

# IES LM-79-08

## MEASUREMENT AND TEST REPORT

For

### GREEN CREATIVE LTD

Room 3603, Level 36, Tower 1, Enterprise Square Five, 38 Wang Chiu Road, Kowloon Bay, KL, Hong Kong

**Test Model: SLFT4/9CCT5S/DUALDIM**

<b>Report Type:</b>	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution
<b>Project Engineer:</b>	Bay Wang
<b>Report Number:</b>	RKSB221207001-10-2
<b>Test Date:</b>	2022-12-08 to 2022-12-09
<b>Report Date:</b>	2022-12-22
<b>Reviewed By:</b>	Seven Xia / EE Engineer
<b>Prepared By:</b>	Bay Area Compliance Laboratories Corp. (Kunshan). No. 248 Chenghu Road, Kunshan, Jiangsu, People's Republic of China Tel: +86-0512-86175000 Fax: +86-0512-88934268
<b>Accreditation:</b>	The IAS Accreditation Number TL-1044.

## 1. Product Description#

### General Information:

One sample was received on 2022-12-07 and used for testing.

Model Tested:	SLFT4/9CCT5S/DUALDIM
Manufacturer:	GREEN CREATIVE LTD
Brand Name:	GREEN CREATIVE
Product Designation:	LED Recessed Downlight
Burning Time Before Test:	0hour(For New Products)
Color Tunable:	White-Tunable
CCT Range:	2700K, 3000K, 3500K, 4000K, 5000K
Least Efficient Setting:	2700K
Most Consumptive Setting:	2700K
Default Setting:	3500K

### Rated Values:

Rated Voltage/Frequency:	120-277VAC 50/60Hz
Rated Power:	10W/8W/7W
Nominal CCT:	2700K/3000K/3500K/4000K/5000K
Nominal Lumen Output:	800lm/840lm/880lm/880lm/880lm @ 10W

## 2. Standards Used

- IES LM-79-08: Approved Method: Electrical & Photometric Measurement of Solid-state Lighting Products
- ANSI C82.77-10-2014: Harmonic Emission Limits – Related Power Quality Requirements for Lighting Equipment
- IES TM-30-18\*: IES Method for Evaluating Light Source Color Rendition

## 3. Description of Test Equipment

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
2.0m integrating sphere	EVERFINE	R98	G121960CS1361154D	2022-06-21	2023-06-20
spectroradiometer	EVERFINE	HAAS-2000	M12048CS1361148	2022-06-21	2023-06-20
Digital CC&CV DC Power Supply	EVERFINE	WY305	G115986CN1361134	2022-06-21	2023-06-20
Thermal Meter	ANYMETRE	TH-20E	N/A	2022-11-11	2023-11-10
Standard Light Source	Osram	24V/50W	JWWCR020106	2021-09-15	2023-09-14
Digital Power Meter	YOKOGAWA	WT210	91KB35700	2022-11-03	2023-11-02
Intelligence ac power supply	EVERFINE	DPS1005	G119890CS1361121	2022-06-21	2023-06-20
AC Power Supply	INVENTFINE	CHP-5KVA	900511765	2022-06-21	2023-06-20
DC Power Supply	INVENTFINE	WL3010	JWDMP030001	2022-06-21	2023-06-20
Power Meter	INVENTFINE	WT500	GSDSQ200007	2022-11-03	2023-11-02

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
Goniophotometer	INVENTFINE	GPM-1900	YWGCF120001	2022-11-14	2023-11-13
Wireless Weather Station	ZHONGXING	KG218	N/A	2022-06-21	2023-06-20
Standard Light Source	INVENTFINE	N/A	JWBYR040008	2021-12-23	2023-12-22

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Kunshan) 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  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$  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.

4 $\pi$  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  $U_{rel}=2.7\%$  ( $k=2$ ), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is  $U=27\text{K}$  ( $k=2$ ), at the 95% confidence level. The uncertainty of the CRI is  $U=2.7(k=2)$ , at the 95% confidence level.

The uncertainty of power meter AC current  $U_{rel}=0.27\%$  of rdg, AC Voltage  $U_{rel}=0.26\%$  of rdg, Power  $U_{rel}=0.41\%$  ( $k=2$ ), 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 ( $\gamma$ ) 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 flux is  $U_{rel}=2.6\%$  ( $k=2$ ), 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]

#### Control Setting: 2700K

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

Test orientation: **Downward**

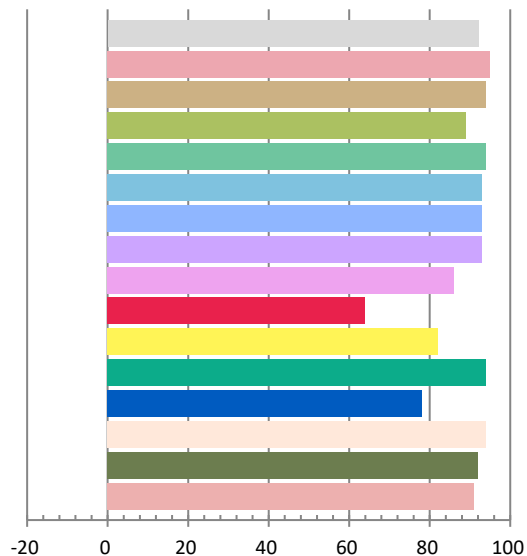
#### Photometric and Electrical Measurement Result

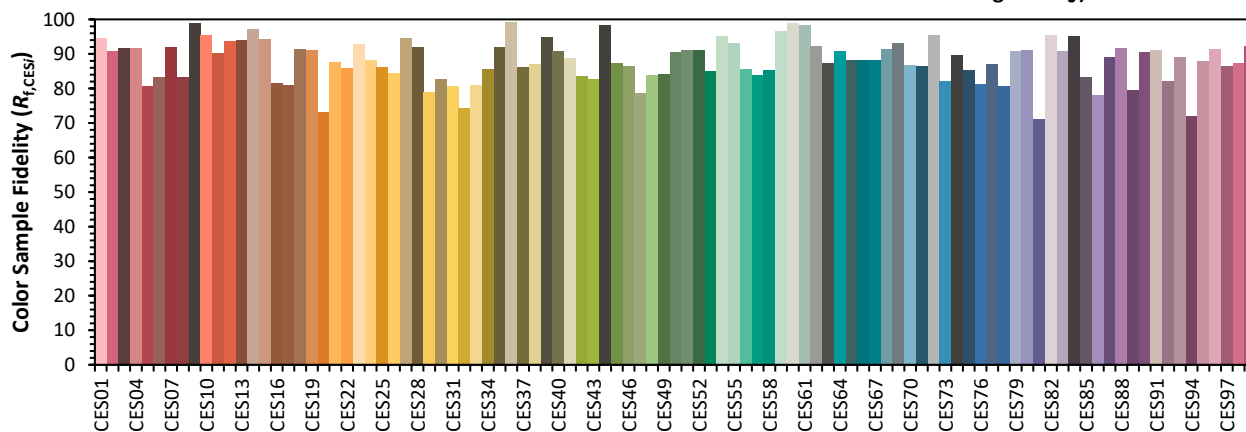
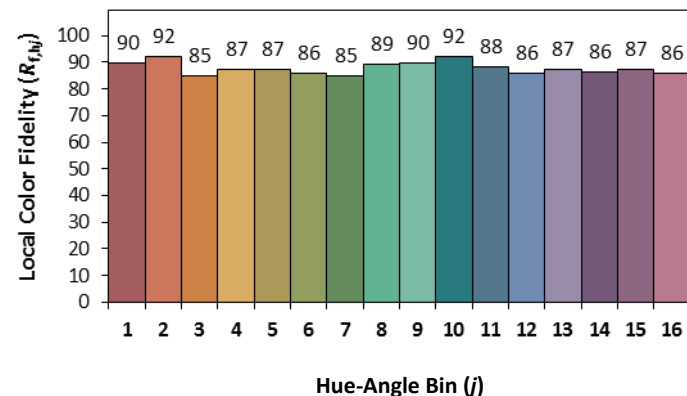
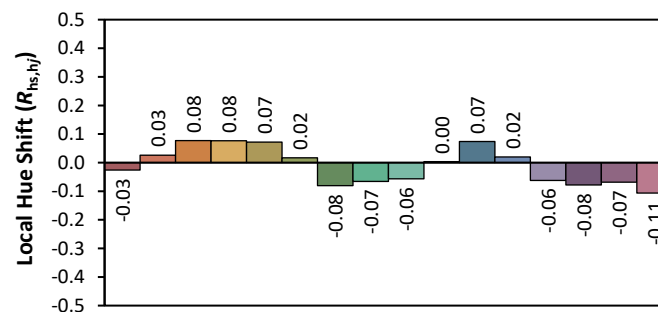
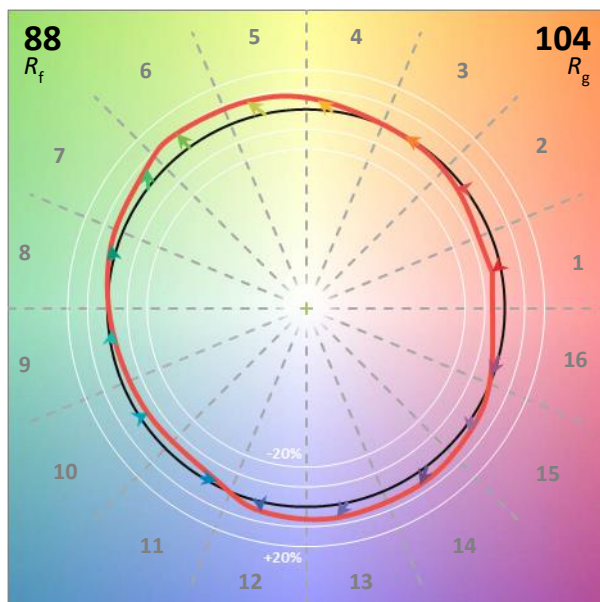
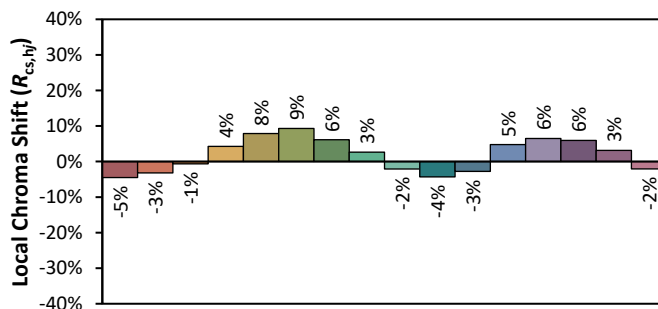
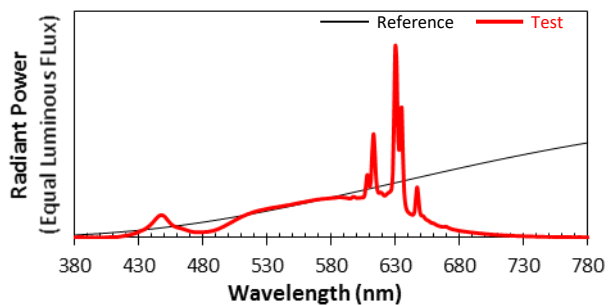
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120	60	0.08124	9.556	0.9803	912.91	95.53

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
2.688	2724	0.00070	0.4591	0.4123	0.2612	0.5279

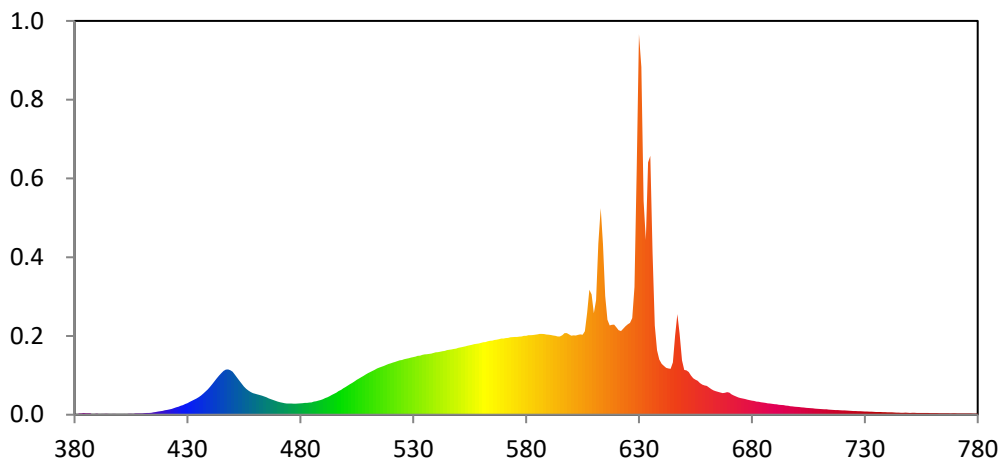
#### Color Rendering Index

Ra			
92.1			
R1	R2	R3	R4
95	94	89	94
R5	R6	R7	R8
93	93	93	86
R9	R10	R11	R12
64	82	94	78
R13	R14	R15	
94	92	91	





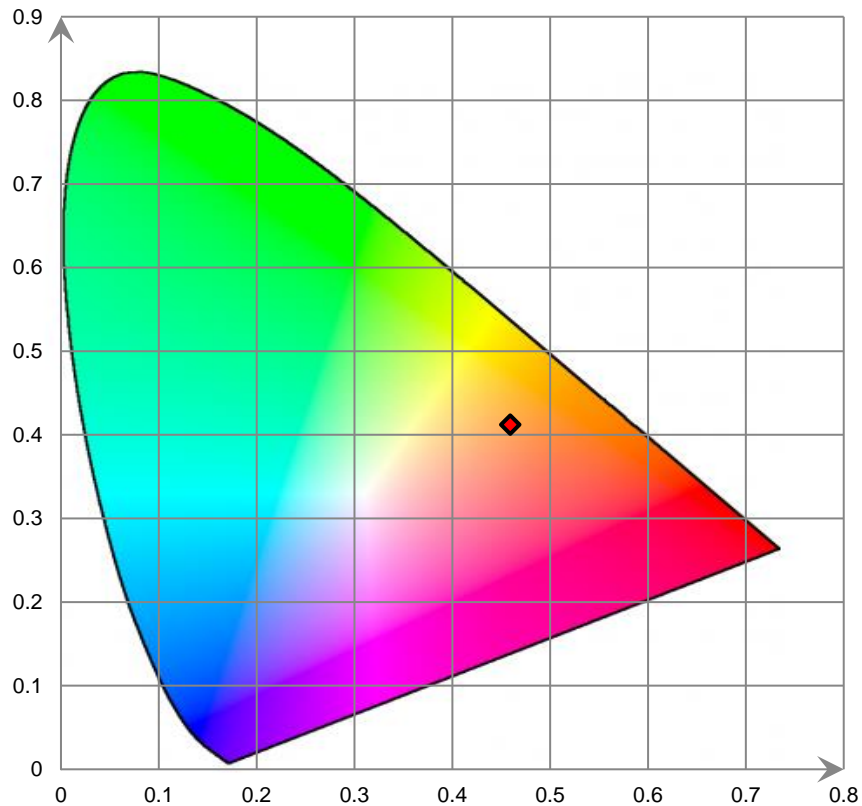
### Relative Spectral Power Distribution



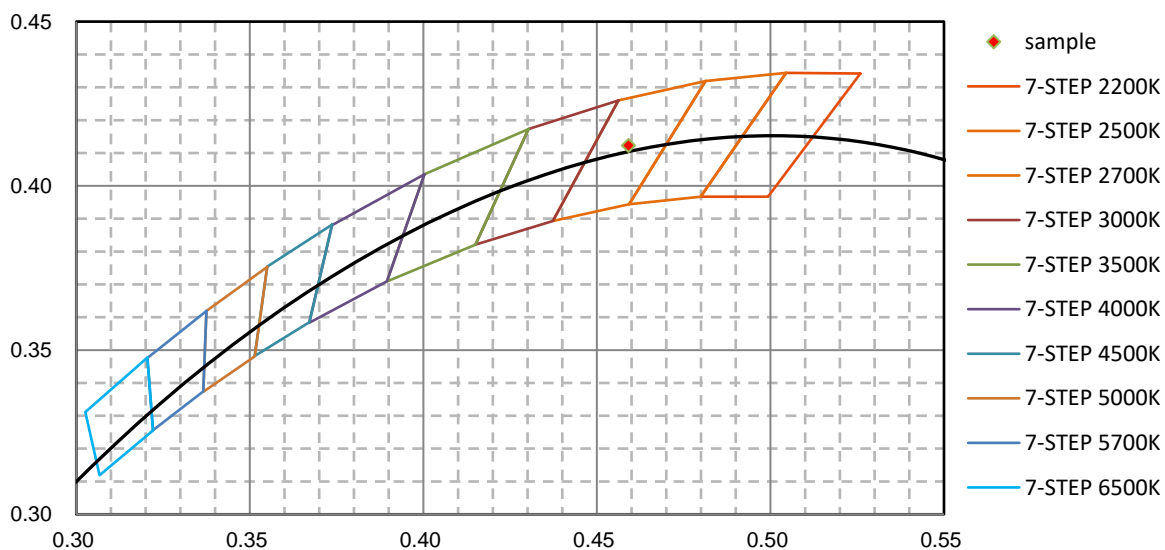
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	2.168E-01	421	8.554E-01	462	3.496E+00	503	5.667E+00	544	1.137E+01
381	4.422E-02	422	9.295E-01	463	3.388E+00	504	5.931E+00	545	1.149E+01
382	2.183E-01	423	1.027E+00	464	3.247E+00	505	6.200E+00	546	1.156E+01
383	2.166E-01	424	1.166E+00	465	3.105E+00	506	6.445E+00	547	1.161E+01
384	3.222E-01	425	1.318E+00	466	2.910E+00	507	6.691E+00	548	1.169E+01
385	2.501E-01	426	1.417E+00	467	2.777E+00	508	6.906E+00	549	1.176E+01
386	2.470E-01	427	1.584E+00	468	2.634E+00	509	7.167E+00	550	1.189E+01
387	2.462E-01	428	1.704E+00	469	2.476E+00	510	7.399E+00	551	1.197E+01
388	4.286E-02	429	1.912E+00	470	2.330E+00	511	7.590E+00	552	1.207E+01
389	1.425E-01	430	2.047E+00	471	2.232E+00	512	7.808E+00	553	1.215E+01
390	1.945E-01	431	2.266E+00	472	2.135E+00	513	7.983E+00	554	1.226E+01
391	8.788E-02	432	2.485E+00	473	2.056E+00	514	8.223E+00	555	1.235E+01
392	1.361E-01	433	2.670E+00	474	2.006E+00	515	8.406E+00	556	1.244E+01
393	1.363E-01	434	2.884E+00	475	1.991E+00	516	8.539E+00	557	1.253E+01
394	1.714E-01	435	3.144E+00	476	1.984E+00	517	8.685E+00	558	1.260E+01
395	1.400E-01	436	3.422E+00	477	1.970E+00	518	8.855E+00	559	1.266E+01
396	1.051E-01	437	3.756E+00	478	1.978E+00	519	9.031E+00	560	1.277E+01
397	1.571E-01	438	4.121E+00	479	1.983E+00	520	9.149E+00	561	1.289E+01
398	1.449E-01	439	4.492E+00	480	2.008E+00	521	9.275E+00	562	1.293E+01
399	1.204E-01	440	4.948E+00	481	2.050E+00	522	9.408E+00	563	1.306E+01
400	1.237E-01	441	5.432E+00	482	2.091E+00	523	9.548E+00	564	1.316E+01
401	9.603E-02	442	5.940E+00	483	2.109E+00	524	9.669E+00	565	1.319E+01
402	1.546E-01	443	6.463E+00	484	2.150E+00	525	9.739E+00	566	1.330E+01
403	1.106E-01	444	6.960E+00	485	2.209E+00	526	9.888E+00	567	1.334E+01
404	1.670E-01	445	7.401E+00	486	2.328E+00	527	9.969E+00	568	1.342E+01
405	1.665E-01	446	7.785E+00	487	2.401E+00	528	1.005E+01	569	1.354E+01
406	1.322E-01	447	8.036E+00	488	2.493E+00	529	1.017E+01	570	1.355E+01
407	2.195E-01	448	8.061E+00	489	2.631E+00	530	1.025E+01	571	1.362E+01
408	2.197E-01	449	7.916E+00	490	2.770E+00	531	1.034E+01	572	1.367E+01
409	2.224E-01	450	7.664E+00	491	2.961E+00	532	1.047E+01	573	1.377E+01
410	2.248E-01	451	7.146E+00	492	3.115E+00	533	1.052E+01	574	1.379E+01
411	2.718E-01	452	6.603E+00	493	3.301E+00	534	1.063E+01	575	1.383E+01
412	3.167E-01	453	6.032E+00	494	3.534E+00	535	1.073E+01	576	1.384E+01
413	3.110E-01	454	5.526E+00	495	3.738E+00	536	1.076E+01	577	1.389E+01
414	3.515E-01	455	5.018E+00	496	3.924E+00	537	1.083E+01	578	1.393E+01
415	4.357E-01	456	4.608E+00	497	4.208E+00	538	1.088E+01	579	1.402E+01
416	4.758E-01	457	4.284E+00	498	4.426E+00	539	1.099E+01	580	1.402E+01
417	5.586E-01	458	4.049E+00	499	4.698E+00	540	1.110E+01	581	1.414E+01
418	6.229E-01	459	3.842E+00	500	4.937E+00	541	1.112E+01	582	1.414E+01
419	6.924E-01	460	3.722E+00	501	5.170E+00	542	1.121E+01	583	1.416E+01
420	7.946E-01	461	3.614E+00	502	5.451E+00	543	1.131E+01	584	1.424E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.429E+01	626	1.634E+01	667	3.854E+00	708	1.080E+00	749	3.429E-01
586	1.439E+01	627	1.718E+01	668	3.884E+00	709	1.058E+00	750	3.242E-01
587	1.436E+01	628	2.271E+01	669	4.003E+00	710	1.037E+00	751	3.337E-01
588	1.435E+01	629	4.375E+01	670	3.932E+00	711	9.937E-01	752	3.307E-01
589	1.426E+01	630	6.768E+01	671	3.621E+00	712	9.710E-01	753	3.184E-01
590	1.423E+01	631	6.184E+01	672	3.421E+00	713	9.661E-01	754	3.206E-01
591	1.418E+01	632	3.801E+01	673	3.244E+00	714	9.238E-01	755	3.168E-01
592	1.410E+01	633	3.108E+01	674	3.088E+00	715	8.783E-01	756	3.067E-01
593	1.402E+01	634	4.486E+01	675	2.948E+00	716	8.692E-01	757	3.079E-01
594	1.393E+01	635	4.605E+01	676	2.875E+00	717	8.434E-01	758	3.188E-01
595	1.391E+01	636	2.880E+01	677	2.790E+00	718	8.274E-01	759	2.890E-01
596	1.413E+01	637	1.586E+01	678	2.677E+00	719	8.004E-01	760	2.866E-01
597	1.450E+01	638	1.146E+01	679	2.596E+00	720	7.650E-01	761	2.839E-01
598	1.452E+01	639	9.819E+00	680	2.491E+00	721	7.558E-01	762	2.766E-01
599	1.430E+01	640	9.066E+00	681	2.441E+00	722	7.455E-01	763	2.696E-01
600	1.405E+01	641	8.668E+00	682	2.343E+00	723	7.158E-01	764	2.638E-01
601	1.410E+01	642	8.348E+00	683	2.303E+00	724	6.887E-01	765	2.686E-01
602	1.409E+01	643	8.213E+00	684	2.218E+00	725	6.562E-01	766	2.691E-01
603	1.419E+01	644	8.169E+00	685	2.176E+00	726	6.448E-01	767	2.634E-01
604	1.427E+01	645	9.312E+00	686	2.106E+00	727	6.315E-01	768	2.388E-01
605	1.423E+01	646	1.409E+01	687	2.032E+00	728	6.204E-01	769	2.547E-01
606	1.486E+01	647	1.791E+01	688	1.997E+00	729	5.938E-01	770	2.481E-01
607	1.810E+01	648	1.443E+01	689	1.937E+00	730	5.738E-01	771	2.364E-01
608	2.221E+01	649	9.678E+00	690	1.891E+00	731	5.710E-01	772	2.302E-01
609	2.141E+01	650	7.969E+00	691	1.843E+00	732	5.432E-01	773	2.277E-01
610	1.804E+01	651	7.874E+00	692	1.762E+00	733	5.356E-01	774	2.191E-01
611	2.036E+01	652	7.582E+00	693	1.730E+00	734	5.256E-01	775	2.179E-01
612	3.042E+01	653	6.965E+00	694	1.703E+00	735	4.993E-01	776	2.151E-01
613	3.672E+01	654	6.495E+00	695	1.609E+00	736	4.963E-01	777	2.181E-01
614	3.040E+01	655	6.230E+00	696	1.582E+00	737	4.798E-01	778	1.913E-01
615	2.111E+01	656	6.024E+00	697	1.519E+00	738	4.660E-01	779	1.916E-01
616	1.690E+01	657	5.647E+00	698	1.494E+00	739	4.554E-01	780	1.920E-01
617	1.587E+01	658	5.340E+00	699	1.432E+00	740	4.322E-01		
618	1.600E+01	659	5.215E+00	700	1.400E+00	741	4.316E-01		
619	1.603E+01	660	5.127E+00	701	1.359E+00	742	4.189E-01		
620	1.554E+01	661	4.843E+00	702	1.300E+00	743	4.059E-01		
621	1.502E+01	662	4.557E+00	703	1.290E+00	744	3.830E-01		
622	1.489E+01	663	4.337E+00	704	1.226E+00	745	3.754E-01		
623	1.531E+01	664	4.191E+00	705	1.195E+00	746	3.601E-01		
624	1.573E+01	665	4.071E+00	706	1.162E+00	747	3.460E-01		
625	1.607E+01	666	3.954E+00	707	1.132E+00	748	3.624E-01		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles





## Control Setting: 3000K

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

Test orientation: **Downward**

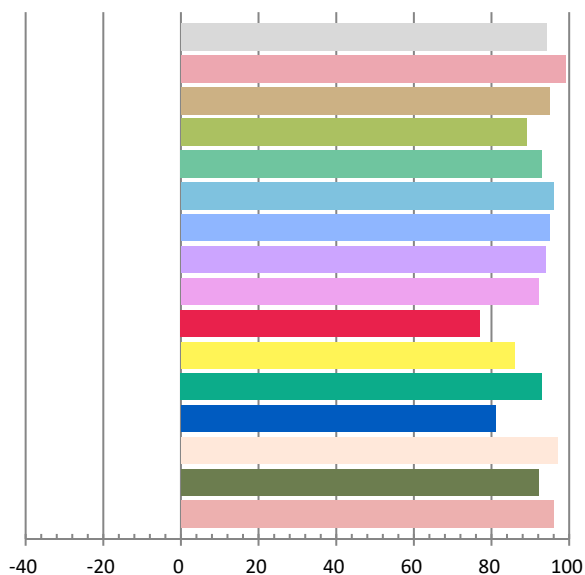
## Photometric and Electrical Measurement Result

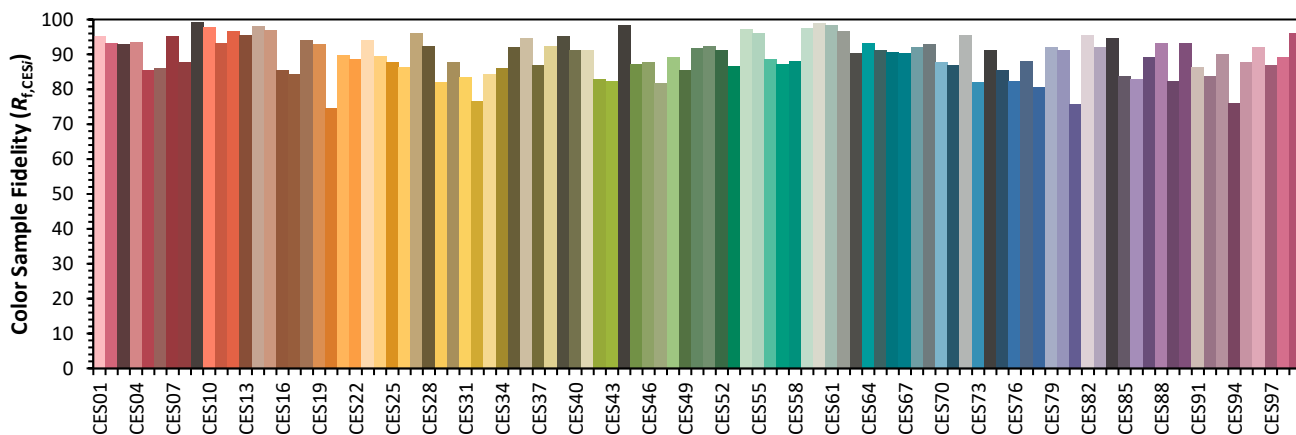
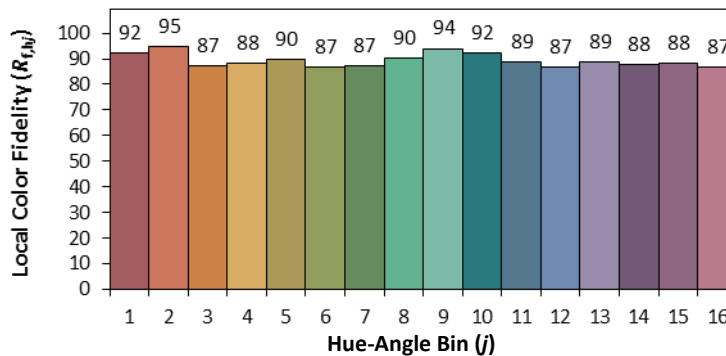
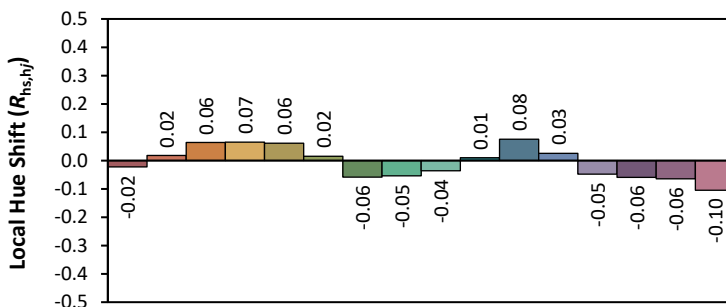
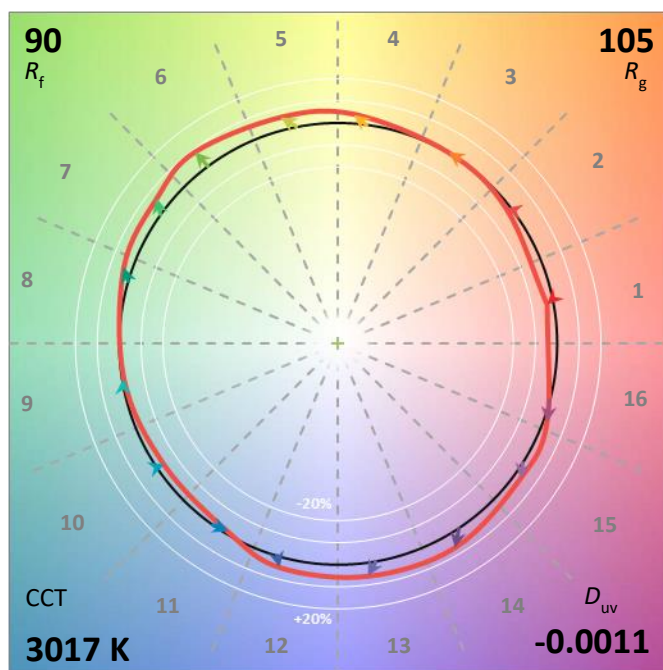
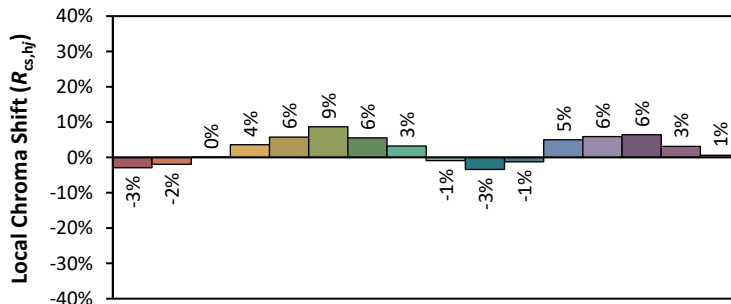
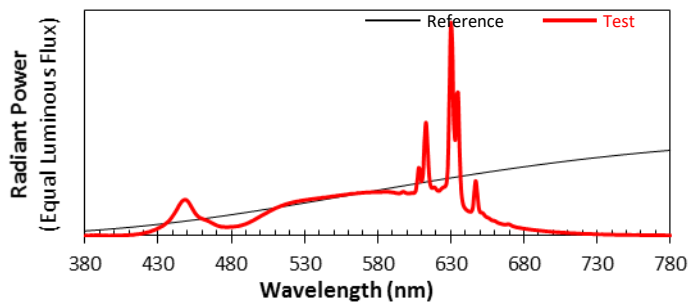
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.08012	9.42	0.9798	934.48	99.2

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
2.788	3018	-0.00107	0.4341	0.4004	0.2503	0.5195

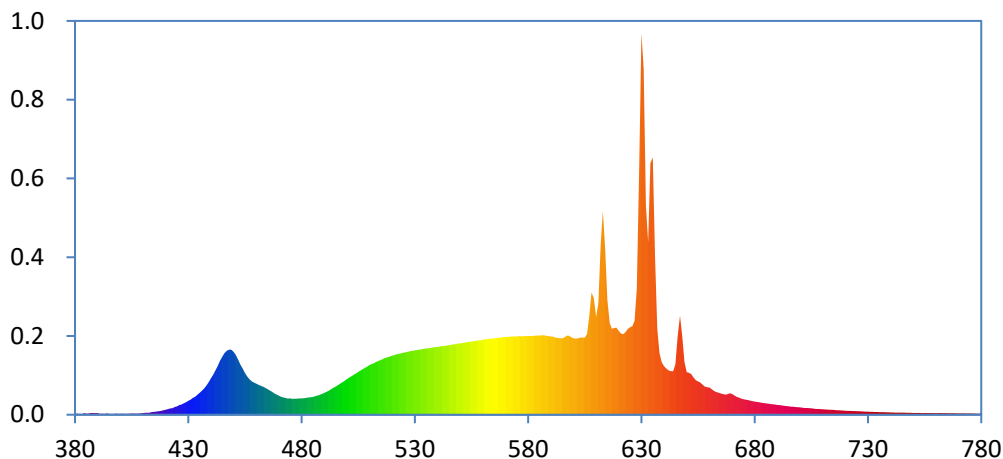
## Color Rendering Index

<b>Ra</b>			
<b>94.2</b>			
<b>R1</b>	<b>R2</b>	<b>R3</b>	<b>R4</b>
99	95	89	93
<b>R5</b>	<b>R6</b>	<b>R7</b>	<b>R8</b>
96	95	94	92
<b>R9</b>	<b>R10</b>	<b>R11</b>	<b>R12</b>
77	86	93	81
<b>R13</b>	<b>R14</b>	<b>R15</b>	
97	92	96	





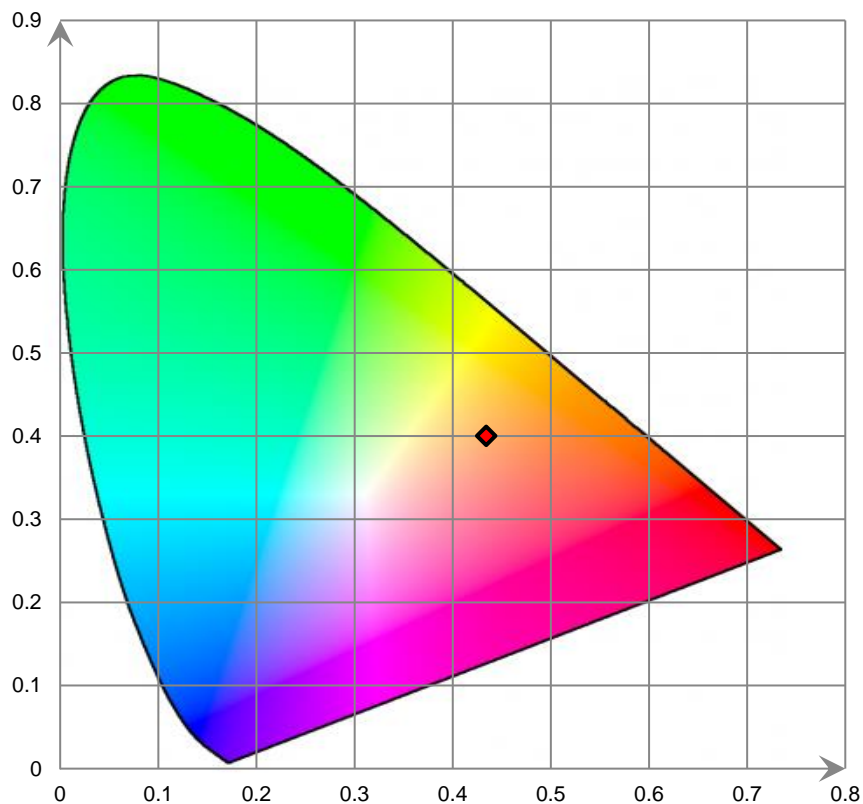
### Relative Spectral Power Distribution



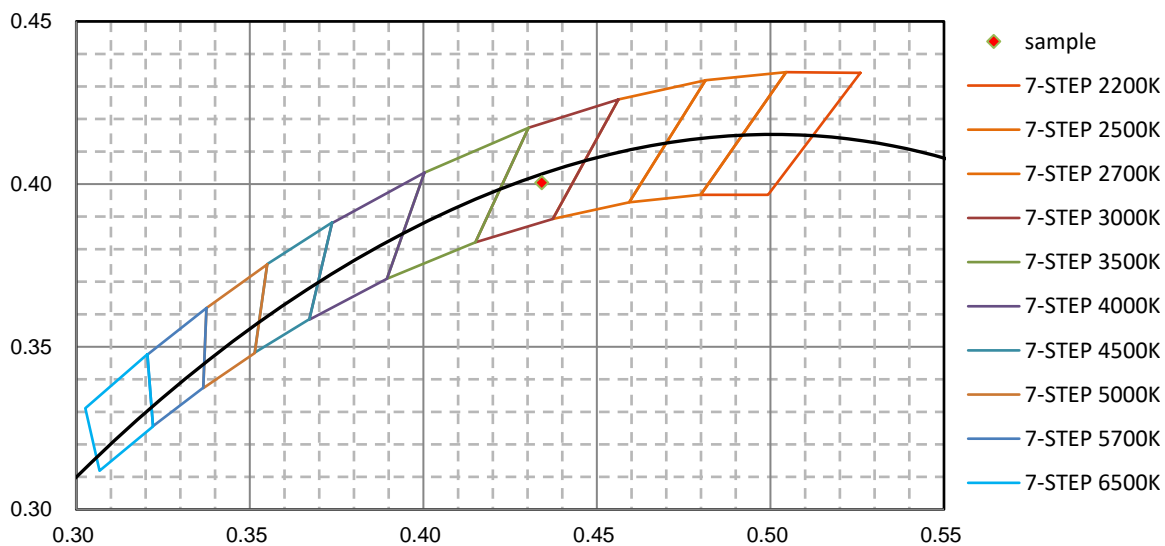
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	9.549E-02	421	9.810E-01	462	5.073E+00	503	6.986E+00	544	1.214E+01
381	1.908E-01	422	1.101E+00	463	4.910E+00	504	7.250E+00	545	1.218E+01
382	5.504E-02	423	1.162E+00	464	4.722E+00	505	7.514E+00	546	1.225E+01
383	1.538E-02	424	1.337E+00	465	4.503E+00	506	7.756E+00	547	1.233E+01
384	2.917E-01	425	1.463E+00	466	4.224E+00	507	7.991E+00	548	1.239E+01
385	1.760E-01	426	1.678E+00	467	4.011E+00	508	8.228E+00	549	1.249E+01
386	2.046E-01	427	1.795E+00	468	3.744E+00	509	8.450E+00	550	1.251E+01
387	2.984E-01	428	1.999E+00	469	3.533E+00	510	8.714E+00	551	1.255E+01
388	2.678E-01	429	2.197E+00	470	3.327E+00	511	8.885E+00	552	1.265E+01
389	2.718E-01	430	2.442E+00	471	3.157E+00	512	9.070E+00	553	1.271E+01
390	2.781E-01	431	2.645E+00	472	3.042E+00	513	9.270E+00	554	1.279E+01
391	1.482E-01	432	2.933E+00	473	2.926E+00	514	9.471E+00	555	1.283E+01
392	1.656E-01	433	3.156E+00	474	2.844E+00	515	9.605E+00	556	1.289E+01
393	1.189E-01	434	3.471E+00	475	2.850E+00	516	9.798E+00	557	1.295E+01
394	2.128E-01	435	3.856E+00	476	2.781E+00	517	9.976E+00	558	1.303E+01
395	1.496E-01	436	4.218E+00	477	2.799E+00	518	1.008E+01	559	1.306E+01
396	8.416E-02	437	4.614E+00	478	2.801E+00	519	1.022E+01	560	1.314E+01
397	6.271E-02	438	5.120E+00	479	2.857E+00	520	1.036E+01	561	1.325E+01
398	2.074E-01	439	5.708E+00	480	2.853E+00	521	1.047E+01	562	1.323E+01
399	1.529E-01	440	6.362E+00	481	2.894E+00	522	1.059E+01	563	1.334E+01
400	1.344E-01	441	7.030E+00	482	2.947E+00	523	1.068E+01	564	1.337E+01
401	1.570E-01	442	7.811E+00	483	3.026E+00	524	1.079E+01	565	1.335E+01
402	1.437E-01	443	8.568E+00	484	3.054E+00	525	1.088E+01	566	1.347E+01
403	1.346E-01	444	9.454E+00	485	3.128E+00	526	1.095E+01	567	1.351E+01
404	1.625E-01	445	1.015E+01	486	3.258E+00	527	1.106E+01	568	1.353E+01
405	1.968E-01	446	1.082E+01	487	3.362E+00	528	1.113E+01	569	1.357E+01
406	1.907E-01	447	1.121E+01	488	3.496E+00	529	1.120E+01	570	1.363E+01
407	1.829E-01	448	1.143E+01	489	3.652E+00	530	1.130E+01	571	1.364E+01
408	2.031E-01	449	1.140E+01	490	3.810E+00	531	1.134E+01	572	1.370E+01
409	2.340E-01	450	1.103E+01	491	4.008E+00	532	1.143E+01	573	1.371E+01
410	2.880E-01	451	1.046E+01	492	4.209E+00	533	1.147E+01	574	1.373E+01
411	3.526E-01	452	9.688E+00	493	4.453E+00	534	1.157E+01	575	1.373E+01
412	3.402E-01	453	8.821E+00	494	4.702E+00	535	1.162E+01	576	1.380E+01
413	3.759E-01	454	8.092E+00	495	4.903E+00	536	1.168E+01	577	1.374E+01
414	4.748E-01	455	7.320E+00	496	5.158E+00	537	1.171E+01	578	1.376E+01
415	5.150E-01	456	6.698E+00	497	5.451E+00	538	1.180E+01	579	1.383E+01
416	5.759E-01	457	6.243E+00	498	5.713E+00	539	1.184E+01	580	1.379E+01
417	6.180E-01	458	5.862E+00	499	5.957E+00	540	1.190E+01	581	1.381E+01
418	6.747E-01	459	5.627E+00	500	6.232E+00	541	1.196E+01	582	1.381E+01
419	7.752E-01	460	5.432E+00	501	6.503E+00	542	1.204E+01	583	1.386E+01
420	8.838E-01	461	5.258E+00	502	6.742E+00	543	1.208E+01	584	1.389E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.390E+01	626	1.553E+01	667	3.547E+00	708	1.020E+00	749	3.317E-01
586	1.393E+01	627	1.644E+01	668	3.597E+00	709	9.768E-01	750	3.081E-01
587	1.394E+01	628	2.207E+01	669	3.758E+00	710	9.532E-01	751	3.023E-01
588	1.384E+01	629	4.323E+01	670	3.663E+00	711	9.253E-01	752	3.096E-01
589	1.380E+01	630	6.687E+01	671	3.396E+00	712	9.074E-01	753	3.046E-01
590	1.371E+01	631	6.065E+01	672	3.139E+00	713	8.704E-01	754	2.912E-01
591	1.369E+01	632	3.669E+01	673	2.990E+00	714	8.637E-01	755	3.072E-01
592	1.354E+01	633	3.024E+01	674	2.840E+00	715	8.344E-01	756	2.786E-01
593	1.346E+01	634	4.415E+01	675	2.723E+00	716	7.929E-01	757	2.794E-01
594	1.343E+01	635	4.511E+01	676	2.648E+00	717	7.727E-01	758	2.916E-01
595	1.339E+01	636	2.766E+01	677	2.566E+00	718	7.513E-01	759	2.797E-01
596	1.357E+01	637	1.504E+01	678	2.473E+00	719	7.205E-01	760	2.572E-01
597	1.388E+01	638	1.078E+01	679	2.386E+00	720	7.043E-01	761	2.750E-01
598	1.387E+01	639	9.184E+00	680	2.302E+00	721	6.649E-01	762	2.823E-01
599	1.359E+01	640	8.528E+00	681	2.249E+00	722	6.748E-01	763	2.598E-01
600	1.342E+01	641	8.089E+00	682	2.193E+00	723	6.516E-01	764	2.661E-01
601	1.337E+01	642	7.783E+00	683	2.104E+00	724	6.355E-01	765	2.631E-01
602	1.340E+01	643	7.639E+00	684	2.052E+00	725	6.073E-01	766	2.581E-01
603	1.352E+01	644	7.623E+00	685	1.988E+00	726	6.095E-01	767	2.446E-01
604	1.352E+01	645	8.823E+00	686	1.943E+00	727	5.806E-01	768	2.409E-01
605	1.352E+01	646	1.364E+01	687	1.871E+00	728	5.544E-01	769	2.324E-01
606	1.414E+01	647	1.735E+01	688	1.819E+00	729	5.471E-01	770	2.237E-01
607	1.736E+01	648	1.378E+01	689	1.789E+00	730	5.326E-01	771	2.260E-01
608	2.142E+01	649	9.203E+00	690	1.728E+00	731	5.203E-01	772	2.228E-01
609	2.052E+01	650	7.464E+00	691	1.686E+00	732	4.961E-01	773	2.277E-01
610	1.716E+01	651	7.362E+00	692	1.633E+00	733	4.868E-01	774	2.048E-01
611	1.961E+01	652	7.143E+00	693	1.579E+00	734	4.848E-01	775	2.179E-01
612	2.968E+01	653	6.547E+00	694	1.524E+00	735	4.584E-01	776	2.063E-01
613	3.571E+01	654	6.062E+00	695	1.489E+00	736	4.459E-01	777	1.908E-01
614	2.923E+01	655	5.832E+00	696	1.415E+00	737	4.420E-01	778	1.704E-01
615	2.016E+01	656	5.636E+00	697	1.393E+00	738	4.207E-01	779	1.707E-01
616	1.606E+01	657	5.270E+00	698	1.355E+00	739	4.162E-01	780	1.710E-01
617	1.507E+01	658	4.942E+00	699	1.310E+00	740	3.881E-01		
618	1.522E+01	659	4.841E+00	700	1.283E+00	741	3.946E-01		
619	1.528E+01	660	4.777E+00	701	1.236E+00	742	3.814E-01		
620	1.471E+01	661	4.491E+00	702	1.191E+00	743	3.699E-01		
621	1.423E+01	662	4.171E+00	703	1.169E+00	744	3.610E-01		
622	1.415E+01	663	3.998E+00	704	1.141E+00	745	3.627E-01		
623	1.452E+01	664	3.870E+00	705	1.110E+00	746	3.605E-01		
624	1.505E+01	665	3.737E+00	706	1.061E+00	747	3.433E-01		
625	1.535E+01	666	3.628E+00	707	1.020E+00	748	3.311E-01		

CIE 1931xy Chromaticity Diagram



7-StepChromaticity Quadrangles



**Control Setting: 3500K**

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

Test orientation: **Downward**

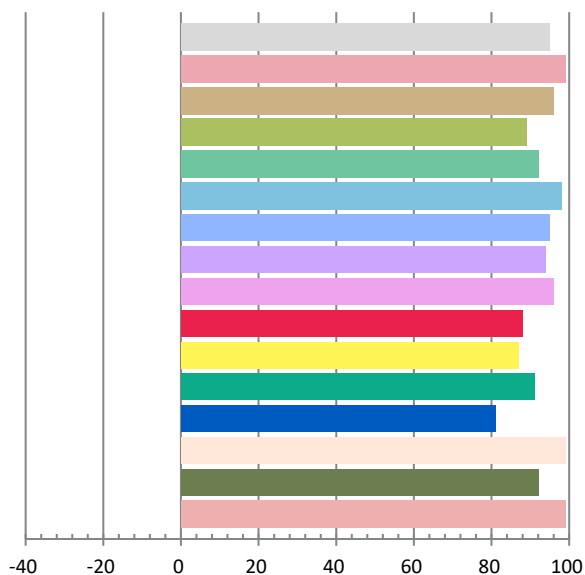
**Photometric and Electrical Measurement Result**

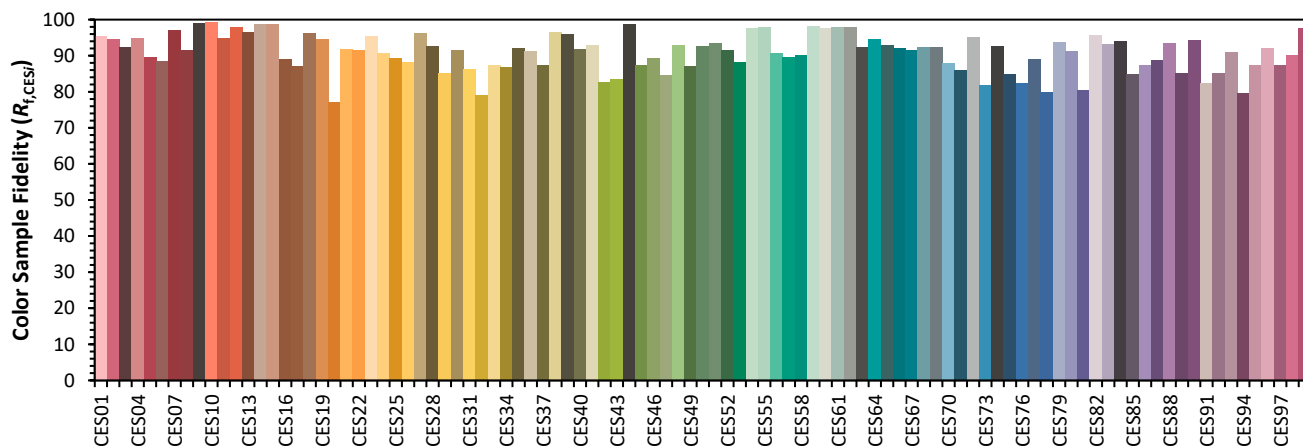
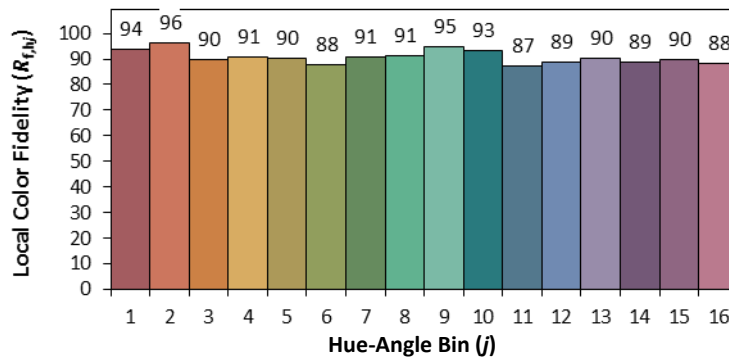
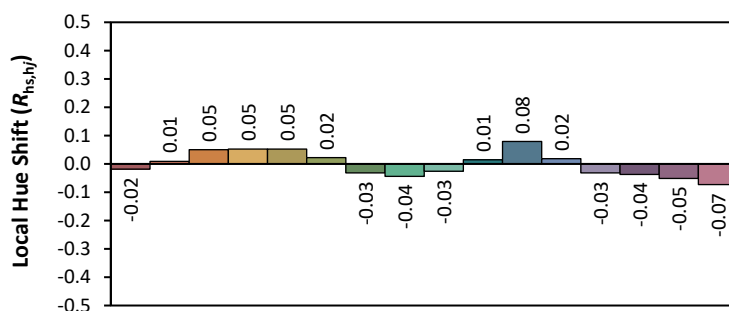
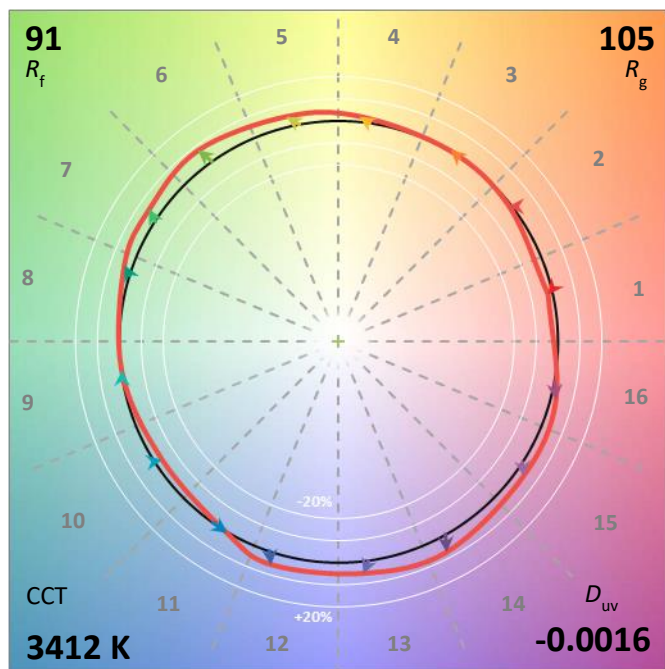
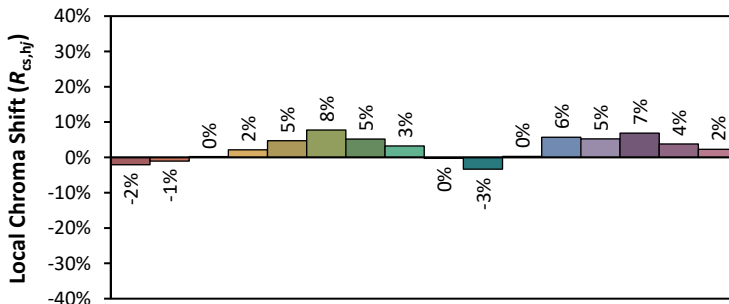
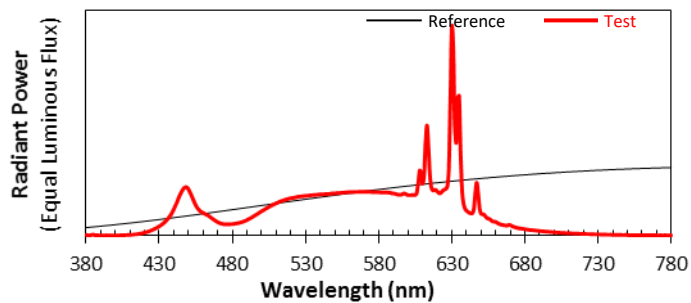
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.07896	9.276	0.979	953.36	102.78

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
2.881	3412	-0.00153	0.4086	0.3889	0.2386	0.5110

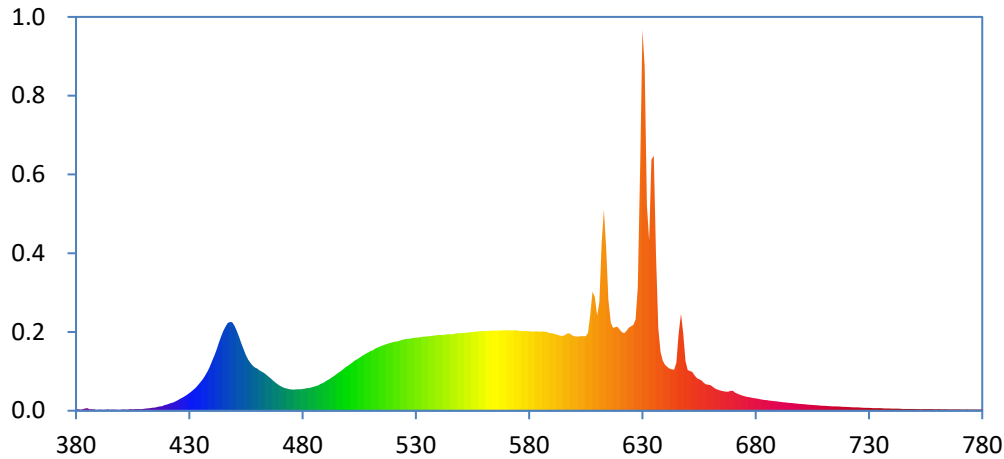
**Color Rendering Index**

<b>Ra</b>			
<b>94.9</b>			
<b>R1</b>	<b>R2</b>	<b>R3</b>	<b>R4</b>
99	96	89	92
<b>R5</b>	<b>R6</b>	<b>R7</b>	<b>R8</b>
98	95	94	96
<b>R9</b>	<b>R10</b>	<b>R11</b>	<b>R12</b>
88	87	91	81
<b>R13</b>	<b>R14</b>	<b>R15</b>	
99	92	99	





### Relative Spectral Power Distribution

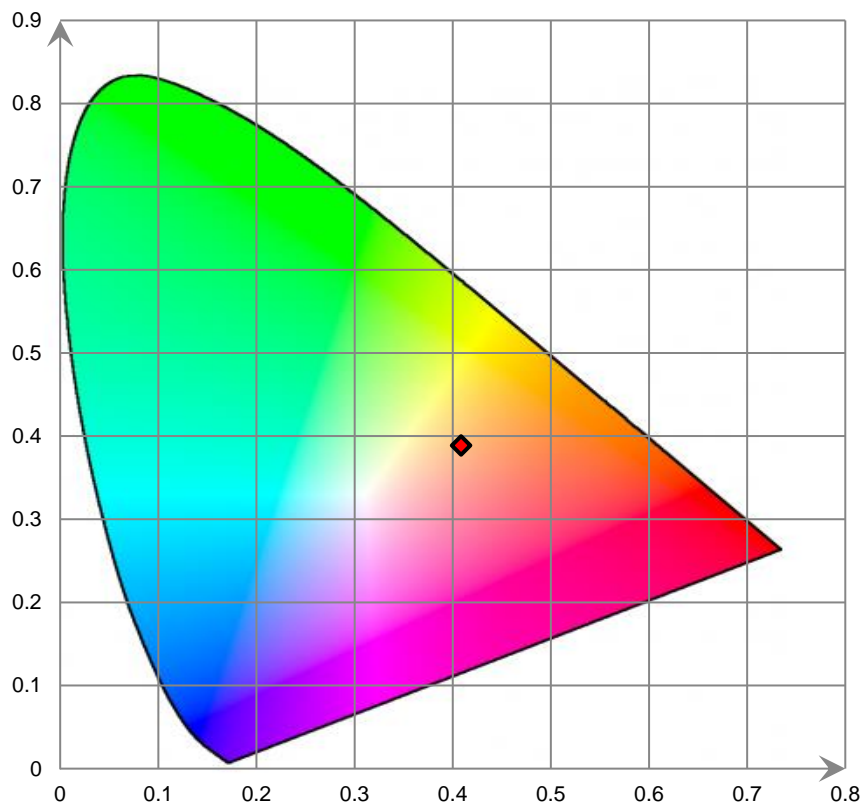


nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	3.320E-01	421	1.161E+00	462	6.613E+00	503	8.482E+00	544	1.297E+01
381	2.234E-01	422	1.301E+00	463	6.404E+00	504	8.704E+00	545	1.299E+01
382	1.523E-01	423	1.419E+00	464	6.121E+00	505	8.957E+00	546	1.296E+01
383	2.557E-01	424	1.613E+00	465	5.785E+00	506	9.220E+00	547	1.304E+01
384	3.730E-01	425	1.802E+00	466	5.456E+00	507	9.447E+00	548	1.313E+01
385	4.344E-01	426	2.025E+00	467	5.113E+00	508	9.703E+00	549	1.315E+01
386	2.439E-01	427	2.225E+00	468	4.792E+00	509	9.883E+00	550	1.314E+01
387	2.315E-01	428	2.435E+00	469	4.518E+00	510	1.013E+01	551	1.322E+01
388	2.564E-01	429	2.721E+00	470	4.251E+00	511	1.027E+01	552	1.323E+01
389	8.683E-02	430	2.988E+00	471	4.055E+00	512	1.054E+01	553	1.327E+01
390	1.583E-01	431	3.285E+00	472	3.867E+00	513	1.070E+01	554	1.332E+01
391	1.659E-01	432	3.614E+00	473	3.759E+00	514	1.085E+01	555	1.335E+01
392	1.344E-01	433	3.976E+00	474	3.664E+00	515	1.101E+01	556	1.338E+01
393	1.622E-01	434	4.387E+00	475	3.599E+00	516	1.117E+01	557	1.343E+01
394	2.286E-01	435	4.877E+00	476	3.591E+00	517	1.131E+01	558	1.346E+01
395	1.265E-01	436	5.363E+00	477	3.608E+00	518	1.142E+01	559	1.350E+01
396	1.961E-01	437	5.965E+00	478	3.636E+00	519	1.154E+01	560	1.351E+01
397	1.770E-01	438	6.619E+00	479	3.648E+00	520	1.164E+01	561	1.353E+01
398	1.530E-01	439	7.417E+00	480	3.691E+00	521	1.174E+01	562	1.352E+01
399	1.222E-01	440	8.332E+00	481	3.736E+00	522	1.179E+01	563	1.357E+01
400	1.525E-01	441	9.317E+00	482	3.825E+00	523	1.189E+01	564	1.360E+01
401	2.179E-01	442	1.032E+01	483	3.870E+00	524	1.203E+01	565	1.359E+01
402	1.661E-01	443	1.149E+01	484	3.971E+00	525	1.211E+01	566	1.359E+01
403	2.006E-01	444	1.255E+01	485	4.082E+00	526	1.219E+01	567	1.361E+01
404	2.590E-01	445	1.352E+01	486	4.222E+00	527	1.221E+01	568	1.363E+01
405	2.117E-01	446	1.424E+01	487	4.322E+00	528	1.227E+01	569	1.366E+01
406	2.612E-01	447	1.487E+01	488	4.547E+00	529	1.235E+01	570	1.364E+01
407	2.766E-01	448	1.507E+01	489	4.692E+00	530	1.239E+01	571	1.363E+01
408	2.775E-01	449	1.498E+01	490	4.929E+00	531	1.241E+01	572	1.363E+01
409	2.835E-01	450	1.437E+01	491	5.182E+00	532	1.248E+01	573	1.362E+01
410	3.133E-01	451	1.352E+01	492	5.405E+00	533	1.254E+01	574	1.365E+01
411	3.758E-01	452	1.253E+01	493	5.677E+00	534	1.258E+01	575	1.359E+01
412	4.119E-01	453	1.143E+01	494	5.920E+00	535	1.262E+01	576	1.353E+01
413	4.738E-01	454	1.037E+01	495	6.206E+00	536	1.265E+01	577	1.351E+01
414	5.130E-01	455	9.430E+00	496	6.483E+00	537	1.268E+01	578	1.352E+01
415	5.566E-01	456	8.649E+00	497	6.767E+00	538	1.274E+01	579	1.348E+01
416	6.534E-01	457	8.133E+00	498	7.070E+00	539	1.278E+01	580	1.350E+01
417	7.379E-01	458	7.653E+00	499	7.377E+00	540	1.286E+01	581	1.345E+01
418	7.729E-01	459	7.322E+00	500	7.633E+00	541	1.286E+01	582	1.343E+01
419	9.498E-01	460	7.129E+00	501	7.907E+00	542	1.286E+01	583	1.346E+01
420	1.040E+00	461	6.847E+00	502	8.185E+00	543	1.292E+01	584	1.344E+01

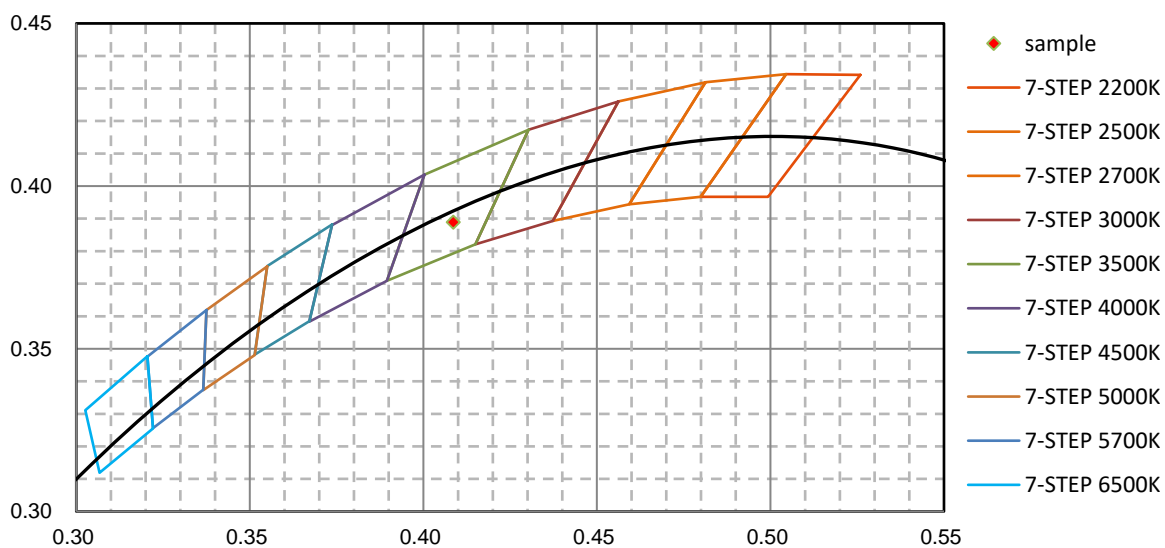


nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.342E+01	626	1.454E+01	667	3.225E+00	708	8.895E-01	749	3.058E-01
586	1.345E+01	627	1.544E+01	668	3.240E+00	709	8.565E-01	750	2.911E-01
587	1.337E+01	628	2.094E+01	669	3.408E+00	710	8.534E-01	751	2.675E-01
588	1.336E+01	629	4.174E+01	670	3.352E+00	711	8.193E-01	752	2.686E-01
589	1.315E+01	630	6.465E+01	671	3.053E+00	712	7.998E-01	753	2.558E-01
590	1.313E+01	631	5.831E+01	672	2.883E+00	713	7.762E-01	754	2.625E-01
591	1.306E+01	632	3.487E+01	673	2.717E+00	714	7.353E-01	755	2.644E-01
592	1.292E+01	633	2.883E+01	674	2.591E+00	715	7.200E-01	756	2.628E-01
593	1.280E+01	634	4.259E+01	675	2.473E+00	716	7.267E-01	757	2.588E-01
594	1.271E+01	635	4.327E+01	676	2.373E+00	717	6.935E-01	758	2.602E-01
595	1.270E+01	636	2.619E+01	677	2.311E+00	718	6.732E-01	759	2.336E-01
596	1.286E+01	637	1.404E+01	678	2.235E+00	719	6.410E-01	760	2.402E-01
597	1.313E+01	638	9.997E+00	679	2.159E+00	720	6.407E-01	761	2.578E-01
598	1.308E+01	639	8.487E+00	680	2.093E+00	721	6.347E-01	762	2.191E-01
599	1.279E+01	640	7.796E+00	681	2.022E+00	722	6.024E-01	763	2.445E-01
600	1.261E+01	641	7.424E+00	682	1.954E+00	723	5.770E-01	764	2.398E-01
601	1.259E+01	642	7.140E+00	683	1.881E+00	724	5.726E-01	765	2.260E-01
602	1.259E+01	643	6.994E+00	684	1.816E+00	725	5.582E-01	766	2.301E-01
603	1.265E+01	644	6.991E+00	685	1.792E+00	726	5.378E-01	767	2.267E-01
604	1.266E+01	645	8.155E+00	686	1.725E+00	727	5.291E-01	768	2.199E-01
605	1.265E+01	646	1.300E+01	687	1.695E+00	728	4.915E-01	769	2.055E-01
606	1.323E+01	647	1.646E+01	688	1.618E+00	729	4.857E-01	770	2.128E-01
607	1.637E+01	648	1.309E+01	689	1.588E+00	730	4.974E-01	771	1.953E-01
608	2.021E+01	649	8.451E+00	690	1.540E+00	731	4.722E-01	772	1.981E-01
609	1.932E+01	650	6.893E+00	691	1.502E+00	732	4.467E-01	773	2.075E-01
610	1.615E+01	651	6.719E+00	692	1.440E+00	733	4.444E-01	774	1.850E-01
611	1.853E+01	652	6.587E+00	693	1.419E+00	734	4.357E-01	775	1.949E-01
612	2.837E+01	653	6.029E+00	694	1.371E+00	735	4.266E-01	776	1.801E-01
613	3.413E+01	654	5.553E+00	695	1.324E+00	736	3.997E-01	777	1.987E-01
614	2.773E+01	655	5.353E+00	696	1.308E+00	737	3.893E-01	778	1.853E-01
615	1.887E+01	656	5.164E+00	697	1.259E+00	738	3.779E-01	779	1.857E-01
616	1.502E+01	657	4.790E+00	698	1.217E+00	739	3.853E-01	780	1.860E-01
617	1.406E+01	658	4.489E+00	699	1.178E+00	740	3.692E-01		
618	1.419E+01	659	4.419E+00	700	1.146E+00	741	3.538E-01		
619	1.426E+01	660	4.348E+00	701	1.111E+00	742	3.445E-01		
620	1.377E+01	661	4.079E+00	702	1.082E+00	743	3.531E-01		
621	1.330E+01	662	3.780E+00	703	1.031E+00	744	3.279E-01		
622	1.316E+01	663	3.605E+00	704	1.009E+00	745	2.992E-01		
623	1.357E+01	664	3.490E+00	705	9.754E-01	746	3.060E-01		
624	1.408E+01	665	3.374E+00	706	9.616E-01	747	2.900E-01		
625	1.435E+01	666	3.281E+00	707	9.367E-01	748	3.085E-01		

CIE 1931xy Chromaticity Diagram



7-StepChromaticity Quadrangles



## Control Setting: 4000K

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

Test orientation: **Downward**

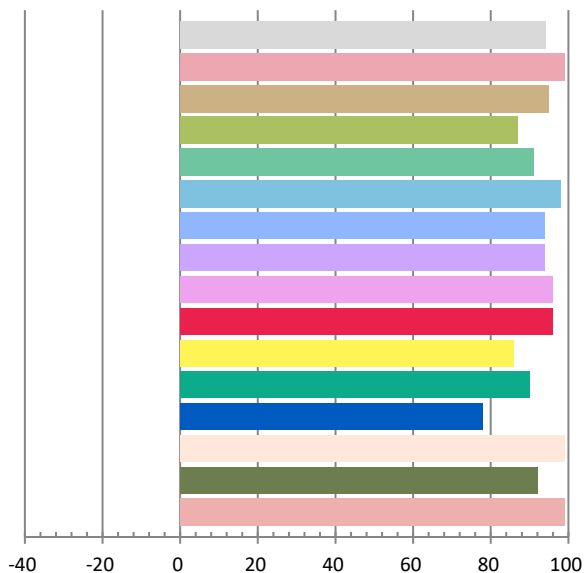
## Photometric and Electrical Measurement Result

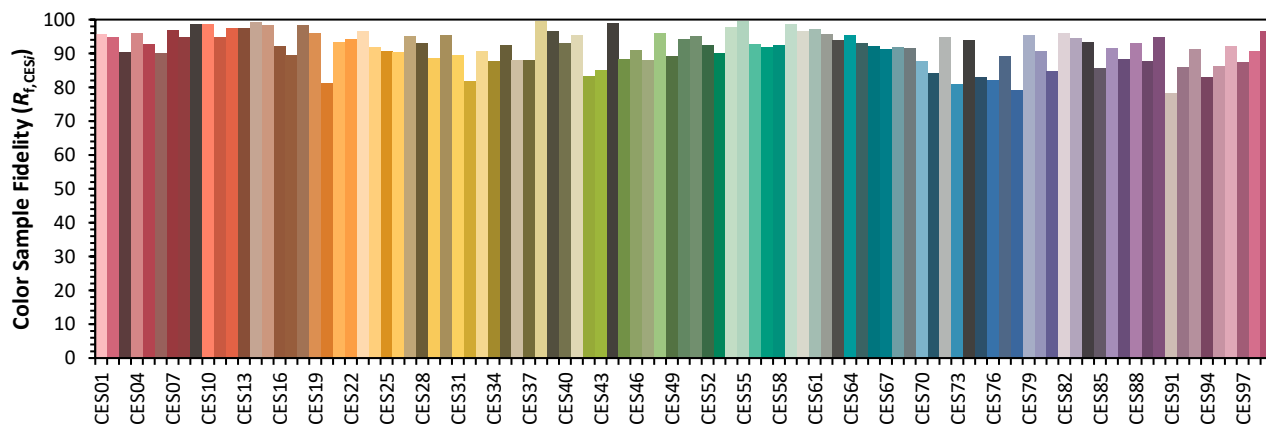
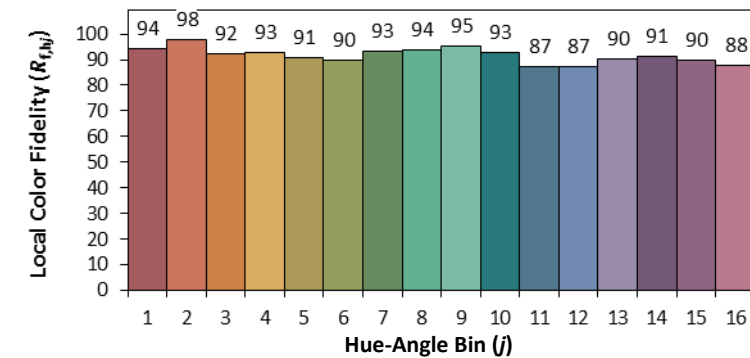
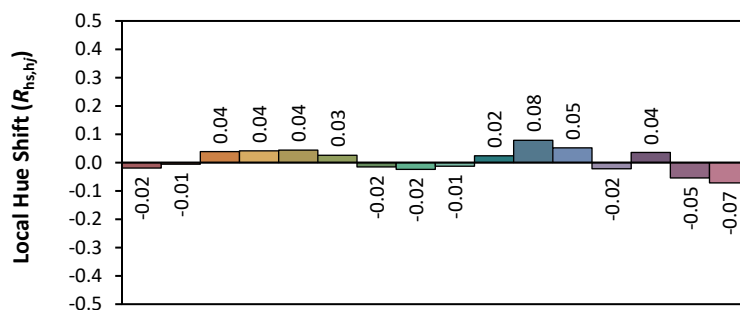
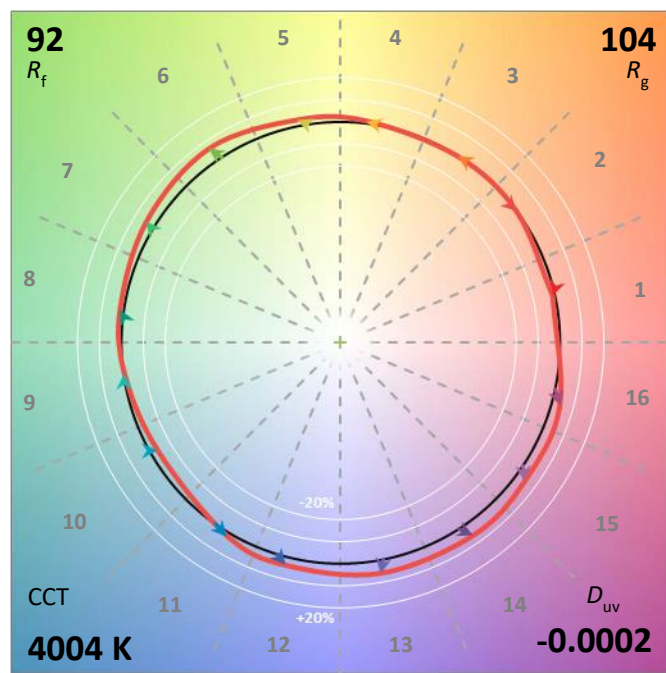
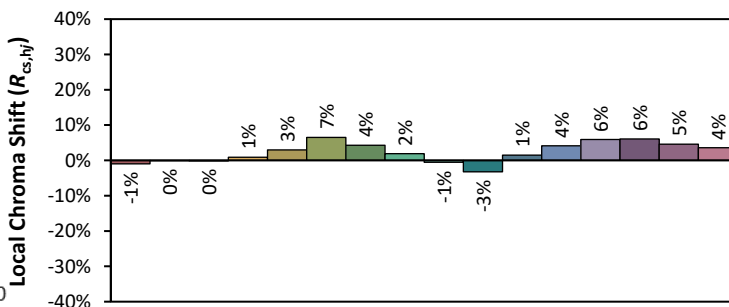
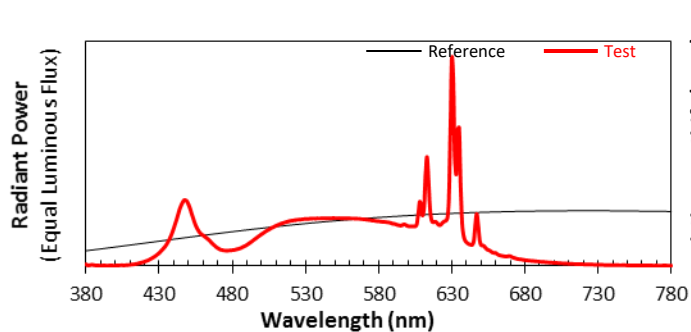
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.07916	9.303	0.9794	958.8	103.06

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
2.938	4003	-0.000138	0.3802	0.3763	0.2251	0.5013

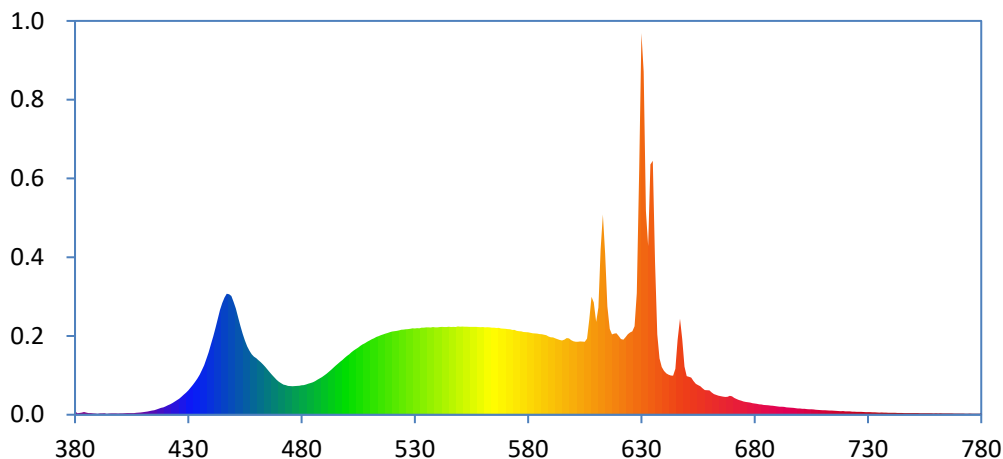
## Color Rendering Index

<b>Ra</b>			
<b>94.2</b>			
<b>R1</b>	<b>R2</b>	<b>R3</b>	<b>R4</b>
99	95	87	91
<b>R5</b>	<b>R6</b>	<b>R7</b>	<b>R8</b>
98	94	94	96
<b>R9</b>	<b>R10</b>	<b>R11</b>	<b>R12</b>
96	86	90	78
<b>R13</b>	<b>R14</b>	<b>R15</b>	
99	92	99	





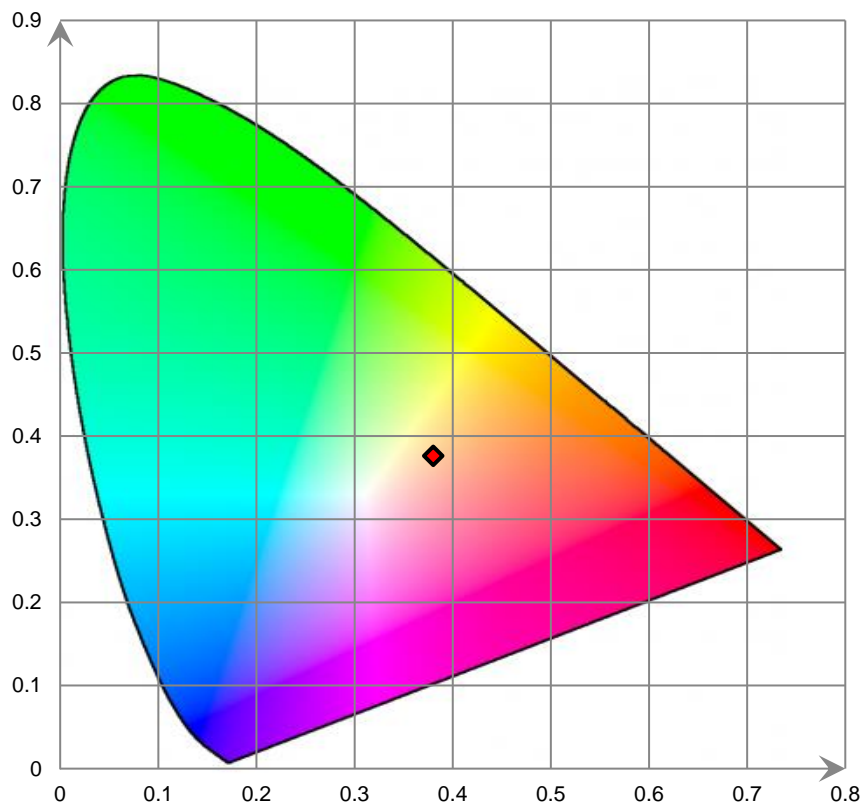
### Relative Spectral Power Distribution



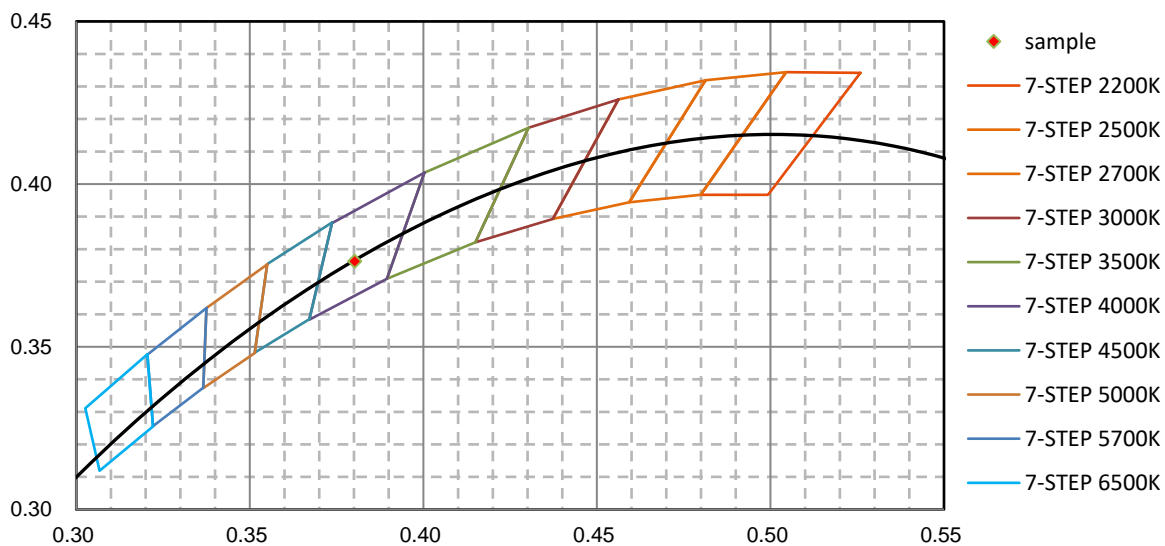
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	5.701E-01	421	1.474E+00	462	8.215E+00	503	1.005E+01	544	1.372E+01
381	2.163E-01	422	1.627E+00	463	7.869E+00	504	1.029E+01	545	1.376E+01
382	2.620E-01	423	1.828E+00	464	7.485E+00	505	1.051E+01	546	1.373E+01
383	3.340E-01	424	2.047E+00	465	7.052E+00	506	1.079E+01	547	1.374E+01
384	4.287E-01	425	2.281E+00	466	6.600E+00	507	1.102E+01	548	1.373E+01
385	3.259E-01	426	2.505E+00	467	6.202E+00	508	1.119E+01	549	1.383E+01
386	2.557E-01	427	2.818E+00	468	5.830E+00	509	1.143E+01	550	1.377E+01
387	2.456E-01	428	3.126E+00	469	5.457E+00	510	1.162E+01	551	1.379E+01
388	1.994E-01	429	3.447E+00	470	5.165E+00	511	1.182E+01	552	1.377E+01
389	1.868E-01	430	3.805E+00	471	4.923E+00	512	1.198E+01	553	1.378E+01
390	1.219E-01	431	4.224E+00	472	4.722E+00	513	1.217E+01	554	1.374E+01
391	1.897E-01	432	4.662E+00	473	4.637E+00	514	1.229E+01	555	1.375E+01
392	2.099E-01	433	5.143E+00	474	4.508E+00	515	1.244E+01	556	1.374E+01
393	2.167E-01	434	5.648E+00	475	4.483E+00	516	1.258E+01	557	1.376E+01
394	1.278E-01	435	6.256E+00	476	4.466E+00	517	1.269E+01	558	1.372E+01
395	1.685E-01	436	6.979E+00	477	4.473E+00	518	1.280E+01	559	1.371E+01
396	2.069E-01	437	7.747E+00	478	4.504E+00	519	1.293E+01	560	1.373E+01
397	2.031E-01	438	8.744E+00	479	4.527E+00	520	1.303E+01	561	1.368E+01
398	1.944E-01	439	9.758E+00	480	4.610E+00	521	1.307E+01	562	1.369E+01
399	1.729E-01	440	1.098E+01	481	4.638E+00	522	1.314E+01	563	1.367E+01
400	1.911E-01	441	1.227E+01	482	4.743E+00	523	1.320E+01	564	1.362E+01
401	1.896E-01	442	1.361E+01	483	4.857E+00	524	1.330E+01	565	1.363E+01
402	2.171E-01	443	1.500E+01	484	4.957E+00	525	1.332E+01	566	1.358E+01
403	2.552E-01	444	1.641E+01	485	5.087E+00	526	1.337E+01	567	1.360E+01
404	2.508E-01	445	1.748E+01	486	5.254E+00	527	1.340E+01	568	1.351E+01
405	2.537E-01	446	1.834E+01	487	5.480E+00	528	1.346E+01	569	1.349E+01
406	2.437E-01	447	1.895E+01	488	5.676E+00	529	1.352E+01	570	1.344E+01
407	2.895E-01	448	1.887E+01	489	5.871E+00	530	1.351E+01	571	1.339E+01
408	3.323E-01	449	1.858E+01	490	6.146E+00	531	1.356E+01	572	1.338E+01
409	3.624E-01	450	1.766E+01	491	6.424E+00	532	1.354E+01	573	1.327E+01
410	4.107E-01	451	1.663E+01	492	6.721E+00	533	1.362E+01	574	1.327E+01
411	4.593E-01	452	1.528E+01	493	7.015E+00	534	1.362E+01	575	1.313E+01
412	5.010E-01	453	1.396E+01	494	7.331E+00	535	1.368E+01	576	1.309E+01
413	5.696E-01	454	1.265E+01	495	7.659E+00	536	1.367E+01	577	1.304E+01
414	6.413E-01	455	1.160E+01	496	7.965E+00	537	1.364E+01	578	1.295E+01
415	7.113E-01	456	1.070E+01	497	8.297E+00	538	1.372E+01	579	1.292E+01
416	8.382E-01	457	1.003E+01	498	8.574E+00	539	1.368E+01	580	1.290E+01
417	9.526E-01	458	9.466E+00	499	8.893E+00	540	1.369E+01	581	1.282E+01
418	1.067E+00	459	9.095E+00	500	9.190E+00	541	1.372E+01	582	1.275E+01
419	1.159E+00	460	8.854E+00	501	9.438E+00	542	1.374E+01	583	1.272E+01
420	1.310E+00	461	8.507E+00	502	9.778E+00	543	1.373E+01	584	1.271E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.263E+01	626	1.304E+01	667	2.788E+00	708	7.596E-01	749	2.516E-01
586	1.260E+01	627	1.384E+01	668	2.810E+00	709	7.375E-01	750	2.442E-01
587	1.253E+01	628	1.903E+01	669	2.951E+00	710	7.082E-01	751	2.447E-01
588	1.245E+01	629	3.841E+01	670	2.882E+00	711	6.916E-01	752	2.389E-01
589	1.226E+01	630	5.974E+01	671	2.617E+00	712	6.803E-01	753	2.269E-01
590	1.212E+01	631	5.368E+01	672	2.451E+00	713	6.499E-01	754	2.307E-01
591	1.210E+01	632	3.188E+01	673	2.318E+00	714	6.406E-01	755	2.174E-01
592	1.195E+01	633	2.640E+01	674	2.195E+00	715	6.158E-01	756	2.321E-01
593	1.182E+01	634	3.916E+01	675	2.085E+00	716	5.991E-01	757	2.202E-01
594	1.171E+01	635	3.975E+01	676	2.012E+00	717	5.783E-01	758	2.326E-01
595	1.162E+01	636	2.388E+01	677	1.953E+00	718	5.550E-01	759	2.023E-01
596	1.174E+01	637	1.257E+01	678	1.915E+00	719	5.741E-01	760	2.133E-01
597	1.199E+01	638	8.828E+00	679	1.808E+00	720	5.371E-01	761	2.113E-01
598	1.195E+01	639	7.457E+00	680	1.761E+00	721	5.249E-01	762	2.167E-01
599	1.168E+01	640	6.860E+00	681	1.701E+00	722	5.160E-01	763	2.049E-01
600	1.149E+01	641	6.475E+00	682	1.642E+00	723	4.804E-01	764	1.989E-01
601	1.141E+01	642	6.270E+00	683	1.602E+00	724	4.804E-01	765	1.975E-01
602	1.142E+01	643	6.138E+00	684	1.543E+00	725	4.637E-01	766	2.038E-01
603	1.146E+01	644	6.111E+00	685	1.515E+00	726	4.598E-01	767	1.883E-01
604	1.145E+01	645	7.196E+00	686	1.489E+00	727	4.419E-01	768	1.700E-01
605	1.141E+01	646	1.169E+01	687	1.418E+00	728	4.312E-01	769	1.862E-01
606	1.192E+01	647	1.502E+01	688	1.392E+00	729	4.147E-01	770	1.839E-01
607	1.489E+01	648	1.181E+01	689	1.359E+00	730	3.997E-01	771	1.732E-01
608	1.847E+01	649	7.538E+00	690	1.306E+00	731	4.009E-01	772	1.837E-01
609	1.759E+01	650	6.045E+00	691	1.266E+00	732	3.758E-01	773	1.587E-01
610	1.452E+01	651	5.943E+00	692	1.247E+00	733	3.706E-01	774	1.612E-01
611	1.679E+01	652	5.799E+00	693	1.224E+00	734	3.638E-01	775	1.768E-01
612	2.593E+01	653	5.275E+00	694	1.159E+00	735	3.405E-01	776	1.632E-01
613	3.132E+01	654	4.841E+00	695	1.135E+00	736	3.530E-01	777	1.622E-01
614	2.525E+01	655	4.644E+00	696	1.097E+00	737	3.334E-01	778	1.389E-01
615	1.698E+01	656	4.469E+00	697	1.066E+00	738	3.207E-01	779	1.392E-01
616	1.343E+01	657	4.136E+00	698	1.036E+00	739	3.077E-01	780	1.394E-01
617	1.257E+01	658	3.864E+00	699	9.862E-01	740	2.995E-01		
618	1.271E+01	659	3.822E+00	700	9.710E-01	741	2.925E-01		
619	1.276E+01	660	3.797E+00	701	9.296E-01	742	2.885E-01		
620	1.232E+01	661	3.485E+00	702	9.251E-01	743	2.762E-01		
621	1.185E+01	662	3.230E+00	703	8.847E-01	744	2.770E-01		
622	1.174E+01	663	3.096E+00	704	8.551E-01	745	2.641E-01		
623	1.215E+01	664	2.987E+00	705	8.463E-01	746	2.614E-01		
624	1.260E+01	665	2.895E+00	706	8.182E-01	747	2.580E-01		
625	1.288E+01	666	2.841E+00	707	7.756E-01	748	2.615E-01		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles



## Control Setting: 5000K

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

Test orientation: **Downward**

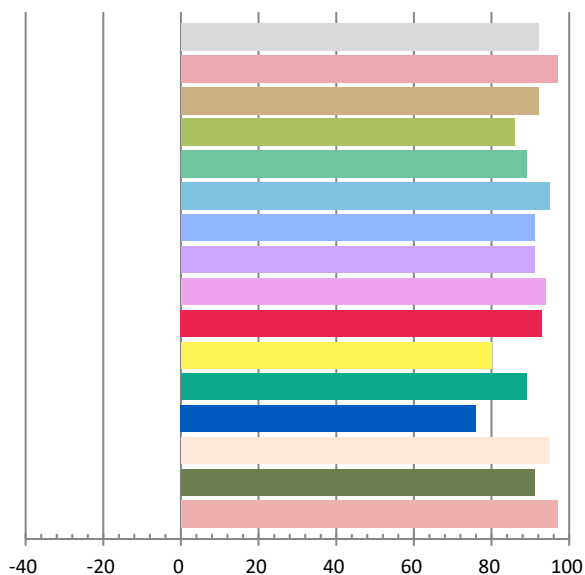
## Photometric and Electrical Measurement Result

Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.07923	9.321	0.9804	964.03	103.42

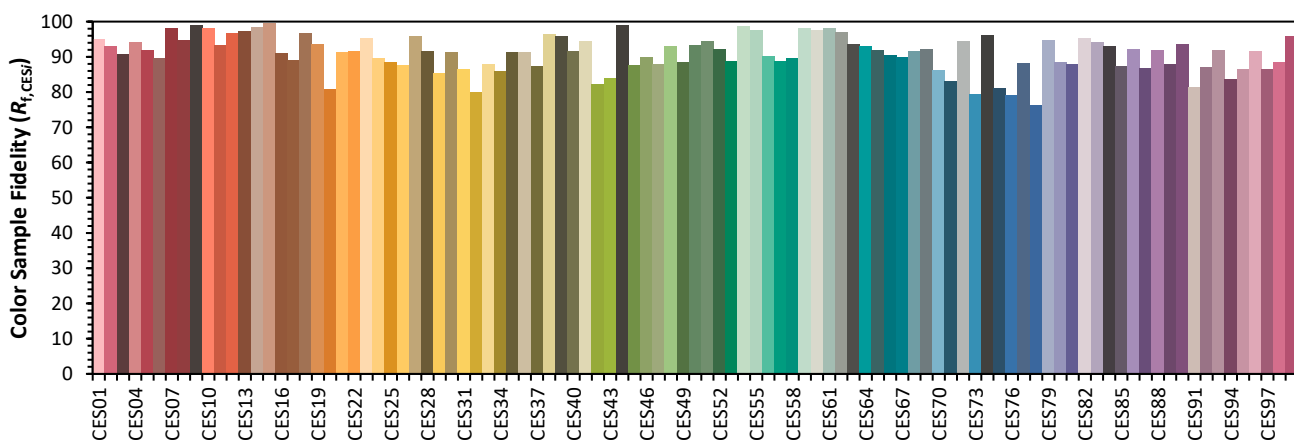
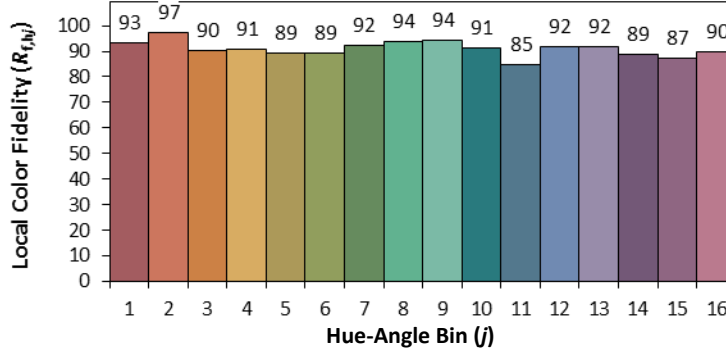
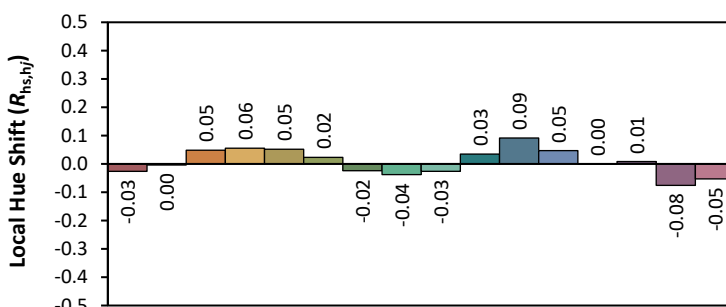
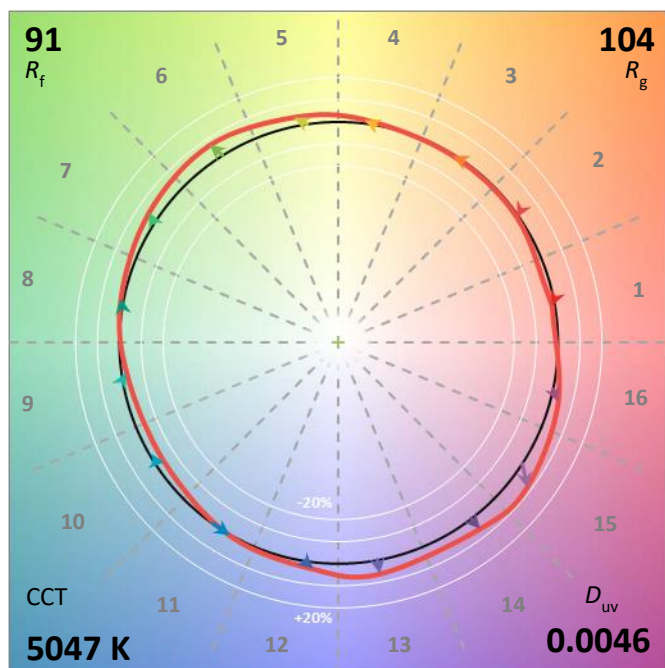
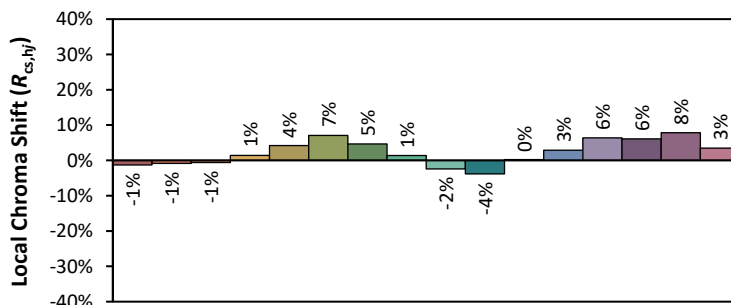
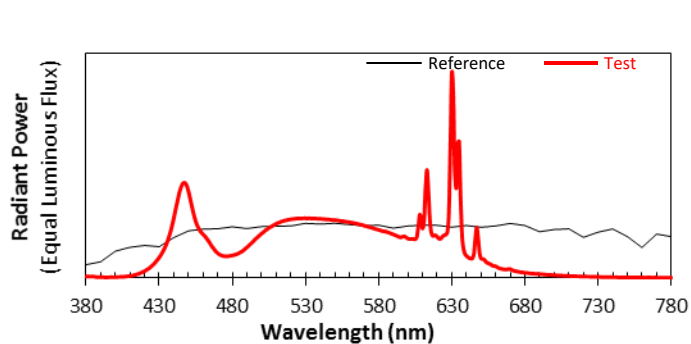
Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
3.007	5043	0.00463	0.3447	0.3606	0.2077	0.4889

## Color Rendering Index

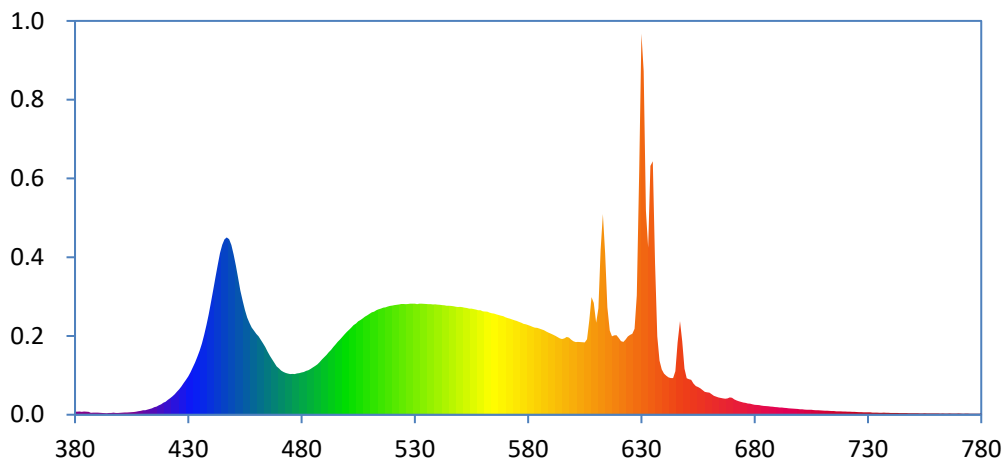
<b>Ra</b>			
<b>92.0</b>			
<b>R1</b>	<b>R2</b>	<b>R3</b>	<b>R4</b>
97	92	86	89
<b>R5</b>	<b>R6</b>	<b>R7</b>	<b>R8</b>
95	91	91	94
<b>R9</b>	<b>R10</b>	<b>R11</b>	<b>R12</b>
93	80	89	76
<b>R13</b>	<b>R14</b>	<b>R15</b>	
95	91	97	







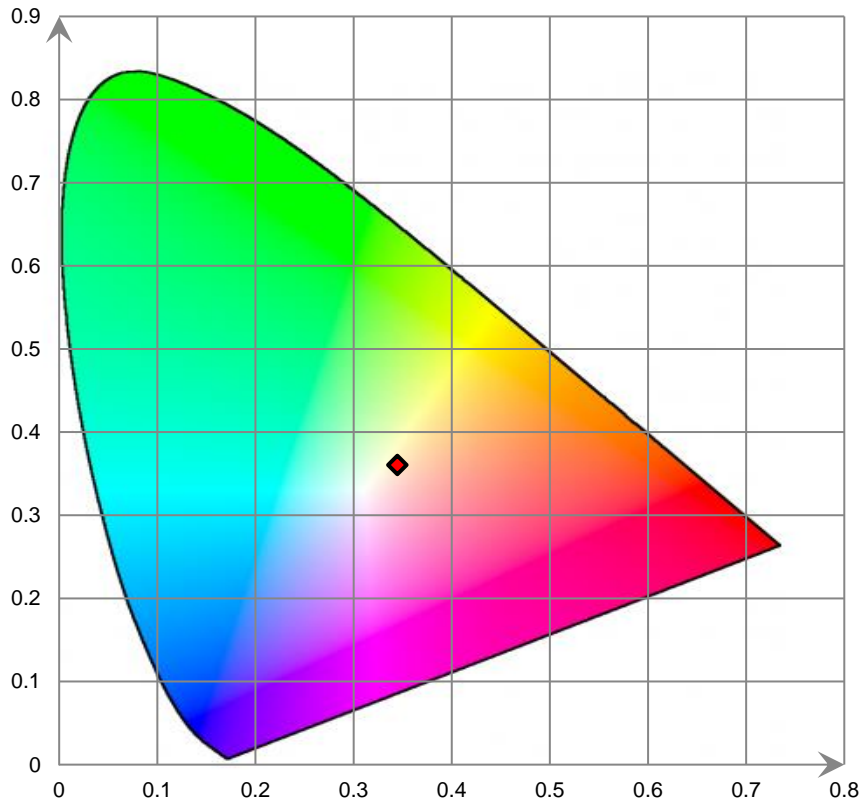
### Relative Spectral Power Distribution



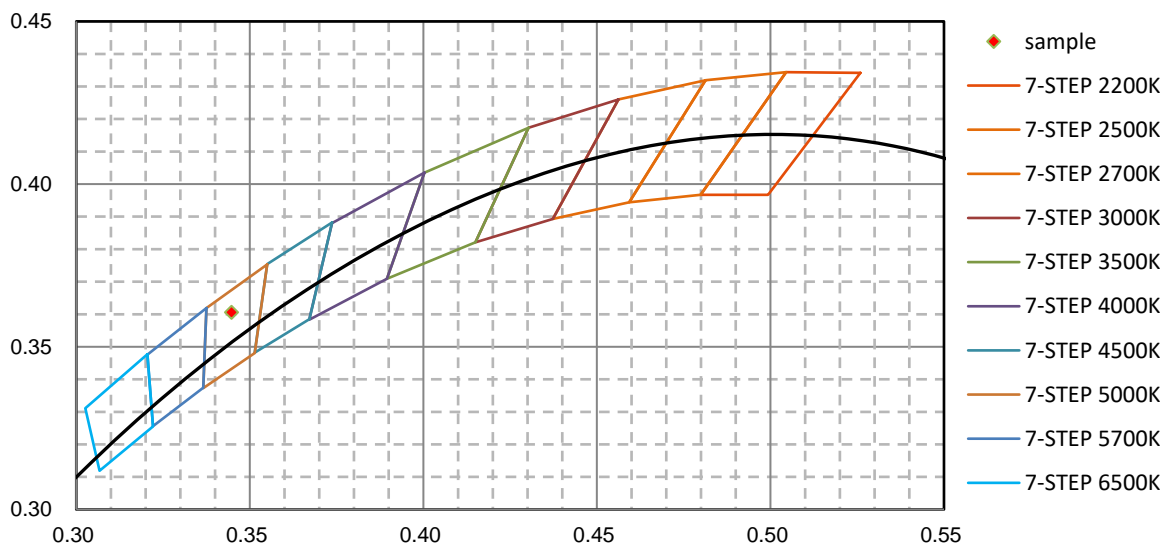
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	4.144E-01	421	2.009E+00	462	1.012E+01	503	1.211E+01	544	1.473E+01
381	4.207E-01	422	2.223E+00	463	9.644E+00	504	1.232E+01	545	1.474E+01
382	4.250E-01	423	2.483E+00	464	9.149E+00	505	1.263E+01	546	1.470E+01
383	3.993E-01	424	2.775E+00	465	8.543E+00	506	1.281E+01	547	1.467E+01
384	4.273E-01	425	3.115E+00	466	7.961E+00	507	1.302E+01	548	1.461E+01
385	4.175E-01	426	3.446E+00	467	7.498E+00	508	1.326E+01	549	1.457E+01
386	3.874E-01	427	3.837E+00	468	7.004E+00	509	1.343E+01	550	1.457E+01
387	2.556E-01	428	4.285E+00	469	6.543E+00	510	1.366E+01	551	1.455E+01
388	2.815E-01	429	4.729E+00	470	6.264E+00	511	1.384E+01	552	1.448E+01
389	2.764E-01	430	5.201E+00	471	5.973E+00	512	1.393E+01	553	1.443E+01
390	2.751E-01	431	5.757E+00	472	5.772E+00	513	1.413E+01	554	1.435E+01
391	2.705E-01	432	6.396E+00	473	5.641E+00	514	1.426E+01	555	1.434E+01
392	2.417E-01	433	7.062E+00	474	5.557E+00	515	1.434E+01	556	1.428E+01
393	2.076E-01	434	7.806E+00	475	5.491E+00	516	1.448E+01	557	1.421E+01
394	1.965E-01	435	8.676E+00	476	5.511E+00	517	1.452E+01	558	1.413E+01
395	2.376E-01	436	9.637E+00	477	5.489E+00	518	1.463E+01	559	1.414E+01
396	2.355E-01	437	1.079E+01	478	5.581E+00	519	1.471E+01	560	1.397E+01
397	2.852E-01	438	1.209E+01	479	5.626E+00	520	1.476E+01	561	1.396E+01
398	2.472E-01	439	1.353E+01	480	5.711E+00	521	1.483E+01	562	1.392E+01
399	2.366E-01	440	1.514E+01	481	5.783E+00	522	1.486E+01	563	1.380E+01
400	2.596E-01	441	1.691E+01	482	5.924E+00	523	1.491E+01	564	1.373E+01
401	2.759E-01	442	1.863E+01	483	6.013E+00	524	1.497E+01	565	1.367E+01
402	3.109E-01	443	2.027E+01	484	6.193E+00	525	1.497E+01	566	1.356E+01
403	3.011E-01	444	2.184E+01	485	6.402E+00	526	1.496E+01	567	1.348E+01
404	3.329E-01	445	2.298E+01	486	6.601E+00	527	1.497E+01	568	1.340E+01
405	3.501E-01	446	2.371E+01	487	6.811E+00	528	1.501E+01	569	1.332E+01
406	3.757E-01	447	2.397E+01	488	7.115E+00	529	1.502E+01	570	1.318E+01
407	4.209E-01	448	2.374E+01	489	7.459E+00	530	1.502E+01	571	1.307E+01
408	4.744E-01	449	2.296E+01	490	7.757E+00	531	1.495E+01	572	1.299E+01
409	5.105E-01	450	2.168E+01	491	8.080E+00	532	1.501E+01	573	1.287E+01
410	5.948E-01	451	2.017E+01	492	8.463E+00	533	1.501E+01	574	1.276E+01
411	6.085E-01	452	1.853E+01	493	8.767E+00	534	1.499E+01	575	1.267E+01
412	6.938E-01	453	1.682E+01	494	9.150E+00	535	1.498E+01	576	1.255E+01
413	7.856E-01	454	1.538E+01	495	9.503E+00	536	1.494E+01	577	1.244E+01
414	8.658E-01	455	1.415E+01	496	9.863E+00	537	1.496E+01	578	1.230E+01
415	1.023E+00	456	1.314E+01	497	1.020E+01	538	1.490E+01	579	1.223E+01
416	1.097E+00	457	1.242E+01	498	1.054E+01	539	1.492E+01	580	1.212E+01
417	1.279E+00	458	1.179E+01	499	1.088E+01	540	1.488E+01	581	1.201E+01
418	1.406E+00	459	1.137E+01	500	1.120E+01	541	1.486E+01	582	1.188E+01
419	1.621E+00	460	1.092E+01	501	1.150E+01	542	1.481E+01	583	1.178E+01
420	1.759E+00	461	1.060E+01	502	1.178E+01	543	1.480E+01	584	1.175E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.165E+01	626	1.095E+01	667	2.156E+00	708	5.970E-01	749	1.948E-01
586	1.153E+01	627	1.161E+01	668	2.206E+00	709	5.750E-01	750	1.957E-01
587	1.142E+01	628	1.614E+01	669	2.325E+00	710	5.680E-01	751	1.885E-01
588	1.126E+01	629	3.291E+01	670	2.287E+00	711	5.412E-01	752	1.849E-01
589	1.110E+01	630	5.154E+01	671	2.078E+00	712	5.342E-01	753	1.825E-01
590	1.096E+01	631	4.645E+01	672	1.922E+00	713	5.088E-01	754	1.740E-01
591	1.082E+01	632	2.759E+01	673	1.813E+00	714	4.934E-01	755	1.858E-01
592	1.067E+01	633	2.258E+01	674	1.723E+00	715	4.893E-01	756	1.713E-01
593	1.050E+01	634	3.364E+01	675	1.648E+00	716	4.621E-01	757	1.821E-01
594	1.033E+01	635	3.427E+01	676	1.598E+00	717	4.612E-01	758	1.682E-01
595	1.025E+01	636	2.052E+01	677	1.516E+00	718	4.496E-01	759	1.735E-01
596	1.032E+01	637	1.061E+01	678	1.484E+00	719	4.363E-01	760	1.690E-01
597	1.050E+01	638	7.307E+00	679	1.415E+00	720	4.247E-01	761	1.676E-01
598	1.042E+01	639	6.116E+00	680	1.355E+00	721	4.090E-01	762	1.524E-01
599	1.014E+01	640	5.562E+00	681	1.321E+00	722	4.069E-01	763	1.735E-01
600	9.931E+00	641	5.258E+00	682	1.293E+00	723	3.965E-01	764	1.598E-01
601	9.829E+00	642	5.036E+00	683	1.241E+00	724	3.818E-01	765	1.604E-01
602	9.851E+00	643	4.944E+00	684	1.198E+00	725	3.700E-01	766	1.626E-01
603	9.826E+00	644	4.948E+00	685	1.166E+00	726	3.572E-01	767	1.501E-01
604	9.796E+00	645	5.876E+00	686	1.146E+00	727	3.434E-01	768	1.573E-01
605	9.774E+00	646	9.747E+00	687	1.110E+00	728	3.379E-01	769	1.507E-01
606	1.021E+01	647	1.267E+01	688	1.077E+00	729	3.227E-01	770	1.632E-01
607	1.275E+01	648	9.905E+00	689	1.049E+00	730	3.196E-01	771	1.529E-01
608	1.590E+01	649	6.224E+00	690	1.020E+00	731	3.200E-01	772	1.358E-01
609	1.513E+01	650	4.930E+00	691	9.797E-01	732	2.951E-01	773	1.421E-01
610	1.245E+01	651	4.808E+00	692	9.668E-01	733	2.889E-01	774	1.509E-01
611	1.438E+01	652	4.714E+00	693	9.249E-01	734	2.743E-01	775	1.381E-01
612	2.232E+01	653	4.221E+00	694	9.147E-01	735	2.680E-01	776	1.326E-01
613	2.714E+01	654	3.877E+00	695	8.715E-01	736	2.672E-01	777	1.368E-01
614	2.184E+01	655	3.739E+00	696	8.490E-01	737	2.745E-01	778	1.223E-01
615	1.454E+01	656	3.574E+00	697	8.207E-01	738	2.524E-01	779	1.225E-01
616	1.139E+01	657	3.334E+00	698	8.056E-01	739	2.583E-01	780	1.228E-01
617	1.060E+01	658	3.095E+00	699	7.774E-01	740	2.469E-01		
618	1.073E+01	659	3.032E+00	700	7.352E-01	741	2.351E-01		
619	1.075E+01	660	2.977E+00	701	7.417E-01	742	2.290E-01		
620	1.038E+01	661	2.778E+00	702	7.036E-01	743	2.267E-01		
621	9.957E+00	662	2.554E+00	703	6.746E-01	744	2.161E-01		
622	9.838E+00	663	2.445E+00	704	6.753E-01	745	2.215E-01		
623	1.016E+01	664	2.335E+00	705	6.671E-01	746	2.109E-01		
624	1.057E+01	665	2.263E+00	706	6.363E-01	747	2.132E-01		
625	1.081E+01	666	2.209E+00	707	6.160E-01	748	1.859E-01		

CIE 1931xy Chromaticity Diagram



7-StepChromaticity Quadrangles



## [Goniophotometer System]

### Control Setting: 2700K

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

Test orientation: **Downward**

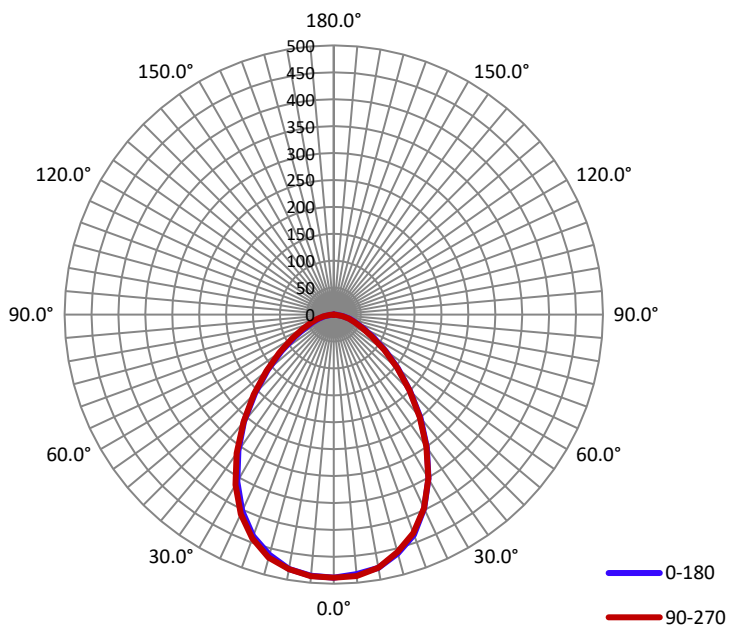
### Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
120.0	60	0.0810	9.55	0.9820

### Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	I <sub>max</sub> (cd)	S/MH(C0/180)	S/MH(C90/270)
914.7	95.83	492.1	1.11	1.11

### Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50%I <sub>max</sub> ):	82.0	82.0	81.8	81.7	81.9
Field Angle(10%I <sub>max</sub> ):	135.4	135.9	135.8	135.9	135.8

**Luminous Intensity (cd) Distribution Data**

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	489	489	489	489	489	489	489	489
5.0°	484	484	485	484	487	488	483	489
10.0°	478	476	476	475	478	483	474	479
15.0°	460	458	460	458	457	462	460	465
20.0°	436	433	431	431	432	435	433	441
25.0°	397	396	394	394	397	399	400	404
30.0°	352	351	350	348	351	355	353	362
35.0°	301	300	299	297	300	301	304	312
40.0°	250	247	247	246	248	250	251	259
45.0°	200	200	198	198	199	202	203	207
50.0°	156	155	154	153	153	155	157	161
55.0°	118	117	116	114	114	115	116	120
60.0°	86	85	83	81	81	83	84	87
65.0°	61	60	59	57	57	58	58	61
70.0°	43	42	41	41	40	41	41	42
75.0°	31	30	29	28	28	29	29	30
80.0°	18	17	17	16	16	15	15	17
85.0°	5	5	4	4	3	2	3	3
90.0°	0	0	0	0	0	0	0	0
95.0°	0	0	0	0	0	0	0	0
100.0°	0	0	0	0	0	0	0	0
105.0°	0	0	0	0	0	0	0	0
110.0°	0	0	0	0	0	0	0	0
115.0°	0	0	0	0	0	0	0	0
120.0°	0	0	0	0	0	0	0	0
125.0°	0	0	0	0	0	0	0	0
130.0°	0	0	0	0	0	0	0	0
135.0°	0	0	0	0	0	0	0	0
140.0°	0	0	0	0	0	0	0	0
145.0°	0	0	0	0	0	0	0	0
150.0°	0	0	0	0	0	0	0	0
155.0°	0	0	0	0	0	0	0	0
160.0°	0	0	0	0	0	0	0	0
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°	489	489	489	489	489	489	489	489
5.0°	487	485	487	485	488	486	485	486
10.0°	480	482	480	479	480	481	473	477
15.0°	462	466	467	466	468	466	460	462
20.0°	438	441	444	442	442	442	435	437
25.0°	403	406	409	407	409	410	402	400
30.0°	358	363	366	364	365	363	358	353
35.0°	309	313	316	313	315	313	306	304
40.0°	260	261	263	261	261	260	253	251
45.0°	207	210	212	211	210	207	203	201
50.0°	160	163	165	165	164	162	158	155
55.0°	118	122	124	124	123	122	119	117
60.0°	84	87	89	90	90	89	87	86
65.0°	58	60	62	64	64	64	62	61
70.0°	41	42	44	45	45	45	44	43
75.0°	28	30	31	32	33	33	32	31
80.0°	16	18	19	20	20	19	18	18
85.0°	3	5	6	8	7	6	5	5
90.0°	0	0	0	0	0	0	0	0
95.0°	0	0	0	0	0	0	0	0
100.0°	0	0	0	0	0	0	0	0
105.0°	0	0	0	0	0	0	0	0
110.0°	0	0	0	0	0	0	0	0
115.0°	0	0	0	0	0	0	0	0
120.0°	0	0	0	0	0	0	0	0
125.0°	0	0	0	0	0	0	0	0
130.0°	0	0	0	0	0	0	0	0
135.0°	0	0	0	0	0	0	0	0
140.0°	0	0	0	0	0	0	0	0
145.0°	0	0	0	0	0	0	0	0
150.0°	0	0	0	0	0	0	0	0
155.0°	0	0	0	0	0	0	0	0
160.0°	0	0	0	0	0	0	0	0
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

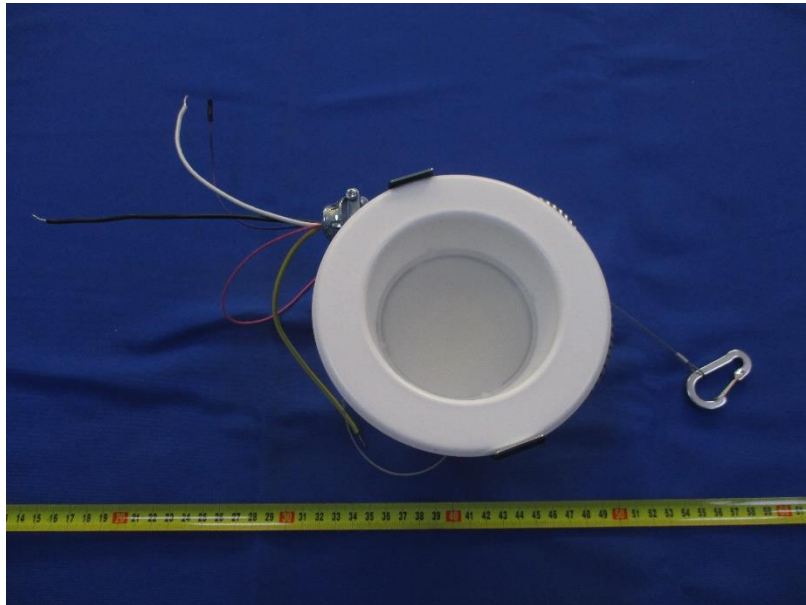
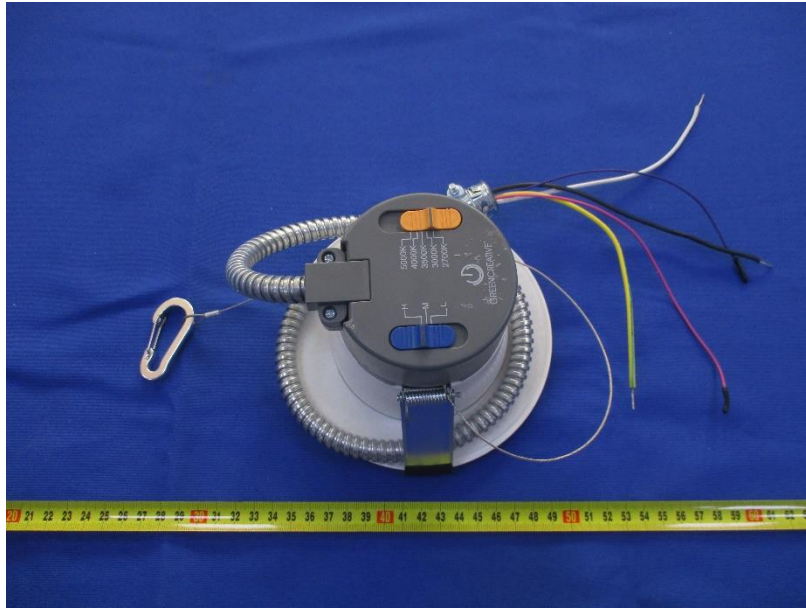
**Zonal Lumen Density Measurement**

Deg	Flux (lm)	%
0-5	11.7	1.27
5-10	34.5	3.78
10-15	55.8	6.09
15-20	74.2	8.11
20-25	88.1	9.63
25-30	96.0	10.50
30-35	97.6	10.67
35-40	93.4	10.21
40-45	84.8	9.26
45-50	73.0	7.98
50-55	60.0	6.56
55-60	47.0	5.13
60-65	35.1	3.84
65-70	25.6	2.81
70-75	19.0	2.08
75-80	12.8	1.40
80-85	5.9	0.65
85-90	0.6	0.06
90-95	0.0	0.00
95-100	0.0	0.00
100-105	0.0	0.00
105-110	0.0	0.00
110-115	0.0	0.00
115-120	0.0	0.00
120-125	0.0	0.00
125-130	0.0	0.00
130-135	0.0	0.00
135-140	0.0	0.00
140-145	0.0	0.00
145-150	0.0	0.00
150-155	0.0	0.00
155-160	0.0	0.00
160-165	0.0	0.00
165-170	0.0	0.00
170-175	0.0	0.00
175-180	0.0	0.00

Deg	Flux (lm)	%
0-5	11.6	1.27
0-10	46.1	5.04
0-15	101.9	11.14
0-20	176.1	19.25
0-25	264.1	28.87
0-30	360.1	39.37
0-35	457.7	50.04
0-40	551.1	60.25
0-45	635.7	69.50
0-50	708.7	77.48
0-55	768.7	84.04
0-60	815.7	89.17
0-65	850.8	93.02
0-70	876.5	95.82
0-75	895.5	97.90
0-80	908.2	99.29
0-85	914.1	99.94
0-90	914.7	100.00
0-95	914.7	100.00
0-100	914.7	100.00
0-105	914.7	100.00
0-110	914.7	100.00
0-115	914.7	100.00
0-120	914.7	100.00
0-125	914.7	100.00
0-130	914.7	100.00
0-135	914.7	100.00
0-140	914.7	100.00
0-145	914.7	100.00
0-150	914.7	100.00
0-155	914.7	100.00
0-160	914.7	100.00
0-165	914.7	100.00
0-170	914.7	100.00
0-175	914.7	100.00
0-180	914.7	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. This report may contain data that are not covered by the accreditation scope and shall be marked with an asterisk "★".
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.
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\*\*\*\*\*END OF REPORT\*\*\*\*\*