

# 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: L6SA19DIM/50K**

<b>Report Type:</b>	Electrical and Photometric tests including: Luminous Flux, Power Factor, Chromaticity, Luminous Intensity Distribution
<b>Test Engineer:</b>	Hexy He <i>Hexy He</i>
<b>Report Number:</b>	RSZ201022503-10
<b>Test Date:</b>	2017-12-26 to 2017-12-27
<b>Report Date:</b>	2020-10-23
<b>Reviewed By:</b>	Blake Zhang / EE Engineer
<b>Prepared By:</b>	Bay Area Compliance Laboratories Corp. (Dongguan). No.69,Pulongcun ,Puxinhu Industrial Area, Tangxia , Dongguan, Guangdong, China. Tel: +86-0769-86858888 Fax:+86-0769-86858588
<b>Accreditation:</b>	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: L6SA19DIM/50K  
 #Manufacturer: Overdrive Electronics Pvt. Ltd.  
 #Product Code: 732  
 #Brand Name: Overdrive  
 #Product Designation: LED LAMP  
 #Burning Time Before Test: 0hour(For New Products)

### Rated Values:

#Rated Voltage/Frequency: 120V/60Hz  
 #Rated Power: 6 W  
 #Nominal CCT: 5000K  
 #Nominal Lumen Output: 560lm

### Note:

1. The applicant Overdrive Electronics Pvt. Ltd. declare that their products with model L6SA19DIM/50K are the same to the products in report#RSZ171221513-10-M1 and is authorized by original applicant to use their test data.
2. All the data in previous report (RSZ171221513-10-M1) 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
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

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
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.

##### 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**

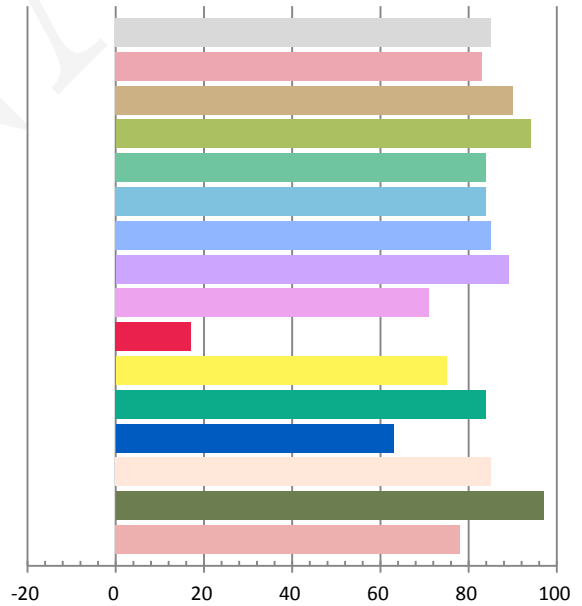
### Photometric and Electrical Measurement Result

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.0	60	0.05065	5.597	0.9212	634.78	113.42

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
2.006	4986	0.00159	0.3458	0.3554	0.2105	0.4866

### Color Rendering Index

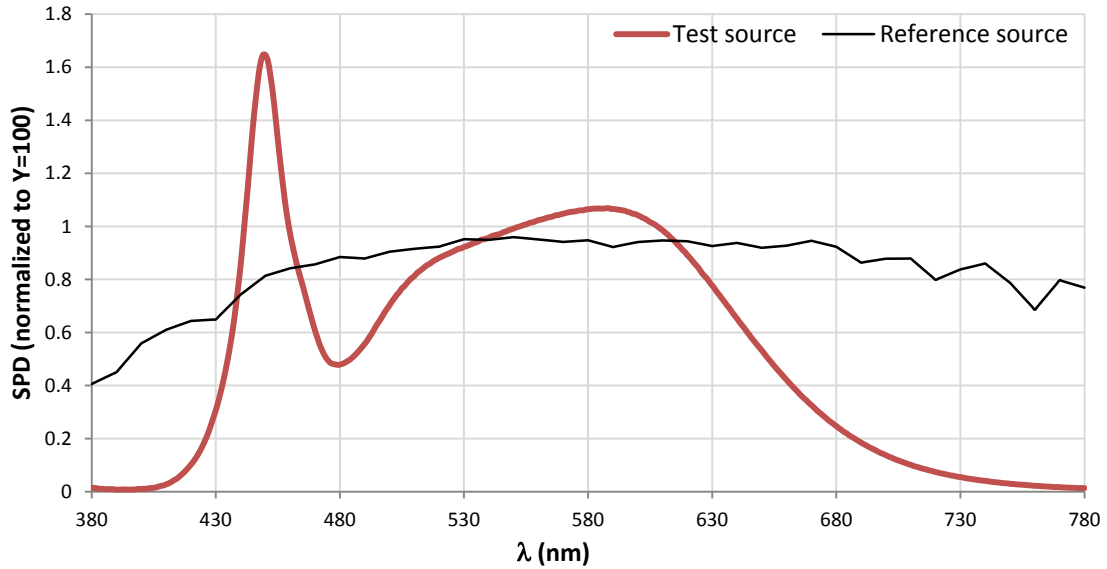
Ra			
<b>85.0</b>			
R1	R2	R3	R4
83	90	94	84
R5	R6	R7	R8
84	85	89	71
R9	R10	R11	R12
17	75	84	63
R13	R14	R15	
85	97	78	



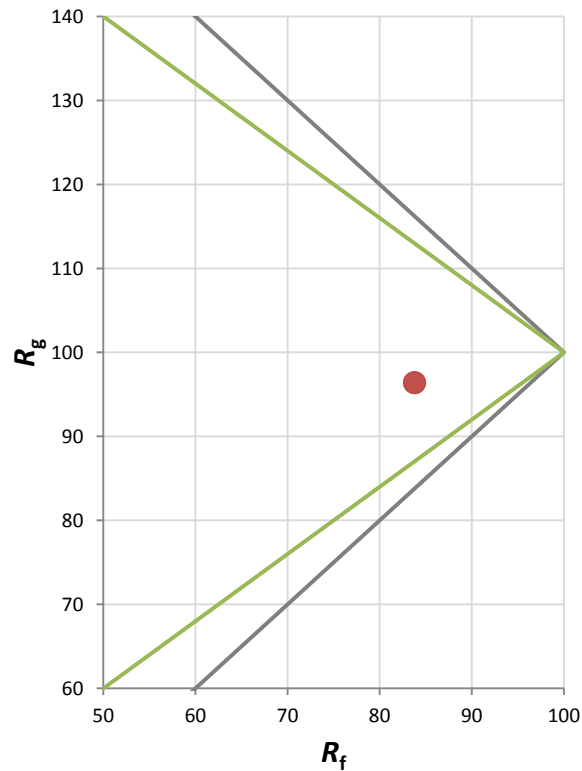
**Fidelity Index and Gamut Index**

Fidelity Index $R_f$	84
Gamut Index $R_g$	96

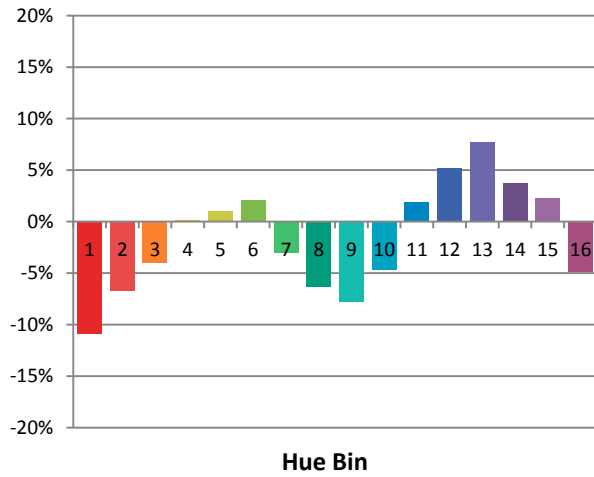
**Spectral Power Distribution Comparison**



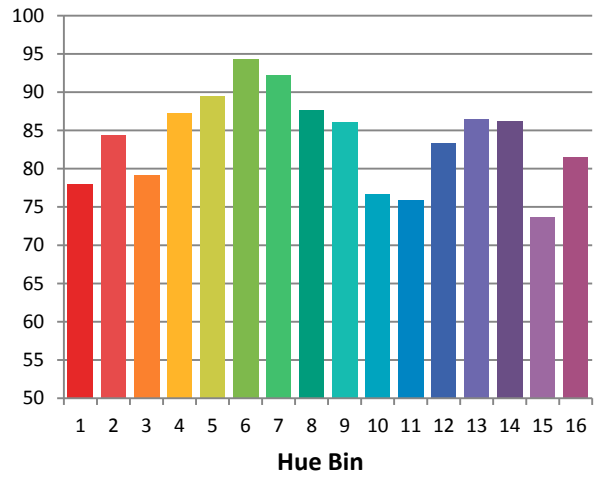
**Plot of  $R_g$  versus  $R_f$**



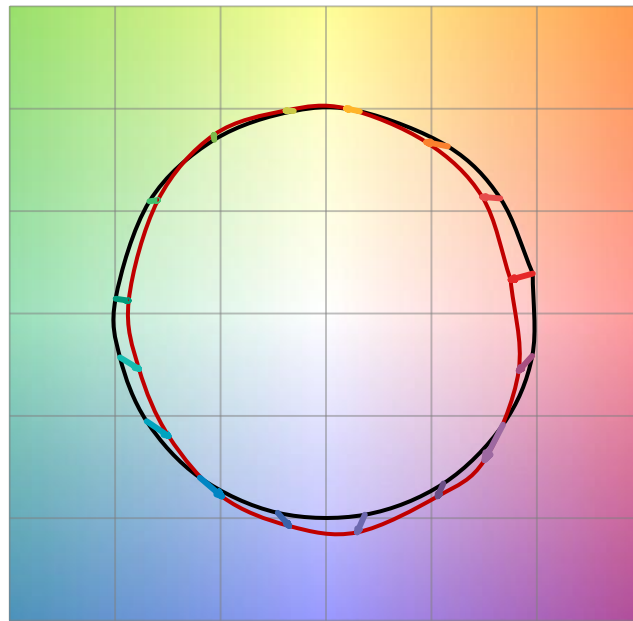
Chroma Shift by Hue



$R_f$  by Hue

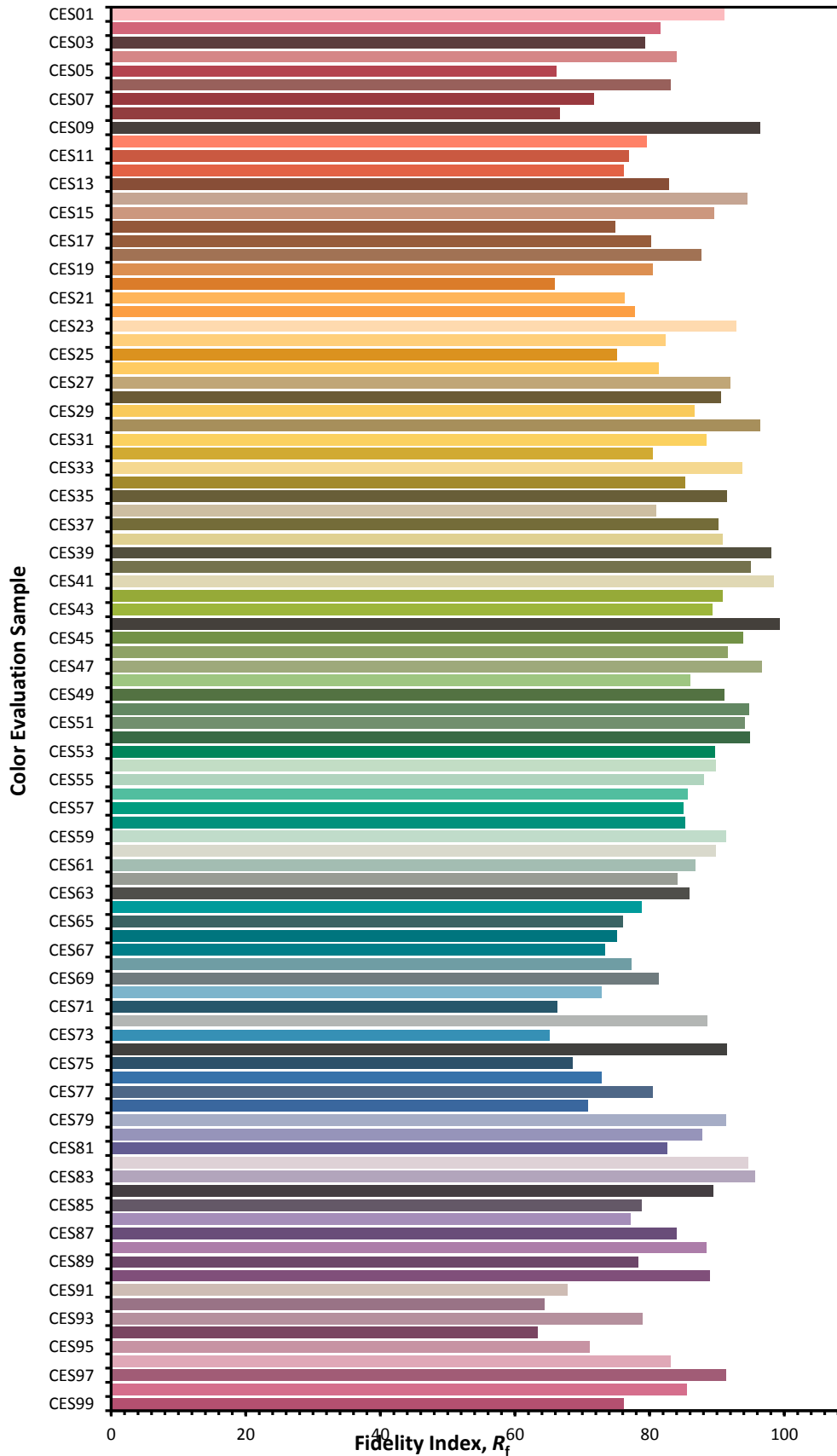


Color Vector Graphic

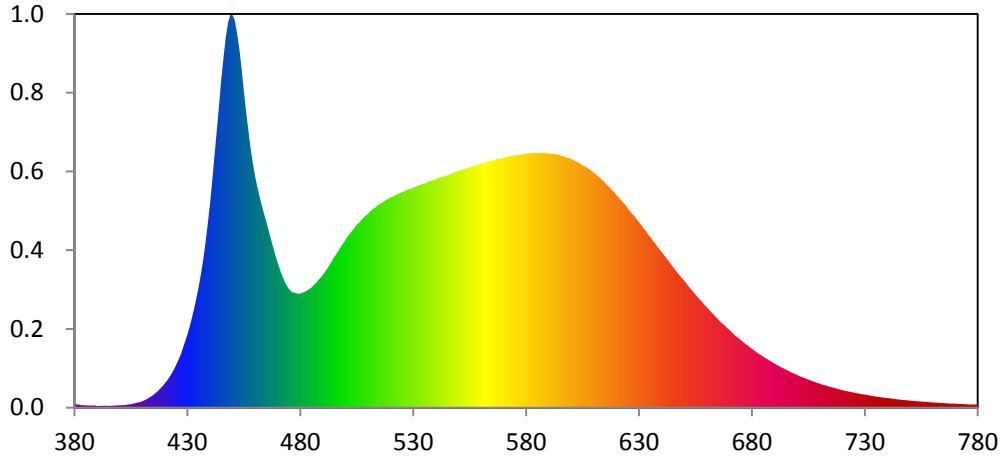


— Reference Illuminat    — Test Source

**Color Fidelity by CES Sample**



Relative Spectral Power Distribution

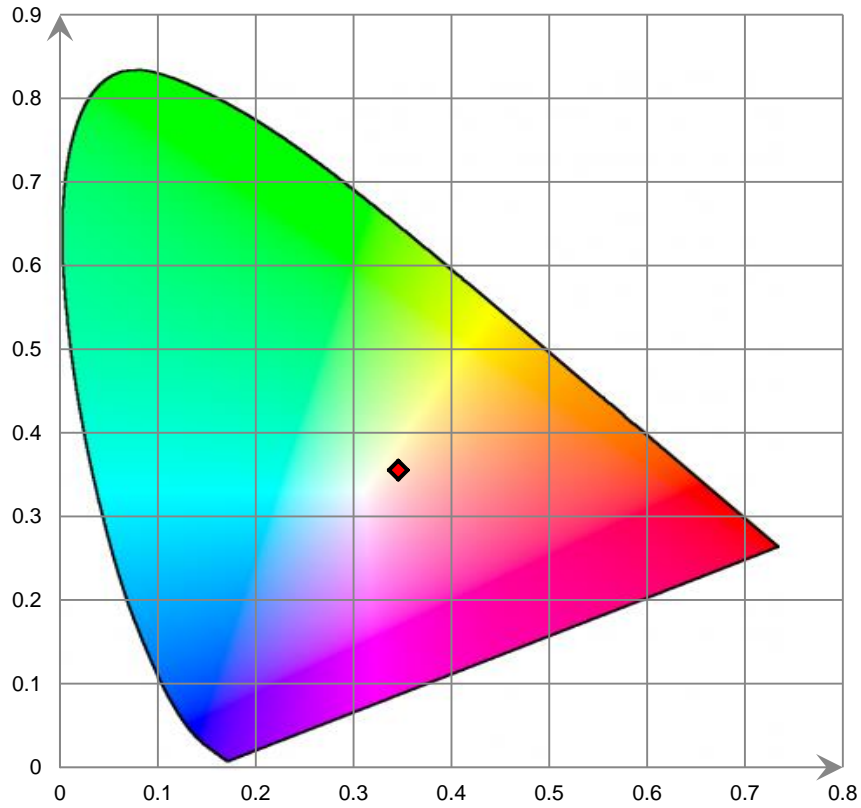


nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	1.342E-01	421	1.058E+00	462	8.200E+00	503	6.905E+00	544	9.017E+00
381	1.307E-01	422	1.187E+00	463	7.847E+00	504	6.997E+00	545	9.049E+00
382	1.218E-01	423	1.327E+00	464	7.527E+00	505	7.130E+00	546	9.095E+00
383	9.968E-02	424	1.485E+00	465	7.223E+00	506	7.198E+00	547	9.119E+00
384	1.006E-01	425	1.664E+00	466	6.899E+00	507	7.308E+00	548	9.160E+00
385	9.297E-02	426	1.859E+00	467	6.572E+00	508	7.405E+00	549	9.187E+00
386	8.599E-02	427	2.071E+00	468	6.246E+00	509	7.488E+00	550	9.220E+00
387	8.939E-02	428	2.321E+00	469	5.936E+00	510	7.555E+00	551	9.253E+00
388	8.789E-02	429	2.584E+00	470	5.639E+00	511	7.653E+00	552	9.281E+00
389	8.605E-02	430	2.851E+00	471	5.374E+00	512	7.721E+00	553	9.307E+00
390	6.803E-02	431	3.158E+00	472	5.120E+00	513	7.788E+00	554	9.342E+00
391	7.119E-02	432	3.501E+00	473	4.924E+00	514	7.859E+00	555	9.363E+00
392	7.443E-02	433	3.863E+00	474	4.751E+00	515	7.927E+00	556	9.403E+00
393	7.720E-02	434	4.278E+00	475	4.624E+00	516	7.974E+00	557	9.426E+00
394	7.673E-02	435	4.729E+00	476	4.526E+00	517	8.036E+00	558	9.446E+00
395	7.049E-02	436	5.225E+00	477	4.480E+00	518	8.097E+00	559	9.480E+00
396	7.419E-02	437	5.779E+00	478	4.463E+00	519	8.142E+00	560	9.514E+00
397	7.622E-02	438	6.435E+00	479	4.441E+00	520	8.192E+00	561	9.531E+00
398	8.441E-02	439	7.160E+00	480	4.451E+00	521	8.230E+00	562	9.553E+00
399	9.474E-02	440	7.935E+00	481	4.478E+00	522	8.272E+00	563	9.583E+00
400	9.086E-02	441	8.834E+00	482	4.517E+00	523	8.312E+00	564	9.609E+00
401	1.023E-01	442	9.807E+00	483	4.569E+00	524	8.347E+00	565	9.625E+00
402	1.016E-01	443	1.076E+01	484	4.625E+00	525	8.393E+00	566	9.648E+00
403	1.164E-01	444	1.182E+01	485	4.695E+00	526	8.430E+00	567	9.688E+00
404	1.295E-01	445	1.283E+01	486	4.779E+00	527	8.476E+00	568	9.689E+00
405	1.363E-01	446	1.367E+01	487	4.867E+00	528	8.512E+00	569	9.718E+00
406	1.515E-01	447	1.443E+01	488	4.968E+00	529	8.528E+00	570	9.738E+00
407	1.799E-01	448	1.501E+01	489	5.073E+00	530	8.575E+00	571	9.762E+00
408	2.031E-01	449	1.530E+01	490	5.179E+00	531	8.600E+00	572	9.786E+00
409	2.192E-01	450	1.530E+01	491	5.294E+00	532	8.637E+00	573	9.800E+00
410	2.561E-01	451	1.509E+01	492	5.430E+00	533	8.673E+00	574	9.813E+00
411	2.909E-01	452	1.459E+01	493	5.563E+00	534	8.711E+00	575	9.820E+00
412	3.348E-01	453	1.396E+01	494	5.714E+00	535	8.737E+00	576	9.845E+00
413	3.925E-01	454	1.318E+01	495	5.863E+00	536	8.773E+00	577	9.856E+00
414	4.398E-01	455	1.233E+01	496	5.990E+00	537	8.830E+00	578	9.855E+00
415	5.034E-01	456	1.153E+01	497	6.127E+00	538	8.840E+00	579	9.883E+00
416	5.809E-01	457	1.080E+01	498	6.278E+00	539	8.869E+00	580	9.896E+00
417	6.581E-01	458	1.009E+01	499	6.403E+00	540	8.893E+00	581	9.903E+00
418	7.500E-01	459	9.513E+00	500	6.529E+00	541	8.945E+00	582	9.914E+00
419	8.416E-01	460	9.011E+00	501	6.667E+00	542	8.976E+00	583	9.917E+00
420	9.509E-01	461	8.596E+00	502	6.783E+00	543	8.997E+00	584	9.921E+00

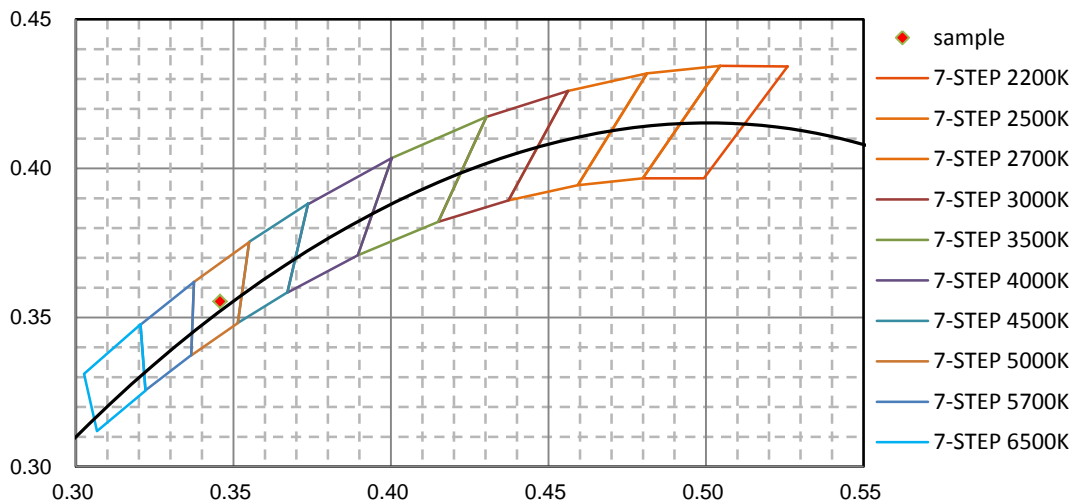


nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	9.917E+00	626	7.645E+00	667	3.272E+00	708	9.988E-01	749	2.892E-01
586	9.917E+00	627	7.549E+00	668	3.194E+00	709	9.637E-01	750	2.747E-01
587	9.924E+00	628	7.458E+00	669	3.106E+00	710	9.396E-01	751	2.716E-01
588	9.935E+00	629	7.333E+00	670	3.029E+00	711	9.054E-01	752	2.609E-01
589	9.912E+00	630	7.222E+00	671	2.948E+00	712	8.796E-01	753	2.537E-01
590	9.905E+00	631	7.112E+00	672	2.862E+00	713	8.555E-01	754	2.484E-01
591	9.897E+00	632	6.983E+00	673	2.787E+00	714	8.282E-01	755	2.402E-01
592	9.882E+00	633	6.879E+00	674	2.717E+00	715	8.020E-01	756	2.370E-01
593	9.870E+00	634	6.759E+00	675	2.642E+00	716	7.840E-01	757	2.269E-01
594	9.854E+00	635	6.648E+00	676	2.566E+00	717	7.565E-01	758	2.211E-01
595	9.835E+00	636	6.525E+00	677	2.491E+00	718	7.340E-01	759	2.110E-01
596	9.802E+00	637	6.419E+00	678	2.430E+00	719	7.118E-01	760	2.059E-01
597	9.779E+00	638	6.291E+00	679	2.361E+00	720	6.873E-01	761	2.028E-01
598	9.737E+00	639	6.176E+00	680	2.299E+00	721	6.678E-01	762	1.976E-01
599	9.726E+00	640	6.066E+00	681	2.229E+00	722	6.442E-01	763	1.879E-01
600	9.684E+00	641	5.943E+00	682	2.169E+00	723	6.301E-01	764	1.848E-01
601	9.646E+00	642	5.833E+00	683	2.099E+00	724	6.089E-01	765	1.798E-01
602	9.597E+00	643	5.725E+00	684	2.053E+00	725	5.939E-01	766	1.742E-01
603	9.561E+00	644	5.600E+00	685	1.986E+00	726	5.712E-01	767	1.683E-01
604	9.503E+00	645	5.491E+00	686	1.929E+00	727	5.583E-01	768	1.617E-01
605	9.445E+00	646	5.368E+00	687	1.881E+00	728	5.385E-01	769	1.598E-01
606	9.401E+00	647	5.265E+00	688	1.826E+00	729	5.202E-01	770	1.584E-01
607	9.353E+00	648	5.152E+00	689	1.773E+00	730	5.101E-01	771	1.493E-01
608	9.288E+00	649	5.051E+00	690	1.720E+00	731	4.954E-01	772	1.491E-01
609	9.223E+00	650	4.947E+00	691	1.668E+00	732	4.765E-01	773	1.407E-01
610	9.158E+00	651	4.837E+00	692	1.624E+00	733	4.604E-01	774	1.391E-01
611	9.081E+00	652	4.721E+00	693	1.571E+00	734	4.495E-01	775	1.358E-01
612	9.015E+00	653	4.615E+00	694	1.529E+00	735	4.354E-01	776	1.323E-01
613	8.926E+00	654	4.512E+00	695	1.483E+00	736	4.221E-01	777	1.261E-01
614	8.840E+00	655	4.405E+00	696	1.443E+00	737	4.113E-01	778	1.267E-01
615	8.763E+00	656	4.303E+00	697	1.393E+00	738	3.956E-01	779	1.255E-01
616	8.661E+00	657	4.205E+00	698	1.351E+00	739	3.866E-01	780	1.258E-01
617	8.578E+00	658	4.110E+00	699	1.317E+00	740	3.787E-01		
618	8.475E+00	659	4.008E+00	700	1.277E+00	741	3.688E-01		
619	8.396E+00	660	3.913E+00	701	1.233E+00	742	3.532E-01		
620	8.288E+00	661	3.814E+00	702	1.200E+00	743	3.402E-01		
621	8.196E+00	662	3.720E+00	703	1.162E+00	744	3.318E-01		
622	8.090E+00	663	3.629E+00	704	1.125E+00	745	3.241E-01		
623	7.985E+00	664	3.540E+00	705	1.093E+00	746	3.126E-01		
624	7.890E+00	665	3.446E+00	706	1.062E+00	747	3.018E-01		
625	7.772E+00	666	3.350E+00	707	1.029E+00	748	2.928E-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**

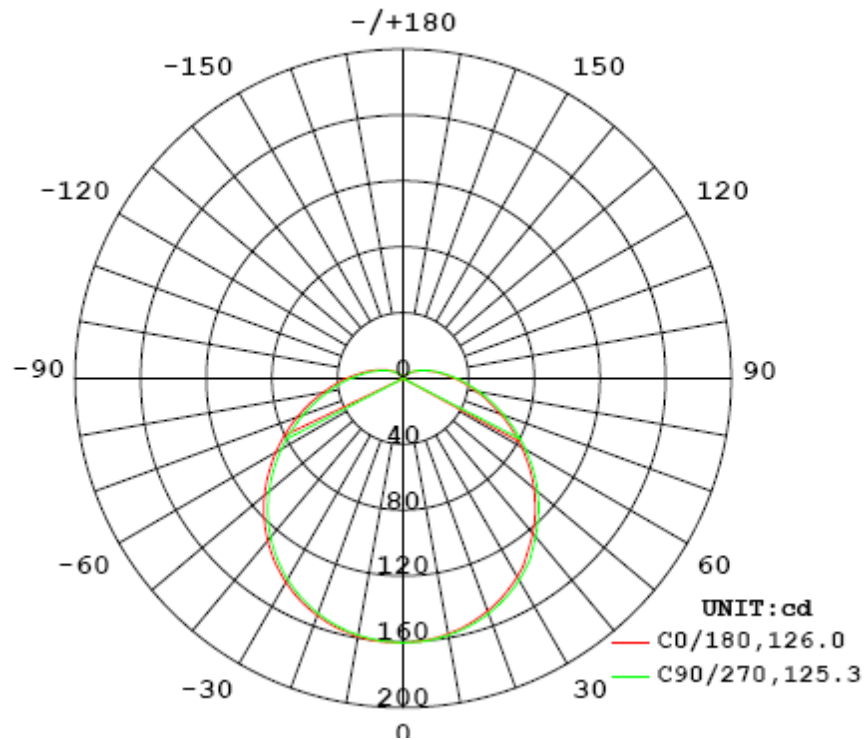
**Electrical Measurement**

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.0	60	0.0505	5.57	0.9191

**Photometric Measurement**

Luminous Flux (lm)	Efficacy (lm/W)	I <sub>max</sub> (cd)	S/MH (C0/180)	S/MH (C90/270)
639.019	114.73	160.6	1.29	1.31

**Luminous Intensity Distribution**



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I <sub>max</sub> ):	126.0	125.4	125.3	126.1	125.7
Field Angle (10% I <sub>max</sub> ):	216.4	215.5	215.1	216.4	215.9

Luminous Intensity (cd) Distribution Data

C γ	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	160	160	160	160	160	160	160	160
5.0°	160	160	160	160	160	160	160	160
10.0°	159	159	159	159	158	158	158	157
15.0°	157	157	156	156	156	155	155	154
20.0°	153	153	153	152	152	151	151	150
25.0°	149	148	148	148	147	146	146	145
30.0°	143	143	142	142	141	140	139	139
35.0°	136	136	136	135	134	133	132	132
40.0°	129	128	128	127	126	125	124	123
45.0°	120	120	119	118	117	116	115	114
50.0°	110	110	109	108	107	106	105	104
55.0°	100	100	99	97	96	95	95	94
60.0°	90	89	88	87	86	85	84	84
65.0°	79	79	77	76	75	75	74	73
70.0°	69	68	67	66	65	64	64	63
75.0°	59	59	57	56	55	55	54	54
80.0°	50	49	48	47	47	46	46	45
85.0°	42	41	41	39	39	39	38	38
90.0°	35	34	34	32	32	32	32	31
95.0°	29	28	28	27	26	26	26	26
100.0°	23	23	23	22	22	22	21	21
105.0°	19	19	19	18	18	18	18	17
110.0°	16	15	15	14	14	14	14	14
115.0°	13	12	12	12	12	12	11	11
120.0°	10	10	10	9	9	9	9	9
125.0°	8	8	8	7	7	7	7	7
130.0°	6	6	6	6	6	6	6	6
135.0°	5	5	5	4	4	4	4	4
140.0°	4	4	3	3	3	3	3	3
145.0°	3	3	2	2	2	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°	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 y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	160	160	160	160	160	160	160	160
5.0°	160	160	160	160	160	160	160	160
10.0°	158	158	158	158	158	159	159	159
15.0°	154	155	155	155	156	156	157	157
20.0°	150	151	151	152	152	153	153	153
25.0°	145	145	146	147	147	148	149	149
30.0°	139	139	140	141	141	142	143	143
35.0°	131	131	132	133	135	136	136	137
40.0°	123	123	124	125	126	127	128	128
45.0°	114	114	115	115	117	118	119	120
50.0°	104	104	105	106	107	108	110	110
55.0°	94	94	94	95	97	98	100	100
60.0°	83	84	84	85	86	88	89	90
65.0°	73	73	74	74	76	77	79	79
70.0°	63	63	64	64	65	67	68	69
75.0°	54	54	54	55	56	57	59	59
80.0°	46	46	46	46	47	49	50	50
85.0°	38	38	38	38	39	41	42	42
90.0°	32	32	32	32	33	34	35	35
95.0°	26	26	26	26	27	28	29	29
100.0°	21	22	21	21	22	23	24	24
105.0°	18	18	18	17	18	19	19	19
110.0°	14	14	14	14	15	15	16	16
115.0°	12	12	11	11	12	12	13	13
120.0°	9	9	9	9	9	10	10	10
125.0°	7	7	7	7	7	8	8	8
130.0°	6	6	6	6	6	6	6	6
135.0°	4	4	4	4	4	5	5	5
140.0°	3	3	3	3	3	3	4	4
145.0°	2	2	2	2	2	2	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)	%	Deg	Flux (lm)	%
0-5	3.8	0.60	0-5	3.8	0.60
5-10	11.4	1.78	0-10	15.2	2.38
10-15	18.6	2.92	0-15	33.8	5.30
15-20	25.3	3.96	0-20	59.2	9.26
20-25	31.3	4.91	0-25	90.5	14.17
25-30	36.5	5.70	0-30	127.0	19.87
30-35	40.5	6.35	0-35	167.5	26.22
35-40	43.3	6.78	0-40	210.9	33.00
40-45	44.9	7.02	0-45	255.8	40.02
45-50	45.2	7.08	0-50	301.0	47.10
50-55	44.3	6.94	0-55	345.3	54.04
55-60	42.3	6.61	0-60	387.6	60.65
60-65	39.4	6.17	0-65	427.0	66.82
65-70	35.8	5.60	0-70	462.7	72.42
70-75	31.8	4.97	0-75	494.5	77.39
75-80	27.6	4.32	0-80	522.1	81.71
80-85	23.6	3.69	0-85	545.7	85.40
85-90	19.8	3.09	0-90	565.5	88.49
90-95	16.4	2.57	0-95	581.9	91.06
95-100	13.4	2.09	0-100	595.2	93.15
100-105	10.8	1.69	0-105	606.0	94.84
105-110	8.6	1.34	0-110	614.6	96.18
110-115	6.7	1.05	0-115	621.3	97.23
115-120	5.2	0.81	0-120	626.5	98.04
120-125	3.9	0.61	0-125	630.4	98.65
125-130	2.9	0.45	0-130	633.3	99.10
130-135	2.1	0.33	0-135	635.4	99.43
135-140	1.4	0.22	0-140	636.8	99.65
140-145	1.0	0.15	0-145	637.8	99.80
145-150	0.6	0.09	0-150	638.3	99.89
150-155	0.3	0.06	0-155	638.7	99.95
155-160	0.2	0.03	0-160	638.9	99.98
160-165	0.1	0.01	0-165	639.0	99.99
165-170	0.0	0.01	0-170	639.0	100.00
170-175	0.0	0.00	0-175	639.0	100.00
175-180	0.0	0.00	0-180	639.0	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.
5. This report cannot be reproduced except in full, without prior written approval of the Company.
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\*\*\*\*\*END OF REPORT\*\*\*\*\*