

# 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: MCR6HO/9CCT5S/DUALDIM/EXT**

<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>	RKSB220907006-10-2
<b>Test Date:</b>	2022-09-13 to 2022-09-14
<b>Report Date:</b>	2022-09-19
<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<sup>#</sup>

### General Information:

One sample was received on 2022-09-07 and used for testing.

Model Tested:	MCR6HO/9CCT5S/DUALDIM/EXT
Manufacturer:	GREEN CREATIVE LTD
Brand Name:	GREEN CREATIVE
Product Designation:	Ceiling Mount
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:	14W
Nominal CCT:	2700K/3000K/3500K/4000K/5000K
Nominal Lumen Output:	1080lm/1100lm/1130lm/1160lm/1190lm

## 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
Integrating Sphere	INVENTFINE	Dia 1.5m	JWWCV090112	2021-11-02	2022-11-01
Power Meter	INVENTFINE	WT500	GSJWQ20009	2021-11-15	2022-11-14
Spectral photometer	INVENTFINE	CMS-3S	GSGSE100017	2021-11-02	2022-11-01
AC Power Supply	INVENTFINE	CHP500	JWJSD010071	2021-11-02	2022-11-01
Standard Light Source	Osram	24V/50W	JWWCR020104	2021-09-15	2023-09-14
Thermal Meter	ANYMETRE	TH-20E	N/A	2021-12-01	2022-11-30
DC Power Supply	INVENTFINE	WL3005	JWWCP020069	2021-11-02	2022-11-01
AC Power Supply	INVENTFINE	CHP-5KVA	900511765	2021-11-02	2022-11-01
DC Power Supply	INVENTFINE	WL3010	JWDMP030001	2021-11-02	2022-11-01
Power Meter	INVENTFINE	WT500	GSDSQ200007	2021-11-15	2022-11-14
Goniophotometer	INVENTFINE	GPM-1900	YWGCF120001	2021-11-15	2022-11-14

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
Wireless Weather Station	ZHONGXING	KG218	N/A	2021-11-02	2022-11-01
Standard Light Source	INVENTFINE	N/A	JWBYR040008	2021-12-23	2022-12-22

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  $U_{rel}=2.6\%$  ( $k=2$ ), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is  $U=34\text{K}$  ( $k=2$ ), at the 95% confidence level. The uncertainty of the CRI is  $U=2.5(k=2)$ , at the 95% confidence level.

The uncertainty of power meter AC current  $U_{rel}=0.48\%$  of rdg, AC Voltage  $U_{rel}=0.25\%$  of rdg, Power  $U_{rel}=0.44\%$ , ( $k=2$ ), 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**

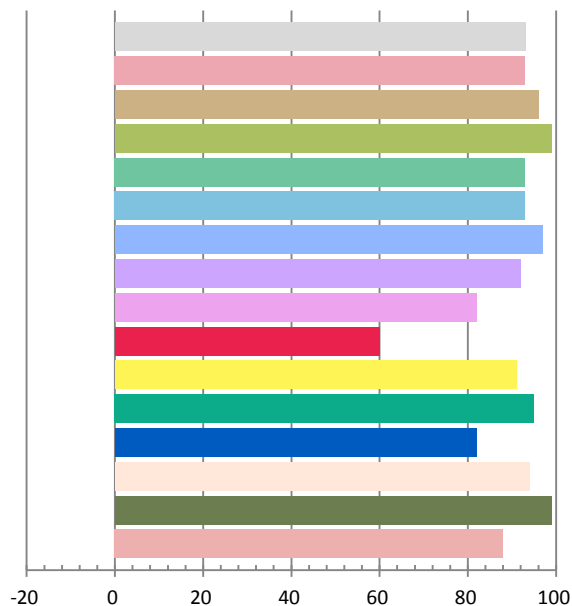
### Photometric and Electrical Measurement Result

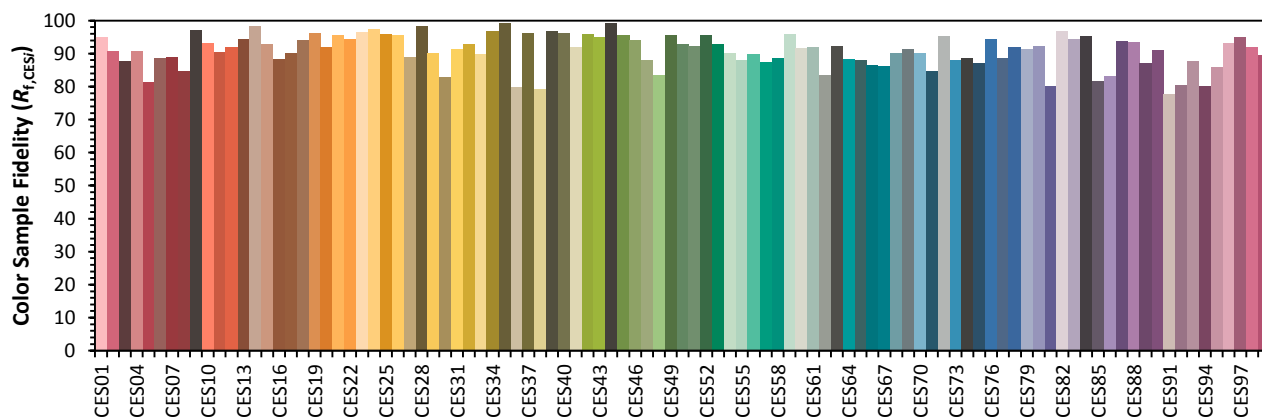
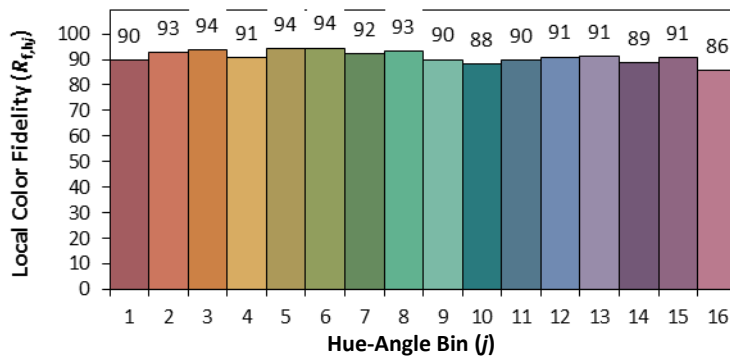
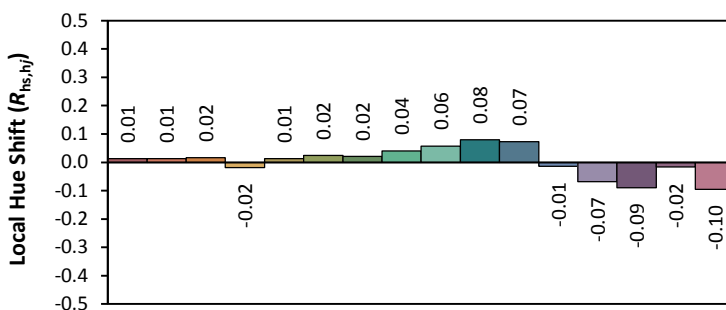
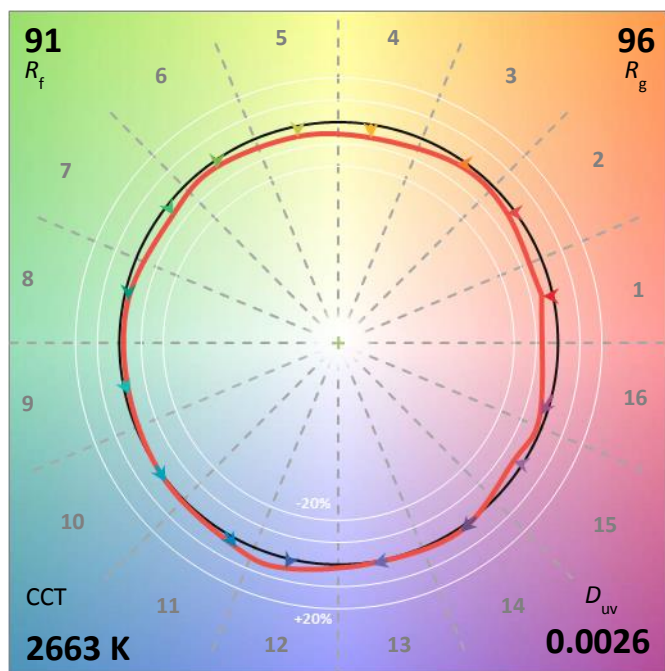
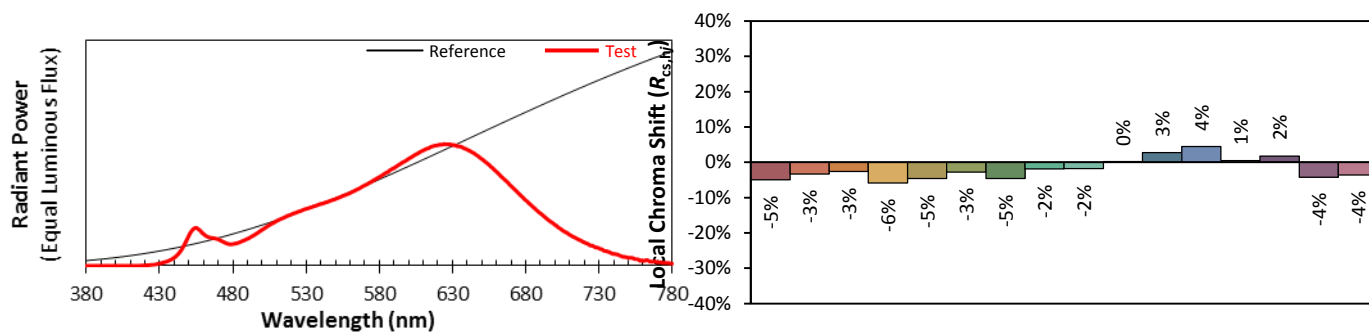
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.00	60	0.1143	13.56	0.9886	1089.56	80.35

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
3.824	2663	0.00261	0.4676	0.4195	0.2635	0.5318

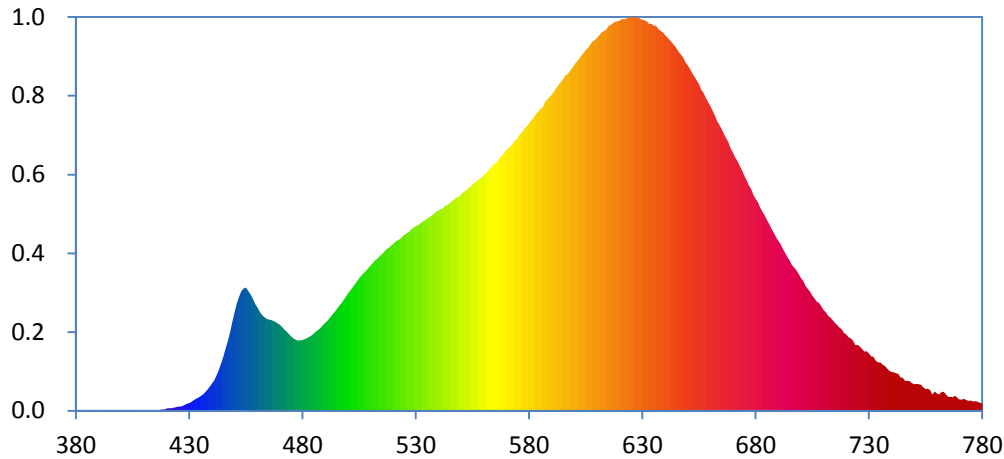
### Color Rendering Index

Ra			
93.1			
R1	R2	R3	R4
93	96	99	93
R5	R6	R7	R8
93	97	92	82
R9	R10	R11	R12
60	91	95	82
R13	R14	R15	
94	99	88	





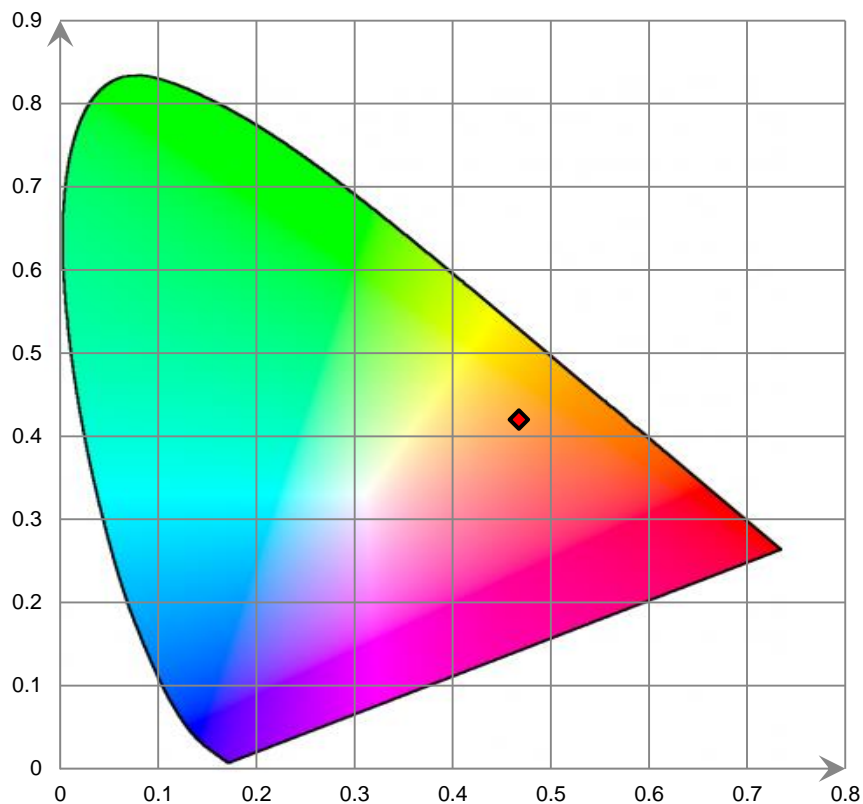
### Relative Spectral Power Distribution



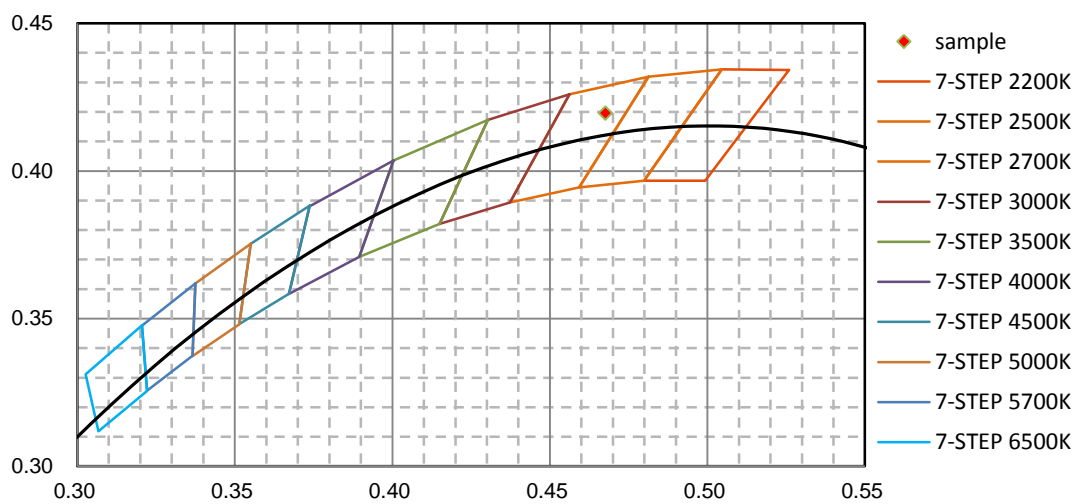
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	4.380E-02	421	1.470E-01	462	5.862E+00	503	7.720E+00	544	1.260E+01
381	4.210E-02	422	1.484E-01	463	5.737E+00	504	7.905E+00	545	1.271E+01
382	4.310E-02	423	1.799E-01	464	5.635E+00	505	8.107E+00	546	1.282E+01
383	3.100E-03	424	2.114E-01	465	5.568E+00	506	8.260E+00	547	1.294E+01
384	4.760E-02	425	2.525E-01	466	5.551E+00	507	8.415E+00	548	1.305E+01
385	2.440E-02	426	2.486E-01	467	5.494E+00	508	8.555E+00	549	1.310E+01
386	2.700E-03	427	2.912E-01	468	5.436E+00	509	8.735E+00	550	1.322E+01
387	1.630E-02	428	3.624E-01	469	5.341E+00	510	8.914E+00	551	1.339E+01
388	1.240E-02	429	4.303E-01	470	5.265E+00	511	9.052E+00	552	1.345E+01
389	7.200E-03	430	4.665E-01	471	5.120E+00	512	9.206E+00	553	1.358E+01
390	4.970E-02	431	5.452E-01	472	4.947E+00	513	9.302E+00	554	1.369E+01
391	1.700E-02	432	6.512E-01	473	4.835E+00	514	9.456E+00	555	1.384E+01
392	4.100E-03	433	7.149E-01	474	4.669E+00	515	9.575E+00	556	1.395E+01
393	1.900E-03	434	8.061E-01	475	4.548E+00	516	9.707E+00	557	1.405E+01
394	1.180E-02	435	8.919E-01	476	4.416E+00	517	9.878E+00	558	1.417E+01
395	4.110E-02	436	1.001E+00	477	4.344E+00	518	9.969E+00	559	1.428E+01
396	2.500E-03	437	1.143E+00	478	4.290E+00	519	1.009E+01	560	1.443E+01
397	6.200E-03	438	1.288E+00	479	4.296E+00	520	1.020E+01	561	1.457E+01
398	9.300E-03	439	1.460E+00	480	4.321E+00	521	1.033E+01	562	1.469E+01
399	5.000E-04	440	1.658E+00	481	4.382E+00	522	1.044E+01	563	1.486E+01
400	0.000E+00	441	1.852E+00	482	4.450E+00	523	1.051E+01	564	1.501E+01
401	1.700E-02	442	2.150E+00	483	4.521E+00	524	1.066E+01	565	1.515E+01
402	2.240E-02	443	2.472E+00	484	4.612E+00	525	1.077E+01	566	1.526E+01
403	1.240E-02	444	2.847E+00	485	4.745E+00	526	1.087E+01	567	1.546E+01
404	1.100E-02	445	3.265E+00	486	4.868E+00	527	1.095E+01	568	1.561E+01
405	1.760E-02	446	3.749E+00	487	4.955E+00	528	1.110E+01	569	1.579E+01
406	3.700E-03	447	4.294E+00	488	5.096E+00	529	1.120E+01	570	1.594E+01
407	5.360E-02	448	4.841E+00	489	5.243E+00	530	1.130E+01	571	1.607E+01
408	1.650E-02	449	5.470E+00	490	5.381E+00	531	1.135E+01	572	1.621E+01
409	3.490E-02	450	6.052E+00	491	5.499E+00	532	1.146E+01	573	1.641E+01
410	4.940E-02	451	6.590E+00	492	5.670E+00	533	1.156E+01	574	1.654E+01
411	3.860E-02	452	6.982E+00	493	5.844E+00	534	1.165E+01	575	1.671E+01
412	3.770E-02	453	7.325E+00	494	6.009E+00	535	1.177E+01	576	1.693E+01
413	1.200E-02	454	7.480E+00	495	6.189E+00	536	1.184E+01	577	1.705E+01
414	3.410E-02	455	7.538E+00	496	6.381E+00	537	1.195E+01	578	1.729E+01
415	3.680E-02	456	7.348E+00	497	6.558E+00	538	1.206E+01	579	1.740E+01
416	4.110E-02	457	7.145E+00	498	6.761E+00	539	1.218E+01	580	1.757E+01
417	6.620E-02	458	6.884E+00	499	6.970E+00	540	1.225E+01	581	1.778E+01
418	6.740E-02	459	6.541E+00	500	7.169E+00	541	1.232E+01	582	1.792E+01
419	7.720E-02	460	6.317E+00	501	7.333E+00	542	1.239E+01	583	1.815E+01
420	1.365E-01	461	6.063E+00	502	7.541E+00	543	1.254E+01	584	1.830E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.848E+01	626	2.408E+01	667	1.668E+01	708	6.596E+00	749	1.690E+00
586	1.858E+01	627	2.404E+01	668	1.643E+01	709	6.354E+00	750	1.625E+00
587	1.889E+01	628	2.409E+01	669	1.606E+01	710	6.155E+00	751	1.642E+00
588	1.904E+01	629	2.398E+01	670	1.580E+01	711	6.001E+00	752	1.623E+00
589	1.921E+01	630	2.391E+01	671	1.551E+01	712	5.800E+00	753	1.584E+00
590	1.933E+01	631	2.389E+01	672	1.524E+01	713	5.690E+00	754	1.426E+00
591	1.953E+01	632	2.383E+01	673	1.496E+01	714	5.544E+00	755	1.330E+00
592	1.974E+01	633	2.368E+01	674	1.468E+01	715	5.372E+00	756	1.340E+00
593	1.993E+01	634	2.368E+01	675	1.437E+01	716	5.239E+00	757	1.281E+00
594	2.011E+01	635	2.356E+01	676	1.410E+01	717	5.080E+00	758	9.953E-01
595	2.028E+01	636	2.356E+01	677	1.379E+01	718	4.985E+00	759	1.165E+00
596	2.050E+01	637	2.336E+01	678	1.356E+01	719	4.750E+00	760	1.047E+00
597	2.062E+01	638	2.323E+01	679	1.321E+01	720	4.681E+00	761	9.973E-01
598	2.079E+01	639	2.316E+01	680	1.296E+01	721	4.495E+00	762	1.146E+00
599	2.097E+01	640	2.298E+01	681	1.275E+01	722	4.424E+00	763	1.148E+00
600	2.119E+01	641	2.285E+01	682	1.242E+01	723	4.260E+00	764	9.918E-01
601	2.135E+01	642	2.268E+01	683	1.219E+01	724	4.019E+00	765	8.408E-01
602	2.151E+01	643	2.253E+01	684	1.191E+01	725	4.037E+00	766	8.618E-01
603	2.171E+01	644	2.238E+01	685	1.166E+01	726	3.922E+00	767	8.189E-01
604	2.189E+01	645	2.220E+01	686	1.142E+01	727	3.769E+00	768	9.170E-01
605	2.206E+01	646	2.197E+01	687	1.111E+01	728	3.623E+00	769	7.924E-01
606	2.219E+01	647	2.180E+01	688	1.088E+01	729	3.634E+00	770	6.835E-01
607	2.239E+01	648	2.158E+01	689	1.061E+01	730	3.497E+00	771	6.880E-01
608	2.257E+01	649	2.132E+01	690	1.038E+01	731	3.320E+00	772	7.302E-01
609	2.270E+01	650	2.113E+01	691	1.019E+01	732	3.314E+00	773	6.417E-01
610	2.283E+01	651	2.091E+01	692	9.912E+00	733	3.063E+00	774	5.952E-01
611	2.298E+01	652	2.065E+01	693	9.679E+00	734	2.964E+00	775	6.273E-01
612	2.314E+01	653	2.043E+01	694	9.414E+00	735	2.946E+00	776	5.620E-01
613	2.324E+01	654	2.019E+01	695	9.202E+00	736	2.812E+00	777	5.918E-01
614	2.332E+01	655	1.998E+01	696	8.928E+00	737	2.747E+00	778	5.456E-01
615	2.354E+01	656	1.964E+01	697	8.749E+00	738	2.575E+00	779	4.811E-01
616	2.361E+01	657	1.946E+01	698	8.573E+00	739	2.453E+00	780	4.576E-01
617	2.370E+01	658	1.917E+01	699	8.359E+00	740	2.365E+00		
618	2.380E+01	659	1.887E+01	700	8.098E+00	741	2.351E+00		
619	2.382E+01	660	1.862E+01	701	7.949E+00	742	2.289E+00		
620	2.387E+01	661	1.835E+01	702	7.643E+00	743	2.247E+00		
621	2.397E+01	662	1.804E+01	703	7.464E+00	744	2.041E+00		
622	2.397E+01	663	1.772E+01	704	7.278E+00	745	2.023E+00		
623	2.400E+01	664	1.747E+01	705	7.042E+00	746	1.821E+00		
624	2.409E+01	665	1.722E+01	706	6.870E+00	747	1.840E+00		
625	2.406E+01	666	1.694E+01	707	6.683E+00	748	1.791E+00		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles





**Control Setting: 3000K**

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

Test orientation: **Downward**

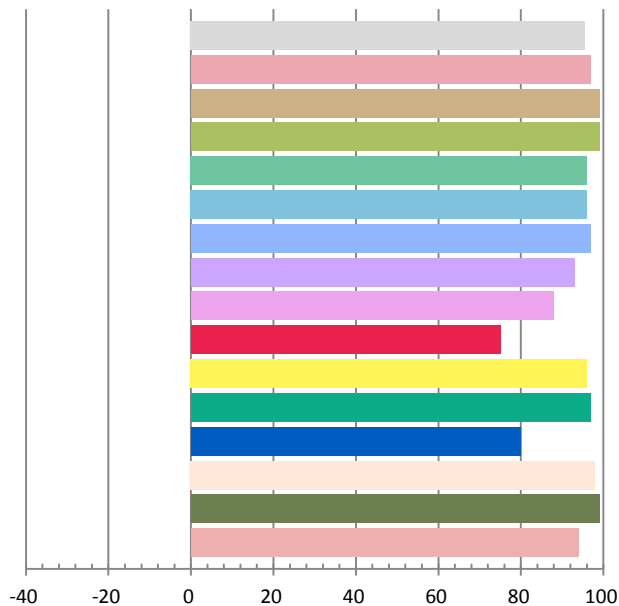
**Photometric and Electrical Measurement Result**

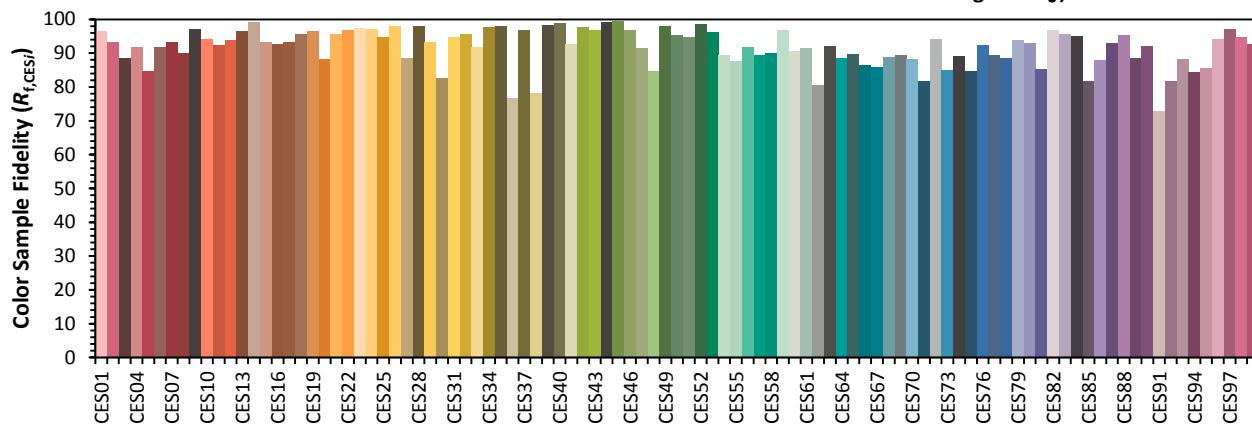
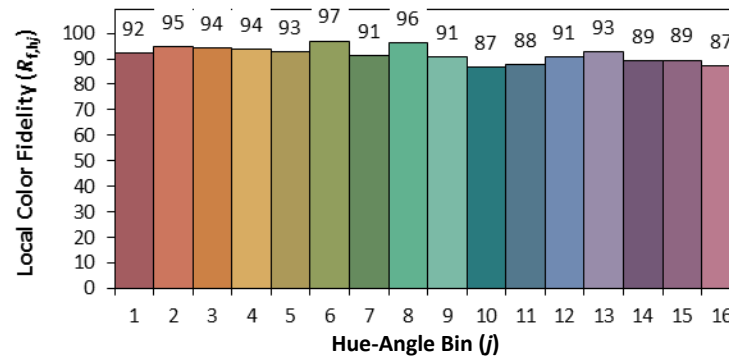
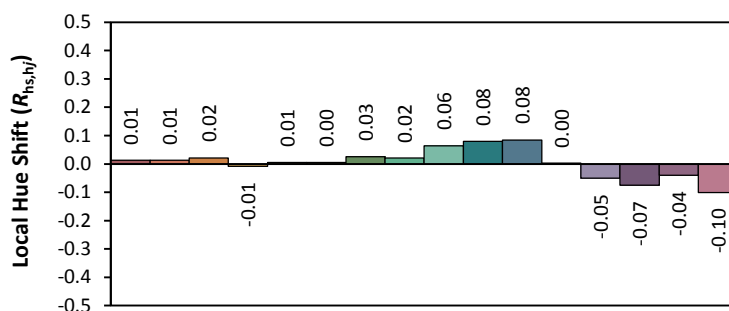
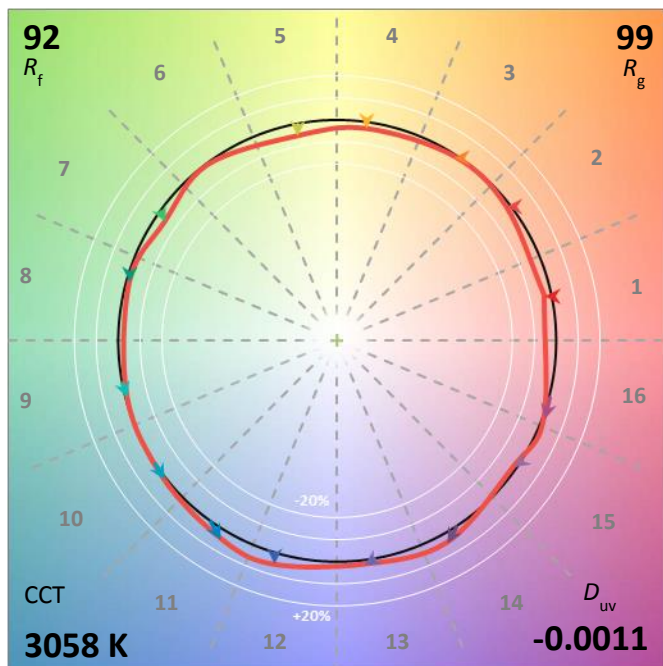
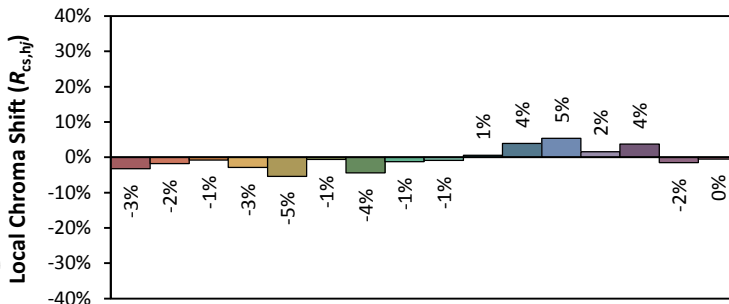
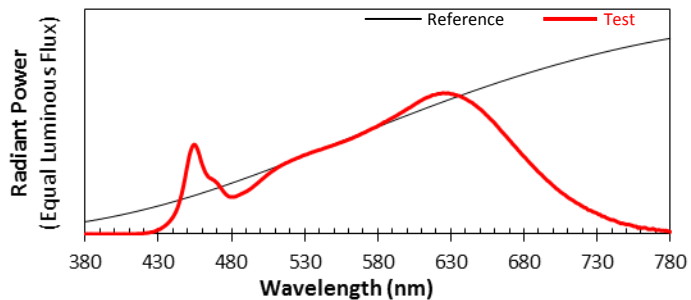
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.1137	13.48	0.9883	1168.45	86.65

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
4.135	3058	-0.00106	0.4314	0.3995	0.2490	0.5187

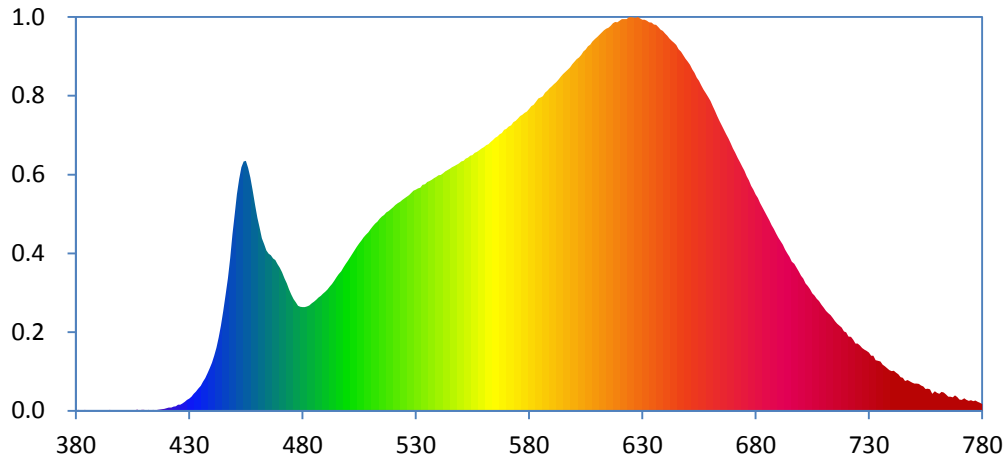
**Color Rendering Index**

<b>Ra</b>			
<b>95.6</b>			
<b>R1</b>	<b>R2</b>	<b>R3</b>	<b>R4</b>
97	99	99	96
<b>R5</b>	<b>R6</b>	<b>R7</b>	<b>R8</b>
96	97	93	88
<b>R9</b>	<b>R10</b>	<b>R11</b>	<b>R12</b>
75	96	97	80
<b>R13</b>	<b>R14</b>	<b>R15</b>	
98	99	94	





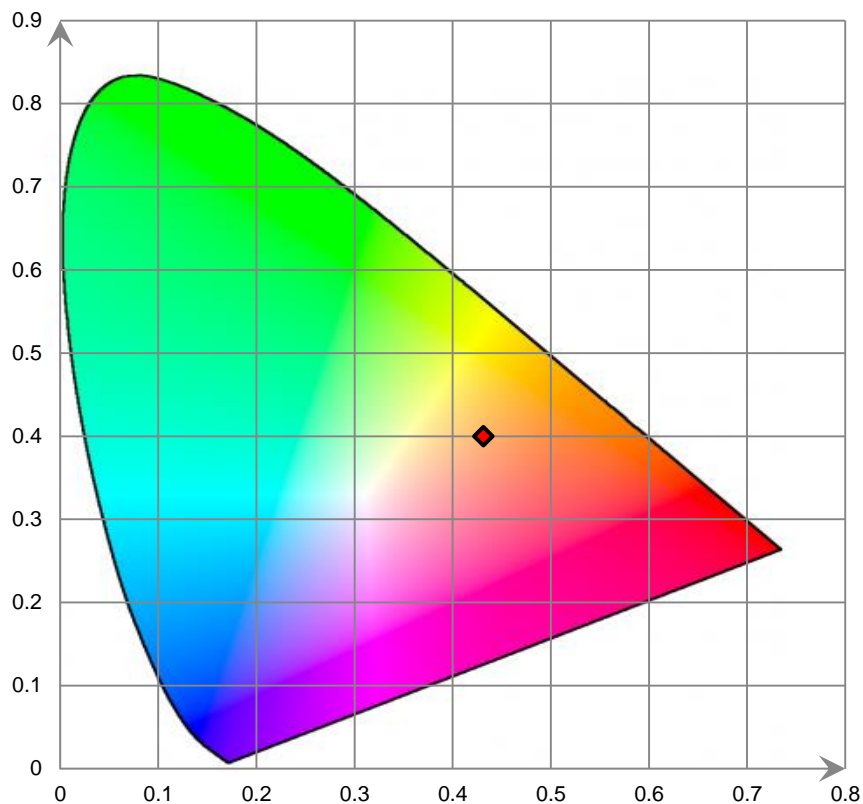
### Relative Spectral Power Distribution



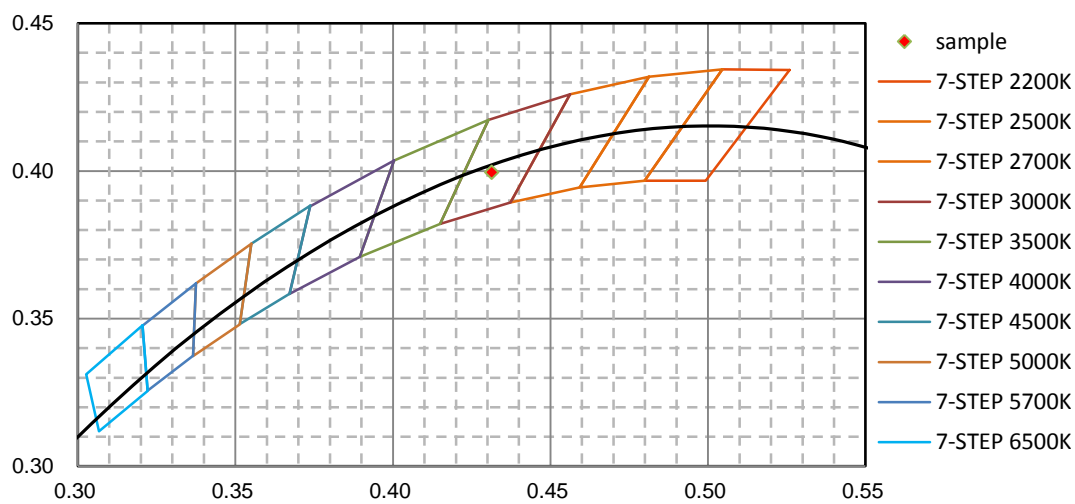
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	3.530E-02	421	1.821E-01	462	1.033E+01	503	9.616E+00	544	1.441E+01
381	6.040E-02	422	1.928E-01	463	9.980E+00	504	9.832E+00	545	1.449E+01
382	3.180E-02	423	2.437E-01	464	9.592E+00	505	1.002E+01	546	1.457E+01
383	1.700E-03	424	2.711E-01	465	9.400E+00	506	1.020E+01	547	1.466E+01
384	5.420E-02	425	3.538E-01	466	9.308E+00	507	1.039E+01	548	1.474E+01
385	2.410E-02	426	3.617E-01	467	9.118E+00	508	1.053E+01	549	1.480E+01
386	2.000E-03	427	4.332E-01	468	9.016E+00	509	1.070E+01	550	1.492E+01
387	3.880E-02	428	5.366E-01	469	8.780E+00	510	1.089E+01	551	1.496E+01
388	1.100E-02	429	6.560E-01	470	8.565E+00	511	1.105E+01	552	1.510E+01
389	3.800E-03	430	7.316E-01	471	8.288E+00	512	1.121E+01	553	1.517E+01
390	4.350E-02	431	8.316E-01	472	7.906E+00	513	1.133E+01	554	1.528E+01
391	1.380E-02	432	1.015E+00	473	7.627E+00	514	1.150E+01	555	1.531E+01
392	3.700E-03	433	1.150E+00	474	7.265E+00	515	1.163E+01	556	1.545E+01
393	9.200E-03	434	1.324E+00	475	6.962E+00	516	1.173E+01	557	1.551E+01
394	1.400E-02	435	1.499E+00	476	6.686E+00	517	1.188E+01	558	1.561E+01
395	5.370E-02	436	1.733E+00	477	6.487E+00	518	1.195E+01	559	1.571E+01
396	1.600E-02	437	1.958E+00	478	6.290E+00	519	1.207E+01	560	1.579E+01
397	8.800E-03	438	2.241E+00	479	6.236E+00	520	1.219E+01	561	1.590E+01
398	1.040E-02	439	2.556E+00	480	6.211E+00	521	1.233E+01	562	1.596E+01
399	1.100E-03	440	2.881E+00	481	6.213E+00	522	1.243E+01	563	1.610E+01
400	1.000E-04	441	3.292E+00	482	6.256E+00	523	1.251E+01	564	1.622E+01
401	1.860E-02	442	3.780E+00	483	6.295E+00	524	1.264E+01	565	1.634E+01
402	1.980E-02	443	4.381E+00	484	6.432E+00	525	1.273E+01	566	1.641E+01
403	2.100E-02	444	5.104E+00	485	6.528E+00	526	1.282E+01	567	1.655E+01
404	1.850E-02	445	5.939E+00	486	6.650E+00	527	1.292E+01	568	1.663E+01
405	2.750E-02	446	6.858E+00	487	6.773E+00	528	1.305E+01	569	1.682E+01
406	4.900E-03	447	7.950E+00	488	6.874E+00	529	1.318E+01	570	1.688E+01
407	6.520E-02	448	9.134E+00	489	7.013E+00	530	1.325E+01	571	1.702E+01
408	1.510E-02	449	1.055E+01	490	7.128E+00	531	1.331E+01	572	1.710E+01
409	5.000E-02	450	1.175E+01	491	7.263E+00	532	1.336E+01	573	1.728E+01
410	5.440E-02	451	1.298E+01	492	7.425E+00	533	1.352E+01	574	1.737E+01
411	4.140E-02	452	1.387E+01	493	7.592E+00	534	1.356E+01	575	1.749E+01
412	5.260E-02	453	1.458E+01	494	7.776E+00	535	1.370E+01	576	1.765E+01
413	1.220E-02	454	1.493E+01	495	7.986E+00	536	1.376E+01	577	1.772E+01
414	4.820E-02	455	1.497E+01	496	8.190E+00	537	1.384E+01	578	1.785E+01
415	4.430E-02	456	1.454E+01	497	8.355E+00	538	1.393E+01	579	1.791E+01
416	4.820E-02	457	1.396E+01	498	8.583E+00	539	1.401E+01	580	1.807E+01
417	7.570E-02	458	1.322E+01	499	8.787E+00	540	1.411E+01	581	1.823E+01
418	9.530E-02	459	1.230E+01	500	8.993E+00	541	1.412E+01	582	1.833E+01
419	1.099E-01	460	1.156E+01	501	9.207E+00	542	1.421E+01	583	1.848E+01
420	1.577E-01	461	1.095E+01	502	9.412E+00	543	1.434E+01	584	1.870E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.877E+01	626	2.355E+01	667	1.655E+01	708	6.580E+00	749	1.694E+00
586	1.884E+01	627	2.353E+01	668	1.631E+01	709	6.343E+00	750	1.627E+00
587	1.906E+01	628	2.359E+01	669	1.601E+01	710	6.163E+00	751	1.622E+00
588	1.917E+01	629	2.350E+01	670	1.571E+01	711	5.977E+00	752	1.605E+00
589	1.931E+01	630	2.343E+01	671	1.546E+01	712	5.840E+00	753	1.516E+00
590	1.943E+01	631	2.343E+01	672	1.514E+01	713	5.720E+00	754	1.452E+00
591	1.957E+01	632	2.336E+01	673	1.488E+01	714	5.560E+00	755	1.301E+00
592	1.968E+01	633	2.326E+01	674	1.462E+01	715	5.357E+00	756	1.329E+00
593	1.984E+01	634	2.324E+01	675	1.437E+01	716	5.214E+00	757	1.283E+00
594	2.000E+01	635	2.314E+01	676	1.405E+01	717	5.102E+00	758	1.008E+00
595	2.016E+01	636	2.311E+01	677	1.379E+01	718	4.979E+00	759	1.174E+00
596	2.030E+01	637	2.297E+01	678	1.347E+01	719	4.759E+00	760	1.069E+00
597	2.043E+01	638	2.282E+01	679	1.325E+01	720	4.687E+00	761	1.016E+00
598	2.056E+01	639	2.274E+01	680	1.296E+01	721	4.448E+00	762	1.120E+00
599	2.076E+01	640	2.259E+01	681	1.274E+01	722	4.428E+00	763	1.094E+00
600	2.090E+01	641	2.247E+01	682	1.243E+01	723	4.257E+00	764	9.727E-01
601	2.107E+01	642	2.228E+01	683	1.218E+01	724	4.026E+00	765	8.320E-01
602	2.116E+01	643	2.216E+01	684	1.190E+01	725	4.015E+00	766	8.399E-01
603	2.131E+01	644	2.204E+01	685	1.166E+01	726	3.910E+00	767	8.006E-01
604	2.151E+01	645	2.190E+01	686	1.140E+01	727	3.756E+00	768	9.223E-01
605	2.164E+01	646	2.166E+01	687	1.112E+01	728	3.666E+00	769	8.157E-01
606	2.184E+01	647	2.149E+01	688	1.088E+01	729	3.586E+00	770	6.723E-01
607	2.193E+01	648	2.129E+01	689	1.061E+01	730	3.487E+00	771	6.527E-01
608	2.211E+01	649	2.108E+01	690	1.037E+01	731	3.288E+00	772	7.449E-01
609	2.227E+01	650	2.091E+01	691	1.015E+01	732	3.298E+00	773	6.460E-01
610	2.238E+01	651	2.072E+01	692	9.944E+00	733	3.027E+00	774	5.882E-01
611	2.253E+01	652	2.045E+01	693	9.665E+00	734	2.983E+00	775	6.272E-01
612	2.266E+01	653	2.025E+01	694	9.421E+00	735	2.950E+00	776	5.635E-01
613	2.278E+01	654	1.996E+01	695	9.213E+00	736	2.757E+00	777	6.125E-01
614	2.288E+01	655	1.976E+01	696	8.922E+00	737	2.668E+00	778	5.358E-01
615	2.294E+01	656	1.949E+01	697	8.795E+00	738	2.548E+00	779	4.776E-01
616	2.305E+01	657	1.925E+01	698	8.563E+00	739	2.441E+00	780	3.950E-01
617	2.320E+01	658	1.903E+01	699	8.327E+00	740	2.375E+00		
618	2.329E+01	659	1.878E+01	700	8.079E+00	741	2.399E+00		
619	2.328E+01	660	1.856E+01	701	7.913E+00	742	2.283E+00		
620	2.336E+01	661	1.823E+01	702	7.630E+00	743	2.184E+00		
621	2.345E+01	662	1.796E+01	703	7.475E+00	744	2.006E+00		
622	2.346E+01	663	1.765E+01	704	7.290E+00	745	1.964E+00		
623	2.347E+01	664	1.736E+01	705	7.039E+00	746	1.786E+00		
624	2.357E+01	665	1.710E+01	706	6.898E+00	747	1.841E+00		
625	2.357E+01	666	1.683E+01	707	6.698E+00	748	1.770E+00		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles



**Control Setting: 3500K**

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

Test orientation: **Downward**

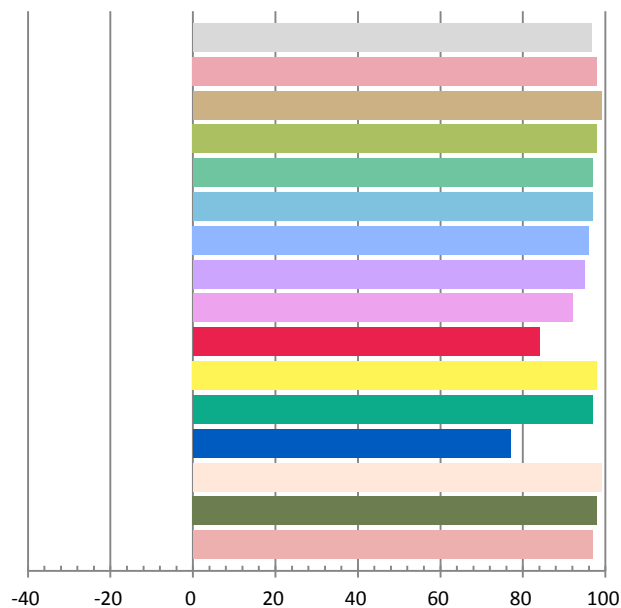
**Photometric and Electrical Measurement Result**

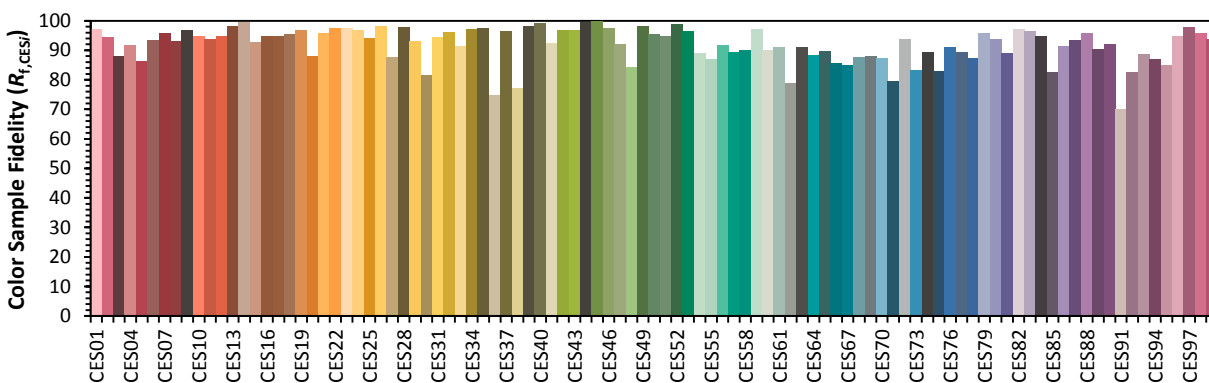
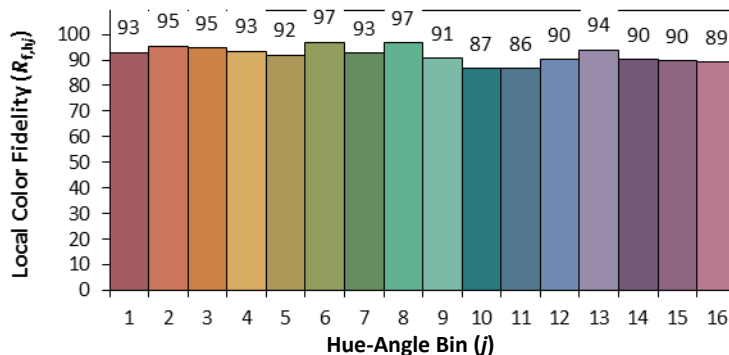
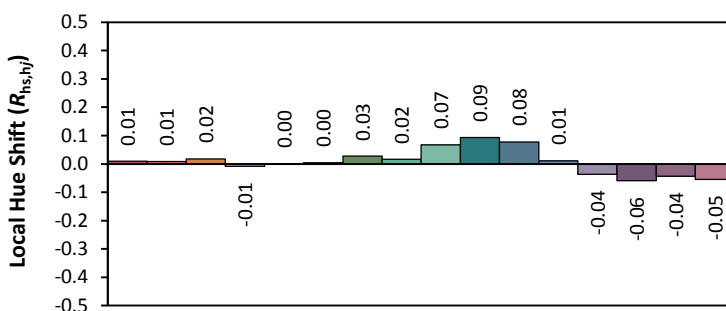
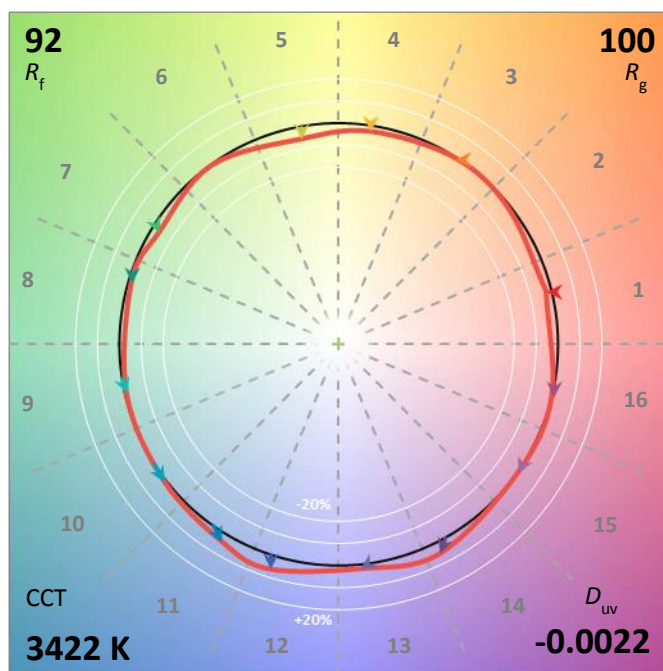
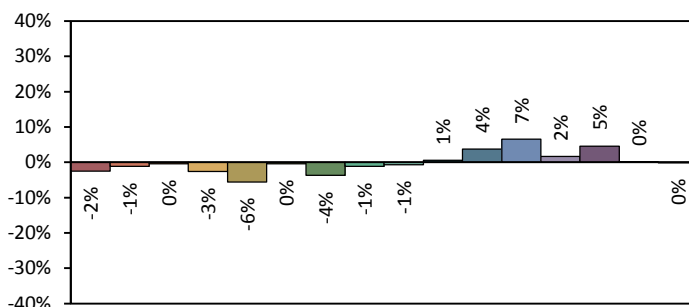
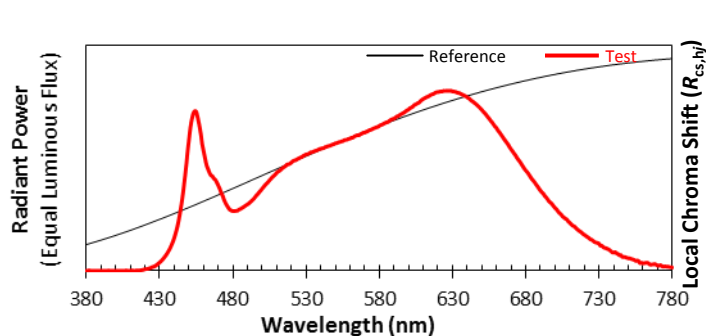
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.1134	13.45	0.988	1177.7	87.56

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
4.182	3423	-0.00224	0.4073	0.3866	0.2387	0.5098

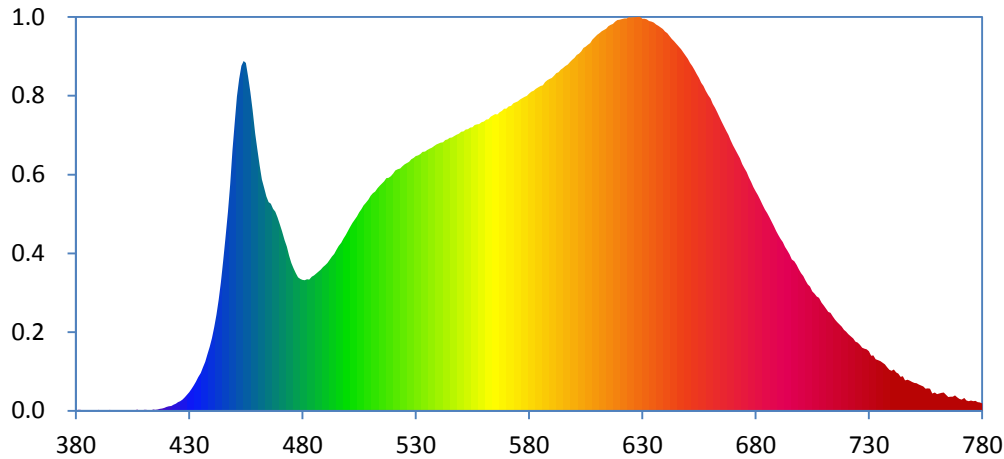
**Color Rendering Index**

<b>Ra</b>			
<b>96.6</b>			
<b>R1</b>	<b>R2</b>	<b>R3</b>	<b>R4</b>
98	99	98	97
<b>R5</b>	<b>R6</b>	<b>R7</b>	<b>R8</b>
97	96	95	92
<b>R9</b>	<b>R10</b>	<b>R11</b>	<b>R12</b>
84	98	97	77
<b>R13</b>	<b>R14</b>	<b>R15</b>	
99	98	97	





### Relative Spectral Power Distribution

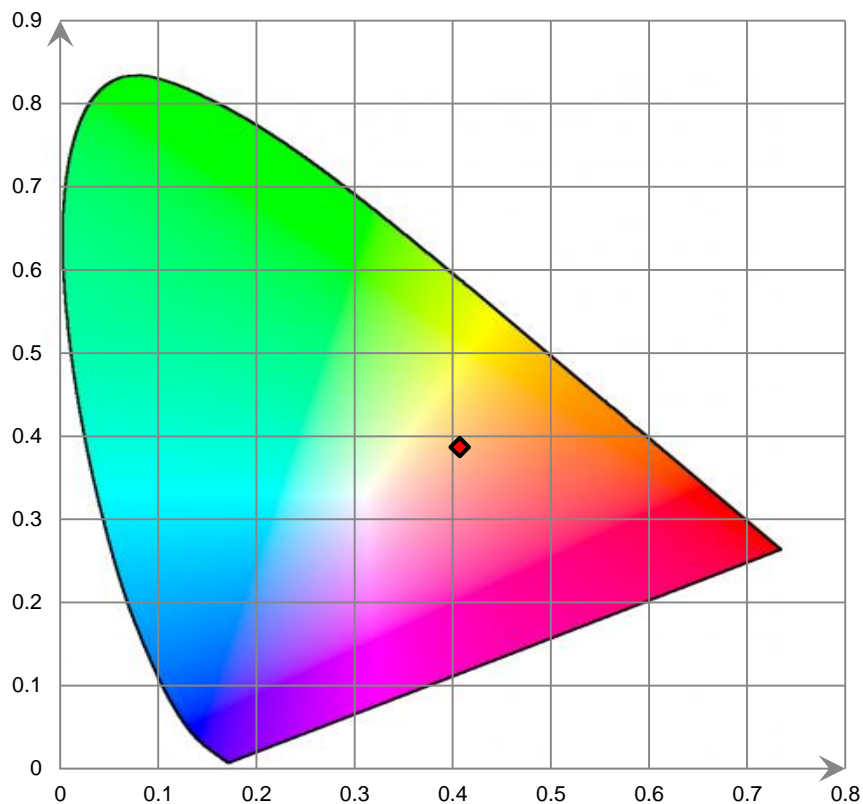


nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	3.520E-02	421	2.441E-01	462	1.293E+01	503	1.067E+01	544	1.516E+01
381	4.760E-02	422	2.652E-01	463	1.246E+01	504	1.085E+01	545	1.524E+01
382	6.050E-02	423	3.303E-01	464	1.198E+01	505	1.108E+01	546	1.527E+01
383	1.020E-02	424	3.874E-01	465	1.166E+01	506	1.127E+01	547	1.536E+01
384	3.790E-02	425	4.884E-01	466	1.157E+01	507	1.147E+01	548	1.543E+01
385	1.180E-02	426	5.271E-01	467	1.128E+01	508	1.162E+01	549	1.548E+01
386	1.000E-03	427	6.260E-01	468	1.113E+01	509	1.179E+01	550	1.559E+01
387	3.590E-02	428	7.460E-01	469	1.079E+01	510	1.201E+01	551	1.560E+01
388	1.800E-02	429	9.009E-01	470	1.043E+01	511	1.216E+01	552	1.571E+01
389	6.300E-03	430	1.044E+00	471	1.003E+01	512	1.225E+01	553	1.574E+01
390	4.580E-02	431	1.208E+00	472	9.535E+00	513	1.243E+01	554	1.582E+01
391	1.610E-02	432	1.406E+00	473	9.175E+00	514	1.257E+01	555	1.584E+01
392	6.400E-03	433	1.624E+00	474	8.665E+00	515	1.270E+01	556	1.597E+01
393	7.000E-03	434	1.872E+00	475	8.266E+00	516	1.282E+01	557	1.600E+01
394	2.180E-02	435	2.109E+00	476	7.956E+00	517	1.300E+01	558	1.602E+01
395	5.250E-02	436	2.423E+00	477	7.690E+00	518	1.302E+01	559	1.613E+01
396	1.170E-02	437	2.735E+00	478	7.458E+00	519	1.311E+01	560	1.616E+01
397	4.900E-03	438	3.155E+00	479	7.366E+00	520	1.326E+01	561	1.626E+01
398	1.600E-03	439	3.567E+00	480	7.316E+00	521	1.342E+01	562	1.628E+01
399	5.000E-04	440	4.064E+00	481	7.301E+00	522	1.350E+01	563	1.644E+01
400	1.000E-04	441	4.658E+00	482	7.340E+00	523	1.353E+01	564	1.651E+01
401	1.590E-02	442	5.356E+00	483	7.338E+00	524	1.365E+01	565	1.657E+01
402	1.750E-02	443	6.199E+00	484	7.487E+00	525	1.376E+01	566	1.656E+01
403	2.140E-02	444	7.188E+00	485	7.561E+00	526	1.384E+01	567	1.668E+01
404	8.300E-03	445	8.364E+00	486	7.667E+00	527	1.391E+01	568	1.676E+01
405	3.490E-02	446	9.616E+00	487	7.781E+00	528	1.405E+01	569	1.687E+01
406	6.400E-03	447	1.113E+01	488	7.888E+00	529	1.413E+01	570	1.688E+01
407	6.460E-02	448	1.267E+01	489	8.025E+00	530	1.424E+01	571	1.700E+01
408	1.860E-02	449	1.454E+01	490	8.141E+00	531	1.426E+01	572	1.705E+01
409	3.510E-02	450	1.607E+01	491	8.260E+00	532	1.434E+01	573	1.718E+01
410	4.300E-02	451	1.755E+01	492	8.434E+00	533	1.447E+01	574	1.723E+01
411	5.300E-02	452	1.854E+01	493	8.609E+00	534	1.448E+01	575	1.730E+01
412	4.210E-02	453	1.928E+01	494	8.761E+00	535	1.457E+01	576	1.739E+01
413	1.260E-02	454	1.954E+01	495	8.989E+00	536	1.465E+01	577	1.747E+01
414	6.650E-02	455	1.943E+01	496	9.203E+00	537	1.469E+01	578	1.754E+01
415	4.800E-02	456	1.866E+01	497	9.390E+00	538	1.478E+01	579	1.759E+01
416	6.430E-02	457	1.781E+01	498	9.626E+00	539	1.488E+01	580	1.772E+01
417	9.710E-02	458	1.681E+01	499	9.824E+00	540	1.493E+01	581	1.782E+01
418	1.165E-01	459	1.549E+01	500	1.005E+01	541	1.498E+01	582	1.788E+01
419	1.587E-01	460	1.458E+01	501	1.028E+01	542	1.500E+01	583	1.799E+01
420	2.166E-01	461	1.372E+01	502	1.049E+01	543	1.512E+01	584	1.807E+01

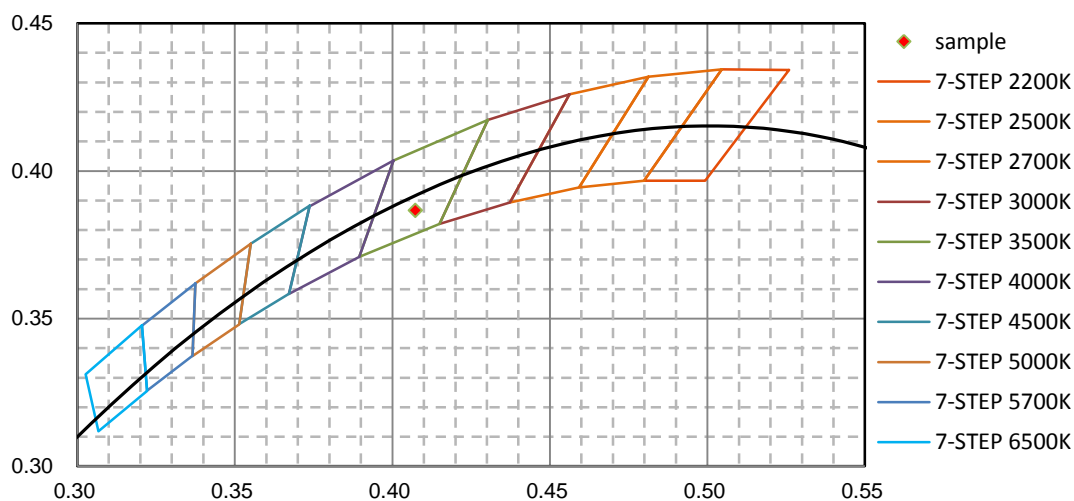


nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.815E+01	626	2.200E+01	667	1.565E+01	708	6.302E+00	749	1.616E+00
586	1.819E+01	627	2.198E+01	668	1.541E+01	709	6.050E+00	750	1.550E+00
587	1.836E+01	628	2.201E+01	669	1.511E+01	710	5.886E+00	751	1.544E+00
588	1.847E+01	629	2.200E+01	670	1.484E+01	711	5.698E+00	752	1.473E+00
589	1.854E+01	630	2.190E+01	671	1.460E+01	712	5.526E+00	753	1.420E+00
590	1.860E+01	631	2.190E+01	672	1.434E+01	713	5.466E+00	754	1.354E+00
591	1.873E+01	632	2.187E+01	673	1.410E+01	714	5.280E+00	755	1.229E+00
592	1.887E+01	633	2.178E+01	674	1.379E+01	715	5.100E+00	756	1.258E+00
593	1.891E+01	634	2.173E+01	675	1.355E+01	716	4.959E+00	757	1.228E+00
594	1.907E+01	635	2.169E+01	676	1.333E+01	717	4.828E+00	758	9.550E-01
595	1.915E+01	636	2.158E+01	677	1.304E+01	718	4.709E+00	759	1.022E+00
596	1.926E+01	637	2.150E+01	678	1.278E+01	719	4.529E+00	760	9.261E-01
597	1.935E+01	638	2.142E+01	679	1.249E+01	720	4.417E+00	761	9.587E-01
598	1.949E+01	639	2.133E+01	680	1.226E+01	721	4.278E+00	762	1.009E+00
599	1.962E+01	640	2.119E+01	681	1.206E+01	722	4.156E+00	763	1.013E+00
600	1.972E+01	641	2.109E+01	682	1.180E+01	723	4.047E+00	764	8.932E-01
601	1.989E+01	642	2.094E+01	683	1.153E+01	724	3.869E+00	765	7.646E-01
602	1.996E+01	643	2.077E+01	684	1.124E+01	725	3.810E+00	766	7.872E-01
603	2.008E+01	644	2.065E+01	685	1.105E+01	726	3.674E+00	767	7.871E-01
604	2.028E+01	645	2.051E+01	686	1.083E+01	727	3.526E+00	768	8.582E-01
605	2.035E+01	646	2.037E+01	687	1.057E+01	728	3.468E+00	769	7.558E-01
606	2.046E+01	647	2.021E+01	688	1.032E+01	729	3.432E+00	770	6.510E-01
607	2.055E+01	648	2.003E+01	689	1.005E+01	730	3.331E+00	771	6.269E-01
608	2.073E+01	649	1.985E+01	690	9.817E+00	731	3.076E+00	772	7.218E-01
609	2.088E+01	650	1.967E+01	691	9.601E+00	732	3.087E+00	773	5.793E-01
610	2.100E+01	651	1.943E+01	692	9.423E+00	733	2.884E+00	774	5.378E-01
611	2.109E+01	652	1.926E+01	693	9.147E+00	734	2.819E+00	775	5.657E-01
612	2.120E+01	653	1.905E+01	694	8.958E+00	735	2.774E+00	776	5.380E-01
613	2.127E+01	654	1.881E+01	695	8.739E+00	736	2.674E+00	777	5.429E-01
614	2.136E+01	655	1.859E+01	696	8.456E+00	737	2.589E+00	778	4.781E-01
615	2.149E+01	656	1.833E+01	697	8.340E+00	738	2.439E+00	779	4.667E-01
616	2.157E+01	657	1.814E+01	698	8.150E+00	739	2.283E+00	780	4.128E-01
617	2.162E+01	658	1.789E+01	699	7.897E+00	740	2.229E+00		
618	2.174E+01	659	1.764E+01	700	7.680E+00	741	2.305E+00		
619	2.182E+01	660	1.745E+01	701	7.518E+00	742	2.150E+00		
620	2.184E+01	661	1.715E+01	702	7.270E+00	743	2.071E+00		
621	2.188E+01	662	1.693E+01	703	7.054E+00	744	1.900E+00		
622	2.193E+01	663	1.667E+01	704	6.930E+00	745	1.934E+00		
623	2.192E+01	664	1.642E+01	705	6.678E+00	746	1.693E+00		
624	2.199E+01	665	1.614E+01	706	6.545E+00	747	1.734E+00		
625	2.197E+01	666	1.590E+01	707	6.380E+00	748	1.680E+00		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles



**Control Setting: 4000K**

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

Test orientation: **Downward**

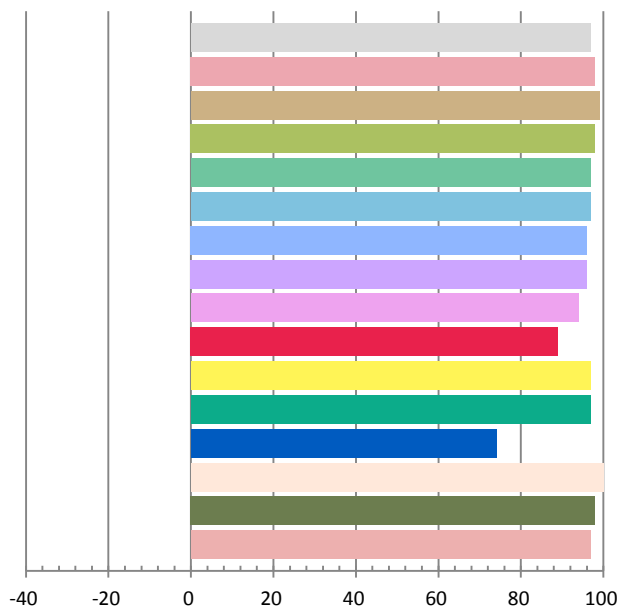
**Photometric and Electrical Measurement Result**

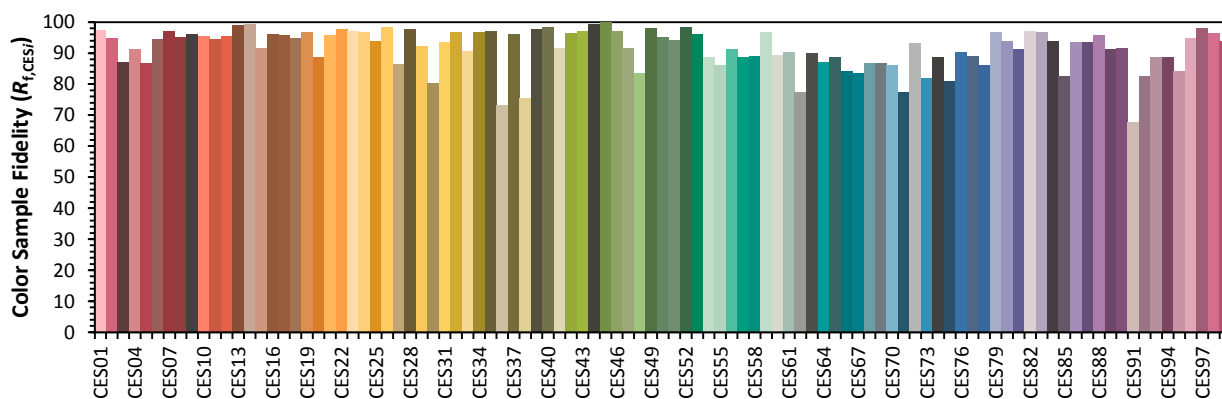
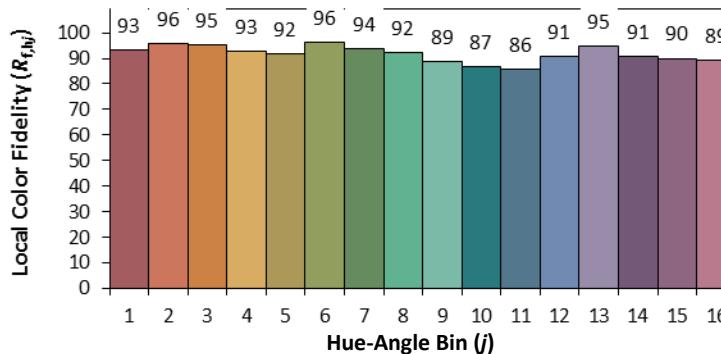
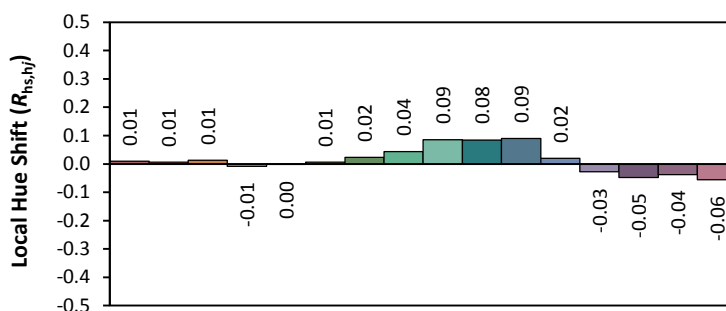
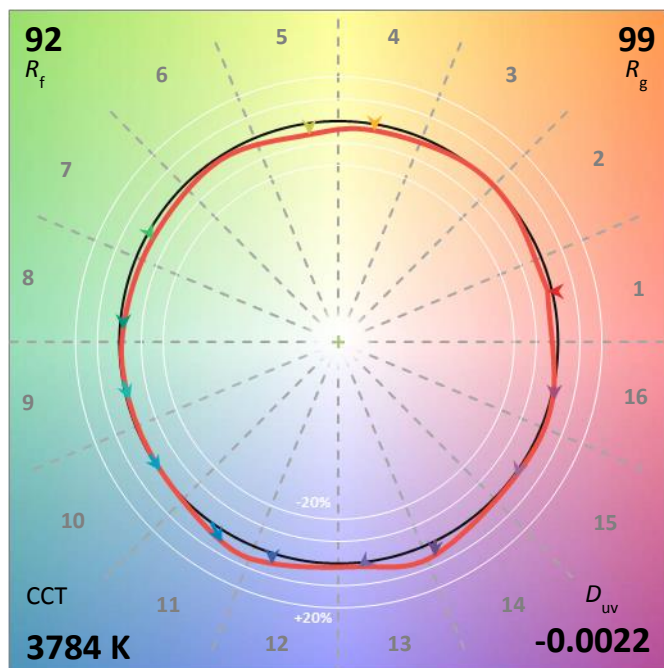
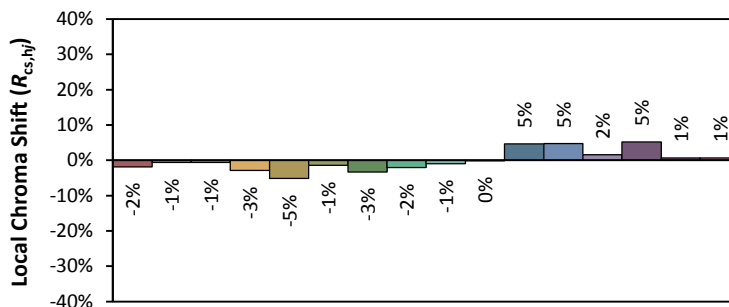
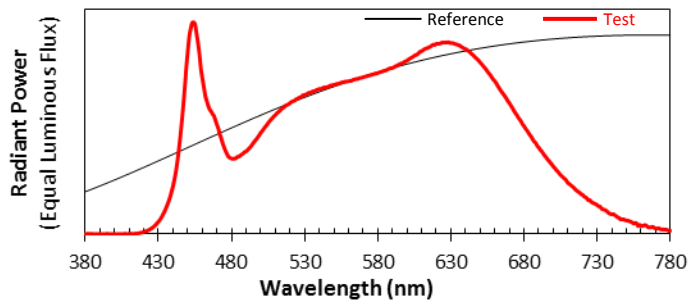
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.1131	13.41	0.9881	1184.49	88.35

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
4.212	3784	-0.00216	0.3887	0.3771	0.2304	0.5029

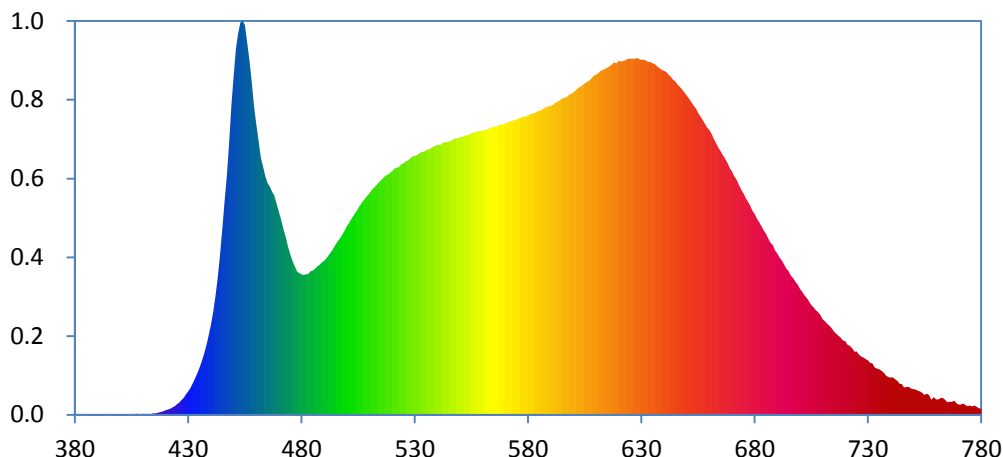
**Color Rendering Index**

<b>Ra</b>			
<b>96.9</b>			
<b>R1</b>	<b>R2</b>	<b>R3</b>	<b>R4</b>
98	99	98	97
<b>R5</b>	<b>R6</b>	<b>R7</b>	<b>R8</b>
97	96	96	94
<b>R9</b>	<b>R10</b>	<b>R11</b>	<b>R12</b>
89	97	97	74
<b>R13</b>	<b>R14</b>	<b>R15</b>	
100	98	97	





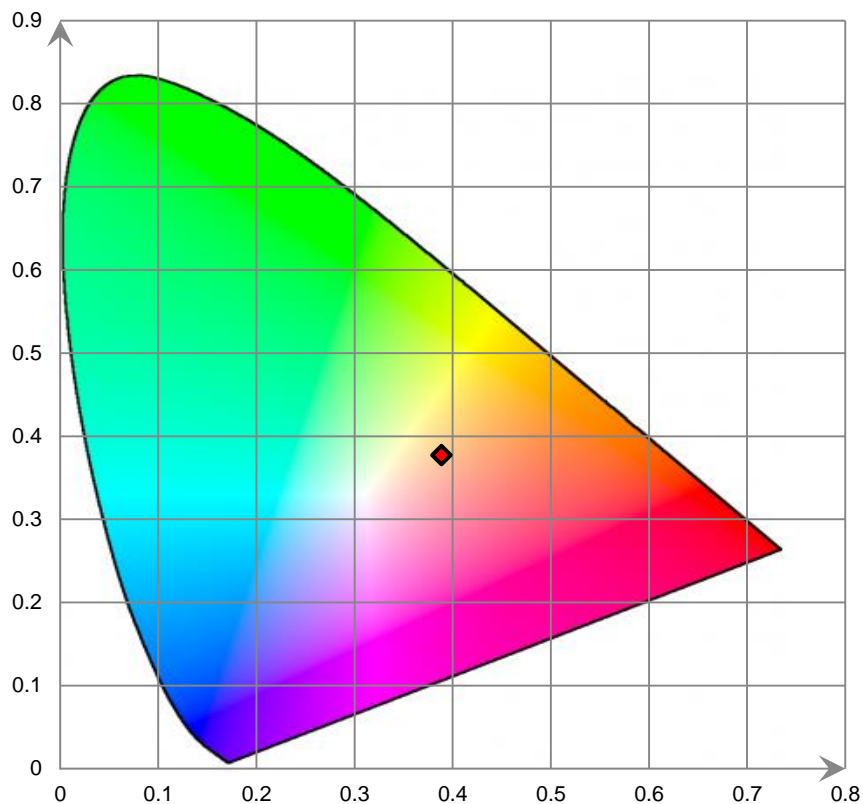
### Relative Spectral Power Distribution



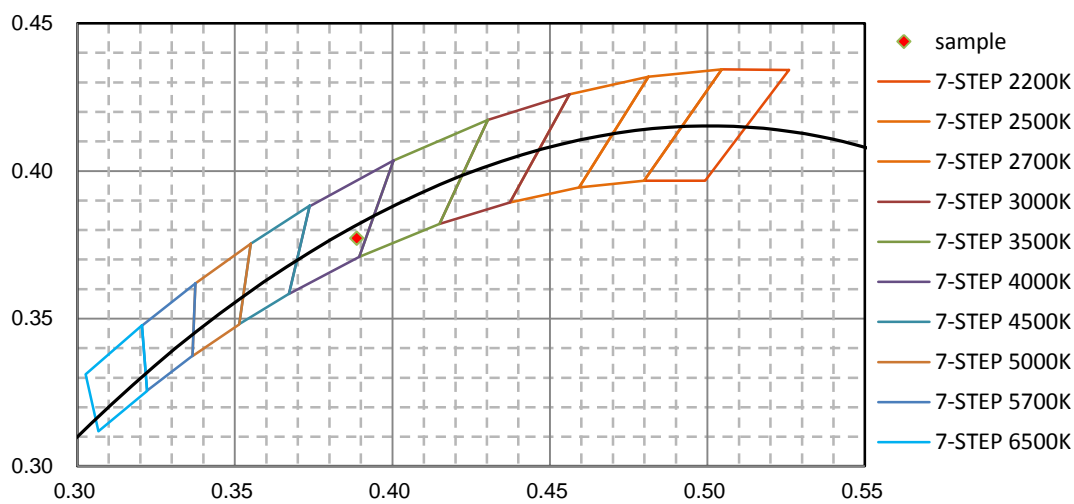
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	2.350E-02	421	3.030E-01	462	1.492E+01	503	1.157E+01	544	1.584E+01
381	3.410E-02	422	3.473E-01	463	1.439E+01	504	1.176E+01	545	1.584E+01
382	4.460E-02	423	4.267E-01	464	1.384E+01	505	1.198E+01	546	1.590E+01
383	1.480E-02	424	5.042E-01	465	1.345E+01	506	1.218E+01	547	1.597E+01
384	5.480E-02	425	6.098E-01	466	1.324E+01	507	1.237E+01	548	1.606E+01
385	2.830E-02	426	7.023E-01	467	1.295E+01	508	1.253E+01	549	1.603E+01
386	2.000E-03	427	8.517E-01	468	1.272E+01	509	1.272E+01	550	1.611E+01
387	3.020E-02	428	9.863E-01	469	1.226E+01	510	1.286E+01	551	1.612E+01
388	1.510E-02	429	1.178E+00	470	1.180E+01	511	1.304E+01	552	1.621E+01
389	8.200E-03	430	1.352E+00	471	1.134E+01	512	1.318E+01	553	1.621E+01
390	4.090E-02	431	1.559E+00	472	1.073E+01	513	1.330E+01	554	1.626E+01
391	1.590E-02	432	1.810E+00	473	1.029E+01	514	1.349E+01	555	1.635E+01
392	5.300E-03	433	2.097E+00	474	9.747E+00	515	1.359E+01	556	1.638E+01
393	1.710E-02	434	2.400E+00	475	9.309E+00	516	1.372E+01	557	1.641E+01
394	1.280E-02	435	2.758E+00	476	8.907E+00	517	1.388E+01	558	1.646E+01
395	5.730E-02	436	3.140E+00	477	8.605E+00	518	1.393E+01	559	1.645E+01
396	1.000E-02	437	3.559E+00	478	8.318E+00	519	1.403E+01	560	1.650E+01
397	1.290E-02	438	4.050E+00	479	8.222E+00	520	1.414E+01	561	1.652E+01
398	8.900E-03	439	4.616E+00	480	8.144E+00	521	1.427E+01	562	1.653E+01
399	4.000E-04	440	5.212E+00	481	8.115E+00	522	1.434E+01	563	1.665E+01
400	0.000E+00	441	5.954E+00	482	8.159E+00	523	1.439E+01	564	1.666E+01
401	1.880E-02	442	6.876E+00	483	8.175E+00	524	1.454E+01	565	1.672E+01
402	2.290E-02	443	7.927E+00	484	8.330E+00	525	1.460E+01	566	1.672E+01
403	2.280E-02	444	9.215E+00	485	8.372E+00	526	1.471E+01	567	1.680E+01
404	1.730E-02	445	1.067E+01	486	8.493E+00	527	1.476E+01	568	1.684E+01
405	2.680E-02	446	1.225E+01	487	8.607E+00	528	1.488E+01	569	1.687E+01
406	4.500E-03	447	1.395E+01	488	8.706E+00	529	1.499E+01	570	1.692E+01
407	7.330E-02	448	1.583E+01	489	8.859E+00	530	1.503E+01	571	1.697E+01
408	1.280E-02	449	1.799E+01	490	8.938E+00	531	1.506E+01	572	1.701E+01
409	3.200E-02	450	1.967E+01	491	9.082E+00	532	1.516E+01	573	1.707E+01
410	5.150E-02	451	2.125E+01	492	9.256E+00	533	1.525E+01	574	1.711E+01
411	4.150E-02	452	2.213E+01	493	9.425E+00	534	1.527E+01	575	1.714E+01
412	4.780E-02	453	2.277E+01	494	9.634E+00	535	1.536E+01	576	1.721E+01
413	1.530E-02	454	2.285E+01	495	9.855E+00	536	1.541E+01	577	1.724E+01
414	7.750E-02	455	2.262E+01	496	1.006E+01	537	1.545E+01	578	1.731E+01
415	6.810E-02	456	2.164E+01	497	1.025E+01	538	1.554E+01	579	1.731E+01
416	8.650E-02	457	2.061E+01	498	1.047E+01	539	1.560E+01	580	1.738E+01
417	1.269E-01	458	1.941E+01	499	1.069E+01	540	1.566E+01	581	1.744E+01
418	1.584E-01	459	1.784E+01	500	1.095E+01	541	1.563E+01	582	1.749E+01
419	1.965E-01	460	1.680E+01	501	1.113E+01	542	1.574E+01	583	1.752E+01
420	2.585E-01	461	1.589E+01	502	1.136E+01	543	1.581E+01	584	1.761E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.763E+01	626	2.067E+01	667	1.485E+01	708	5.958E+00	749	1.527E+00
586	1.769E+01	627	2.066E+01	668	1.461E+01	709	5.767E+00	750	1.483E+00
587	1.779E+01	628	2.070E+01	669	1.432E+01	710	5.523E+00	751	1.471E+00
588	1.785E+01	629	2.065E+01	670	1.414E+01	711	5.418E+00	752	1.384E+00
589	1.790E+01	630	2.060E+01	671	1.386E+01	712	5.276E+00	753	1.355E+00
590	1.792E+01	631	2.062E+01	672	1.363E+01	713	5.160E+00	754	1.259E+00
591	1.800E+01	632	2.056E+01	673	1.333E+01	714	5.020E+00	755	1.143E+00
592	1.809E+01	633	2.049E+01	674	1.308E+01	715	4.832E+00	756	1.219E+00
593	1.816E+01	634	2.047E+01	675	1.285E+01	716	4.699E+00	757	1.157E+00
594	1.824E+01	635	2.039E+01	676	1.260E+01	717	4.592E+00	758	8.805E-01
595	1.833E+01	636	2.034E+01	677	1.238E+01	718	4.482E+00	759	1.022E+00
596	1.840E+01	637	2.020E+01	678	1.213E+01	719	4.299E+00	760	8.887E-01
597	1.844E+01	638	2.012E+01	679	1.185E+01	720	4.272E+00	761	8.818E-01
598	1.857E+01	639	2.001E+01	680	1.166E+01	721	4.072E+00	762	9.608E-01
599	1.863E+01	640	1.997E+01	681	1.138E+01	722	3.991E+00	763	9.855E-01
600	1.872E+01	641	1.988E+01	682	1.118E+01	723	3.858E+00	764	8.759E-01
601	1.883E+01	642	1.974E+01	683	1.095E+01	724	3.648E+00	765	7.286E-01
602	1.894E+01	643	1.962E+01	684	1.068E+01	725	3.671E+00	766	7.589E-01
603	1.903E+01	644	1.944E+01	685	1.049E+01	726	3.489E+00	767	7.420E-01
604	1.911E+01	645	1.934E+01	686	1.020E+01	727	3.380E+00	768	8.161E-01
605	1.924E+01	646	1.917E+01	687	9.974E+00	728	3.321E+00	769	6.900E-01
606	1.931E+01	647	1.900E+01	688	9.835E+00	729	3.239E+00	770	5.975E-01
607	1.939E+01	648	1.887E+01	689	9.529E+00	730	3.147E+00	771	5.960E-01
608	1.952E+01	649	1.870E+01	690	9.354E+00	731	2.998E+00	772	6.556E-01
609	1.968E+01	650	1.851E+01	691	9.116E+00	732	2.979E+00	773	5.566E-01
610	1.974E+01	651	1.834E+01	692	8.947E+00	733	2.747E+00	774	5.004E-01
611	1.984E+01	652	1.814E+01	693	8.719E+00	734	2.676E+00	775	5.337E-01
612	1.996E+01	653	1.796E+01	694	8.484E+00	735	2.644E+00	776	4.783E-01
613	2.001E+01	654	1.778E+01	695	8.327E+00	736	2.551E+00	777	5.276E-01
614	2.008E+01	655	1.753E+01	696	8.076E+00	737	2.422E+00	778	4.566E-01
615	2.014E+01	656	1.733E+01	697	7.915E+00	738	2.259E+00	779	3.750E-01
616	2.023E+01	657	1.714E+01	698	7.703E+00	739	2.194E+00	780	3.659E-01
617	2.034E+01	658	1.690E+01	699	7.530E+00	740	2.148E+00		
618	2.045E+01	659	1.665E+01	700	7.297E+00	741	2.169E+00		
619	2.039E+01	660	1.651E+01	701	7.132E+00	742	2.059E+00		
620	2.053E+01	661	1.629E+01	702	6.925E+00	743	1.963E+00		
621	2.051E+01	662	1.599E+01	703	6.769E+00	744	1.807E+00		
622	2.054E+01	663	1.574E+01	704	6.577E+00	745	1.773E+00		
623	2.057E+01	664	1.549E+01	705	6.377E+00	746	1.583E+00		
624	2.067E+01	665	1.528E+01	706	6.236E+00	747	1.612E+00		
625	2.065E+01	666	1.506E+01	707	6.070E+00	748	1.619E+00		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles



**Control Setting: 5000K**

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

Test orientation: **Downward**

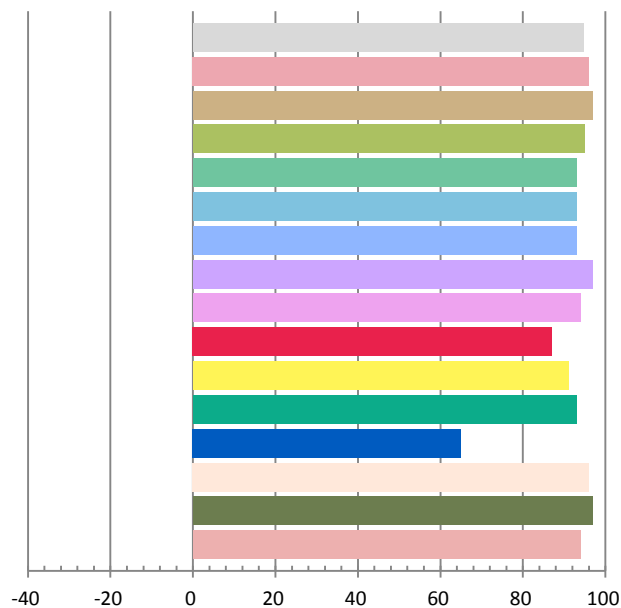
**Photometric and Electrical Measurement Result**

Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.1141	13.53	0.9885	1226.1	90.62

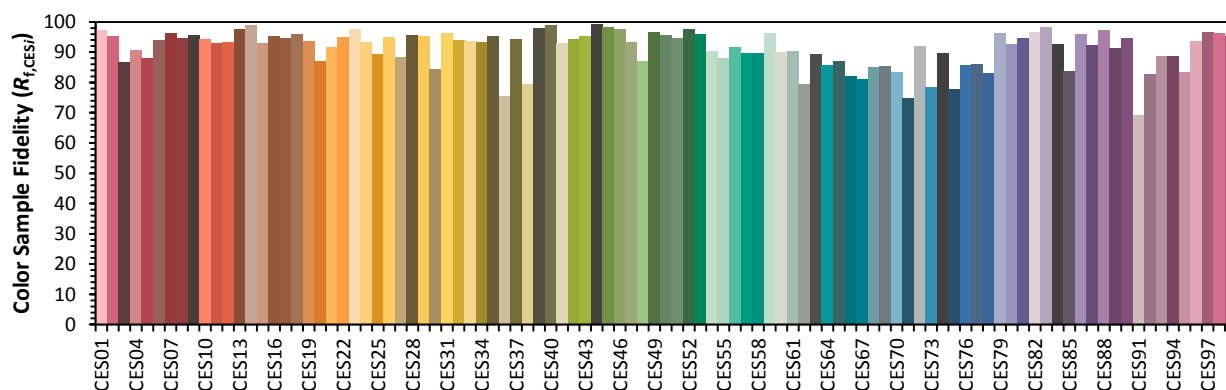
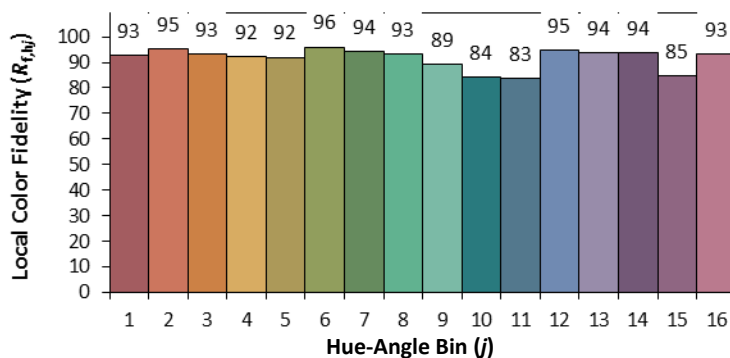
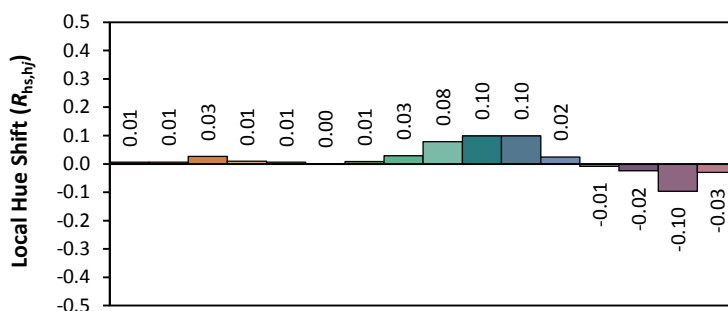
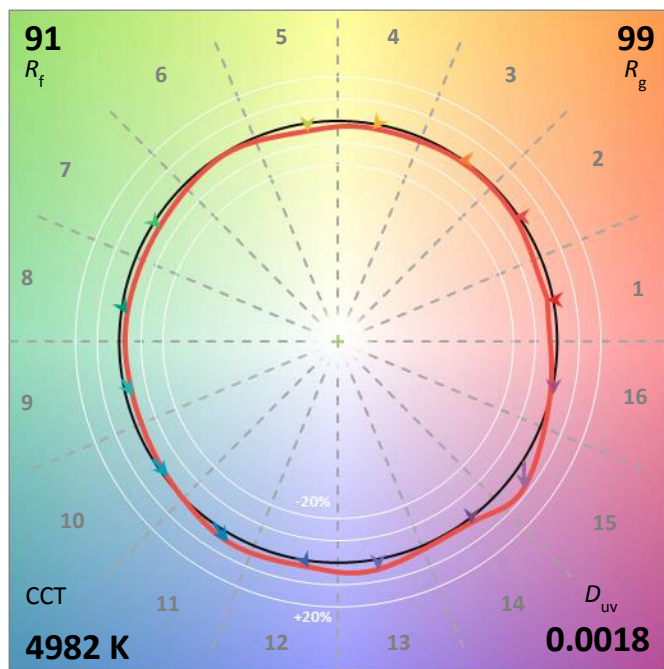
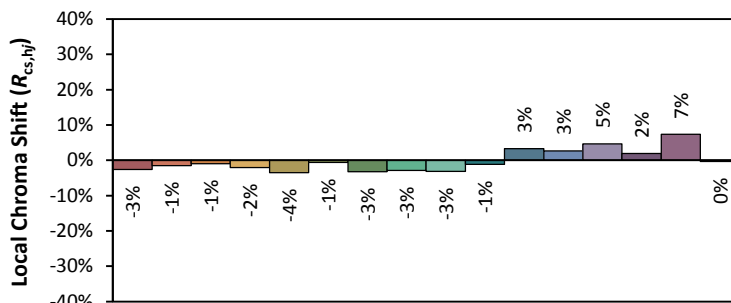
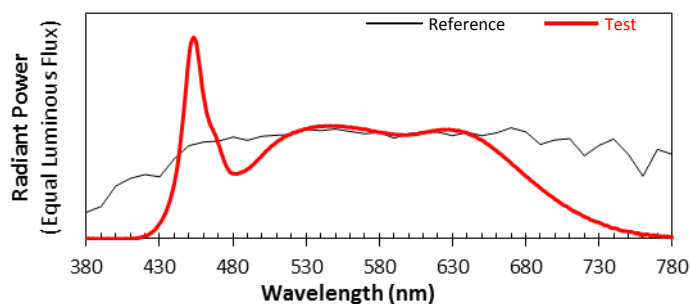
Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
4.336	4983	0.00182	0.3460	0.3560	0.2103	0.4869

**Color Rendering Index**

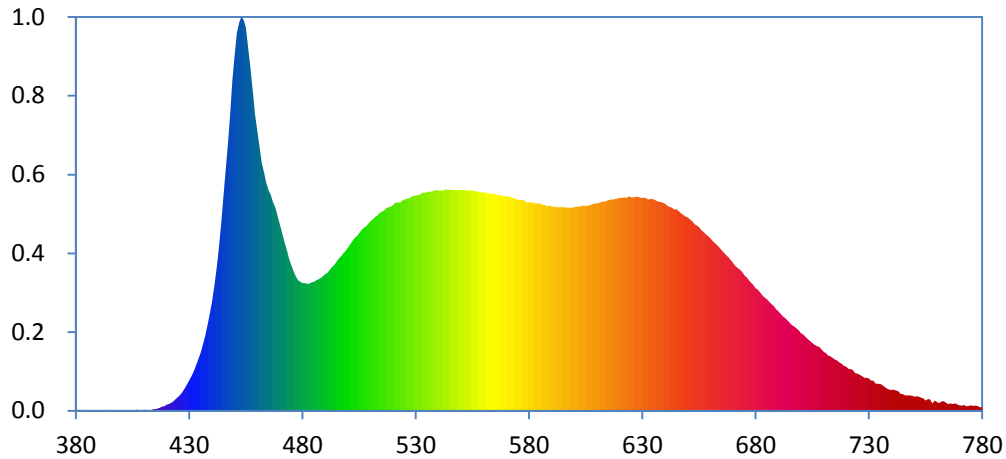
<b>Ra</b>			
<b>94.7</b>			
<b>R1</b>	<b>R2</b>	<b>R3</b>	<b>R4</b>
96	97	95	93
<b>R5</b>	<b>R6</b>	<b>R7</b>	<b>R8</b>
93	93	97	94
<b>R9</b>	<b>R10</b>	<b>R11</b>	<b>R12</b>
87	91	93	65
<b>R13</b>	<b>R14</b>	<b>R15</b>	
96	97	94	







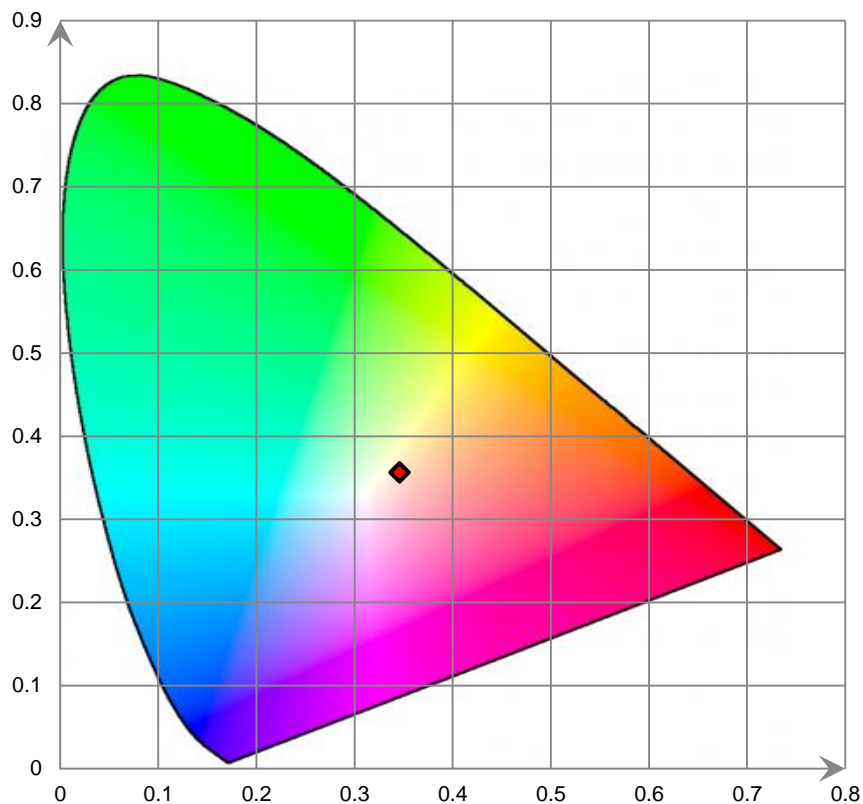
### Relative Spectral Power Distribution



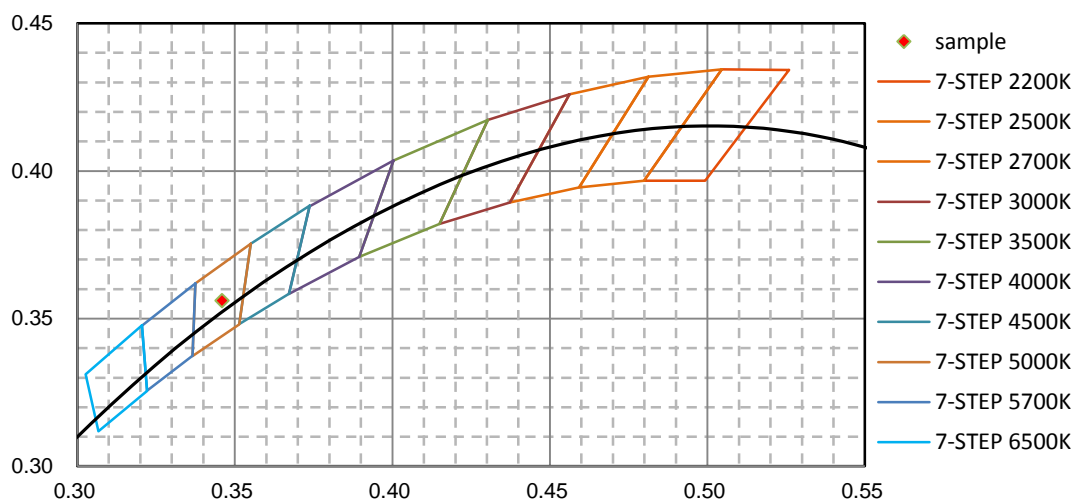
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	5.980E-02	421	5.484E-01	462	2.007E+01	503	1.404E+01	544	1.793E+01
381	7.800E-02	422	6.387E-01	463	1.935E+01	504	1.419E+01	545	1.796E+01
382	6.470E-02	423	7.854E-01	464	1.848E+01	505	1.442E+01	546	1.794E+01
383	1.340E-02	424	9.515E-01	465	1.791E+01	506	1.466E+01	547	1.795E+01
384	7.240E-02	425	1.118E+00	466	1.753E+01	507	1.488E+01	548	1.793E+01
385	5.280E-02	426	1.301E+00	467	1.693E+01	508	1.498E+01	549	1.792E+01
386	2.510E-02	427	1.538E+00	468	1.653E+01	509	1.521E+01	550	1.797E+01
387	2.610E-02	428	1.817E+00	469	1.583E+01	510	1.541E+01	551	1.791E+01
388	1.920E-02	429	2.129E+00	470	1.514E+01	511	1.558E+01	552	1.798E+01
389	2.310E-02	430	2.457E+00	471	1.447E+01	512	1.576E+01	553	1.787E+01
390	3.300E-02	431	2.807E+00	472	1.367E+01	513	1.585E+01	554	1.791E+01
391	1.100E-02	432	3.194E+00	473	1.309E+01	514	1.606E+01	555	1.789E+01
392	2.400E-03	433	3.661E+00	474	1.235E+01	515	1.617E+01	556	1.785E+01
393	9.800E-03	434	4.146E+00	475	1.183E+01	516	1.629E+01	557	1.780E+01
394	1.740E-02	435	4.733E+00	476	1.132E+01	517	1.647E+01	558	1.778E+01
395	7.250E-02	436	5.407E+00	477	1.093E+01	518	1.652E+01	559	1.772E+01
396	3.070E-02	437	6.088E+00	478	1.061E+01	519	1.659E+01	560	1.776E+01
397	6.500E-03	438	6.940E+00	479	1.048E+01	520	1.672E+01	561	1.773E+01
398	2.700E-03	439	7.848E+00	480	1.038E+01	521	1.688E+01	562	1.763E+01
399	1.000E-04	440	8.807E+00	481	1.036E+01	522	1.693E+01	563	1.764E+01
400	3.000E-04	441	1.005E+01	482	1.032E+01	523	1.694E+01	564	1.763E+01
401	2.130E-02	442	1.144E+01	483	1.033E+01	524	1.707E+01	565	1.760E+01
402	1.460E-02	443	1.307E+01	484	1.046E+01	525	1.716E+01	566	1.752E+01
403	2.940E-02	444	1.493E+01	485	1.048E+01	526	1.724E+01	567	1.754E+01
404	2.340E-02	445	1.713E+01	486	1.060E+01	527	1.725E+01	568	1.741E+01
405	2.950E-02	446	1.928E+01	487	1.069E+01	528	1.738E+01	569	1.747E+01
406	1.090E-02	447	2.167E+01	488	1.078E+01	529	1.747E+01	570	1.742E+01
407	9.810E-02	448	2.412E+01	489	1.095E+01	530	1.747E+01	571	1.742E+01
408	2.550E-02	449	2.693E+01	490	1.109E+01	531	1.751E+01	572	1.734E+01
409	4.810E-02	450	2.892E+01	491	1.121E+01	532	1.759E+01	573	1.730E+01
410	7.100E-02	451	3.072E+01	492	1.145E+01	533	1.772E+01	574	1.720E+01
411	7.480E-02	452	3.154E+01	493	1.167E+01	534	1.771E+01	575	1.713E+01
412	5.730E-02	453	3.200E+01	494	1.184E+01	535	1.776E+01	576	1.714E+01
413	5.090E-02	454	3.177E+01	495	1.208E+01	536	1.780E+01	577	1.710E+01
414	1.317E-01	455	3.113E+01	496	1.234E+01	537	1.780E+01	578	1.708E+01
415	1.342E-01	456	2.951E+01	497	1.255E+01	538	1.787E+01	579	1.693E+01
416	1.859E-01	457	2.792E+01	498	1.283E+01	539	1.793E+01	580	1.694E+01
417	2.244E-01	458	2.612E+01	499	1.301E+01	540	1.790E+01	581	1.695E+01
418	3.294E-01	459	2.401E+01	500	1.326E+01	541	1.790E+01	582	1.686E+01
419	3.724E-01	460	2.268E+01	501	1.352E+01	542	1.788E+01	583	1.684E+01
420	4.878E-01	461	2.140E+01	502	1.378E+01	543	1.798E+01	584	1.685E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.681E+01	626	1.735E+01	667	1.264E+01	708	5.190E+00	749	1.218E+00
586	1.673E+01	627	1.737E+01	668	1.248E+01	709	4.996E+00	750	1.136E+00
587	1.671E+01	628	1.738E+01	669	1.225E+01	710	4.784E+00	751	1.168E+00
588	1.661E+01	629	1.731E+01	670	1.204E+01	711	4.667E+00	752	1.139E+00
589	1.665E+01	630	1.730E+01	671	1.178E+01	712	4.479E+00	753	1.060E+00
590	1.660E+01	631	1.731E+01	672	1.161E+01	713	4.426E+00	754	1.019E+00
591	1.659E+01	632	1.725E+01	673	1.147E+01	714	4.295E+00	755	8.378E-01
592	1.656E+01	633	1.716E+01	674	1.127E+01	715	4.147E+00	756	9.411E-01
593	1.655E+01	634	1.724E+01	675	1.099E+01	716	4.072E+00	757	9.403E-01
594	1.654E+01	635	1.715E+01	676	1.084E+01	717	3.923E+00	758	6.078E-01
595	1.657E+01	636	1.707E+01	677	1.062E+01	718	3.813E+00	759	8.236E-01
596	1.650E+01	637	1.697E+01	678	1.039E+01	719	3.634E+00	760	6.961E-01
597	1.652E+01	638	1.698E+01	679	1.021E+01	720	3.598E+00	761	6.329E-01
598	1.649E+01	639	1.690E+01	680	9.966E+00	721	3.408E+00	762	7.427E-01
599	1.650E+01	640	1.682E+01	681	9.816E+00	722	3.374E+00	763	7.734E-01
600	1.654E+01	641	1.667E+01	682	9.630E+00	723	3.276E+00	764	6.387E-01
601	1.658E+01	642	1.657E+01	683	9.372E+00	724	3.051E+00	765	5.406E-01
602	1.658E+01	643	1.652E+01	684	9.188E+00	725	3.006E+00	766	5.837E-01
603	1.661E+01	644	1.636E+01	685	9.038E+00	726	2.910E+00	767	5.479E-01
604	1.667E+01	645	1.638E+01	686	8.832E+00	727	2.813E+00	768	6.053E-01
605	1.663E+01	646	1.621E+01	687	8.644E+00	728	2.664E+00	769	5.165E-01
606	1.667E+01	647	1.605E+01	688	8.496E+00	729	2.679E+00	770	4.330E-01
607	1.672E+01	648	1.591E+01	689	8.231E+00	730	2.616E+00	771	4.076E-01
608	1.679E+01	649	1.578E+01	690	8.097E+00	731	2.455E+00	772	4.599E-01
609	1.685E+01	650	1.570E+01	691	7.889E+00	732	2.452E+00	773	3.668E-01
610	1.684E+01	651	1.554E+01	692	7.678E+00	733	2.213E+00	774	3.761E-01
611	1.690E+01	652	1.540E+01	693	7.532E+00	734	2.184E+00	775	4.480E-01
612	1.698E+01	653	1.517E+01	694	7.355E+00	735	2.169E+00	776	3.803E-01
613	1.701E+01	654	1.506E+01	695	7.177E+00	736	2.062E+00	777	4.104E-01
614	1.704E+01	655	1.493E+01	696	6.966E+00	737	1.917E+00	778	3.829E-01
615	1.710E+01	656	1.468E+01	697	6.832E+00	738	1.788E+00	779	2.860E-01
616	1.716E+01	657	1.454E+01	698	6.687E+00	739	1.716E+00	780	2.711E-01
617	1.716E+01	658	1.434E+01	699	6.533E+00	740	1.691E+00		
618	1.721E+01	659	1.418E+01	700	6.281E+00	741	1.708E+00		
619	1.724E+01	660	1.403E+01	701	6.175E+00	742	1.634E+00		
620	1.732E+01	661	1.378E+01	702	6.012E+00	743	1.574E+00		
621	1.730E+01	662	1.362E+01	703	5.817E+00	744	1.381E+00		
622	1.735E+01	663	1.345E+01	704	5.664E+00	745	1.359E+00		
623	1.730E+01	664	1.327E+01	705	5.501E+00	746	1.237E+00		
624	1.741E+01	665	1.303E+01	706	5.351E+00	747	1.240E+00		
625	1.733E+01	666	1.284E+01	707	5.256E+00	748	1.250E+00		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles



## [Goniophotometer System]

**Control Setting: 2700K**

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

Test orientation: **Downward**

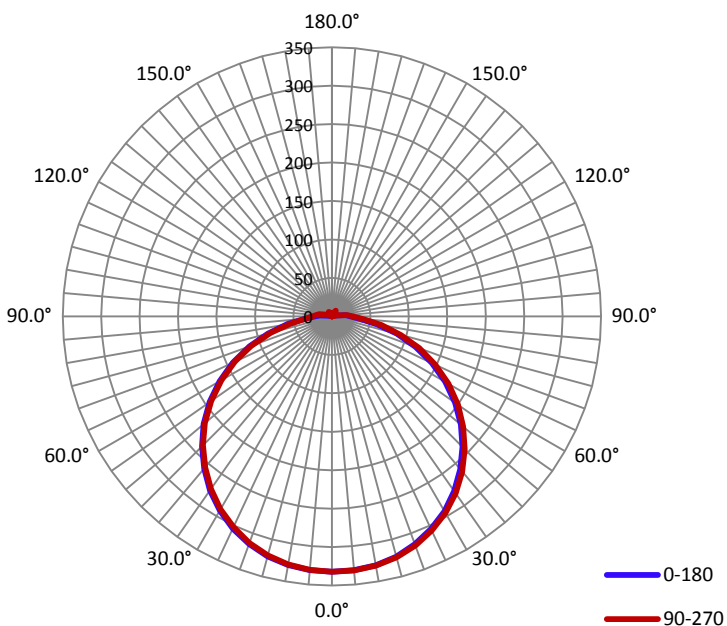
### Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
120.0	60	0.1140	13.61	0.9920

### Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	$I_{max}(cd)$	S/MH(C0/180)	S/MH(C90/270)
1094.5	80.47	332.2	1.31	1.31

### Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50% $I_{max}$ ):	121.4	121.3	121.6	121.8	121.5
Field Angle(10% $I_{max}$ ):	171.4	171.7	172.6	172.3	172.0

**Luminous Intensity (cd) Distribution Data**

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	332	332	332	332	332	332	332	332
5.0°	331	332	331	331	332	332	332	331
10.0°	329	329	329	329	329	330	329	329
15.0°	324	324	324	324	324	325	325	324
20.0°	315	316	316	317	317	317	317	316
25.0°	305	306	306	307	307	307	307	306
30.0°	293	293	293	295	295	295	295	294
35.0°	277	278	278	280	281	281	280	279
40.0°	260	261	262	263	264	264	263	262
45.0°	240	241	242	244	244	244	244	243
50.0°	219	220	221	222	223	223	222	221
55.0°	196	196	197	199	200	200	199	198
60.0°	170	171	172	174	175	175	174	173
65.0°	143	145	146	147	148	149	148	147
70.0°	116	117	118	120	121	122	121	119
75.0°	87	89	90	92	93	93	92	91
80.0°	60	61	63	64	66	66	65	63
85.0°	37	38	39	41	42	42	41	39
90.0°	24	24	23	26	28	26	24	24
95.0°	18	16	9	12	20	13	7	14
100.0°	8	5	0	1	6	2	0	4
105.0°	3	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	2	2	2	2	2	2	1
140.0°	0	2	3	5	7	5	4	1
145.0°	0	1	3	7	9	7	4	1
150.0°	0	1	3	6	7	6	3	0
155.0°	0	0	2	5	5	4	2	0
160.0°	0	0	1	2	3	3	1	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°	332	332	332	332	332	332	332	332
5.0°	331	331	331	331	331	331	331	331
10.0°	328	328	328	328	327	328	328	328
15.0°	323	322	322	322	322	322	322	322
20.0°	315	315	314	313	313	314	314	314
25.0°	305	304	303	303	303	303	303	304
30.0°	292	291	290	289	290	290	290	290
35.0°	276	275	274	274	274	274	275	275
40.0°	258	258	257	257	257	257	257	257
45.0°	239	238	237	236	237	237	237	238
50.0°	218	217	215	215	215	215	216	216
55.0°	194	193	191	191	191	191	192	193
60.0°	169	167	166	166	166	166	167	167
65.0°	143	141	140	140	139	139	140	140
70.0°	114	113	111	111	112	111	112	112
75.0°	86	84	83	83	82	83	84	84
80.0°	59	56	56	55	55	56	57	56
85.0°	35	34	34	34	34	35	35	35
90.0°	22	22	22	23	25	25	24	24
95.0°	15	15	13	17	21	18	15	17
100.0°	5	4	0	10	17	10	0	5
105.0°	2	0	0	6	10	5	0	0
110.0°	0	0	0	0	4	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	1	2	2	1	1	1
140.0°	0	0	3	5	6	4	3	2
145.0°	0	0	3	6	7	6	3	1
150.0°	0	0	2	5	6	4	2	1
155.0°	0	0	1	3	5	3	2	0
160.0°	0	0	0	2	3	2	1	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

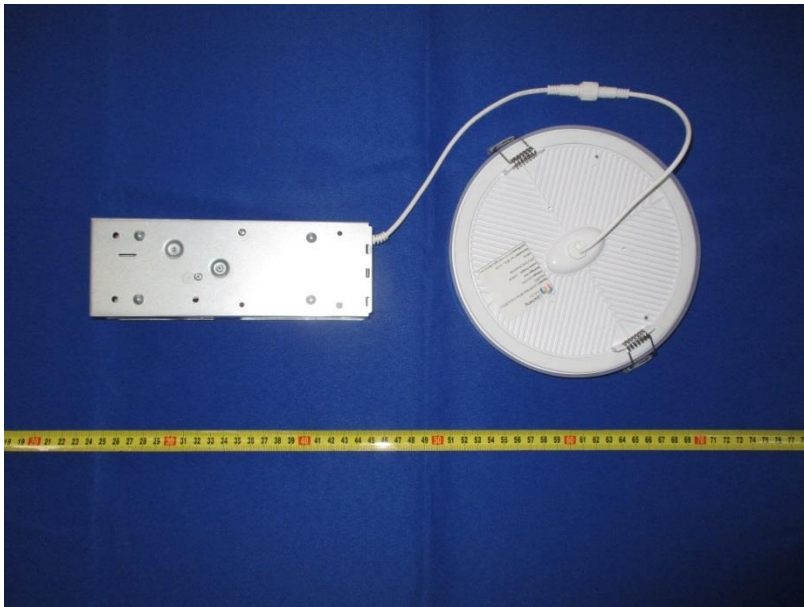
**Zonal Lumen Density Measurement**

Deg	Flux (lm)	%
0-5	8.0	0.72
5-10	23.5	2.15
10-15	38.6	3.53
15-20	52.6	4.80
20-25	65.1	5.94
25-30	75.4	6.91
30-35	83.9	7.66
35-40	89.4	8.18
40-45	92.6	8.46
45-50	92.7	8.47
50-55	89.9	8.22
55-60	84.4	7.71
60-65	76.3	6.96
65-70	65.5	5.99
70-75	53.0	4.84
75-80	39.2	3.60
80-85	26.0	2.38
85-90	16.1	1.48
90-95	11.0	0.99
95-100	5.1	0.46
100-105	1.6	0.14
105-110	0.4	0.04
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	0.1	0.01
135-140	0.8	0.07
140-145	1.2	0.10
145-150	1.0	0.10
150-155	0.6	0.05
155-160	0.4	0.03
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	7.9	0.72
0-10	31.5	2.88
0-15	70.2	6.41
0-20	122.8	11.22
0-25	187.8	17.16
0-30	263.4	24.06
0-35	347.2	31.72
0-40	436.7	39.90
0-45	529.2	48.35
0-50	621.9	56.82
0-55	711.9	65.04
0-60	796.3	72.75
0-65	872.4	79.71
0-70	938.0	85.70
0-75	991.0	90.54
0-80	1030.2	94.12
0-85	1056.1	96.49
0-90	1072.3	97.97
0-95	1083.3	98.97
0-100	1088.4	99.44
0-105	1089.9	99.58
0-110	1090.3	99.62
0-115	1090.4	99.62
0-120	1090.4	99.62
0-125	1090.4	99.62
0-130	1090.4	99.62
0-135	1090.5	99.63
0-140	1091.3	99.70
0-145	1092.5	99.82
0-150	1093.5	99.91
0-155	1094.1	99.96
0-160	1094.4	99.99
0-165	1094.5	100.00
0-170	1094.5	100.00
0-175	1094.5	100.00
0-180	1094.5	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.
5. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.
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\*\*\*\*\*END OF REPORT\*\*\*\*\*