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: L6WNA19/27K

Report Type:	Electrical and Photometric tests including: Luminous Flux, Power Factor, Chromaticity, Luminous Intensity Distribution
Test Engineer:	Hexy He
Report Number:	RSZ201022506-10
Test Date:	2017-12-26 to 2017-12-27
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 2017-12-21 and used for testing.

#Model Tested:	L6WNA19/27K
#Manufacturer:	Overdrive Electronics Pvt. Ltd.
#Product Code:	790G
#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:	2700K
#Nominal Lumen Output:	630Im

Note:

1. The applicant Overdrive Electronics Pvt. Ltd. declare that their products with model L6WNA19/27K are the same to the products in report#RSZ171221511-10 and is authorized by original applicant to use their test data.
2. All the data in previous report (RSZ171221511-10) 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	Calibration date	Calibration due date
1.5m temperature integrating sphere	SENSING	SPR-600	S09008	2017-07-11	2018-07-11
High-precision rapid spectral analysis system	EVERFINE	HAAS-2000	M112048CA1361125	2017-07-11	2018-07-11
Digital power meter	YOKOGAWA	WT310	13398	2017-12-05	2018-12-05
Programmable Precision DC Power Supply	ITECH	IT6154	0061 0417 6471 0010 19	2017-03-03	2018-03-03
thermometer	SENSING	NA	NA	2017-03-09	2018-03-09
Standard Light Source	SENSING	NA	LSD090808	2017-12-05	2018-12-05
Precision frequency power supply	ALL Power	APW-105N	970613	2017-03-03	2018-03-03

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
AC POWER SUPPLY	EVERFINE	VPS1030 PWM	1012017	2017-03-03	2018-03-03
Digital CC&CV DC Power Supply	EVERFINE	WY12010	1009009	2017-03-03	2018-03-03
Digital power meter	YOKOGAWA	WT-210	91j926132	2017-03-03	2018-03-03
full-field speed goniophotometer	EVERFINE	GO-R5000	YG108492N10120001	2017-03-09	2018-03-09
Wireless Remote Sensor	N/A	433MHz	N/A	2017-03-20	2018-03-20
Standard Light Source	EVERFINE	D908	1012003	2017-12-17	2018-12-17

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=2.1% (K=2), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is U=25K (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=0.19 % 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.

Additional Test

The Additional Test item may not be covered by IESNA LM-79-2008. Additional test including power factor, off-state power and THD, was measured by Digital Power Meter after stabilized at 25°C±1°C.Test voltage for THD and power factor test would be equal to rated voltage or, in case of a voltage range, maximum value of that range.

The uncertainty of power meter AC current U=0.19 % of rdg, AC Voltage U=0.15% of rdg, Power U=0.46%) (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: **Baseup**

Photometric and Electrical Measurement Result

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.0	60	0.06272	6.383	0.8482	639.68	100.22

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
1.9883	2709	-0.00006	0.4591	0.4103	0.2621	0.5271

Color Rendering Index

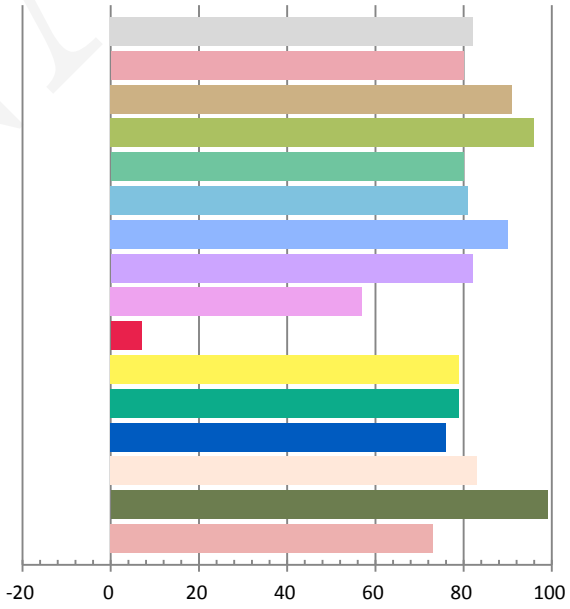
Ra
82.1

R1	R2	R3	R4
80	91	96	80

R5	R6	R7	R8
81	90	82	57

R9	R10	R11	R12
7	79	79	76

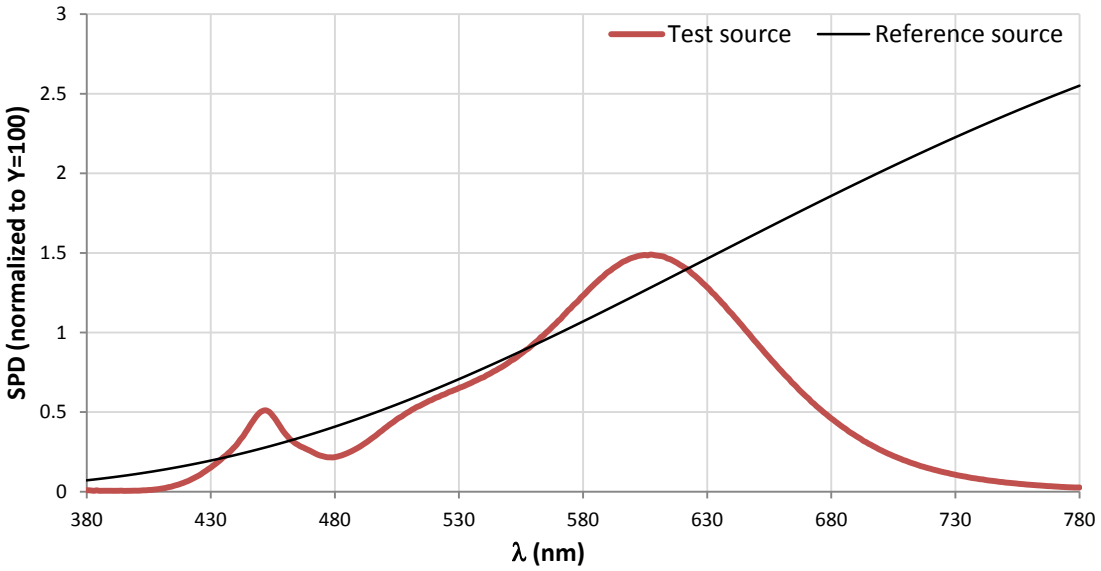
R13	R14	R15
83	99	73



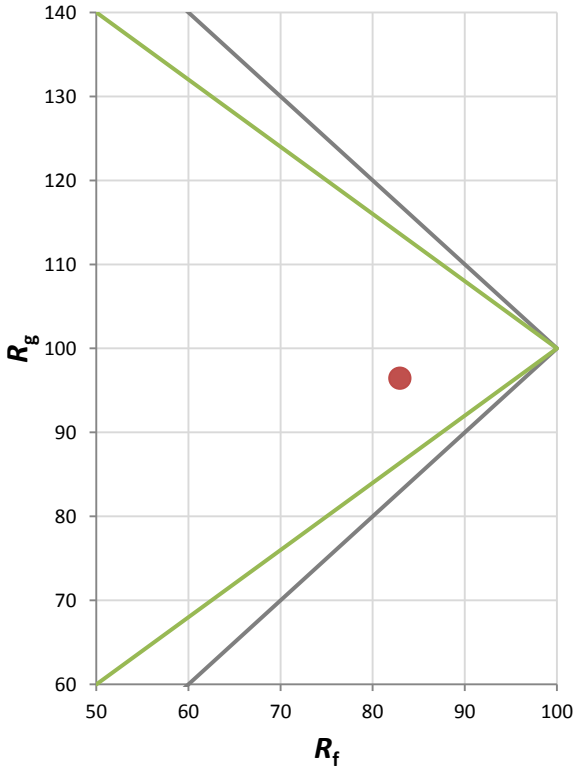
Fidelity Index and Gamut Index

Fidelity Index R_f	83
Gamut Index R_g	96

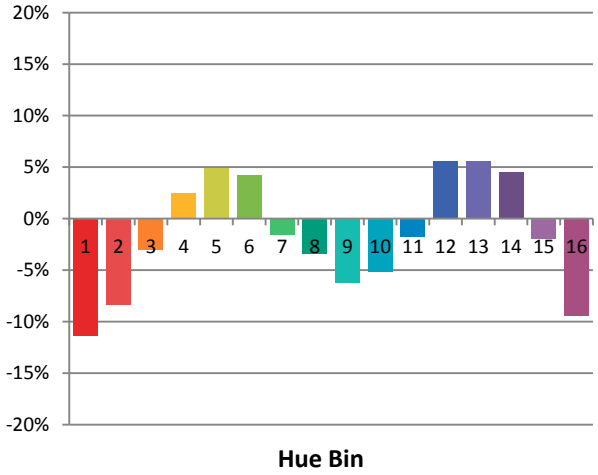
Spectral Power Distribution Comparison



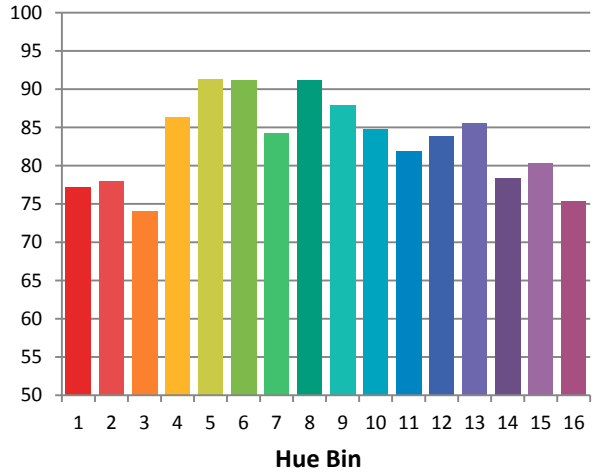
Plot of R_g versus R_f



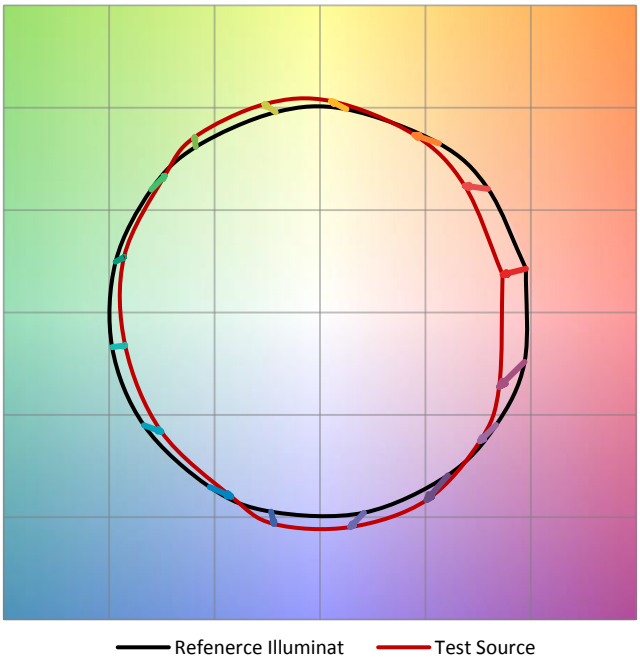
Chroma Shift by Hue



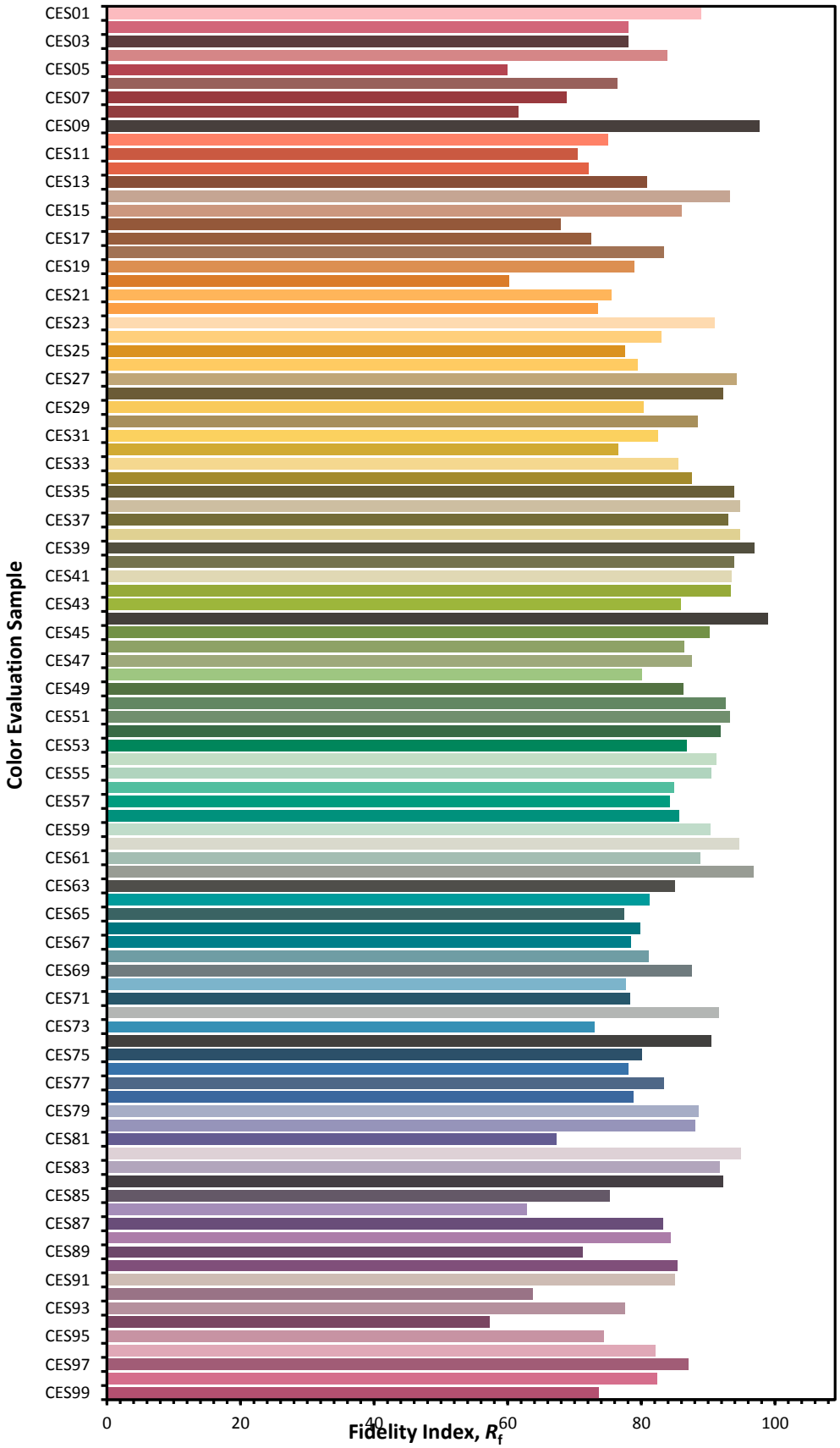
R_f by Hue



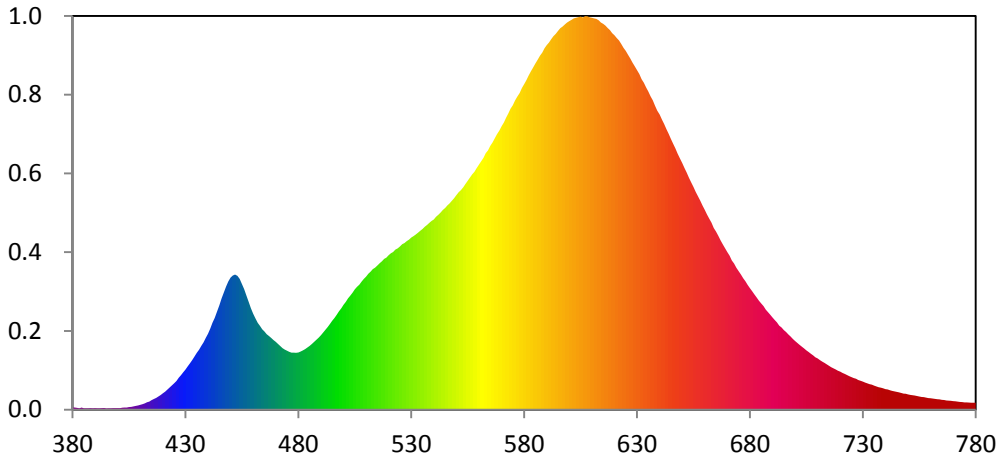
Color Vector Graphic



Color Fidelity by CES Sample



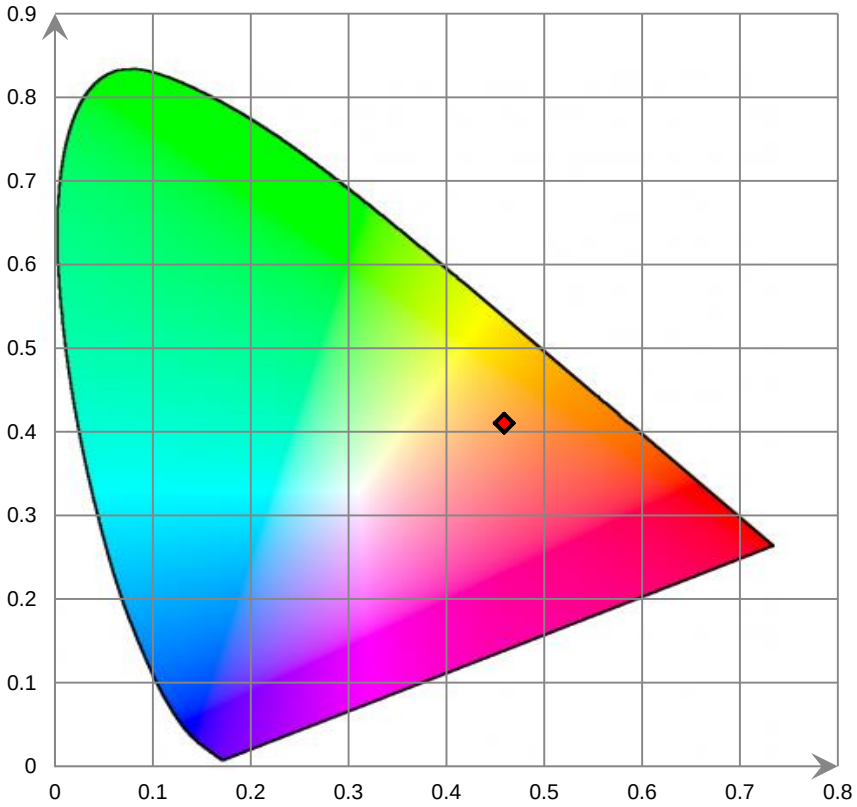
Relative Spectral Power Distribution



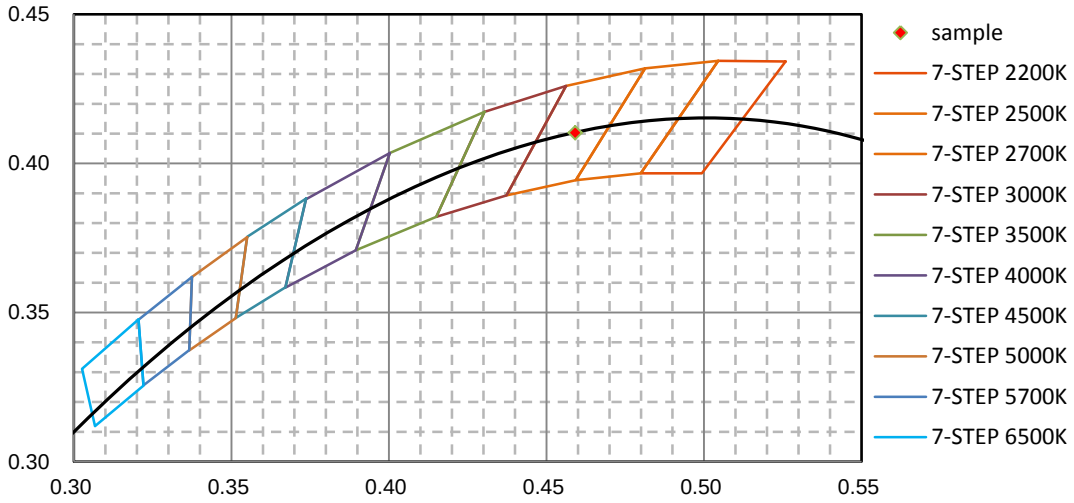
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	8.748E-02	421	6.374E-01	462	3.075E+00	503	4.041E+00	544	7.078E+00
381	7.925E-02	422	7.137E-01	463	2.971E+00	504	4.144E+00	545	7.146E+00
382	6.510E-02	423	7.847E-01	464	2.850E+00	505	4.264E+00	546	7.238E+00
383	5.061E-02	424	8.606E-01	465	2.769E+00	506	4.354E+00	547	7.312E+00
384	7.873E-02	425	9.359E-01	466	2.675E+00	507	4.431E+00	548	7.402E+00
385	5.038E-02	426	1.021E+00	467	2.613E+00	508	4.540E+00	549	7.496E+00
386	5.188E-02	427	1.130E+00	468	2.543E+00	509	4.637E+00	550	7.600E+00
387	5.139E-02	428	1.221E+00	469	2.473E+00	510	4.714E+00	551	7.709E+00
388	5.352E-02	429	1.327E+00	470	2.409E+00	511	4.818E+00	552	7.782E+00
389	5.222E-02	430	1.420E+00	471	2.330E+00	512	4.894E+00	553	7.880E+00
390	5.379E-02	431	1.534E+00	472	2.255E+00	513	4.982E+00	554	8.000E+00
391	4.804E-02	432	1.643E+00	473	2.183E+00	514	5.036E+00	555	8.111E+00
392	5.208E-02	433	1.758E+00	474	2.130E+00	515	5.111E+00	556	8.223E+00
393	5.239E-02	434	1.880E+00	475	2.092E+00	516	5.191E+00	557	8.339E+00
394	5.920E-02	435	2.018E+00	476	2.053E+00	517	5.262E+00	558	8.428E+00
395	4.595E-02	436	2.122E+00	477	2.022E+00	518	5.344E+00	559	8.559E+00
396	4.890E-02	437	2.261E+00	478	2.022E+00	519	5.393E+00	560	8.690E+00
397	4.947E-02	438	2.387E+00	479	2.015E+00	520	5.475E+00	561	8.811E+00
398	5.345E-02	439	2.545E+00	480	2.031E+00	521	5.541E+00	562	8.929E+00
399	5.715E-02	440	2.690E+00	481	2.064E+00	522	5.589E+00	563	9.093E+00
400	5.675E-02	441	2.873E+00	482	2.105E+00	523	5.672E+00	564	9.187E+00
401	5.777E-02	442	3.083E+00	483	2.148E+00	524	5.718E+00	565	9.345E+00
402	6.958E-02	443	3.251E+00	484	2.206E+00	525	5.785E+00	566	9.466E+00
403	8.019E-02	444	3.486E+00	485	2.264E+00	526	5.865E+00	567	9.612E+00
404	8.154E-02	445	3.704E+00	486	2.332E+00	527	5.908E+00	568	9.761E+00
405	9.717E-02	446	3.943E+00	487	2.401E+00	528	5.973E+00	569	9.889E+00
406	1.029E-01	447	4.154E+00	488	2.477E+00	529	6.025E+00	570	1.005E+01
407	1.189E-01	448	4.364E+00	489	2.558E+00	530	6.097E+00	571	1.017E+01
408	1.353E-01	449	4.546E+00	490	2.642E+00	531	6.151E+00	572	1.035E+01
409	1.515E-01	450	4.680E+00	491	2.738E+00	532	6.208E+00	573	1.050E+01
410	1.767E-01	451	4.755E+00	492	2.835E+00	533	6.276E+00	574	1.067E+01
411	1.985E-01	452	4.787E+00	493	2.932E+00	534	6.341E+00	575	1.079E+01
412	2.280E-01	453	4.741E+00	494	3.040E+00	535	6.404E+00	576	1.096E+01
413	2.662E-01	454	4.635E+00	495	3.150E+00	536	6.484E+00	577	1.109E+01
414	2.905E-01	455	4.456E+00	496	3.251E+00	537	6.545E+00	578	1.122E+01
415	3.365E-01	456	4.273E+00	497	3.363E+00	538	6.619E+00	579	1.140E+01
416	3.798E-01	457	4.047E+00	498	3.490E+00	539	6.688E+00	580	1.154E+01
417	4.175E-01	458	3.826E+00	499	3.594E+00	540	6.738E+00	581	1.168E+01
418	4.718E-01	459	3.598E+00	500	3.717E+00	541	6.836E+00	582	1.184E+01
419	5.206E-01	460	3.408E+00	501	3.823E+00	542	6.909E+00	583	1.199E+01
420	5.819E-01	461	3.240E+00	502	3.943E+00	543	6.988E+00	584	1.213E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.227E+01	626	1.258E+01	667	5.998E+00	708	1.928E+00	749	5.655E-01
586	1.240E+01	627	1.245E+01	668	5.856E+00	709	1.861E+00	750	5.411E-01
587	1.254E+01	628	1.230E+01	669	5.719E+00	710	1.818E+00	751	5.277E-01
588	1.265E+01	629	1.217E+01	670	5.584E+00	711	1.759E+00	752	5.141E-01
589	1.280E+01	630	1.203E+01	671	5.461E+00	712	1.704E+00	753	5.004E-01
590	1.292E+01	631	1.189E+01	672	5.290E+00	713	1.658E+00	754	4.876E-01
591	1.301E+01	632	1.171E+01	673	5.180E+00	714	1.611E+00	755	4.723E-01
592	1.313E+01	633	1.159E+01	674	5.036E+00	715	1.559E+00	756	4.543E-01
593	1.323E+01	634	1.142E+01	675	4.915E+00	716	1.508E+00	757	4.462E-01
594	1.332E+01	635	1.127E+01	676	4.791E+00	717	1.468E+00	758	4.297E-01
595	1.342E+01	636	1.110E+01	677	4.659E+00	718	1.425E+00	759	4.149E-01
596	1.352E+01	637	1.096E+01	678	4.551E+00	719	1.382E+00	760	4.065E-01
597	1.358E+01	638	1.077E+01	679	4.421E+00	720	1.347E+00	761	3.945E-01
598	1.365E+01	639	1.060E+01	680	4.307E+00	721	1.302E+00	762	3.846E-01
599	1.372E+01	640	1.046E+01	681	4.202E+00	722	1.267E+00	763	3.725E-01
600	1.377E+01	641	1.028E+01	682	4.086E+00	723	1.230E+00	764	3.653E-01
601	1.381E+01	642	1.012E+01	683	3.977E+00	724	1.190E+00	765	3.530E-01
602	1.386E+01	643	9.943E+00	684	3.865E+00	725	1.157E+00	766	3.426E-01
603	1.389E+01	644	9.780E+00	685	3.765E+00	726	1.122E+00	767	3.299E-01
604	1.391E+01	645	9.595E+00	686	3.670E+00	727	1.097E+00	768	3.232E-01
605	1.393E+01	646	9.425E+00	687	3.547E+00	728	1.055E+00	769	3.168E-01
606	1.390E+01	647	9.263E+00	688	3.455E+00	729	1.025E+00	770	3.038E-01
607	1.395E+01	648	9.076E+00	689	3.367E+00	730	9.947E-01	771	2.981E-01
608	1.394E+01	649	8.898E+00	690	3.270E+00	731	9.609E-01	772	2.864E-01
609	1.391E+01	650	8.741E+00	691	3.182E+00	732	9.354E-01	773	2.778E-01
610	1.389E+01	651	8.563E+00	692	3.093E+00	733	9.077E-01	774	2.712E-01
611	1.387E+01	652	8.403E+00	693	2.983E+00	734	8.862E-01	775	2.628E-01
612	1.385E+01	653	8.221E+00	694	2.916E+00	735	8.554E-01	776	2.567E-01
613	1.380E+01	654	8.054E+00	695	2.822E+00	736	8.253E-01	777	2.519E-01
614	1.372E+01	655	7.893E+00	696	2.754E+00	737	7.992E-01	778	2.461E-01
615	1.368E+01	656	7.719E+00	697	2.669E+00	738	7.833E-01	779	2.460E-01
616	1.361E+01	657	7.569E+00	698	2.596E+00	739	7.573E-01	780	2.464E-01
617	1.353E+01	658	7.404E+00	699	2.510E+00	740	7.329E-01		
618	1.345E+01	659	7.231E+00	700	2.440E+00	741	7.217E-01		
619	1.335E+01	660	7.081E+00	701	2.370E+00	742	6.914E-01		
620	1.327E+01	661	6.915E+00	702	2.299E+00	743	6.678E-01		
621	1.317E+01	662	6.768E+00	703	2.230E+00	744	6.492E-01		
622	1.309E+01	663	6.628E+00	704	2.170E+00	745	6.350E-01		
623	1.296E+01	664	6.441E+00	705	2.101E+00	746	6.161E-01		
624	1.282E+01	665	6.313E+00	706	2.045E+00	747	5.957E-01		
625	1.271E+01	666	6.165E+00	707	1.983E+00	748	5.741E-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: **Baseup**

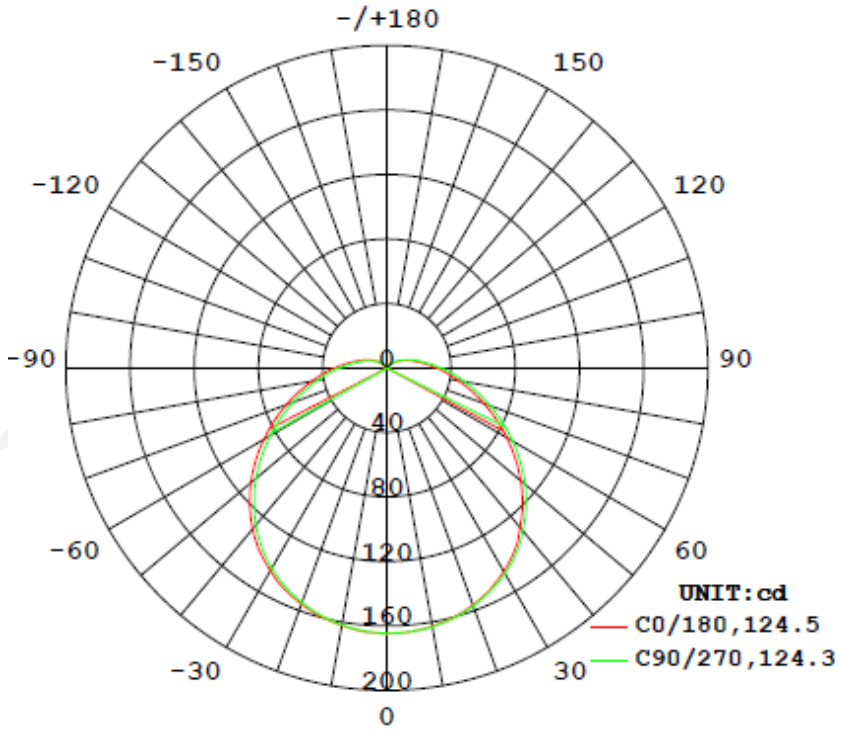
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.0	60	0.0627	6.41	0.8518

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I_{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
644.947	100.62	164.6	1.32	1.33

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I_{max}):	124.5	124.1	124.3	124.6	124.4
Field Angle (10% I_{max}):	212.9	212.3	212.7	213.0	212.7

Luminous Intensity (cd) Distribution Data

C / γ	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	165	165	165	165	165	165	165	165
5.0°	164	164	164	164	164	164	164	164
10.0°	162	162	162	162	162	162	162	162
15.0°	160	159	159	159	159	159	159	160
20.0°	156	155	155	155	155	155	155	156
25.0°	151	151	150	150	150	150	150	151
30.0°	145	145	144	144	143	143	144	144
35.0°	139	137	137	136	136	136	136	137
40.0°	130	129	128	128	127	127	127	128
45.0°	121	120	119	118	117	117	117	118
50.0°	111	109	108	107	107	106	107	108
55.0°	100	98	97	96	95	95	96	97
60.0°	89	87	86	84	84	84	84	85
65.0°	78	76	75	73	73	73	73	74
70.0°	67	65	64	63	62	62	63	63
75.0°	57	55	54	52	52	52	53	53
80.0°	48	46	45	44	44	44	44	45
85.0°	40	39	38	36	36	36	36	37
90.0°	33	32	31	30	30	30	30	31
95.0°	27	26	25	25	25	24	25	25
100.0°	22	22	21	20	20	20	20	20
105.0°	18	18	17	16	16	16	16	17
110.0°	15	14	14	13	13	13	13	13
115.0°	12	12	11	11	11	11	11	11
120.0°	10	9	9	9	8	8	8	9
125.0°	8	7	7	7	7	7	7	7
130.0°	6	6	5	5	5	5	5	5
135.0°	5	4	4	4	4	4	4	4
140.0°	3	3	3	3	3	3	3	3
145.0°	2	2	2	2	2	2	2	2
150.0°	2	2	2	2	1	1	1	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

Luminous Intensity (cd) Distribution Data (cont.)

C / γ	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	165	165	165	165	165	165	165	165
5.0°	164	164	164	164	164	164	164	164
10.0°	163	163	163	163	163	163	163	163
15.0°	160	160	160	161	161	161	160	160
20.0°	156	157	157	157	157	157	157	156
25.0°	152	152	153	153	153	153	152	152
30.0°	146	146	147	147	147	147	147	146
35.0°	139	139	140	140	140	140	140	140
40.0°	129	130	131	131	132	132	132	131
45.0°	119	120	121	122	122	123	122	122
50.0°	109	110	111	112	112	113	112	112
55.0°	98	99	100	101	101	102	102	101
60.0°	86	87	88	89	90	91	91	90
65.0°	75	76	77	78	79	80	79	79
70.0°	64	65	66	67	68	69	69	68
75.0°	54	55	56	57	58	58	58	58
80.0°	45	46	47	48	49	49	49	49
85.0°	38	39	39	40	41	41	41	40
90.0°	31	32	32	33	34	34	34	33
95.0°	25	26	26	27	28	28	28	28
100.0°	21	21	22	22	23	23	23	23
105.0°	17	17	18	18	19	19	19	18
110.0°	14	14	14	15	15	15	15	15
115.0°	11	11	11	12	12	12	12	12
120.0°	9	9	9	9	10	10	10	10
125.0°	7	7	7	7	8	8	8	8
130.0°	5	6	6	6	6	6	6	6
135.0°	4	4	4	4	5	5	5	5
140.0°	3	3	3	3	3	4	4	4
145.0°	2	2	2	2	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	3.9	0.61
5-10	11.7	1.81
10-15	19.1	2.96
15-20	26.0	4.04
20-25	32.2	5.00
25-30	37.6	5.82
30-35	41.8	6.48
35-40	44.7	6.93
40-45	46.2	7.17
45-50	46.4	7.19
50-55	45.2	7.01
55-60	42.9	6.66
60-65	39.7	6.15
65-70	35.8	5.54
70-75	31.5	4.89
75-80	27.1	4.21
80-85	23.0	3.57
85-90	19.2	2.98
90-95	15.8	2.45
95-100	12.9	2.00
100-105	10.4	1.61
105-110	8.2	1.27
110-115	6.5	1.00
115-120	5.0	0.77
120-125	3.8	0.59
125-130	2.8	0.43
130-135	2.0	0.31
135-140	1.4	0.21
140-145	0.9	0.15
145-150	0.6	0.09
150-155	0.3	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	3.9	0.61
0-10	15.6	2.42
0-15	34.7	5.38
0-20	60.7	9.42
0-25	93.0	14.42
0-30	130.5	20.24
0-35	172.3	26.72
0-40	217.0	33.65
0-45	263.2	40.82
0-50	309.6	48.01
0-55	354.9	55.02
0-60	397.8	61.68
0-65	437.5	67.83
0-70	473.2	73.37
0-75	504.7	78.26
0-80	531.9	82.47
0-85	554.9	86.04
0-90	574.1	89.02
0-95	590.0	91.47
0-100	602.8	93.47
0-105	613.2	95.08
0-110	621.4	96.35
0-115	627.9	97.35
0-120	632.8	98.12
0-125	636.6	98.71
0-130	639.4	99.14
0-135	641.4	99.45
0-140	642.8	99.66
0-145	643.7	99.81
0-150	644.3	99.90
0-155	644.6	99.95
0-160	644.8	99.98
0-165	644.9	99.99
0-170	644.9	100.00
0-175	644.9	100.00
0-180	644.9	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.
5. This report cannot be reproduced except in full, without prior written approval of the Company.
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**********END OF REPORT**********