
110.0°	16	16	16	16	16	16	17	17
115.0°	12	13	13	13	13	13	13	13
120.0°	10	10	10	10	10	10	11	11
125.0°	8	8	8	8	8	8	8	8
130.0°	6	6	6	6	6	6	6	7
135.0°	5	5	5	5	5	5	5	5
140.0°	3	3	3	4	4	4	4	4
145.0°	2	2	2	3	3	3	3	3
150.0°	2	2	2	2	2	2	2	2
155.0°	1	1	1	1	1	1	1	1
160.0°	1	1	1	1	1	1	1	1
165.0°	0	0	0	0	0	0	0	0
170.0°	0	0	0	0	0	0	0	0
175.0°	0	0	0	0	0	0	0	0
180.0°	0	0	0	0	0	0	0	0

Zonal Lumen Density Measurement

Deg	Flux (lm)	%
0-5	4.8	0.61
5-10	14.1	1.82
10-15	23.1	2.98
15-20	31.5	4.06
20-25	39.0	5.02
25-30	45.5	5.86
30-35	50.6	6.52
35-40	54.3	7.00
40-45	56.3	7.26
45-50	56.6	7.29
50-55	55.1	7.10
55-60	52.2	6.72
60-65	48.1	6.20
65-70	43.3	5.58
70-75	38.0	4.89
75-80	32.6	4.20
80-85	27.4	3.53
85-90	22.7	2.92
90-95	18.5	2.39
95-100	14.9	1.92
100-105	11.9	1.54
105-110	9.4	1.20
110-115	7.3	0.94
115-120	5.6	0.72
120-125	4.2	0.54
125-130	3.1	0.40
130-135	2.2	0.28
135-140	1.5	0.20
140-145	1.0	0.13
145-150	0.6	0.08
150-155	0.4	0.05
155-160	0.2	0.03
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	4.8	0.61
0-10	18.9	2.43
0-15	42.0	5.41
0-20	73.5	9.47
0-25	112.4	14.49
0-30	157.9	20.35
0-35	208.5	26.87
0-40	262.9	33.87
0-45	319.2	41.13
0-50	375.8	48.42
0-55	430.8	55.52
0-60	483.0	62.24
0-65	531.1	68.44
0-70	574.4	74.02
0-75	612.3	78.91
0-80	644.9	83.11
0-85	672.3	86.64
0-90	695.0	89.56
0-95	713.5	91.95
0-100	728.5	93.87
0-105	740.4	95.41
0-110	749.8	96.61
0-115	757.0	97.55
0-120	762.6	98.27
0-125	766.8	98.81
0-130	769.9	99.21
0-135	772.1	99.49
0-140	773.6	99.69
0-145	774.6	99.82
0-150	775.3	99.90
0-155	775.7	99.95
0-160	775.9	99.98
0-165	776.0	99.99
0-170	776.0	100.00
0-175	776.0	100.00
0-180	776.0	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. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.
3. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.
4. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.
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**********END OF REPORT**********