

# 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/30K**

<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>	RSZ201022502-10
<b>Test Date:</b>	2017-11-07
<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 2017-11-03 and used for testing.

#Model Tested: L6SA19DIM/30K  
 #Manufacturer: Overdrive Electronics Pvt. Ltd.  
 #Product Code: 731  
 #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 W  
 #Nominal CCT: 3000K  
 #Nominal Lumen Output: 545lm

### Note:

1. The applicant Overdrive Electronics Pvt. Ltd. declare that their products with model L6SA19DIM/30K are the same to the products in report#RSZ171103516-10 and is authorized by original applicant to use their test data.
2. All the data in previous report (RSZ171103516-10) 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°C	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°C	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**

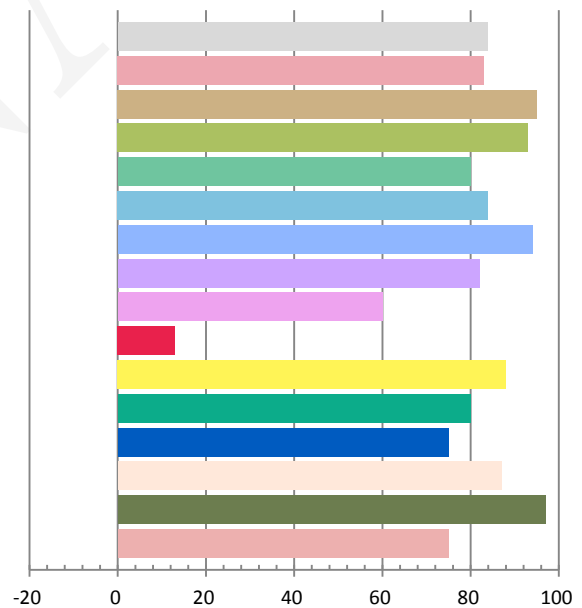
### Photometric and Electrical Measurement Result

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.1	60	0.05064	5.579	0.9174	573.14	102.73

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
1.7578	3079	0.00137	0.4333	0.4062	0.2473	0.5217

### Color Rendering Index

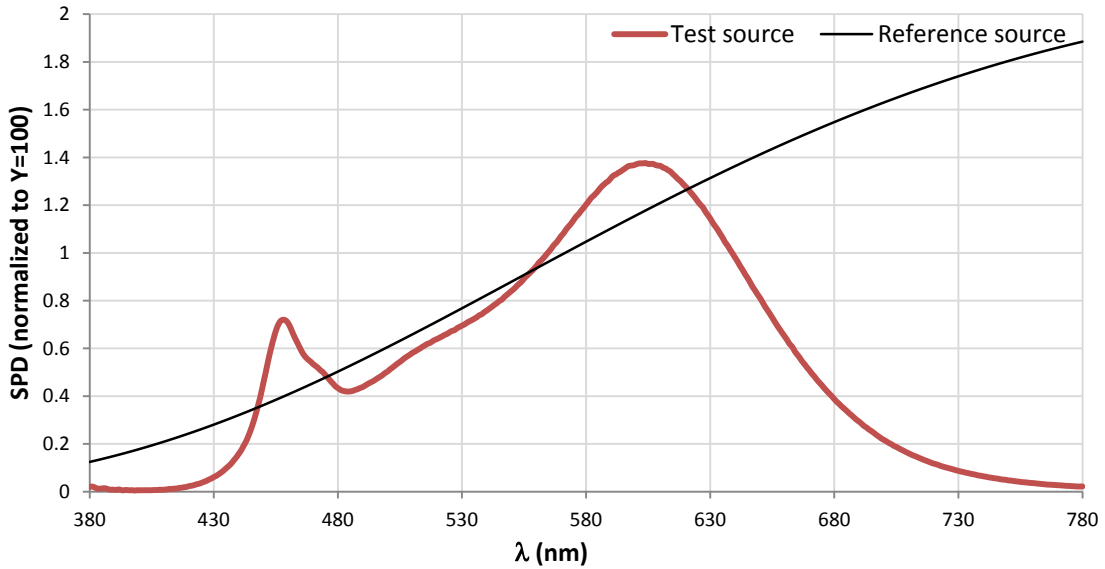
Ra			
<b>83.8</b>			
R1	R2	R3	R4
83	95	93	80
R5	R6	R7	R8
84	94	82	60
R9	R10	R11	R12
13	88	80	75
R13	R14	R15	
87	97	75	



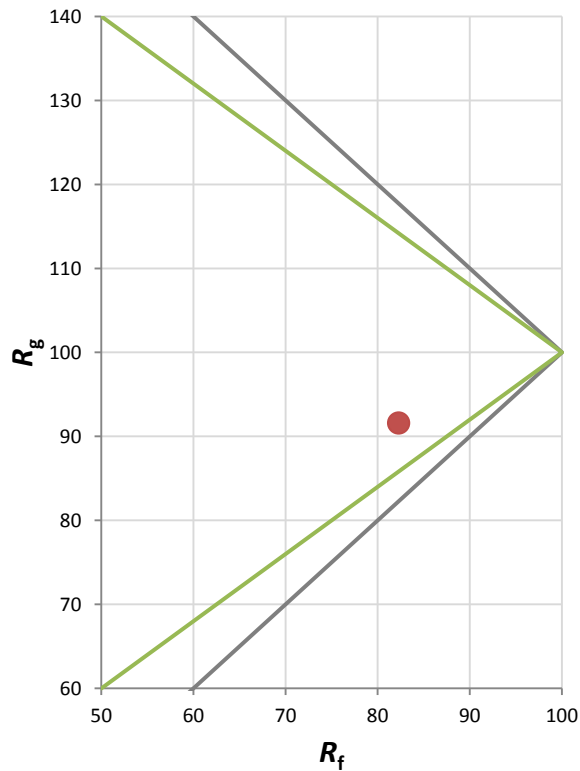
**Fidelity Index and Gamut Index**

Fidelity Index $R_f$	82
Gamut Index $R_g$	92

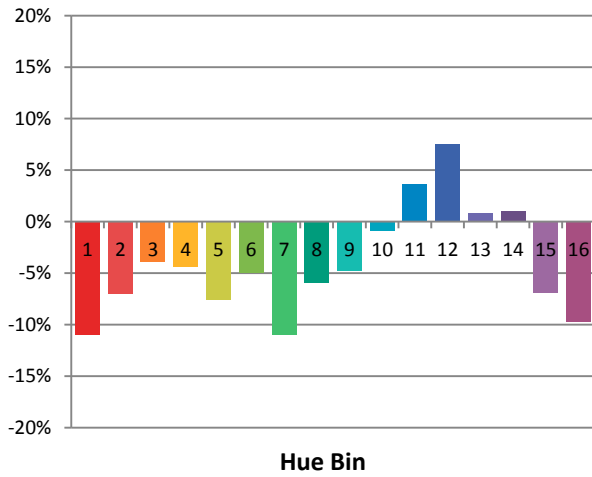
**Spectral Power Distribution Comparison**



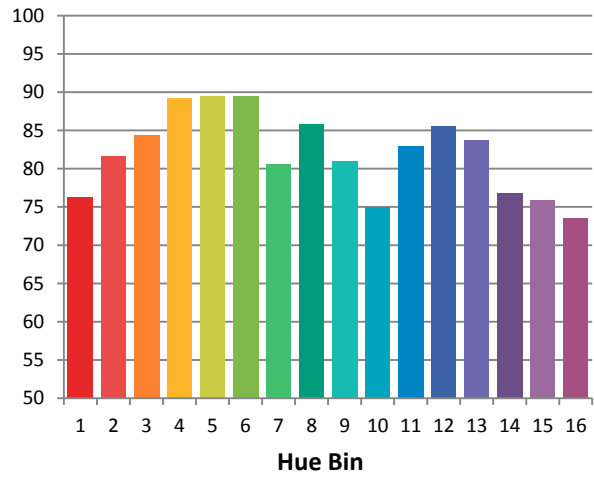
**Plot of  $R_g$  versus  $R_f$**



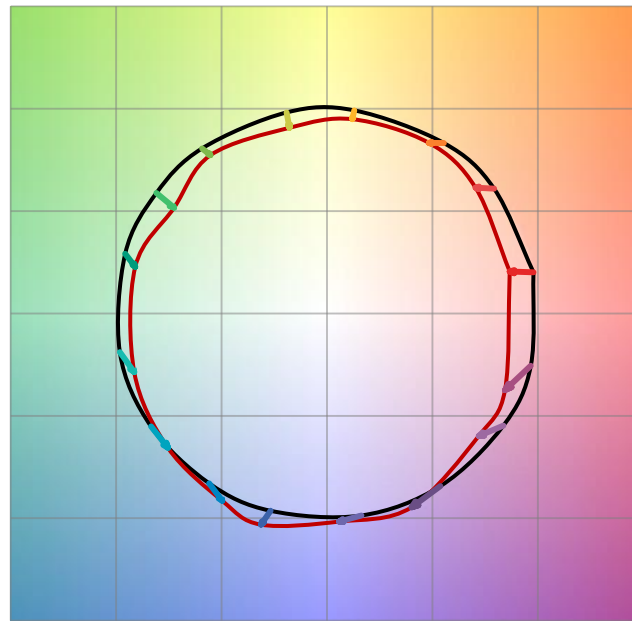
**Chroma Shift by Hue**



**$R_f$  by Hue**

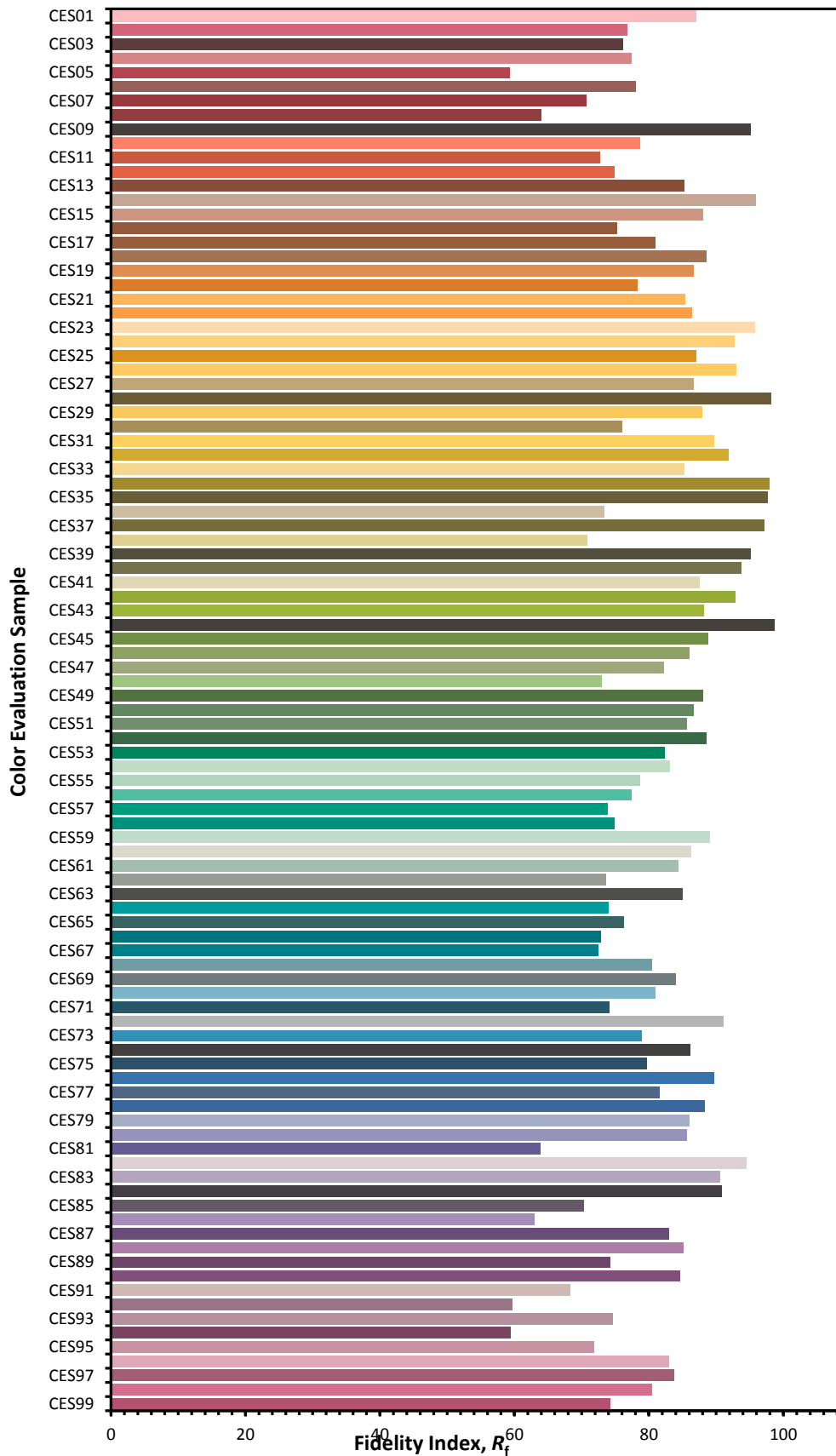


**Color Vector Graphic**

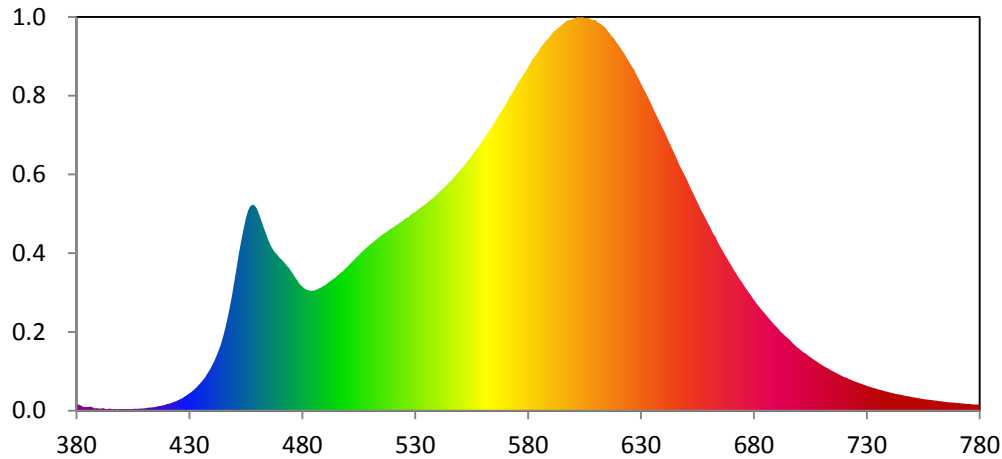


— Reference Illuminat    — Test Source

**Color Fidelity by CES Sample**



**Relative Spectral Power Distribution**

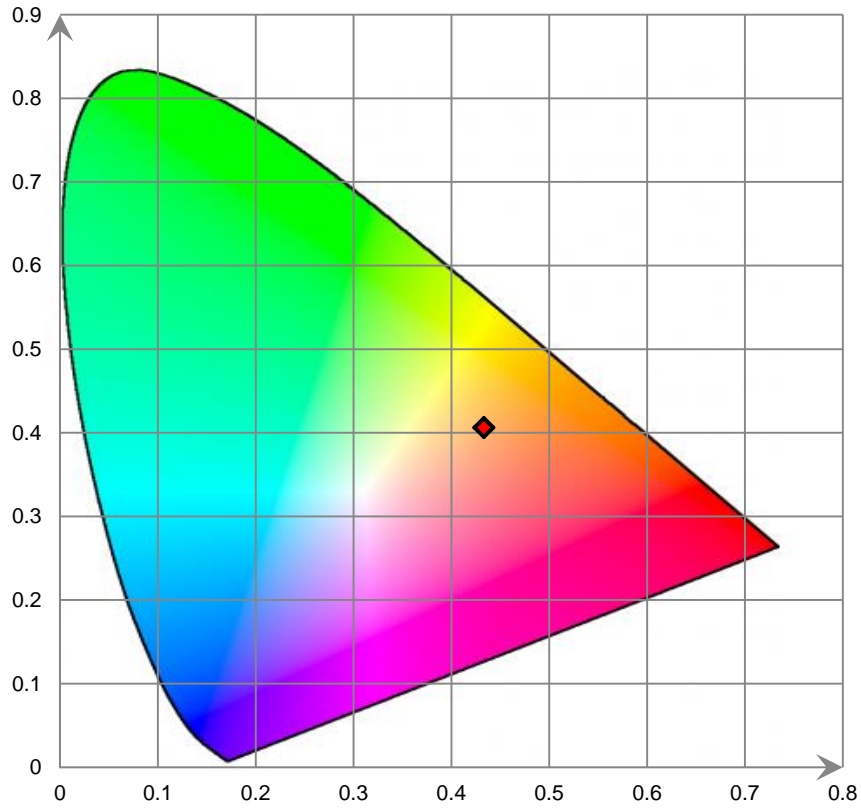


nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	1.641E-01	421	2.070E-01	462	5.536E+00	503	4.432E+00	544	6.622E+00
381	1.818E-01	422	2.287E-01	463	5.351E+00	504	4.502E+00	545	6.698E+00
382	1.488E-01	423	2.572E-01	464	5.176E+00	505	4.562E+00	546	6.748E+00
383	1.131E-01	424	2.770E-01	465	5.000E+00	506	4.630E+00	547	6.838E+00
384	1.051E-01	425	3.079E-01	466	4.844E+00	507	4.701E+00	548	6.912E+00
385	1.135E-01	426	3.431E-01	467	4.728E+00	508	4.758E+00	549	6.986E+00
386	1.207E-01	427	3.761E-01	468	4.641E+00	509	4.813E+00	550	7.059E+00
387	1.007E-01	428	4.228E-01	469	4.572E+00	510	4.876E+00	551	7.131E+00
388	6.942E-02	429	4.632E-01	470	4.486E+00	511	4.923E+00	552	7.222E+00
389	7.231E-02	430	5.128E-01	471	4.421E+00	512	4.978E+00	553	7.306E+00
390	6.366E-02	431	5.568E-01	472	4.351E+00	513	5.028E+00	554	7.380E+00
391	6.660E-02	432	6.139E-01	473	4.263E+00	514	5.088E+00	555	7.488E+00
392	7.699E-02	433	6.761E-01	474	4.198E+00	515	5.137E+00	556	7.575E+00
393	4.776E-02	434	7.437E-01	475	4.095E+00	516	5.194E+00	557	7.661E+00
394	5.325E-02	435	8.248E-01	476	3.999E+00	517	5.224E+00	558	7.745E+00
395	5.764E-02	436	9.011E-01	477	3.893E+00	518	5.278E+00	559	7.833E+00
396	4.670E-02	437	9.853E-01	478	3.801E+00	519	5.333E+00	560	7.934E+00
397	5.333E-02	438	1.096E+00	479	3.702E+00	520	5.367E+00	561	8.050E+00
398	3.965E-02	439	1.200E+00	480	3.643E+00	521	5.415E+00	562	8.134E+00
399	4.914E-02	440	1.323E+00	481	3.580E+00	522	5.458E+00	563	8.230E+00
400	4.879E-02	441	1.448E+00	482	3.546E+00	523	5.510E+00	564	8.335E+00
401	5.080E-02	442	1.608E+00	483	3.527E+00	524	5.546E+00	565	8.438E+00
402	4.945E-02	443	1.767E+00	484	3.520E+00	525	5.602E+00	566	8.545E+00
403	5.175E-02	444	1.969E+00	485	3.525E+00	526	5.652E+00	567	8.667E+00
404	4.987E-02	445	2.198E+00	486	3.544E+00	527	5.676E+00	568	8.754E+00
405	5.118E-02	446	2.458E+00	487	3.576E+00	528	5.744E+00	569	8.871E+00
406	5.790E-02	447	2.754E+00	488	3.605E+00	529	5.791E+00	570	8.990E+00
407	5.643E-02	448	3.079E+00	489	3.646E+00	530	5.835E+00	571	9.092E+00
408	6.751E-02	449	3.431E+00	490	3.678E+00	531	5.881E+00	572	9.222E+00
409	6.497E-02	450	3.834E+00	491	3.731E+00	532	5.937E+00	573	9.327E+00
410	7.041E-02	451	4.224E+00	492	3.784E+00	533	5.988E+00	574	9.426E+00
411	7.716E-02	452	4.640E+00	493	3.831E+00	534	6.031E+00	575	9.551E+00
412	9.467E-02	453	5.014E+00	494	3.875E+00	535	6.081E+00	576	9.670E+00
413	9.429E-02	454	5.350E+00	495	3.928E+00	536	6.133E+00	577	9.758E+00
414	1.037E-01	455	5.651E+00	496	3.987E+00	537	6.201E+00	578	9.876E+00
415	1.123E-01	456	5.873E+00	497	4.040E+00	538	6.238E+00	579	9.975E+00
416	1.282E-01	457	6.005E+00	498	4.098E+00	539	6.311E+00	580	1.009E+01
417	1.386E-01	458	6.043E+00	499	4.169E+00	540	6.367E+00	581	1.020E+01
418	1.551E-01	459	6.017E+00	500	4.224E+00	541	6.430E+00	582	1.032E+01
419	1.669E-01	460	5.917E+00	501	4.298E+00	542	6.495E+00	583	1.040E+01
420	1.943E-01	461	5.745E+00	502	4.362E+00	543	6.563E+00	584	1.049E+01

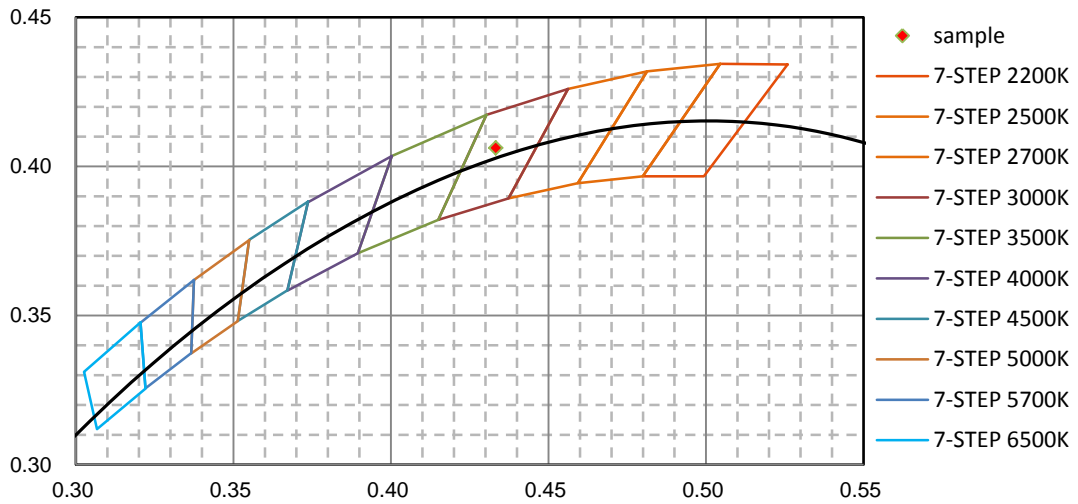


nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.059E+01	626	1.009E+01	667	4.585E+00	708	1.434E+00	749	4.160E-01
586	1.070E+01	627	1.000E+01	668	4.481E+00	709	1.388E+00	750	3.982E-01
587	1.078E+01	628	9.853E+00	669	4.365E+00	710	1.347E+00	751	3.908E-01
588	1.086E+01	629	9.729E+00	670	4.261E+00	711	1.305E+00	752	3.786E-01
589	1.092E+01	630	9.602E+00	671	4.144E+00	712	1.265E+00	753	3.655E-01
590	1.102E+01	631	9.455E+00	672	4.047E+00	713	1.234E+00	754	3.556E-01
591	1.111E+01	632	9.331E+00	673	3.932E+00	714	1.194E+00	755	3.432E-01
592	1.115E+01	633	9.209E+00	674	3.834E+00	715	1.158E+00	756	3.336E-01
593	1.121E+01	634	9.067E+00	675	3.739E+00	716	1.120E+00	757	3.274E-01
594	1.126E+01	635	8.930E+00	676	3.634E+00	717	1.087E+00	758	3.167E-01
595	1.132E+01	636	8.769E+00	677	3.535E+00	718	1.054E+00	759	3.075E-01
596	1.138E+01	637	8.652E+00	678	3.444E+00	719	1.018E+00	760	3.015E-01
597	1.144E+01	638	8.507E+00	679	3.352E+00	720	9.867E-01	761	2.934E-01
598	1.146E+01	639	8.373E+00	680	3.253E+00	721	9.646E-01	762	2.824E-01
599	1.147E+01	640	8.231E+00	681	3.160E+00	722	9.343E-01	763	2.742E-01
600	1.150E+01	641	8.096E+00	682	3.080E+00	723	9.030E-01	764	2.659E-01
601	1.153E+01	642	7.937E+00	683	2.993E+00	724	8.746E-01	765	2.555E-01
602	1.154E+01	643	7.803E+00	684	2.916E+00	725	8.496E-01	766	2.484E-01
603	1.154E+01	644	7.652E+00	685	2.838E+00	726	8.285E-01	767	2.446E-01
604	1.155E+01	645	7.517E+00	686	2.756E+00	727	8.031E-01	768	2.397E-01
605	1.152E+01	646	7.371E+00	687	2.681E+00	728	7.808E-01	769	2.340E-01
606	1.152E+01	647	7.210E+00	688	2.603E+00	729	7.533E-01	770	2.259E-01
607	1.152E+01	648	7.084E+00	689	2.524E+00	730	7.317E-01	771	2.228E-01
608	1.148E+01	649	6.944E+00	690	2.463E+00	731	7.080E-01	772	2.158E-01
609	1.146E+01	650	6.818E+00	691	2.387E+00	732	6.906E-01	773	2.083E-01
610	1.145E+01	651	6.672E+00	692	2.308E+00	733	6.671E-01	774	2.026E-01
611	1.139E+01	652	6.519E+00	693	2.252E+00	734	6.502E-01	775	1.996E-01
612	1.136E+01	653	6.389E+00	694	2.181E+00	735	6.296E-01	776	1.921E-01
613	1.130E+01	654	6.257E+00	695	2.127E+00	736	6.117E-01	777	1.879E-01
614	1.125E+01	655	6.117E+00	696	2.062E+00	737	5.952E-01	778	1.807E-01
615	1.116E+01	656	5.974E+00	697	1.992E+00	738	5.698E-01	779	1.826E-01
616	1.108E+01	657	5.836E+00	698	1.933E+00	739	5.587E-01	780	1.830E-01
617	1.099E+01	658	5.710E+00	699	1.868E+00	740	5.397E-01		
618	1.092E+01	659	5.583E+00	700	1.818E+00	741	5.269E-01		
619	1.082E+01	660	5.457E+00	701	1.769E+00	742	5.068E-01		
620	1.073E+01	661	5.332E+00	702	1.712E+00	743	4.938E-01		
621	1.064E+01	662	5.189E+00	703	1.669E+00	744	4.791E-01		
622	1.053E+01	663	5.099E+00	704	1.611E+00	745	4.670E-01		
623	1.043E+01	664	4.945E+00	705	1.571E+00	746	4.531E-01		
624	1.032E+01	665	4.826E+00	706	1.523E+00	747	4.360E-01		
625	1.020E+01	666	4.715E+00	707	1.476E+00	748	4.244E-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**

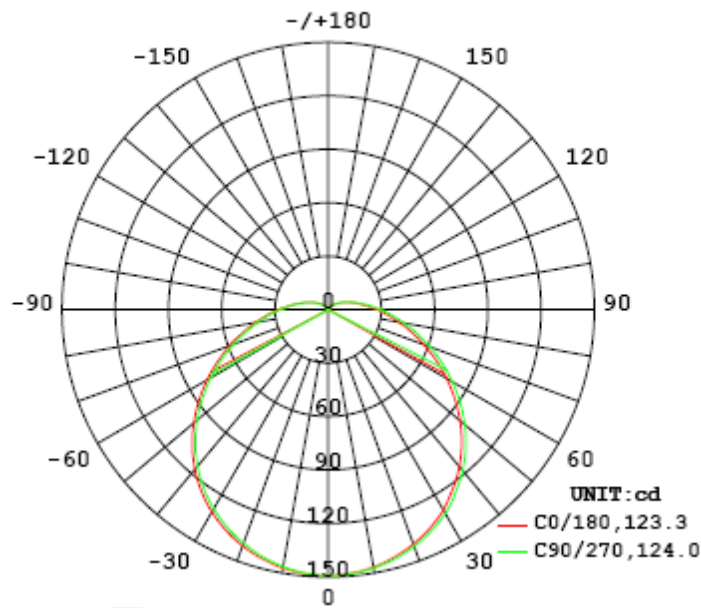
**Electrical Measurement**

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.0	60	0.0506	5.56	0.9156

**Photometric Measurement**

Luminous Flux (lm)	Efficacy (lm/W)	$I_{max}$ (cd)	S/MH (C0/180)	S/MH (C90/270)
575.672	103.54	149.3	1.29	1.31

**Luminous Intensity Distribution**



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% $I_{max}$ ):	123.3	123.9	124.0	123.1	123.6
Field Angle (10% $I_{max}$ ):	210.1	211.1	211.1	209.3	210.4

Luminous Intensity (cd) Distribution Data

C γ	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	149	149	149	149	149	149	149	149
5.0°	149	149	148	148	148	148	148	148
10.0°	147	147	147	147	146	146	146	146
15.0°	145	144	144	144	143	143	143	144
20.0°	141	141	140	140	140	139	140	140
25.0°	137	136	135	135	135	135	135	135
30.0°	131	131	130	130	129	129	129	129
35.0°	125	124	123	123	122	122	122	122
40.0°	117	116	116	115	115	114	114	115
45.0°	108	108	107	107	106	106	105	106
50.0°	99	98	98	97	97	96	96	96
55.0°	89	89	88	87	87	86	86	86
60.0°	79	78	78	77	76	76	75	75
65.0°	69	68	68	67	66	66	65	65
70.0°	59	59	58	57	57	56	56	55
75.0°	50	49	49	48	48	47	47	47
80.0°	42	41	41	40	40	39	39	39
85.0°	34	34	34	33	33	33	32	32
90.0°	28	28	28	27	27	27	26	26
95.0°	23	23	23	22	22	22	21	21
100.0°	19	19	18	18	18	18	17	17
105.0°	15	15	15	15	15	14	14	14
110.0°	12	12	12	12	12	12	11	11
115.0°	10	10	10	10	9	9	9	9
120.0°	8	8	8	8	7	7	7	7
125.0°	6	6	6	6	6	6	6	6
130.0°	5	5	5	5	5	4	4	4
135.0°	4	4	4	4	3	3	3	3
140.0°	3	3	3	3	3	3	3	3
145.0°	2	2	2	2	2	2	2	2
150.0°	1	1	1	1	1	1	1	1
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°	149	149	149	149	149	149	149	149
5.0°	148	149	149	149	149	149	149	149
10.0°	147	147	147	147	147	147	148	148
15.0°	144	144	144	145	145	145	145	145
20.0°	140	140	141	141	141	142	142	142
25.0°	135	136	136	137	137	137	138	137
30.0°	130	130	131	132	132	132	132	132
35.0°	123	123	124	125	125	125	125	125
40.0°	115	116	117	117	118	118	118	118
45.0°	106	107	108	109	110	110	110	109
50.0°	97	98	99	100	100	101	100	100
55.0°	87	88	89	90	91	91	90	90
60.0°	77	78	79	80	81	81	80	80
65.0°	67	68	69	70	71	71	70	69
70.0°	57	59	60	61	61	61	60	59
75.0°	49	50	51	51	52	52	51	50
80.0°	41	42	43	43	43	43	43	42
85.0°	34	35	35	36	36	36	35	35
90.0°	28	28	29	29	30	30	29	28
95.0°	23	23	24	24	24	24	23	23
100.0°	18	19	19	20	20	20	19	19
105.0°	15	15	16	16	16	16	15	15
110.0°	12	12	13	13	13	13	12	12
115.0°	10	10	10	10	10	10	10	10
120.0°	8	8	8	8	8	8	8	8
125.0°	6	6	6	6	7	6	6	6
130.0°	5	5	5	5	5	5	5	5
135.0°	4	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°	1	1	1	1	1	1	1	1
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	3.6	0.62	0-5	3.6	0.62
5-10	10.6	1.83	0-10	14.1	2.45
10-15	17.3	3.00	0-15	31.4	5.45
15-20	23.5	4.08	0-20	54.9	9.53
20-25	29.0	5.04	0-25	83.9	14.57
25-30	33.7	5.86	0-30	117.6	20.43
30-35	37.5	6.50	0-35	155.1	26.93
35-40	40.0	6.96	0-40	195.1	33.89
40-45	41.4	7.19	0-45	236.5	41.08
45-50	41.6	7.23	0-50	278.1	48.31
50-55	40.6	7.04	0-55	318.7	55.35
55-60	38.5	6.69	0-60	357.1	62.04
60-65	35.5	6.17	0-65	392.7	68.21
65-70	32.0	5.56	0-70	424.7	73.77
70-75	28.1	4.89	0-75	452.8	78.66
75-80	24.2	4.20	0-80	477.0	82.86
80-85	20.4	3.56	0-85	497.5	86.42
85-90	17.0	2.94	0-90	514.4	89.36
90-95	13.9	2.42	0-95	528.3	91.78
95-100	11.2	1.95	0-100	539.6	93.73
100-105	9.0	1.56	0-105	548.6	95.29
105-110	7.1	1.23	0-110	555.7	96.52
110-115	5.5	0.96	0-115	561.2	97.48
115-120	4.2	0.74	0-120	565.4	98.22
120-125	3.2	0.56	0-125	568.6	98.78
125-130	2.4	0.40	0-130	571.0	99.18
130-135	1.7	0.30	0-135	572.7	99.48
135-140	1.2	0.20	0-140	573.8	99.68
140-145	0.8	0.14	0-145	574.6	99.82
145-150	0.5	0.08	0-150	575.1	99.90
150-155	0.3	0.05	0-155	575.4	99.95
155-160	0.2	0.03	0-160	575.5	99.98
160-165	0.1	0.01	0-165	575.6	99.99
165-170	0.0	0.01	0-170	575.7	100.00
170-175	0.0	0.00	0-175	575.7	100.00
175-180	0.0	0.00	0-180	575.7	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\*\*\*\*\*