

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: MGR4/9CCT5S/DUALDIM/EXT

Report Type:	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution
Project Engineer:	Bay Wang <i>Bay Wang</i>
Report Number:	RKSB220907002-10-2
Test Date:	2022-09-07 to 2022-09-08
Report Date:	2022-09-16
Reviewed By:	Seven Xia / EE Engineer <i>Seven Xia</i>
Prepared By:	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
Accreditation:	The IAS Accreditation Number TL-1044.



1. Product Description#

General Information:

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

Model Tested:	MGR4/9CCT5S/DUALDIM/EXT
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:	120-277V 50/60Hz
Rated Power:	8W
Nominal CCT:	2700K/3000K/3500K/4000K/5000K
Nominal Lumen Output:	580lm/600lm/615lm/630lm/650lm

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	2021-11-02	2022-11-01
spectroradiometer	EVERFINE	HAAS-2000	M12048CS1361148	2021-11-02	2022-11-01
Digital CC&CV DC Power Supply	EVERFINE	WY305	G115986CN1361134	2021-11-02	2022-11-01
Thermal Meter	ANYMETRE	TH-20E	N/A	2021-12-01	2022-11-30
Standard Light Source	Osram	24V/50W	JWWCR020106	2021-09-15	2023-09-14
Digital Power Meter	YOKOGAWA	WT210	91KB35700	2021-11-13	2022-11-12
Intelligence ac power supply	EVERFINE	DPS1005	G119890CS1361121	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

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
Goniophotometer	INVENTFINE	GPM-1900	YWGCF120001	2021-11-15	2022-11-14
Wireless Weather Station	ZHONGXING	KG218	N/A	2021-11-02	2022-11-01
Standard Light Source	INVENTFINE	N/A	JWBYSR040008	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.

4π geometry was used during measurement. The product was operated in its intended orientation in application and was recorded in this report.

The uncertainty of the light output (luminous flux) measurements is $U_{rel}=2.7\%$ ($k=2$), 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 (γ) test intervals were set no more than 1 degree while data for 5 degree intervals is reported. The horizontal angle (C plane) test intervals were set no more than 22.5 degree.

The uncertainty of the luminous 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 8W

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

Test orientation: **Downward**

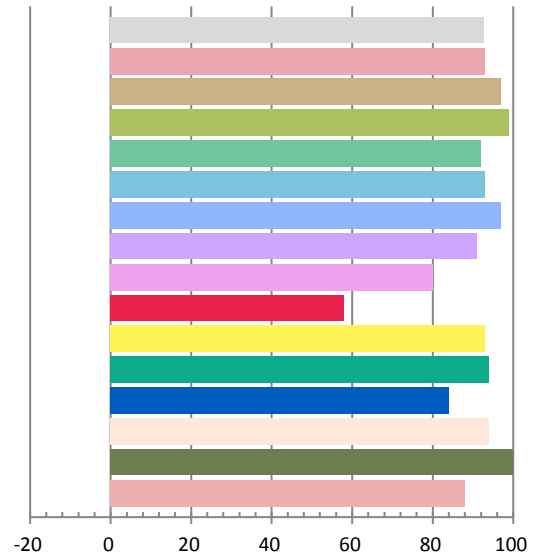
Photometric and Electrical Measurement Result

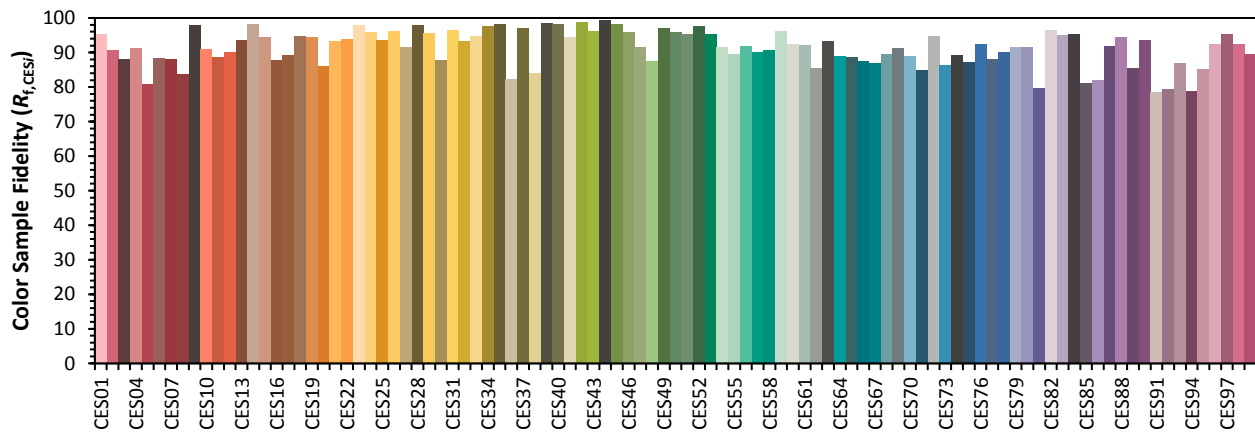
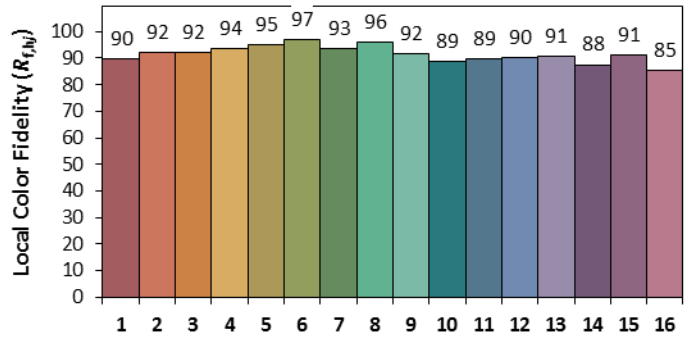
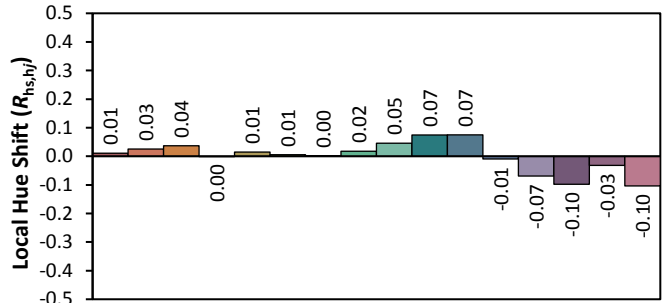
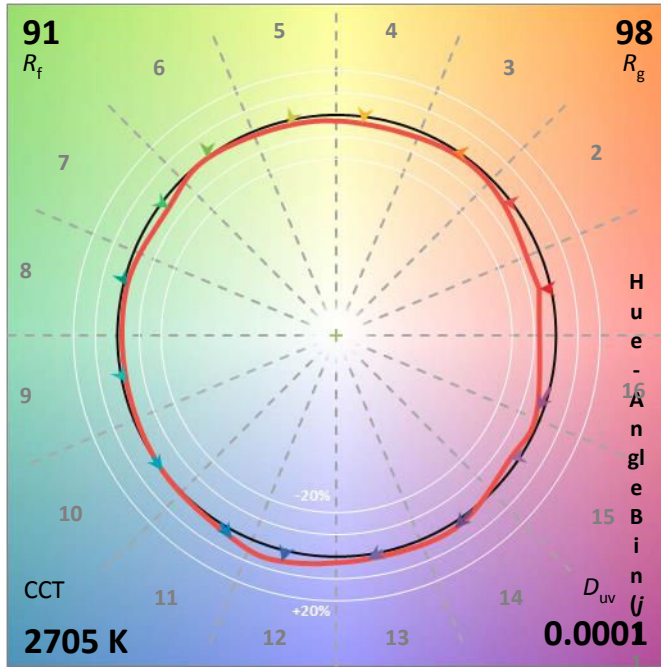
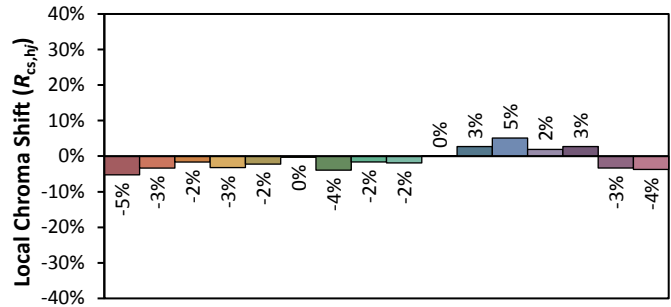
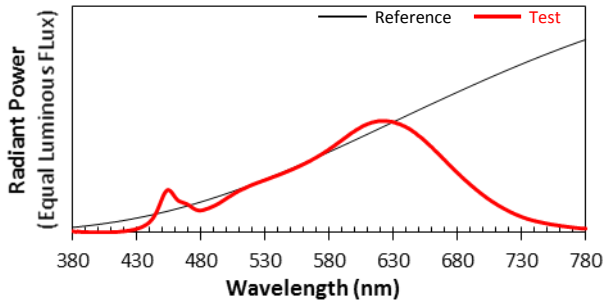
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.1	60	0.06519	7.682	0.9815	603.59	78.57

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
2.135	2706	0.00011	0.4596	0.4108	0.2622	0.5274

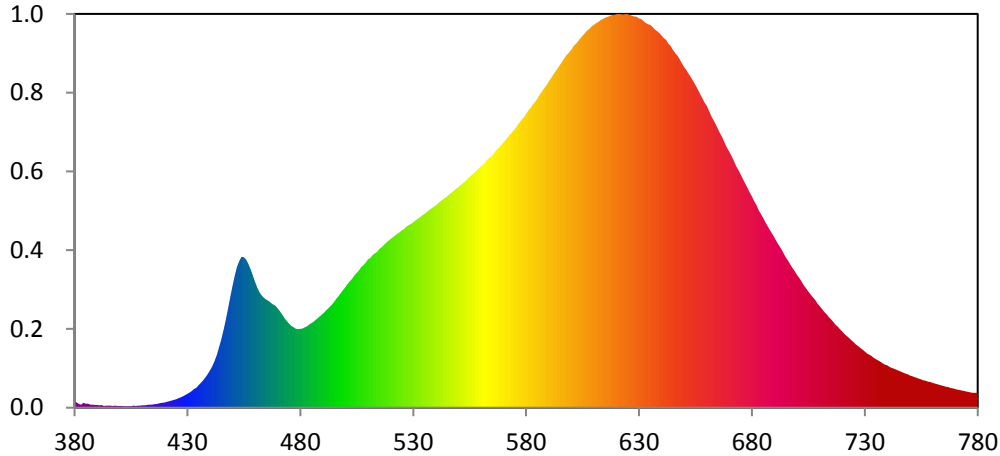
Color Rendering Index

Ra			
92.8			
R1	R2	R3	R4
93	97	99	92
R5	R6	R7	R8
93	97	91	80
R9	R10	R11	R12
58	93	94	84
R13	R14	R15	
94	100	88	





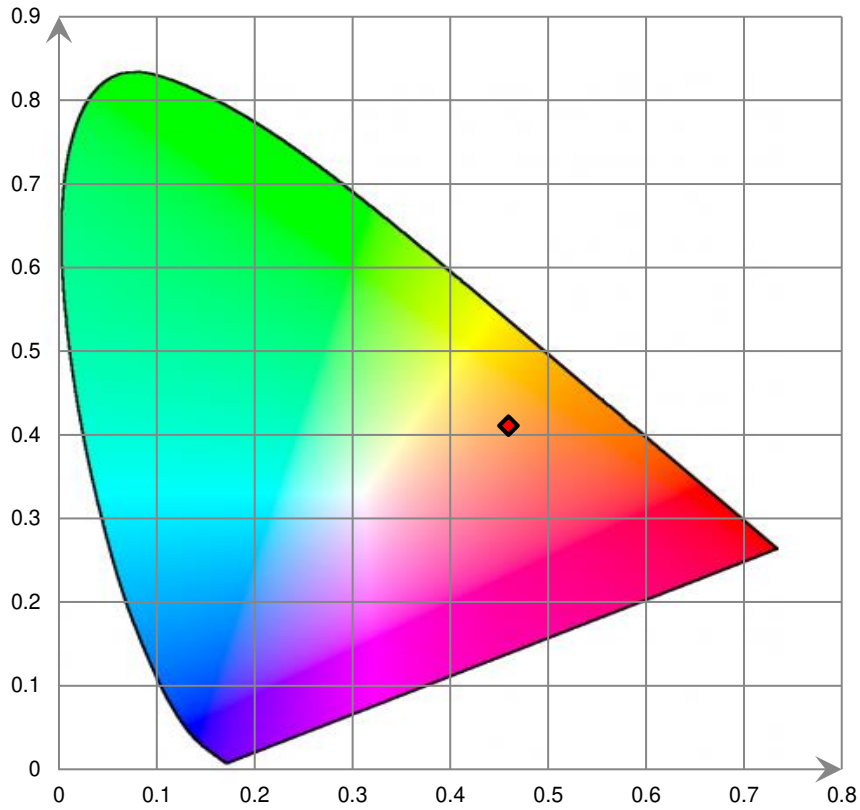
Relative Spectral Power Distribution



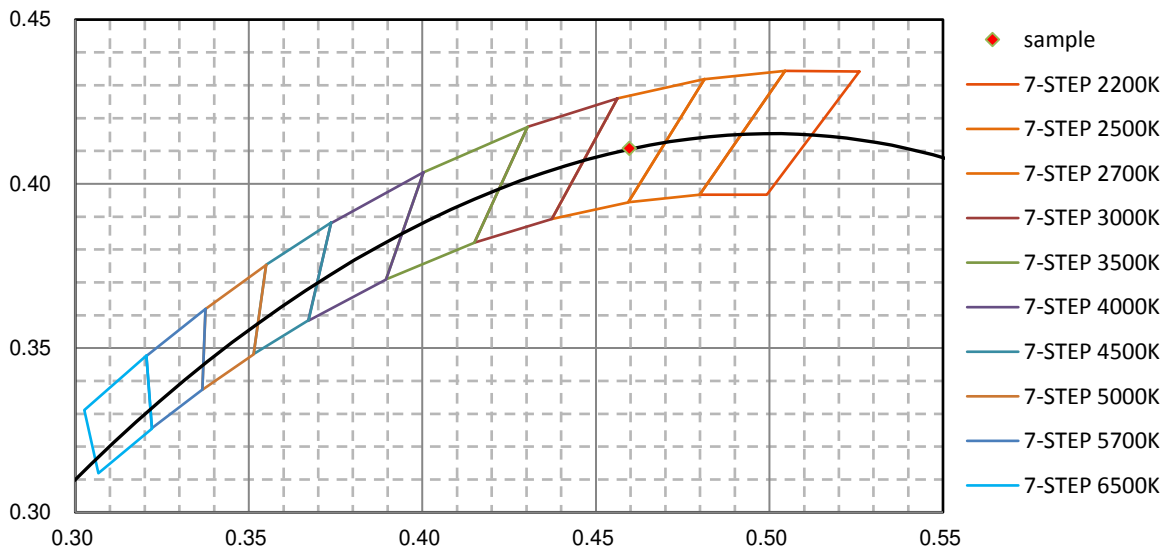
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	1.981E-01	421	1.935E-01	462	3.826E+00	503	4.287E+00	544	6.969E+00
381	1.794E-01	422	2.133E-01	463	3.715E+00	504	4.394E+00	545	7.017E+00
382	1.266E-01	423	2.380E-01	464	3.646E+00	505	4.477E+00	546	7.087E+00
383	1.036E-01	424	2.628E-01	465	3.585E+00	506	4.571E+00	547	7.145E+00
384	1.671E-01	425	2.853E-01	466	3.543E+00	507	4.675E+00	548	7.209E+00
385	1.341E-01	426	3.127E-01	467	3.486E+00	508	4.739E+00	549	7.279E+00
386	1.291E-01	427	3.443E-01	468	3.429E+00	509	4.827E+00	550	7.327E+00
387	9.855E-02	428	3.759E-01	469	3.386E+00	510	4.927E+00	551	7.408E+00
388	9.787E-02	429	4.250E-01	470	3.302E+00	511	4.979E+00	552	7.463E+00
389	8.898E-02	430	4.597E-01	471	3.201E+00	512	5.073E+00	553	7.527E+00
390	9.238E-02	431	5.036E-01	472	3.101E+00	513	5.129E+00	554	7.597E+00
391	8.343E-02	432	5.585E-01	473	2.983E+00	514	5.187E+00	555	7.672E+00
392	8.985E-02	433	6.180E-01	474	2.887E+00	515	5.277E+00	556	7.734E+00
393	6.259E-02	434	6.662E-01	475	2.790E+00	516	5.331E+00	557	7.802E+00
394	6.787E-02	435	7.479E-01	476	2.718E+00	517	5.405E+00	558	7.875E+00
395	7.192E-02	436	8.220E-01	477	2.669E+00	518	5.483E+00	559	7.950E+00
396	7.468E-02	437	9.142E-01	478	2.622E+00	519	5.540E+00	560	8.026E+00
397	5.749E-02	438	1.004E+00	479	2.610E+00	520	5.603E+00	561	8.089E+00
398	6.455E-02	439	1.111E+00	480	2.619E+00	521	5.660E+00	562	8.160E+00
399	5.917E-02	440	1.250E+00	481	2.636E+00	522	5.724E+00	563	8.254E+00
400	5.714E-02	441	1.392E+00	482	2.670E+00	523	5.778E+00	564	8.324E+00
401	6.321E-02	442	1.560E+00	483	2.711E+00	524	5.836E+00	565	8.385E+00
402	5.254E-02	443	1.766E+00	484	2.775E+00	525	5.892E+00	566	8.487E+00
403	5.182E-02	444	2.014E+00	485	2.810E+00	526	5.938E+00	567	8.571E+00
404	5.094E-02	445	2.279E+00	486	2.869E+00	527	6.011E+00	568	8.654E+00
405	5.155E-02	446	2.586E+00	487	2.924E+00	528	6.061E+00	569	8.735E+00
406	6.500E-02	447	2.929E+00	488	2.988E+00	529	6.109E+00	570	8.816E+00
407	6.058E-02	448	3.303E+00	489	3.056E+00	530	6.163E+00	571	8.903E+00
408	6.720E-02	449	3.684E+00	490	3.118E+00	531	6.222E+00	572	9.003E+00
409	6.864E-02	450	4.052E+00	491	3.193E+00	532	6.283E+00	573	9.088E+00
410	7.891E-02	451	4.401E+00	492	3.265E+00	533	6.330E+00	574	9.174E+00
411	8.293E-02	452	4.681E+00	493	3.357E+00	534	6.401E+00	575	9.258E+00
412	8.770E-02	453	4.871E+00	494	3.424E+00	535	6.437E+00	576	9.365E+00
413	9.701E-02	454	5.009E+00	495	3.528E+00	536	6.502E+00	577	9.470E+00
414	1.015E-01	455	5.007E+00	496	3.631E+00	537	6.563E+00	578	9.562E+00
415	1.101E-01	456	4.933E+00	497	3.719E+00	538	6.616E+00	579	9.650E+00
416	1.222E-01	457	4.787E+00	498	3.819E+00	539	6.677E+00	580	9.758E+00
417	1.367E-01	458	4.588E+00	499	3.913E+00	540	6.726E+00	581	9.870E+00
418	1.550E-01	459	4.373E+00	500	4.013E+00	541	6.785E+00	582	9.965E+00
419	1.649E-01	460	4.164E+00	501	4.123E+00	542	6.848E+00	583	1.008E+01
420	1.799E-01	461	3.970E+00	502	4.208E+00	543	6.904E+00	584	1.017E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.028E+01	626	1.305E+01	667	8.965E+00	708	3.577E+00	749	1.109E+00
586	1.041E+01	627	1.302E+01	668	8.801E+00	709	3.465E+00	750	1.070E+00
587	1.051E+01	628	1.300E+01	669	8.641E+00	710	3.380E+00	751	1.045E+00
588	1.062E+01	629	1.299E+01	670	8.517E+00	711	3.284E+00	752	1.014E+00
589	1.072E+01	630	1.293E+01	671	8.349E+00	712	3.188E+00	753	9.895E-01
590	1.084E+01	631	1.291E+01	672	8.194E+00	713	3.110E+00	754	9.653E-01
591	1.095E+01	632	1.285E+01	673	8.024E+00	714	3.013E+00	755	9.456E-01
592	1.106E+01	633	1.278E+01	674	7.892E+00	715	2.940E+00	756	9.135E-01
593	1.117E+01	634	1.275E+01	675	7.744E+00	716	2.850E+00	757	8.981E-01
594	1.128E+01	635	1.272E+01	676	7.596E+00	717	2.764E+00	758	8.671E-01
595	1.139E+01	636	1.265E+01	677	7.449E+00	718	2.700E+00	759	8.560E-01
596	1.150E+01	637	1.256E+01	678	7.305E+00	719	2.610E+00	760	8.297E-01
597	1.162E+01	638	1.250E+01	679	7.153E+00	720	2.539E+00	761	7.995E-01
598	1.172E+01	639	1.245E+01	680	7.024E+00	721	2.456E+00	762	7.798E-01
599	1.180E+01	640	1.236E+01	681	6.864E+00	722	2.384E+00	763	7.639E-01
600	1.190E+01	641	1.227E+01	682	6.741E+00	723	2.320E+00	764	7.397E-01
601	1.202E+01	642	1.222E+01	683	6.572E+00	724	2.244E+00	765	7.211E-01
602	1.209E+01	643	1.210E+01	684	6.441E+00	725	2.173E+00	766	6.950E-01
603	1.218E+01	644	1.202E+01	685	6.307E+00	726	2.104E+00	767	6.825E-01
604	1.227E+01	645	1.190E+01	686	6.158E+00	727	2.049E+00	768	6.591E-01
605	1.236E+01	646	1.179E+01	687	6.034E+00	728	1.988E+00	769	6.447E-01
606	1.245E+01	647	1.170E+01	688	5.905E+00	729	1.927E+00	770	6.205E-01
607	1.253E+01	648	1.158E+01	689	5.771E+00	730	1.862E+00	771	6.054E-01
608	1.258E+01	649	1.144E+01	690	5.637E+00	731	1.804E+00	772	5.883E-01
609	1.266E+01	650	1.132E+01	691	5.498E+00	732	1.760E+00	773	5.702E-01
610	1.272E+01	651	1.123E+01	692	5.381E+00	733	1.712E+00	774	5.564E-01
611	1.277E+01	652	1.110E+01	693	5.264E+00	734	1.652E+00	775	5.377E-01
612	1.282E+01	653	1.099E+01	694	5.126E+00	735	1.611E+00	776	5.280E-01
613	1.289E+01	654	1.084E+01	695	4.994E+00	736	1.573E+00	777	5.064E-01
614	1.292E+01	655	1.071E+01	696	4.890E+00	737	1.521E+00	778	4.971E-01
615	1.295E+01	656	1.057E+01	697	4.761E+00	738	1.476E+00	779	4.981E-01
616	1.299E+01	657	1.042E+01	698	4.639E+00	739	1.433E+00	780	4.990E-01
617	1.301E+01	658	1.029E+01	699	4.535E+00	740	1.412E+00		
618	1.305E+01	659	1.013E+01	700	4.409E+00	741	1.352E+00		
619	1.305E+01	660	1.003E+01	701	4.307E+00	742	1.328E+00		
620	1.307E+01	661	9.862E+00	702	4.189E+00	743	1.295E+00		
621	1.308E+01	662	9.695E+00	703	4.072E+00	744	1.260E+00		
622	1.307E+01	663	9.550E+00	704	3.970E+00	745	1.226E+00		
623	1.306E+01	664	9.418E+00	705	3.869E+00	746	1.200E+00		
624	1.308E+01	665	9.252E+00	706	3.770E+00	747	1.165E+00		
625	1.307E+01	666	9.109E+00	707	3.658E+00	748	1.132E+00		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles



Control Setting: 3000K 8W

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

Test orientation: **Downward**

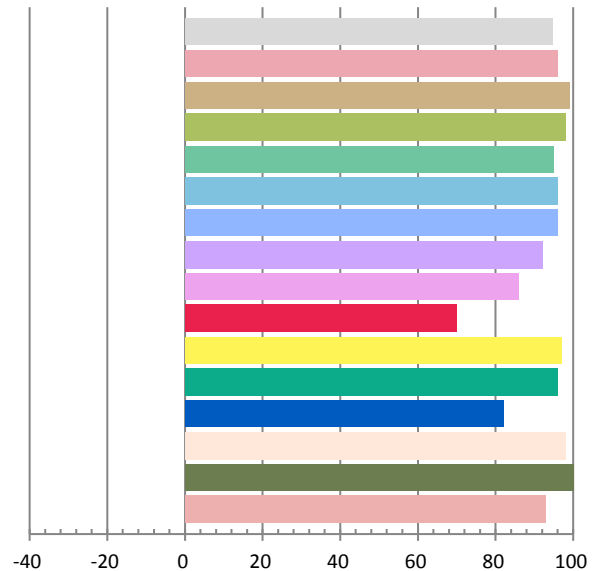
Photometric and Electrical Measurement Result

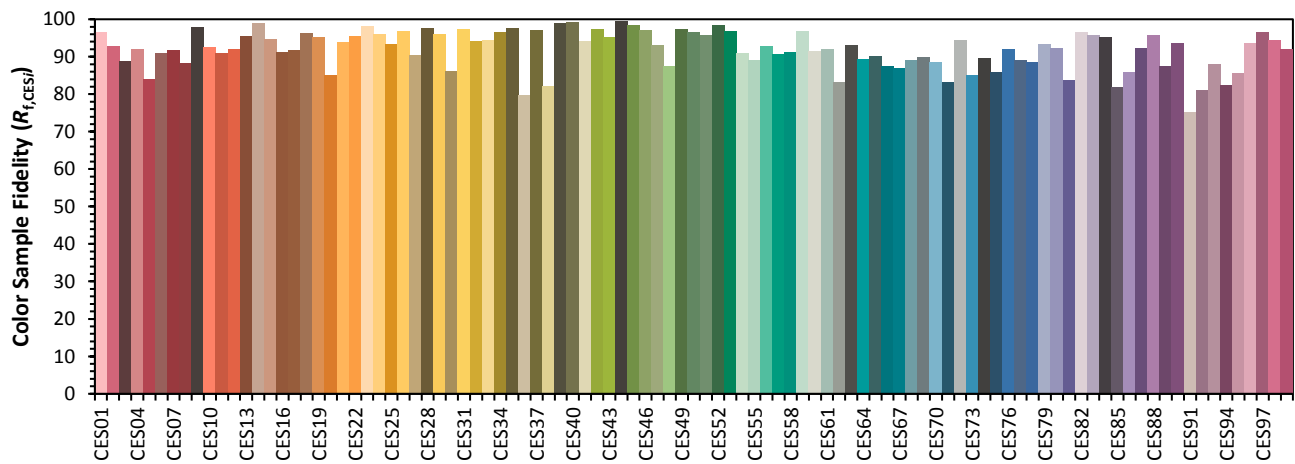
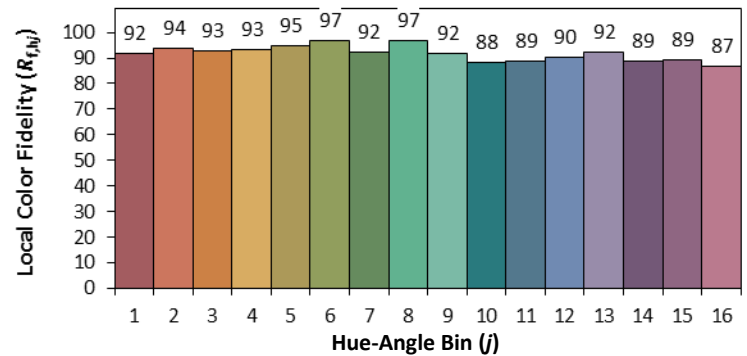
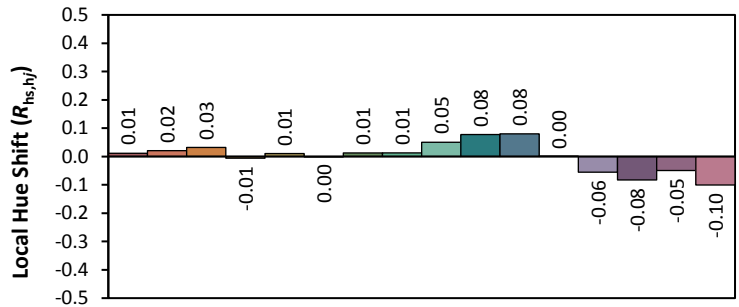
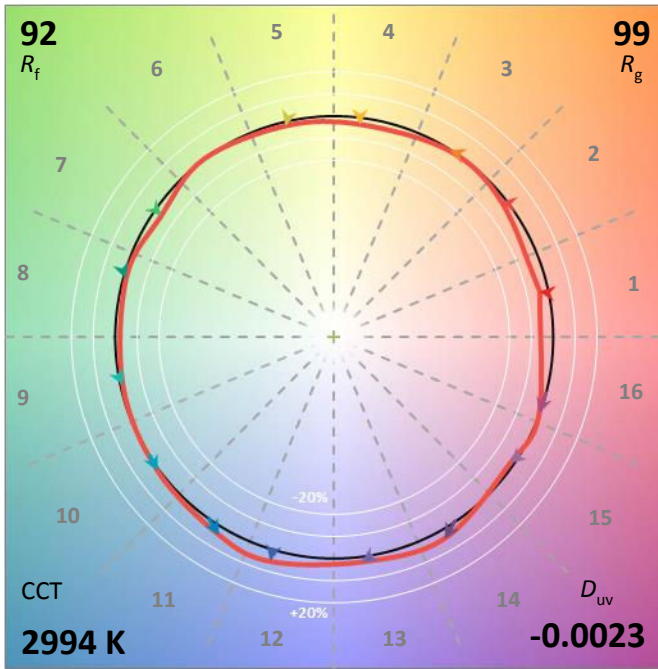
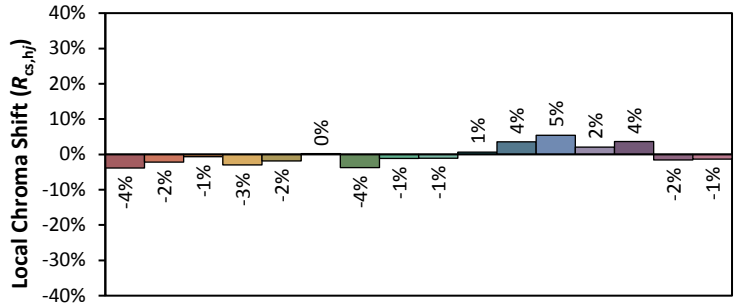
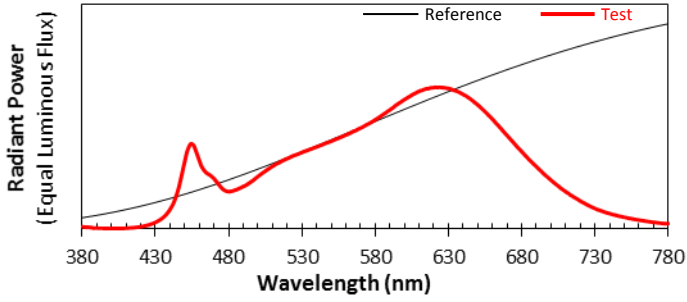
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.1	60	0.06476	7.635	0.982	621.26	81.37

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
2.215	2995	-0.00229	0.4340	0.3974	0.2516	0.5183

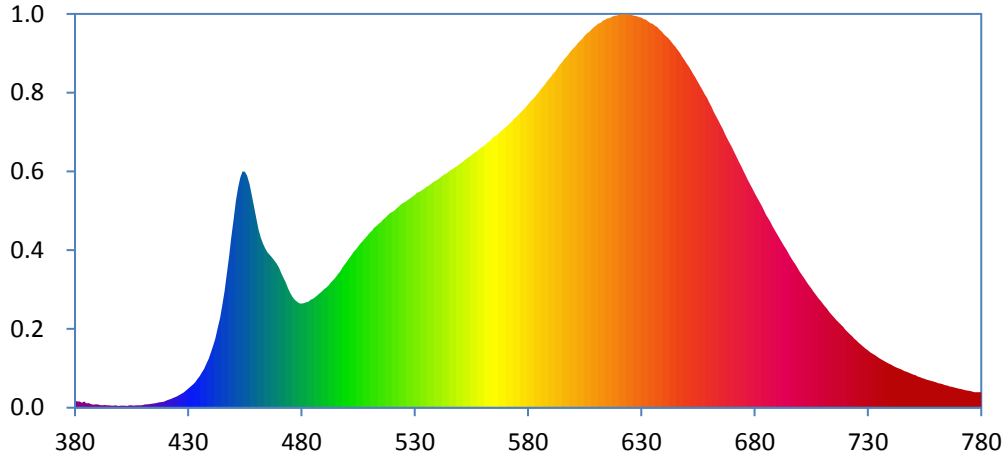
Color Rendering Index

Ra			
94.8			
R1	R2	R3	R4
96	99	98	95
R5	R6	R7	R8
96	96	92	86
R9	R10	R11	R12
70	97	96	82
R13	R14	R15	
98	100	93	





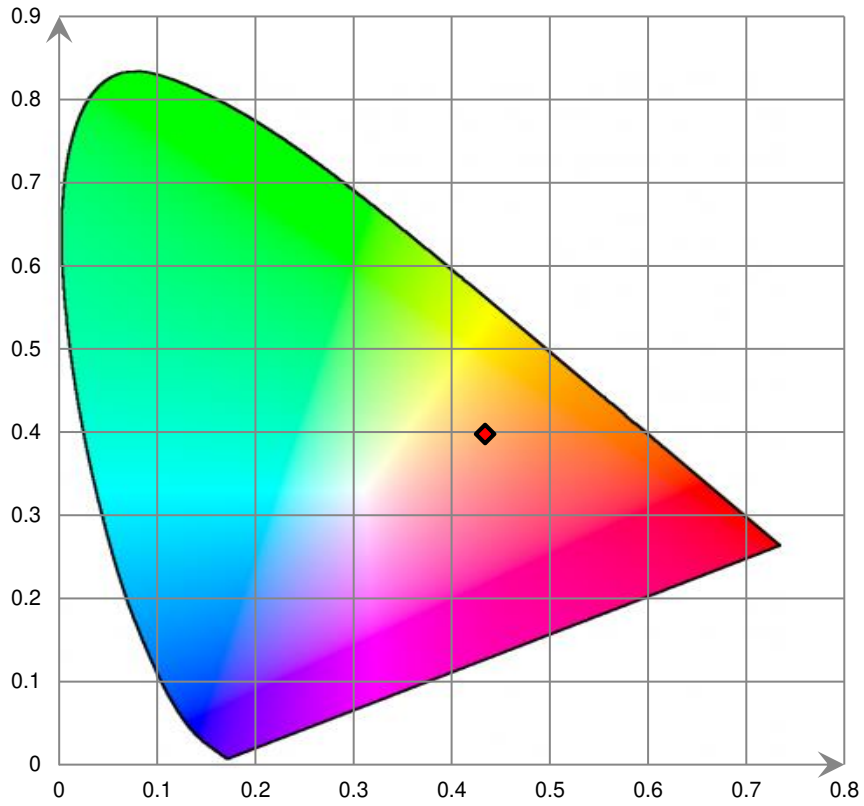
Relative Spectral Power Distribution



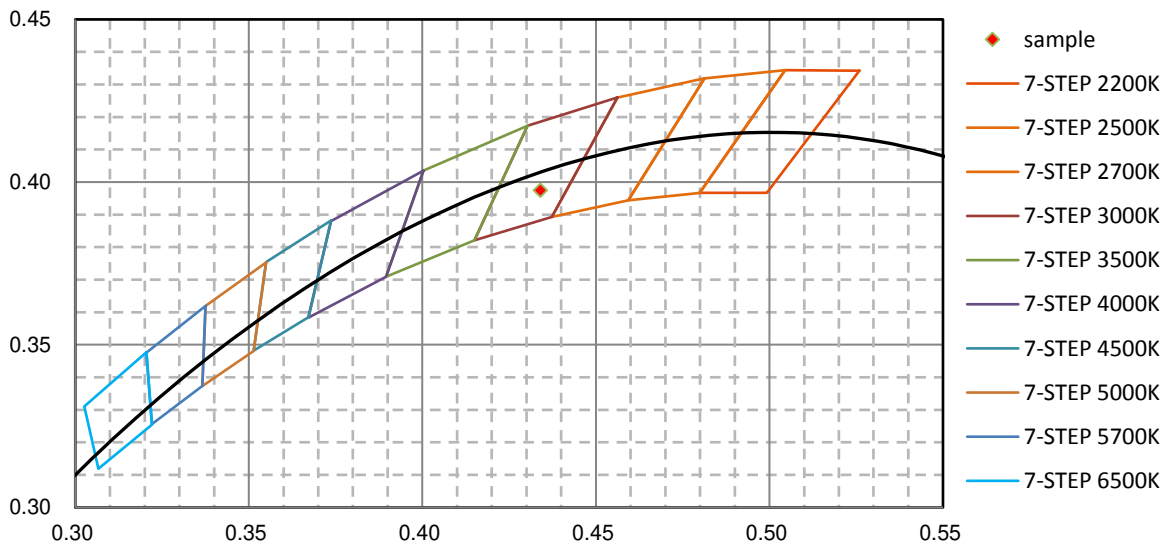
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	2.283E-01	421	2.476E-01	462	5.450E+00	503	4.984E+00	544	7.509E+00
381	2.038E-01	422	2.680E-01	463	5.257E+00	504	5.072E+00	545	7.569E+00
382	1.961E-01	423	3.061E-01	464	5.102E+00	505	5.165E+00	546	7.627E+00
383	1.583E-01	424	3.294E-01	465	4.978E+00	506	5.252E+00	547	7.670E+00
384	1.957E-01	425	3.628E-01	466	4.895E+00	507	5.343E+00	548	7.716E+00
385	1.381E-01	426	4.044E-01	467	4.811E+00	508	5.434E+00	549	7.765E+00
386	1.511E-01	427	4.495E-01	468	4.719E+00	509	5.511E+00	550	7.816E+00
387	1.168E-01	428	4.923E-01	469	4.604E+00	510	5.599E+00	551	7.870E+00
388	9.557E-02	429	5.514E-01	470	4.491E+00	511	5.663E+00	552	7.930E+00
389	1.099E-01	430	6.065E-01	471	4.316E+00	512	5.766E+00	553	7.997E+00
390	1.061E-01	431	6.708E-01	472	4.161E+00	513	5.822E+00	554	8.029E+00
391	8.899E-02	432	7.454E-01	473	4.010E+00	514	5.890E+00	555	8.089E+00
392	8.034E-02	433	8.190E-01	474	3.829E+00	515	5.947E+00	556	8.157E+00
393	9.092E-02	434	9.158E-01	475	3.678E+00	516	6.028E+00	557	8.195E+00
394	8.129E-02	435	1.011E+00	476	3.556E+00	517	6.089E+00	558	8.258E+00
395	7.585E-02	436	1.130E+00	477	3.464E+00	518	6.155E+00	559	8.323E+00
396	6.775E-02	437	1.250E+00	478	3.395E+00	519	6.236E+00	560	8.373E+00
397	6.346E-02	438	1.412E+00	479	3.351E+00	520	6.270E+00	561	8.419E+00
398	7.409E-02	439	1.566E+00	480	3.334E+00	521	6.324E+00	562	8.484E+00
399	5.554E-02	440	1.764E+00	481	3.345E+00	522	6.397E+00	563	8.542E+00
400	6.904E-02	441	1.981E+00	482	3.382E+00	523	6.460E+00	564	8.616E+00
401	6.474E-02	442	2.224E+00	483	3.398E+00	524	6.523E+00	565	8.693E+00
402	6.443E-02	443	2.538E+00	484	3.462E+00	525	6.571E+00	566	8.724E+00
403	5.728E-02	444	2.886E+00	485	3.495E+00	526	6.609E+00	567	8.785E+00
404	7.927E-02	445	3.307E+00	486	3.548E+00	527	6.655E+00	568	8.851E+00
405	7.738E-02	446	3.751E+00	487	3.608E+00	528	6.715E+00	569	8.924E+00
406	6.969E-02	447	4.307E+00	488	3.665E+00	529	6.760E+00	570	8.989E+00
407	7.975E-02	448	4.860E+00	489	3.731E+00	530	6.813E+00	571	9.049E+00
408	7.593E-02	449	5.480E+00	490	3.799E+00	531	6.885E+00	572	9.123E+00
409	7.838E-02	450	6.030E+00	491	3.855E+00	532	6.920E+00	573	9.190E+00
410	8.357E-02	451	6.618E+00	492	3.918E+00	533	6.967E+00	574	9.272E+00
411	1.034E-01	452	7.053E+00	493	4.015E+00	534	7.014E+00	575	9.332E+00
412	1.069E-01	453	7.381E+00	494	4.095E+00	535	7.075E+00	576	9.404E+00
413	1.160E-01	454	7.575E+00	495	4.184E+00	536	7.111E+00	577	9.476E+00
414	1.247E-01	455	7.567E+00	496	4.282E+00	537	7.159E+00	578	9.553E+00
415	1.343E-01	456	7.441E+00	497	4.362E+00	538	7.221E+00	579	9.633E+00
416	1.488E-01	457	7.162E+00	498	4.483E+00	539	7.261E+00	580	9.717E+00
417	1.650E-01	458	6.799E+00	499	4.584E+00	540	7.309E+00	581	9.807E+00
418	1.793E-01	459	6.440E+00	500	4.686E+00	541	7.355E+00	582	9.887E+00
419	1.928E-01	460	6.064E+00	501	4.788E+00	542	7.418E+00	583	9.964E+00
420	2.216E-01	461	5.704E+00	502	4.886E+00	543	7.469E+00	584	1.006E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.015E+01	626	1.258E+01	667	8.757E+00	708	3.514E+00	749	1.090E+00
586	1.024E+01	627	1.255E+01	668	8.622E+00	709	3.429E+00	750	1.059E+00
587	1.032E+01	628	1.255E+01	669	8.466E+00	710	3.336E+00	751	1.040E+00
588	1.042E+01	629	1.252E+01	670	8.328E+00	711	3.243E+00	752	1.002E+00
589	1.051E+01	630	1.251E+01	671	8.182E+00	712	3.166E+00	753	9.810E-01
590	1.059E+01	631	1.246E+01	672	8.033E+00	713	3.056E+00	754	9.510E-01
591	1.070E+01	632	1.243E+01	673	7.878E+00	714	2.981E+00	755	9.318E-01
592	1.077E+01	633	1.237E+01	674	7.752E+00	715	2.898E+00	756	9.027E-01
593	1.089E+01	634	1.232E+01	675	7.593E+00	716	2.816E+00	757	8.760E-01
594	1.100E+01	635	1.230E+01	676	7.452E+00	717	2.745E+00	758	8.581E-01
595	1.108E+01	636	1.224E+01	677	7.298E+00	718	2.668E+00	759	8.383E-01
596	1.118E+01	637	1.219E+01	678	7.165E+00	719	2.589E+00	760	8.149E-01
597	1.125E+01	638	1.211E+01	679	7.031E+00	720	2.501E+00	761	7.868E-01
598	1.134E+01	639	1.205E+01	680	6.887E+00	721	2.424E+00	762	7.697E-01
599	1.144E+01	640	1.197E+01	681	6.749E+00	722	2.355E+00	763	7.571E-01
600	1.152E+01	641	1.190E+01	682	6.605E+00	723	2.293E+00	764	7.238E-01
601	1.160E+01	642	1.184E+01	683	6.474E+00	724	2.214E+00	765	7.107E-01
602	1.168E+01	643	1.174E+01	684	6.331E+00	725	2.147E+00	766	6.865E-01
603	1.176E+01	644	1.165E+01	685	6.182E+00	726	2.078E+00	767	6.706E-01
604	1.183E+01	645	1.157E+01	686	6.063E+00	727	2.020E+00	768	6.493E-01
605	1.192E+01	646	1.146E+01	687	5.946E+00	728	1.956E+00	769	6.308E-01
606	1.199E+01	647	1.137E+01	688	5.798E+00	729	1.895E+00	770	6.090E-01
607	1.205E+01	648	1.124E+01	689	5.678E+00	730	1.839E+00	771	5.999E-01
608	1.212E+01	649	1.115E+01	690	5.557E+00	731	1.783E+00	772	5.817E-01
609	1.220E+01	650	1.103E+01	691	5.425E+00	732	1.727E+00	773	5.645E-01
610	1.225E+01	651	1.093E+01	692	5.305E+00	733	1.689E+00	774	5.455E-01
611	1.231E+01	652	1.080E+01	693	5.180E+00	734	1.636E+00	775	5.370E-01
612	1.233E+01	653	1.068E+01	694	5.060E+00	735	1.587E+00	776	5.179E-01
613	1.240E+01	654	1.057E+01	695	4.923E+00	736	1.545E+00	777	5.014E-01
614	1.244E+01	655	1.043E+01	696	4.809E+00	737	1.500E+00	778	5.000E-01
615	1.248E+01	656	1.031E+01	697	4.690E+00	738	1.460E+00	779	5.010E-01
616	1.248E+01	657	1.017E+01	698	4.589E+00	739	1.417E+00	780	5.019E-01
617	1.252E+01	658	1.004E+01	699	4.466E+00	740	1.391E+00		
618	1.256E+01	659	9.919E+00	700	4.348E+00	741	1.346E+00		
619	1.256E+01	660	9.770E+00	701	4.241E+00	742	1.308E+00		
620	1.258E+01	661	9.636E+00	702	4.134E+00	743	1.276E+00		
621	1.261E+01	662	9.472E+00	703	4.022E+00	744	1.242E+00		
622	1.260E+01	663	9.334E+00	704	3.924E+00	745	1.214E+00		
623	1.260E+01	664	9.207E+00	705	3.828E+00	746	1.173E+00		
624	1.261E+01	665	9.055E+00	706	3.713E+00	747	1.150E+00		
625	1.260E+01	666	8.929E+00	707	3.612E+00	748	1.120E+00		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles



Control Setting: 3500K 8W

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

Test orientation: **Downward**

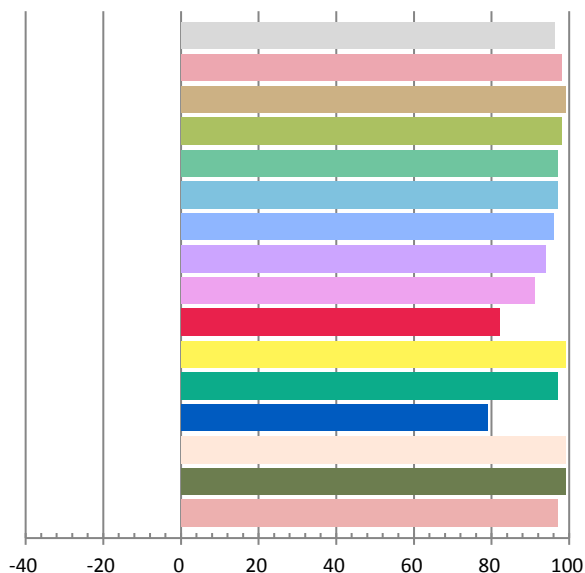
Photometric and Electrical Measurement Result

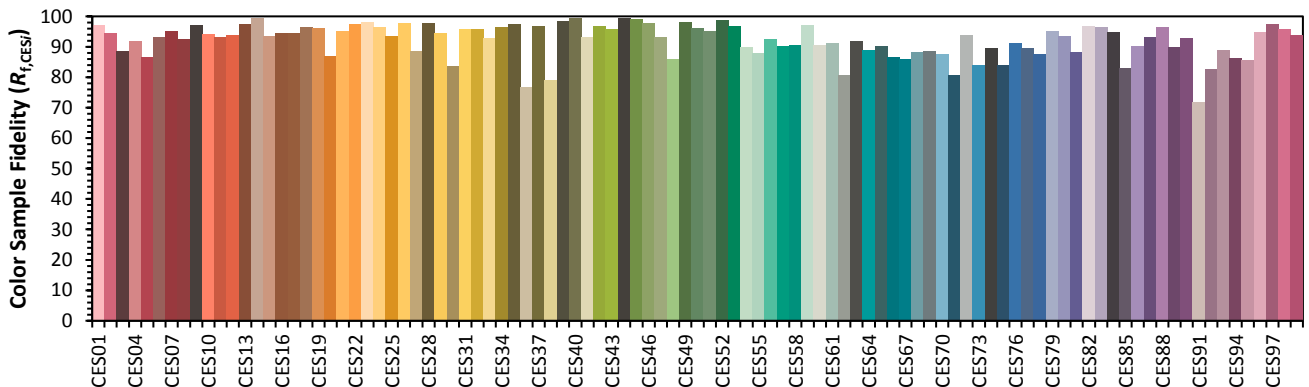
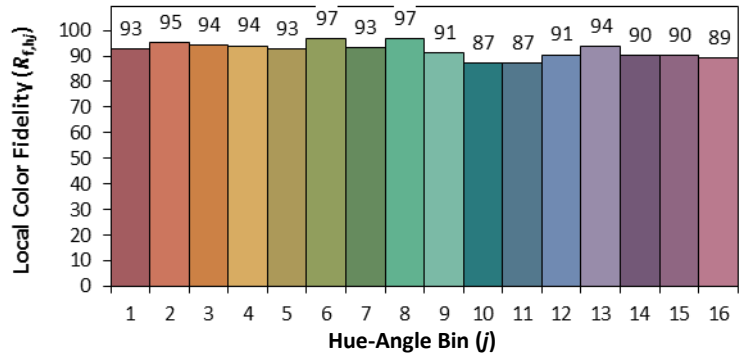
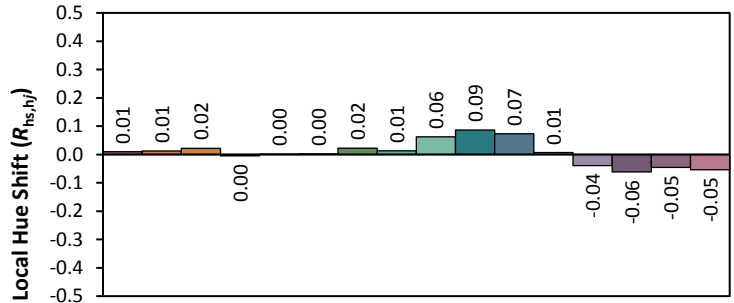
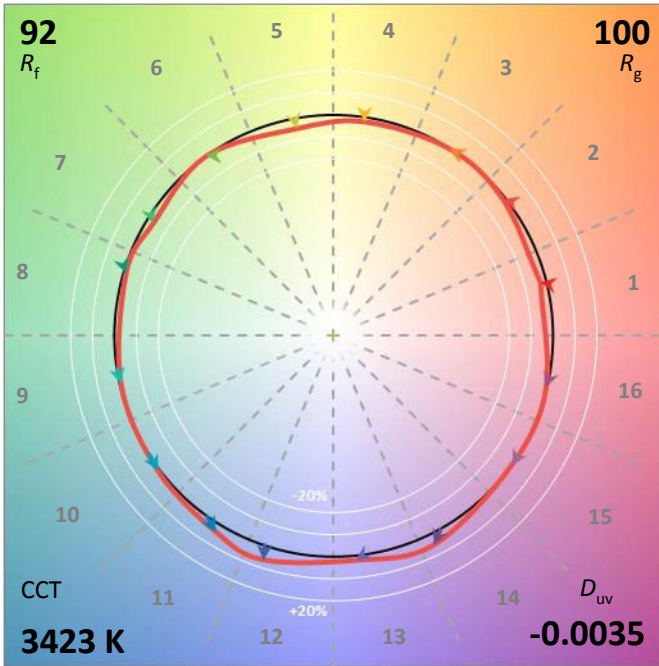
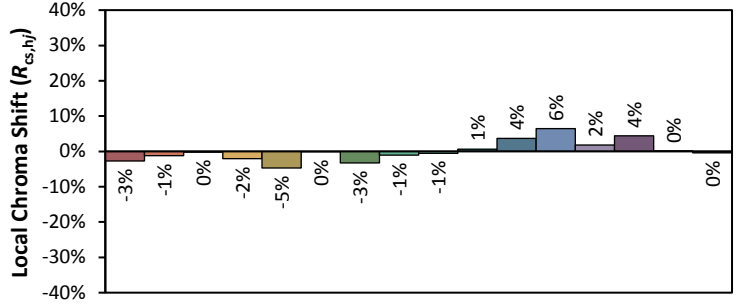
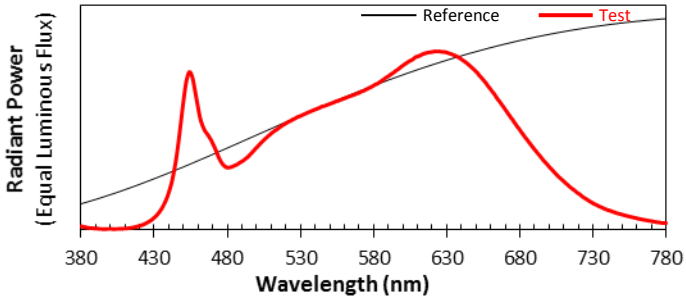
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.1	60	0.06468	7.627	0.9821	639.11	83.8

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
2.293	3423	-0.00346	0.4059	0.3832	0.2393	0.5082

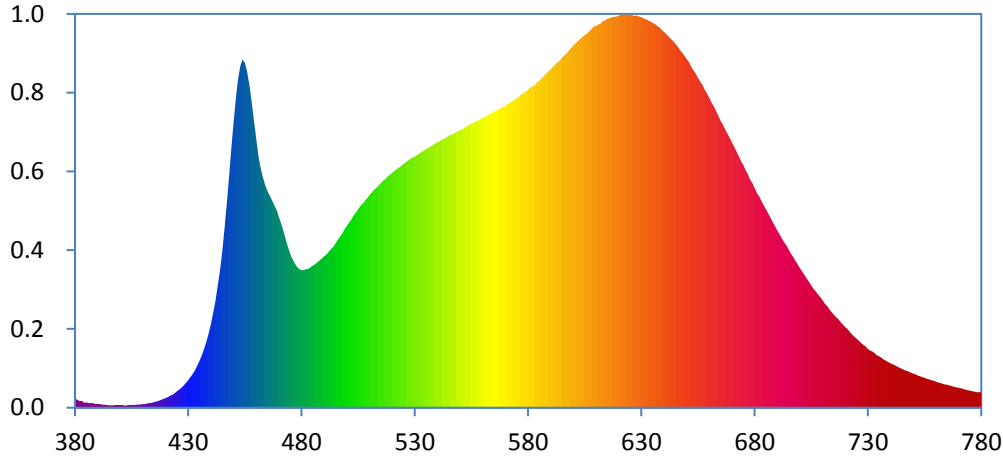
Color Rendering Index

Ra			
96.3			
R1	R2	R3	R4
98	99	98	97
R5	R6	R7	R8
97	96	94	91
R9	R10	R11	R12
82	99	97	79
R13	R14	R15	
99	99	97	





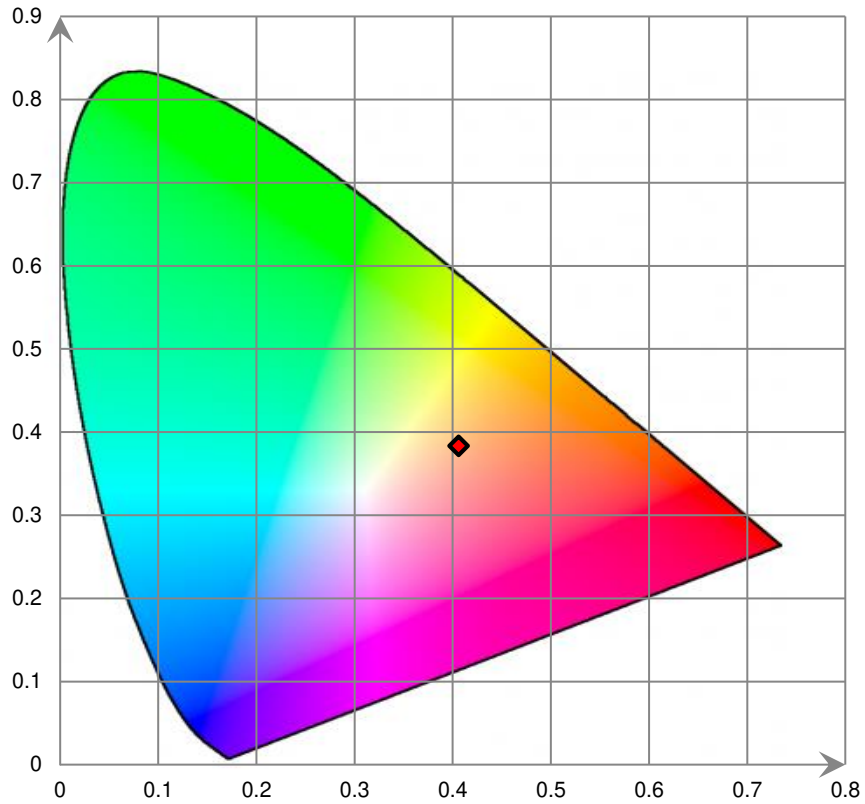
Relative Spectral Power Distribution



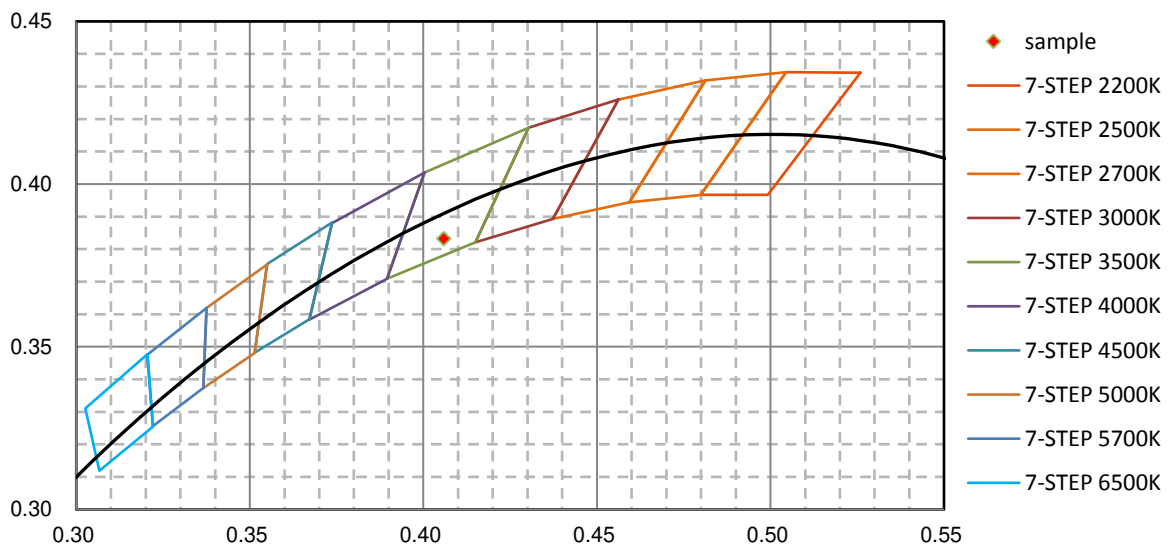
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	2.651E-01	421	3.227E-01	462	7.228E+00	503	5.811E+00	544	8.182E+00
381	2.487E-01	422	3.582E-01	463	6.948E+00	504	5.901E+00	545	8.236E+00
382	1.946E-01	423	3.922E-01	464	6.720E+00	505	6.002E+00	546	8.245E+00
383	2.114E-01	424	4.432E-01	465	6.546E+00	506	6.092E+00	547	8.286E+00
384	1.517E-01	425	4.982E-01	466	6.413E+00	507	6.176E+00	548	8.322E+00
385	1.639E-01	426	5.478E-01	467	6.276E+00	508	6.267E+00	549	8.354E+00
386	1.354E-01	427	6.026E-01	468	6.126E+00	509	6.343E+00	550	8.392E+00
387	1.424E-01	428	6.718E-01	469	5.965E+00	510	6.443E+00	551	8.424E+00
388	1.361E-01	429	7.514E-01	470	5.756E+00	511	6.503E+00	552	8.468E+00
389	1.093E-01	430	8.321E-01	471	5.557E+00	512	6.595E+00	553	8.504E+00
390	1.133E-01	431	9.228E-01	472	5.333E+00	513	6.641E+00	554	8.551E+00
391	1.142E-01	432	1.029E+00	473	5.084E+00	514	6.718E+00	555	8.593E+00
392	9.007E-02	433	1.144E+00	474	4.861E+00	515	6.786E+00	556	8.602E+00
393	8.881E-02	434	1.278E+00	475	4.648E+00	516	6.863E+00	557	8.663E+00
394	8.445E-02	435	1.424E+00	476	4.492E+00	517	6.918E+00	558	8.685E+00
395	7.620E-02	436	1.587E+00	477	4.364E+00	518	6.995E+00	559	8.732E+00
396	7.280E-02	437	1.788E+00	478	4.260E+00	519	7.051E+00	560	8.757E+00
397	7.394E-02	438	2.001E+00	479	4.192E+00	520	7.105E+00	561	8.799E+00
398	8.491E-02	439	2.242E+00	480	4.153E+00	521	7.163E+00	562	8.842E+00
399	8.444E-02	440	2.521E+00	481	4.167E+00	522	7.213E+00	563	8.878E+00
400	8.048E-02	441	2.855E+00	482	4.181E+00	523	7.257E+00	564	8.920E+00
401	8.479E-02	442	3.210E+00	483	4.207E+00	524	7.313E+00	565	8.947E+00
402	6.844E-02	443	3.661E+00	484	4.249E+00	525	7.379E+00	566	8.984E+00
403	7.556E-02	444	4.184E+00	485	4.304E+00	526	7.415E+00	567	9.010E+00
404	8.341E-02	445	4.766E+00	486	4.337E+00	527	7.464E+00	568	9.061E+00
405	8.318E-02	446	5.452E+00	487	4.395E+00	528	7.527E+00	569	9.100E+00
406	8.348E-02	447	6.197E+00	488	4.460E+00	529	7.558E+00	570	9.121E+00
407	9.543E-02	448	7.003E+00	489	4.510E+00	530	7.593E+00	571	9.194E+00
408	9.665E-02	449	7.849E+00	490	4.578E+00	531	7.643E+00	572	9.229E+00
409	1.053E-01	450	8.624E+00	491	4.633E+00	532	7.689E+00	573	9.260E+00
410	1.133E-01	451	9.350E+00	492	4.721E+00	533	7.734E+00	574	9.309E+00
411	1.125E-01	452	9.936E+00	493	4.795E+00	534	7.776E+00	575	9.365E+00
412	1.281E-01	453	1.032E+01	494	4.875E+00	535	7.820E+00	576	9.404E+00
413	1.438E-01	454	1.052E+01	495	4.974E+00	536	7.861E+00	577	9.466E+00
414	1.543E-01	455	1.044E+01	496	5.077E+00	537	7.904E+00	578	9.505E+00
415	1.724E-01	456	1.018E+01	497	5.181E+00	538	7.945E+00	579	9.560E+00
416	1.894E-01	457	9.721E+00	498	5.281E+00	539	7.984E+00	580	9.609E+00
417	2.101E-01	458	9.203E+00	499	5.395E+00	540	8.031E+00	581	9.678E+00
418	2.376E-01	459	8.655E+00	500	5.497E+00	541	8.049E+00	582	9.720E+00
419	2.691E-01	460	8.113E+00	501	5.598E+00	542	8.105E+00	583	9.760E+00
420	2.923E-01	461	7.595E+00	502	5.698E+00	543	8.131E+00	584	9.845E+00

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	9.895E+00	626	1.187E+01	667	8.423E+00	708	3.424E+00	749	1.061E+00
586	9.971E+00	627	1.185E+01	668	8.290E+00	709	3.329E+00	750	1.027E+00
587	1.003E+01	628	1.186E+01	669	8.156E+00	710	3.242E+00	751	1.008E+00
588	1.011E+01	629	1.183E+01	670	8.008E+00	711	3.142E+00	752	9.764E-01
589	1.018E+01	630	1.181E+01	671	7.876E+00	712	3.069E+00	753	9.543E-01
590	1.023E+01	631	1.177E+01	672	7.731E+00	713	2.979E+00	754	9.235E-01
591	1.031E+01	632	1.174E+01	673	7.600E+00	714	2.887E+00	755	9.007E-01
592	1.037E+01	633	1.171E+01	674	7.454E+00	715	2.814E+00	756	8.804E-01
593	1.044E+01	634	1.167E+01	675	7.343E+00	716	2.733E+00	757	8.601E-01
594	1.050E+01	635	1.163E+01	676	7.181E+00	717	2.670E+00	758	8.325E-01
595	1.059E+01	636	1.159E+01	677	7.054E+00	718	2.592E+00	759	8.150E-01
596	1.065E+01	637	1.154E+01	678	6.894E+00	719	2.497E+00	760	7.875E-01
597	1.072E+01	638	1.150E+01	679	6.793E+00	720	2.433E+00	761	7.626E-01
598	1.080E+01	639	1.142E+01	680	6.654E+00	721	2.376E+00	762	7.473E-01
599	1.088E+01	640	1.136E+01	681	6.500E+00	722	2.284E+00	763	7.247E-01
600	1.095E+01	641	1.129E+01	682	6.384E+00	723	2.215E+00	764	6.982E-01
601	1.102E+01	642	1.123E+01	683	6.246E+00	724	2.142E+00	765	6.885E-01
602	1.108E+01	643	1.115E+01	684	6.109E+00	725	2.089E+00	766	6.700E-01
603	1.115E+01	644	1.108E+01	685	5.997E+00	726	2.029E+00	767	6.498E-01
604	1.121E+01	645	1.099E+01	686	5.867E+00	727	1.961E+00	768	6.327E-01
605	1.127E+01	646	1.091E+01	687	5.742E+00	728	1.900E+00	769	6.179E-01
606	1.131E+01	647	1.081E+01	688	5.608E+00	729	1.851E+00	770	6.010E-01
607	1.138E+01	648	1.074E+01	689	5.493E+00	730	1.780E+00	771	5.807E-01
608	1.145E+01	649	1.064E+01	690	5.356E+00	731	1.730E+00	772	5.637E-01
609	1.153E+01	650	1.054E+01	691	5.252E+00	732	1.695E+00	773	5.431E-01
610	1.154E+01	651	1.045E+01	692	5.126E+00	733	1.643E+00	774	5.313E-01
611	1.159E+01	652	1.031E+01	693	5.009E+00	734	1.586E+00	775	5.185E-01
612	1.162E+01	653	1.021E+01	694	4.900E+00	735	1.557E+00	776	4.964E-01
613	1.169E+01	654	1.010E+01	695	4.779E+00	736	1.508E+00	777	4.872E-01
614	1.171E+01	655	9.981E+00	696	4.645E+00	737	1.455E+00	778	4.721E-01
615	1.176E+01	656	9.866E+00	697	4.548E+00	738	1.416E+00	779	4.730E-01
616	1.177E+01	657	9.751E+00	698	4.436E+00	739	1.380E+00	780	4.739E-01
617	1.181E+01	658	9.601E+00	699	4.328E+00	740	1.340E+00		
618	1.182E+01	659	9.485E+00	700	4.210E+00	741	1.316E+00		
619	1.183E+01	660	9.360E+00	701	4.115E+00	742	1.280E+00		
620	1.185E+01	661	9.220E+00	702	4.015E+00	743	1.240E+00		
621	1.187E+01	662	9.106E+00	703	3.901E+00	744	1.207E+00		
622	1.189E+01	663	8.967E+00	704	3.804E+00	745	1.177E+00		
623	1.188E+01	664	8.822E+00	705	3.698E+00	746	1.134E+00		
624	1.188E+01	665	8.673E+00	706	3.598E+00	747	1.116E+00		
625	1.188E+01	666	8.561E+00	707	3.507E+00	748	1.089E+00		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles



Control Setting: 4000K 8W

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

Test orientation: **Downward**

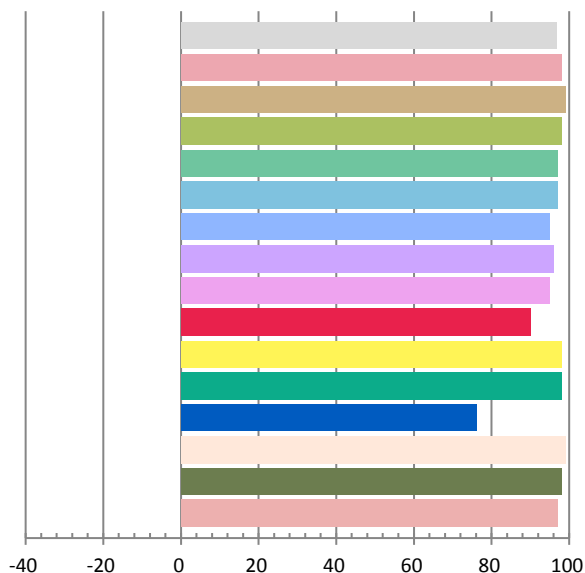
Photometric and Electrical Measurement Result

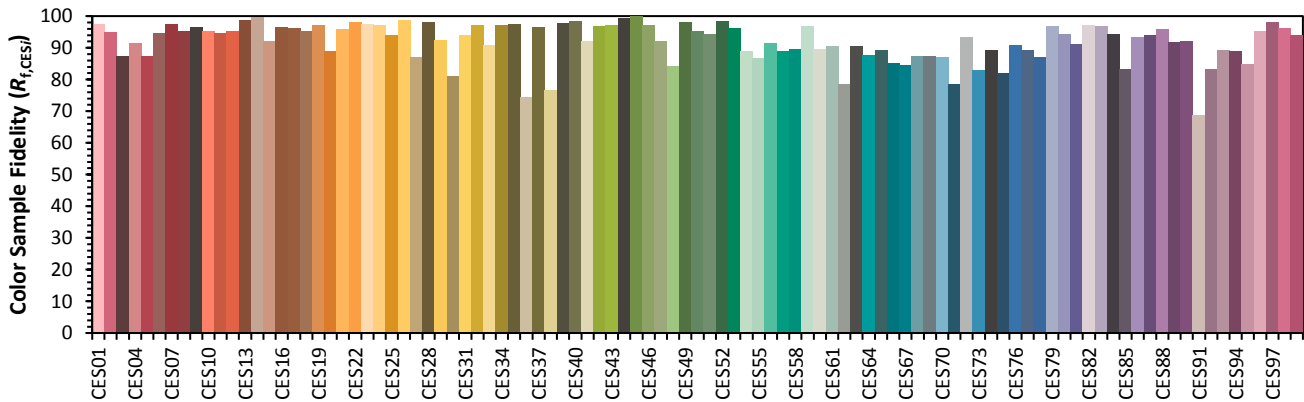
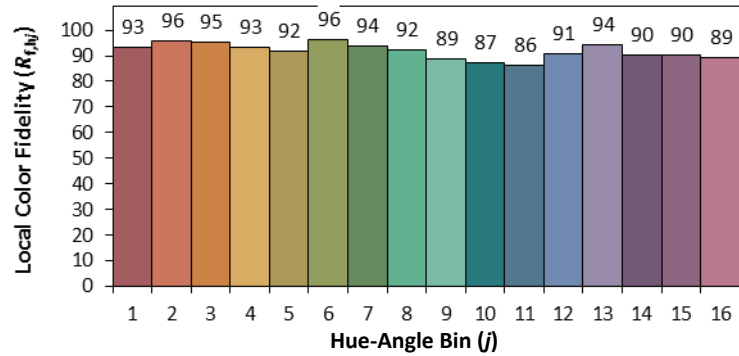
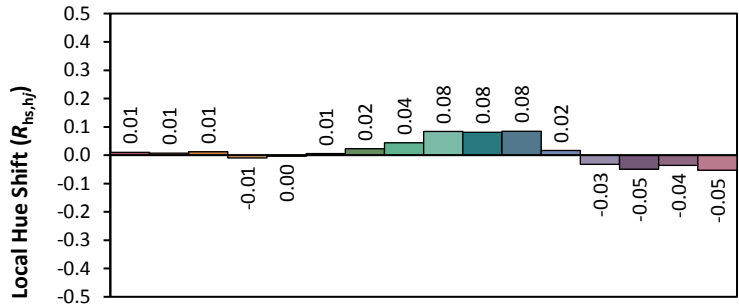
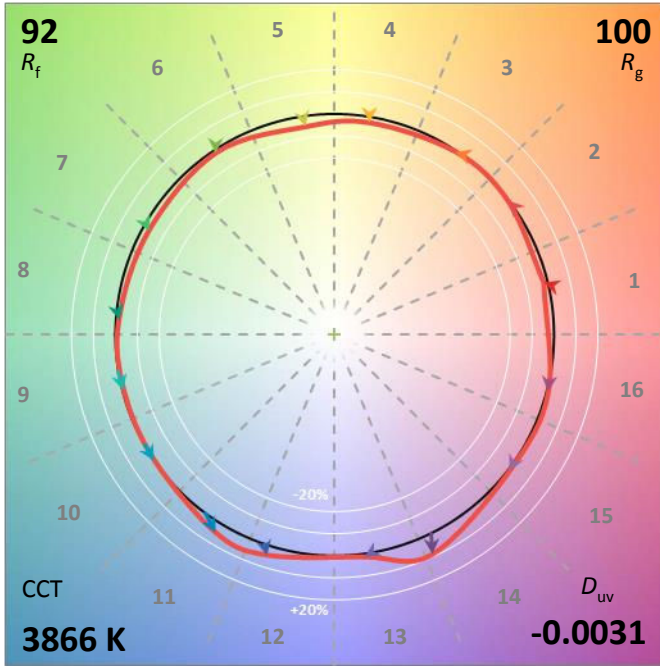
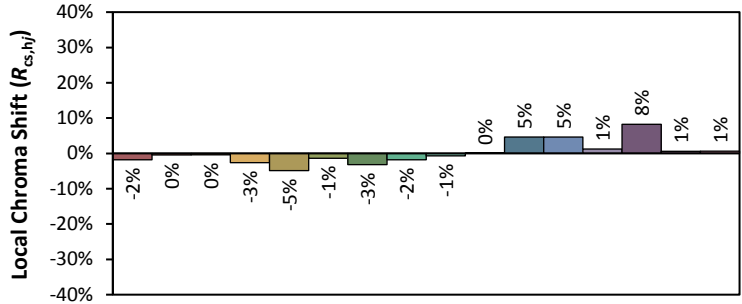
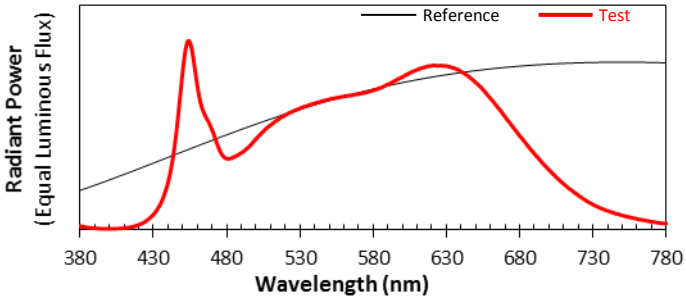
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.1	60	0.06465	7.62	0.9817	645.27	84.68

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
2.326	3866	-0.00309	0.3841	0.3724	0.2293	0.5002

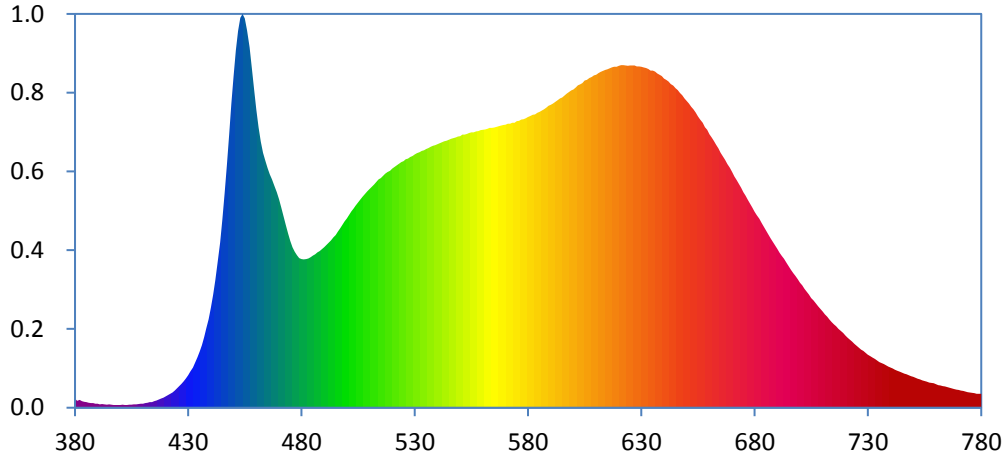
Color Rendering Index

Ra			
96.9			
R1	R2	R3	R4
98	99	98	97
R5	R6	R7	R8
97	95	96	95
R9	R10	R11	R12
90	98	98	76
R13	R14	R15	
99	98	97	





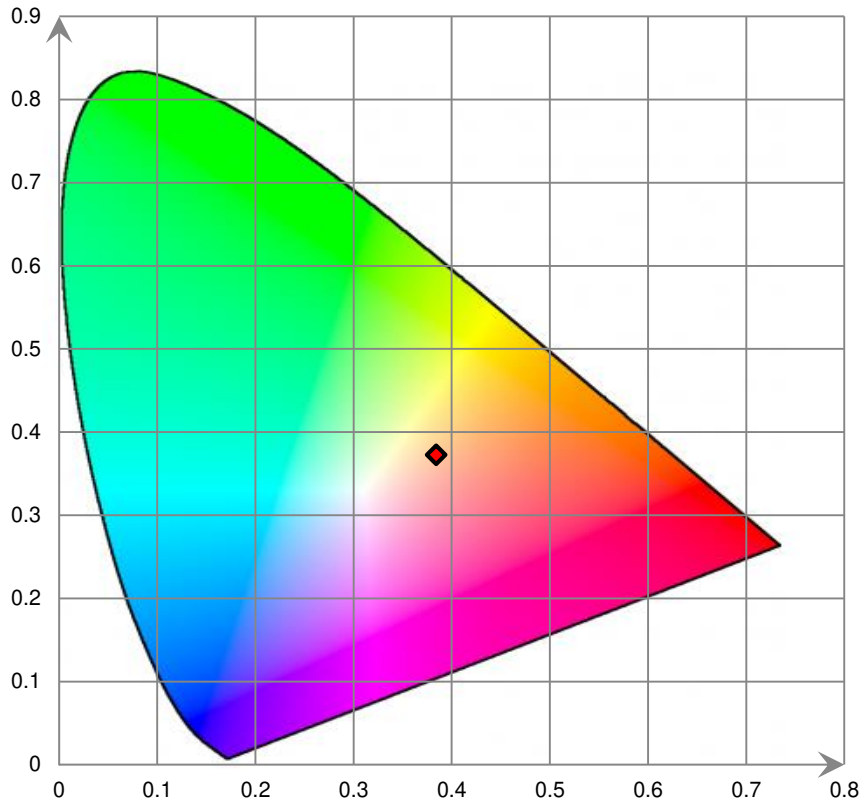
Relative Spectral Power Distribution



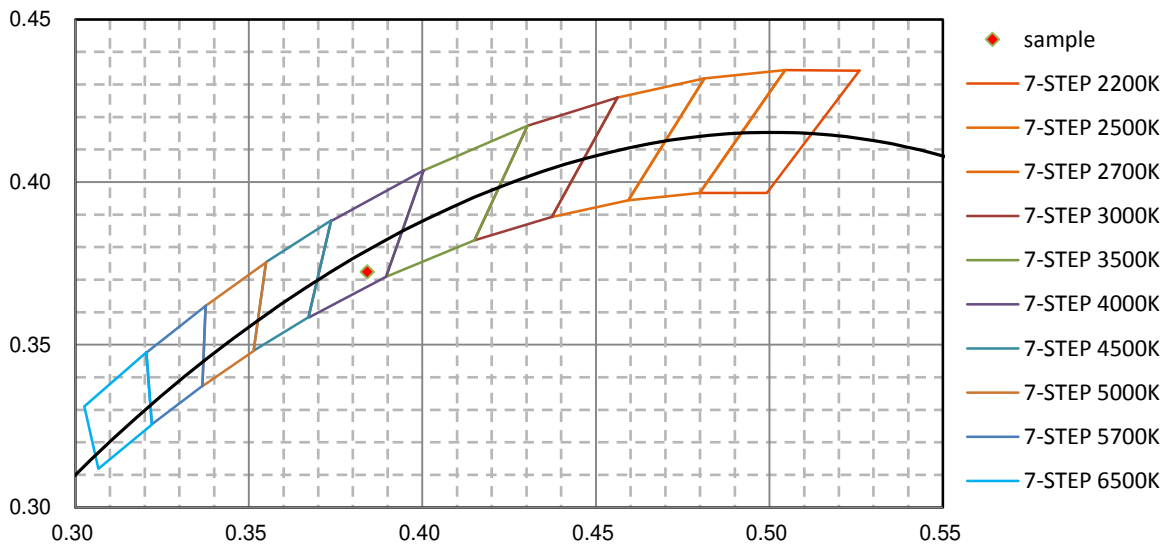
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	2.991E-01	421	4.071E-01	462	8.596E+00	503	6.429E+00	544	8.620E+00
381	2.247E-01	422	4.456E-01	463	8.234E+00	504	6.536E+00	545	8.656E+00
382	2.509E-01	423	4.895E-01	464	7.979E+00	505	6.627E+00	546	8.688E+00
383	2.074E-01	424	5.496E-01	465	7.741E+00	506	6.724E+00	547	8.708E+00
384	1.949E-01	425	6.213E-01	466	7.537E+00	507	6.822E+00	548	8.733E+00
385	1.774E-01	426	6.949E-01	467	7.370E+00	508	6.909E+00	549	8.757E+00
386	1.649E-01	427	7.688E-01	468	7.174E+00	509	6.987E+00	550	8.775E+00
387	1.495E-01	428	8.536E-01	469	6.957E+00	510	7.062E+00	551	8.818E+00
388	1.484E-01	429	9.466E-01	470	6.730E+00	511	7.135E+00	552	8.823E+00
389	1.322E-01	430	1.053E+00	471	6.462E+00	512	7.212E+00	553	8.840E+00
390	1.306E-01	431	1.171E+00	472	6.183E+00	513	7.288E+00	554	8.869E+00
391	1.117E-01	432	1.302E+00	473	5.909E+00	514	7.370E+00	555	8.893E+00
392	1.144E-01	433	1.463E+00	474	5.633E+00	515	7.419E+00	556	8.891E+00
393	1.071E-01	434	1.628E+00	475	5.393E+00	516	7.484E+00	557	8.925E+00
394	9.499E-02	435	1.816E+00	476	5.184E+00	517	7.559E+00	558	8.939E+00
395	1.043E-01	436	2.023E+00	477	5.035E+00	518	7.611E+00	559	8.961E+00
396	9.386E-02	437	2.277E+00	478	4.929E+00	519	7.657E+00	560	8.981E+00
397	8.907E-02	438	2.577E+00	479	4.834E+00	520	7.726E+00	561	8.986E+00
398	9.135E-02	439	2.858E+00	480	4.803E+00	521	7.775E+00	562	9.010E+00
399	9.232E-02	440	3.234E+00	481	4.786E+00	522	7.831E+00	563	9.034E+00
400	8.867E-02	441	3.646E+00	482	4.798E+00	523	7.882E+00	564	9.043E+00
401	9.555E-02	442	4.125E+00	483	4.821E+00	524	7.929E+00	565	9.044E+00
402	8.883E-02	443	4.692E+00	484	4.861E+00	525	7.965E+00	566	9.072E+00
403	8.532E-02	444	5.338E+00	485	4.913E+00	526	8.024E+00	567	9.092E+00
404	1.013E-01	445	6.093E+00	486	4.959E+00	527	8.050E+00	568	9.109E+00
405	1.016E-01	446	6.925E+00	487	5.017E+00	528	8.098E+00	569	9.128E+00
406	1.064E-01	447	7.833E+00	488	5.058E+00	529	8.124E+00	570	9.141E+00
407	1.039E-01	448	8.802E+00	489	5.123E+00	530	8.178E+00	571	9.169E+00
408	1.160E-01	449	9.818E+00	490	5.183E+00	531	8.224E+00	572	9.177E+00
409	1.282E-01	450	1.072E+01	491	5.256E+00	532	8.249E+00	573	9.205E+00
410	1.335E-01	451	1.154E+01	492	5.323E+00	533	8.295E+00	574	9.203E+00
411	1.546E-01	452	1.217E+01	493	5.402E+00	534	8.318E+00	575	9.253E+00
412	1.571E-01	453	1.259E+01	494	5.499E+00	535	8.351E+00	576	9.265E+00
413	1.779E-01	454	1.272E+01	495	5.578E+00	536	8.384E+00	577	9.307E+00
414	1.844E-01	455	1.258E+01	496	5.689E+00	537	8.429E+00	578	9.322E+00
415	2.119E-01	456	1.219E+01	497	5.788E+00	538	8.458E+00	579	9.347E+00
416	2.317E-01	457	1.164E+01	498	5.903E+00	539	8.480E+00	580	9.388E+00
417	2.682E-01	458	1.097E+01	499	6.024E+00	540	8.513E+00	581	9.418E+00
418	2.926E-01	459	1.029E+01	500	6.118E+00	541	8.542E+00	582	9.458E+00
419	3.258E-01	460	9.627E+00	501	6.232E+00	542	8.570E+00	583	9.468E+00
420	3.678E-01	461	9.058E+00	502	6.339E+00	543	8.599E+00	584	9.526E+00

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	9.555E+00	626	1.105E+01	667	8.006E+00	708	3.274E+00	749	1.013E+00
586	9.599E+00	627	1.105E+01	668	7.869E+00	709	3.187E+00	750	9.953E-01
587	9.642E+00	628	1.102E+01	669	7.743E+00	710	3.102E+00	751	9.616E-01
588	9.689E+00	629	1.103E+01	670	7.611E+00	711	3.013E+00	752	9.365E-01
589	9.749E+00	630	1.101E+01	671	7.469E+00	712	2.935E+00	753	9.165E-01
590	9.786E+00	631	1.099E+01	672	7.349E+00	713	2.846E+00	754	8.893E-01
591	9.820E+00	632	1.097E+01	673	7.230E+00	714	2.767E+00	755	8.664E-01
592	9.871E+00	633	1.094E+01	674	7.101E+00	715	2.698E+00	756	8.451E-01
593	9.925E+00	634	1.089E+01	675	6.966E+00	716	2.634E+00	757	8.165E-01
594	9.989E+00	635	1.089E+01	676	6.843E+00	717	2.549E+00	758	8.005E-01
595	1.003E+01	636	1.085E+01	677	6.708E+00	718	2.485E+00	759	7.866E-01
596	1.008E+01	637	1.079E+01	678	6.591E+00	719	2.414E+00	760	7.565E-01
597	1.015E+01	638	1.076E+01	679	6.460E+00	720	2.334E+00	761	7.329E-01
598	1.019E+01	639	1.071E+01	680	6.329E+00	721	2.261E+00	762	7.195E-01
599	1.024E+01	640	1.063E+01	681	6.216E+00	722	2.198E+00	763	6.963E-01
600	1.028E+01	641	1.059E+01	682	6.098E+00	723	2.133E+00	764	6.839E-01
601	1.034E+01	642	1.053E+01	683	5.972E+00	724	2.065E+00	765	6.627E-01
602	1.041E+01	643	1.046E+01	684	5.842E+00	725	2.002E+00	766	6.428E-01
603	1.045E+01	644	1.040E+01	685	5.724E+00	726	1.937E+00	767	6.237E-01
604	1.048E+01	645	1.032E+01	686	5.597E+00	727	1.877E+00	768	6.067E-01
605	1.057E+01	646	1.026E+01	687	5.477E+00	728	1.835E+00	769	5.833E-01
606	1.059E+01	647	1.016E+01	688	5.359E+00	729	1.777E+00	770	5.714E-01
607	1.065E+01	648	1.009E+01	689	5.245E+00	730	1.714E+00	771	5.580E-01
608	1.068E+01	649	9.991E+00	690	5.128E+00	731	1.671E+00	772	5.382E-01
609	1.073E+01	650	9.902E+00	691	5.009E+00	732	1.622E+00	773	5.185E-01
610	1.076E+01	651	9.822E+00	692	4.908E+00	733	1.576E+00	774	5.053E-01
611	1.081E+01	652	9.722E+00	693	4.806E+00	734	1.529E+00	775	4.908E-01
612	1.085E+01	653	9.641E+00	694	4.681E+00	735	1.477E+00	776	4.782E-01
613	1.088E+01	654	9.538E+00	695	4.564E+00	736	1.446E+00	777	4.710E-01
614	1.090E+01	655	9.411E+00	696	4.447E+00	737	1.407E+00	778	4.509E-01
615	1.093E+01	656	9.307E+00	697	4.347E+00	738	1.369E+00	779	4.517E-01
616	1.096E+01	657	9.205E+00	698	4.254E+00	739	1.332E+00	780	4.526E-01
617	1.100E+01	658	9.064E+00	699	4.149E+00	740	1.296E+00		
618	1.101E+01	659	8.971E+00	700	4.041E+00	741	1.267E+00		
619	1.102E+01	660	8.833E+00	701	3.952E+00	742	1.227E+00		
620	1.104E+01	661	8.731E+00	702	3.839E+00	743	1.195E+00		
621	1.106E+01	662	8.618E+00	703	3.744E+00	744	1.162E+00		
622	1.106E+01	663	8.485E+00	704	3.655E+00	745	1.127E+00		
623	1.105E+01	664	8.376E+00	705	3.540E+00	746	1.101E+00		
624	1.104E+01	665	8.235E+00	706	3.465E+00	747	1.077E+00		
625	1.105E+01	666	8.121E+00	707	3.370E+00	748	1.053E+00		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles



Control Setting: 5000K 8W

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

Test orientation: **Downward**

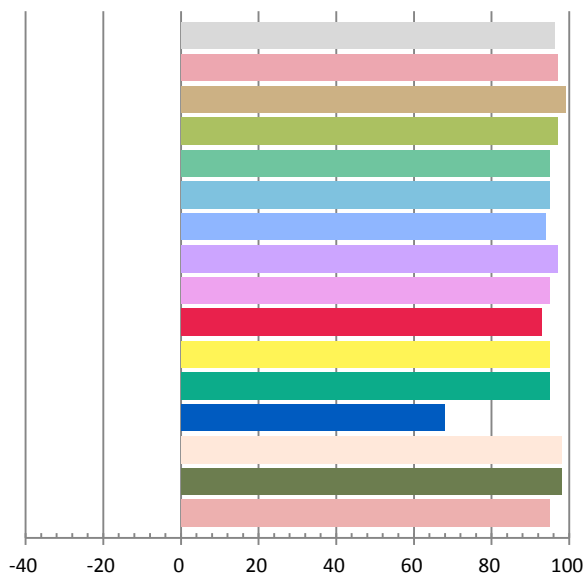
Photometric and Electrical Measurement Result

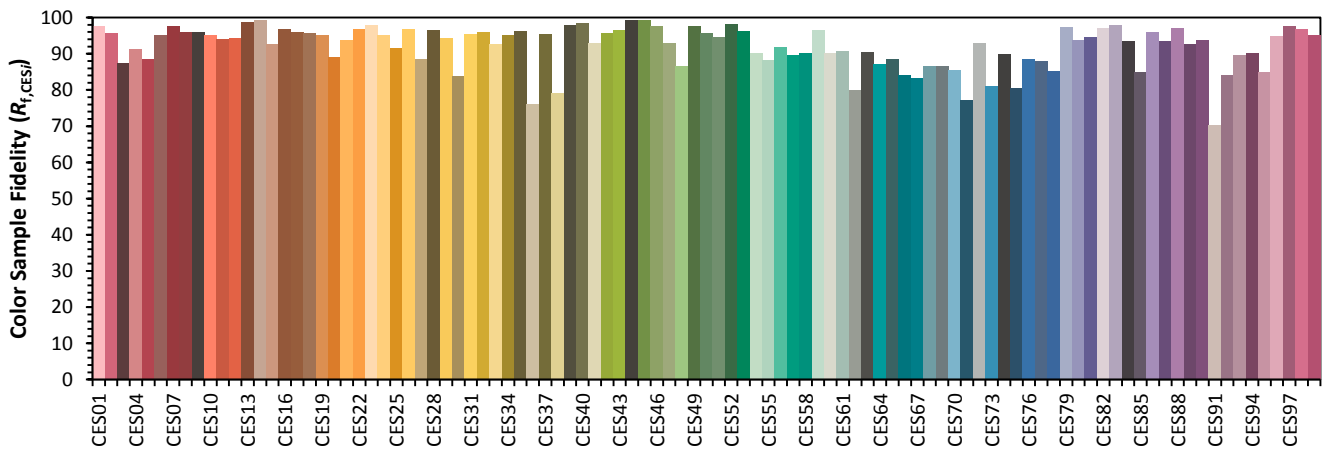
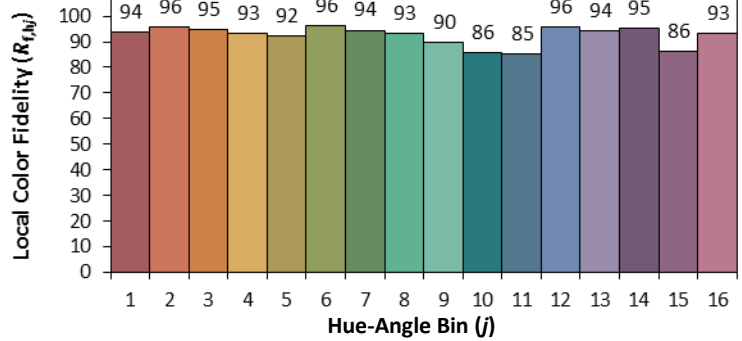
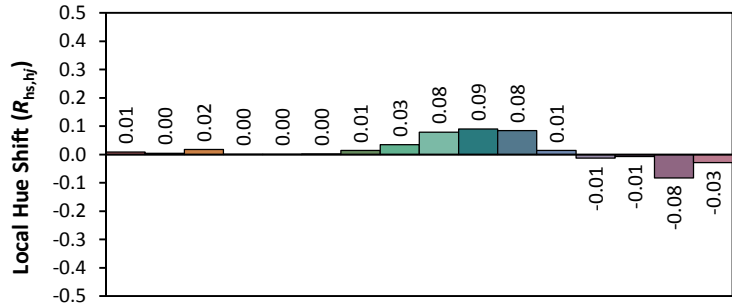
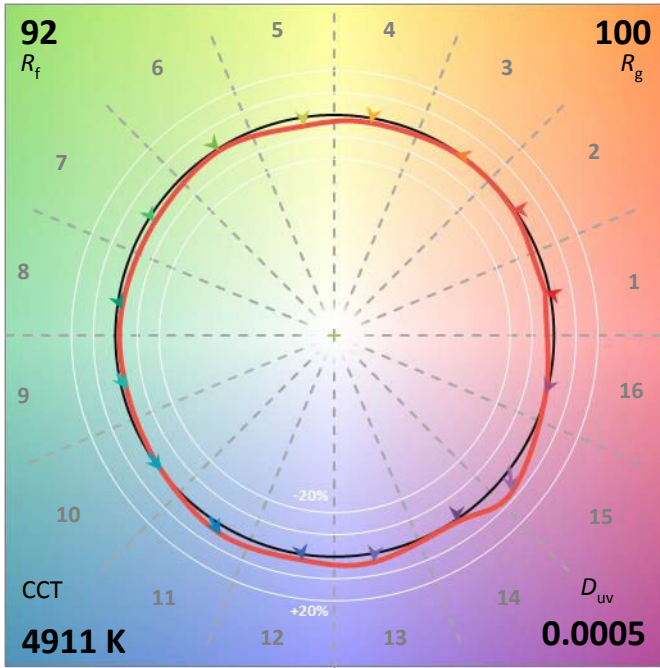
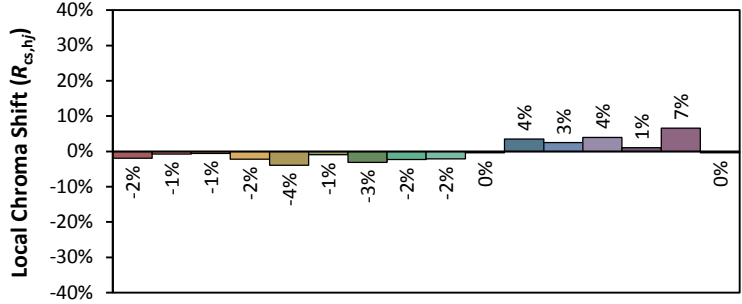
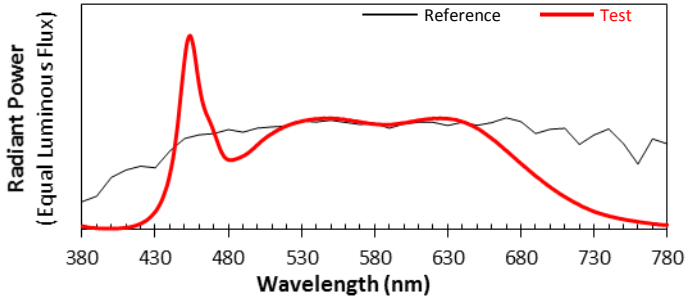
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.06571	7.706	0.9772	650.29	84.39

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
2.353	4908	0.000566	0.3478	0.3549	0.2120	0.4867

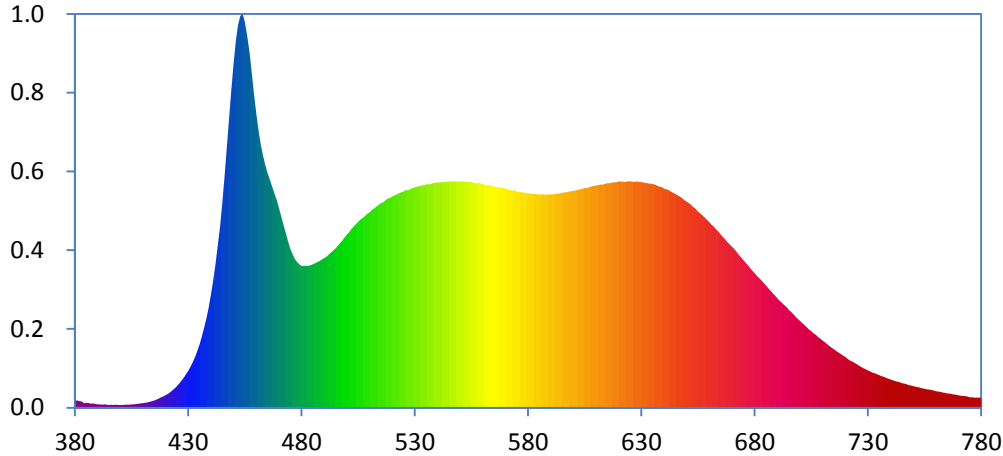
Color Rendering Index

Ra			
96.1			
R1	R2	R3	R4
97	99	97	95
R5	R6	R7	R8
95	94	97	95
R9	R10	R11	R12
93	95	95	68
R13	R14	R15	
98	98	95	





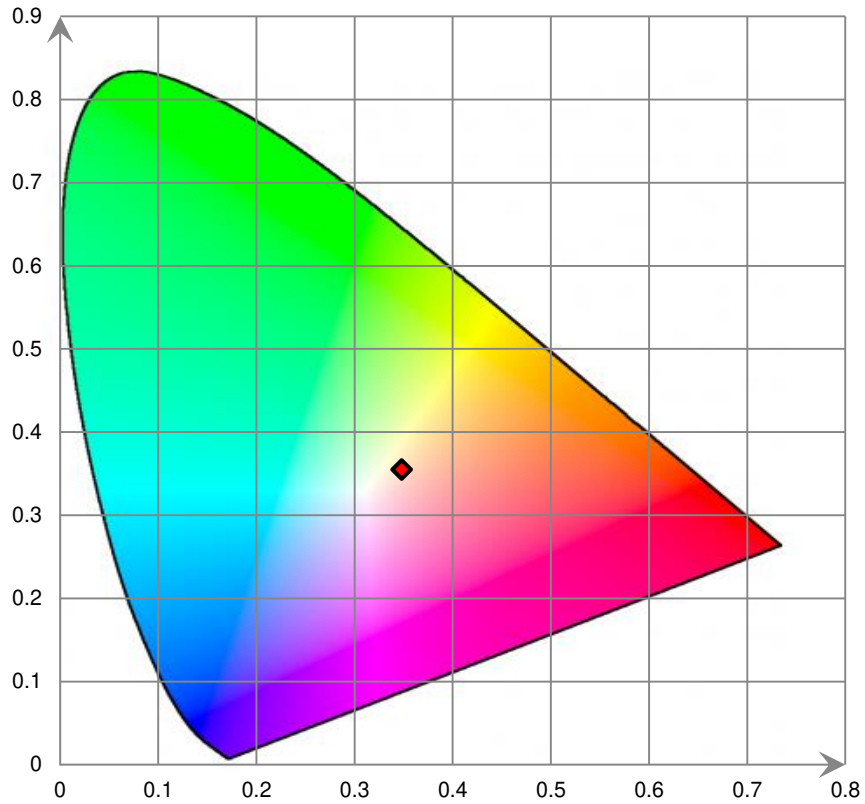
Relative Spectral Power Distribution



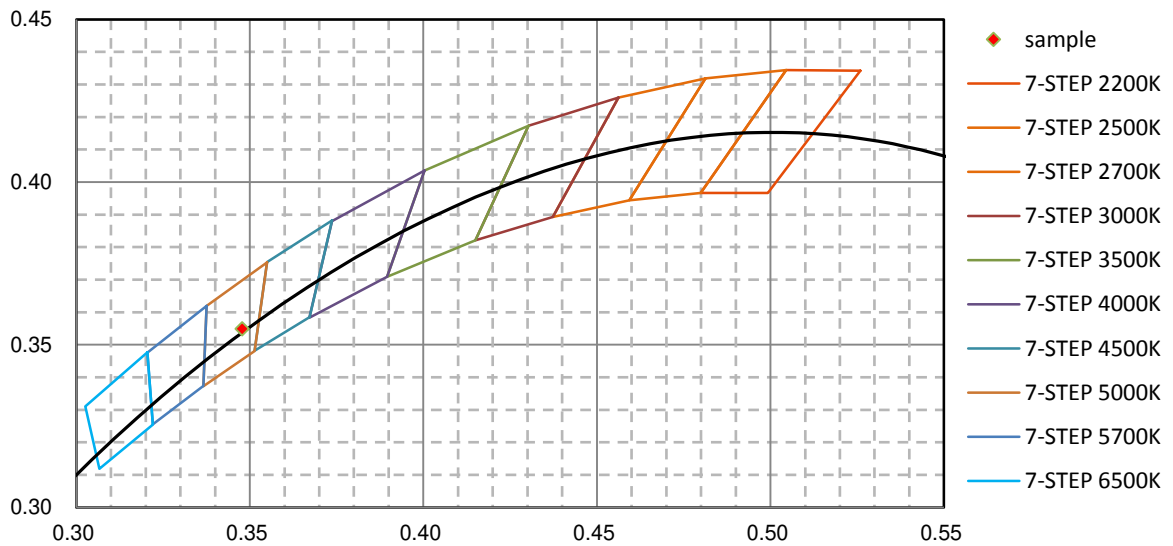
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	3.013E-01	421	5.832E-01	462	1.094E+01	503	7.516E+00	544	9.386E+00
381	3.030E-01	422	6.518E-01	463	1.047E+01	504	7.620E+00	545	9.407E+00
382	2.719E-01	423	7.246E-01	464	1.008E+01	505	7.717E+00	546	9.405E+00
383	2.616E-01	424	8.044E-01	465	9.755E+00	506	7.808E+00	547	9.392E+00
384	1.805E-01	425	8.982E-01	466	9.489E+00	507	7.890E+00	548	9.402E+00
385	2.042E-01	426	1.002E+00	467	9.213E+00	508	7.977E+00	549	9.399E+00
386	1.882E-01	427	1.120E+00	468	8.932E+00	509	8.070E+00	550	9.400E+00
387	1.602E-01	428	1.244E+00	469	8.625E+00	510	8.115E+00	551	9.403E+00
388	1.764E-01	429	1.387E+00	470	8.292E+00	511	8.219E+00	552	9.392E+00
389	1.595E-01	430	1.526E+00	471	7.947E+00	512	8.281E+00	553	9.375E+00
390	1.450E-01	431	1.702E+00	472	7.583E+00	513	8.355E+00	554	9.382E+00
391	1.388E-01	432	1.907E+00	473	7.262E+00	514	8.427E+00	555	9.377E+00
392	1.229E-01	433	2.122E+00	474	6.926E+00	515	8.503E+00	556	9.347E+00
393	1.349E-01	434	2.369E+00	475	6.620E+00	516	8.537E+00	557	9.330E+00
394	1.261E-01	435	2.640E+00	476	6.393E+00	517	8.616E+00	558	9.341E+00
395	1.099E-01	436	2.975E+00	477	6.190E+00	518	8.691E+00	559	9.323E+00
396	1.213E-01	437	3.332E+00	478	6.061E+00	519	8.713E+00	560	9.288E+00
397	1.172E-01	438	3.701E+00	479	5.959E+00	520	8.778E+00	561	9.259E+00
398	1.217E-01	439	4.159E+00	480	5.896E+00	521	8.822E+00	562	9.254E+00
399	1.162E-01	440	4.687E+00	481	5.882E+00	522	8.868E+00	563	9.251E+00
400	1.151E-01	441	5.262E+00	482	5.892E+00	523	8.912E+00	564	9.215E+00
401	1.168E-01	442	5.929E+00	483	5.895E+00	524	8.957E+00	565	9.193E+00
402	1.217E-01	443	6.686E+00	484	5.927E+00	525	8.986E+00	566	9.171E+00
403	1.206E-01	444	7.557E+00	485	5.969E+00	526	9.044E+00	567	9.172E+00
404	1.203E-01	445	8.561E+00	486	6.010E+00	527	9.039E+00	568	9.145E+00
405	1.336E-01	446	9.642E+00	487	6.058E+00	528	9.079E+00	569	9.123E+00
406	1.434E-01	447	1.084E+01	488	6.104E+00	529	9.123E+00	570	9.111E+00
407	1.495E-01	448	1.204E+01	489	6.167E+00	530	9.157E+00	571	9.062E+00
408	1.630E-01	449	1.322E+01	490	6.223E+00	531	9.187E+00	572	9.053E+00
409	1.785E-01	450	1.430E+01	491	6.275E+00	532	9.210E+00	573	9.021E+00
410	1.907E-01	451	1.524E+01	492	6.370E+00	533	9.231E+00	574	9.030E+00
411	2.021E-01	452	1.592E+01	493	6.438E+00	534	9.247E+00	575	8.989E+00
412	2.223E-01	453	1.629E+01	494	6.541E+00	535	9.277E+00	576	8.975E+00
413	2.451E-01	454	1.636E+01	495	6.635E+00	536	9.296E+00	577	8.951E+00
414	2.706E-01	455	1.605E+01	496	6.737E+00	537	9.291E+00	578	8.947E+00
415	3.042E-01	456	1.550E+01	497	6.846E+00	538	9.323E+00	579	8.923E+00
416	3.460E-01	457	1.475E+01	498	6.949E+00	539	9.354E+00	580	8.905E+00
417	3.812E-01	458	1.390E+01	499	7.086E+00	540	9.356E+00	581	8.903E+00
418	4.306E-01	459	1.302E+01	500	7.187E+00	541	9.366E+00	582	8.887E+00
419	4.757E-01	460	1.221E+01	501	7.291E+00	542	9.366E+00	583	8.885E+00
420	5.213E-01	461	1.152E+01	502	7.424E+00	543	9.380E+00	584	8.883E+00

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	8.851E+00	626	9.402E+00	667	7.007E+00	708	2.934E+00	749	9.290E-01
586	8.869E+00	627	9.389E+00	668	6.887E+00	709	2.861E+00	750	8.997E-01
587	8.860E+00	628	9.403E+00	669	6.772E+00	710	2.793E+00	751	8.774E-01
588	8.856E+00	629	9.378E+00	670	6.677E+00	711	2.718E+00	752	8.561E-01
589	8.867E+00	630	9.377E+00	671	6.586E+00	712	2.634E+00	753	8.274E-01
590	8.866E+00	631	9.358E+00	672	6.466E+00	713	2.566E+00	754	8.076E-01
591	8.862E+00	632	9.346E+00	673	6.355E+00	714	2.498E+00	755	7.925E-01
592	8.886E+00	633	9.316E+00	674	6.244E+00	715	2.423E+00	756	7.677E-01
593	8.888E+00	634	9.314E+00	675	6.135E+00	716	2.356E+00	757	7.490E-01
594	8.917E+00	635	9.292E+00	676	6.037E+00	717	2.300E+00	758	7.324E-01
595	8.931E+00	636	9.272E+00	677	5.923E+00	718	2.235E+00	759	7.093E-01
596	8.952E+00	637	9.227E+00	678	5.805E+00	719	2.166E+00	760	6.855E-01
597	8.954E+00	638	9.185E+00	679	5.704E+00	720	2.109E+00	761	6.742E-01
598	8.985E+00	639	9.174E+00	680	5.594E+00	721	2.034E+00	762	6.531E-01
599	8.990E+00	640	9.106E+00	681	5.490E+00	722	1.967E+00	763	6.343E-01
600	9.011E+00	641	9.082E+00	682	5.383E+00	723	1.918E+00	764	6.172E-01
601	9.033E+00	642	9.045E+00	683	5.286E+00	724	1.864E+00	765	5.962E-01
602	9.046E+00	643	8.981E+00	684	5.181E+00	725	1.816E+00	766	5.861E-01
603	9.082E+00	644	8.924E+00	685	5.069E+00	726	1.755E+00	767	5.688E-01
604	9.098E+00	645	8.872E+00	686	4.964E+00	727	1.698E+00	768	5.549E-01
605	9.131E+00	646	8.826E+00	687	4.865E+00	728	1.647E+00	769	5.358E-01
606	9.130E+00	647	8.765E+00	688	4.753E+00	729	1.601E+00	770	5.149E-01
607	9.165E+00	648	8.700E+00	689	4.657E+00	730	1.553E+00	771	5.018E-01
608	9.193E+00	649	8.629E+00	690	4.556E+00	731	1.507E+00	772	4.861E-01
609	9.218E+00	650	8.564E+00	691	4.454E+00	732	1.457E+00	773	4.801E-01
610	9.240E+00	651	8.499E+00	692	4.369E+00	733	1.428E+00	774	4.574E-01
611	9.250E+00	652	8.426E+00	693	4.275E+00	734	1.386E+00	775	4.367E-01
612	9.274E+00	653	8.333E+00	694	4.178E+00	735	1.344E+00	776	4.388E-01
613	9.281E+00	654	8.263E+00	695	4.063E+00	736	1.314E+00	777	4.203E-01
614	9.304E+00	655	8.148E+00	696	3.979E+00	737	1.279E+00	778	4.139E-01
615	9.334E+00	656	8.084E+00	697	3.888E+00	738	1.240E+00	779	4.147E-01
616	9.330E+00	657	7.979E+00	698	3.786E+00	739	1.208E+00	780	4.155E-01
617	9.359E+00	658	7.890E+00	699	3.695E+00	740	1.176E+00		
618	9.370E+00	659	7.796E+00	700	3.612E+00	741	1.135E+00		
619	9.369E+00	660	7.705E+00	701	3.515E+00	742	1.112E+00		
620	9.408E+00	661	7.602E+00	702	3.439E+00	743	1.086E+00		
621	9.395E+00	662	7.524E+00	703	3.349E+00	744	1.052E+00		
622	9.399E+00	663	7.409E+00	704	3.257E+00	745	1.024E+00		
623	9.384E+00	664	7.324E+00	705	3.189E+00	746	9.992E-01		
624	9.406E+00	665	7.207E+00	706	3.098E+00	747	9.791E-01		
625	9.408E+00	666	7.096E+00	707	3.019E+00	748	9.398E-01		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles



[Goniophotometer System]

Control Setting: 2700K 8W

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

Test orientation: **Downward**

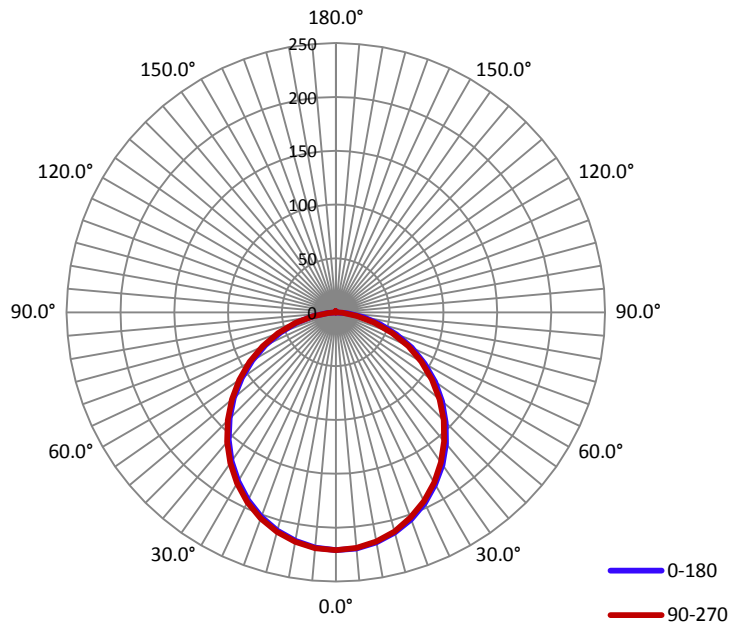
Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
120.0	60	0.0650	7.64	0.9820

Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	$I_{max}(cd)$	S/MH(C0/180)	S/MH(C90/270)
610.2	79.92	221.2	1.23	1.23

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50% I_{max}):	109.5	109.5	109.3	109.3	109.4
Field Angle(10% I_{max}):	161.2	161.2	159.1	160.1	160.4

Luminous Intensity (cd) Distribution Data

C \ y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	221	221	221	221	221	221	221	221
5.0°	220	220	220	220	220	220	220	220
10.0°	217	217	217	216	216	216	216	216
15.0°	212	212	211	211	211	210	210	210
20.0°	205	204	204	203	203	203	203	203
25.0°	196	195	195	194	194	193	193	193
30.0°	185	184	184	183	183	182	182	182
35.0°	173	173	172	171	170	170	169	170
40.0°	159	159	158	157	157	156	156	156
45.0°	145	144	143	142	142	141	141	141
50.0°	129	128	128	127	126	125	125	125
55.0°	113	112	111	110	109	108	109	108
60.0°	95	95	94	93	92	91	91	91
65.0°	78	77	76	75	74	73	73	74
70.0°	60	59	59	57	56	55	56	56
75.0°	43	42	41	40	37	36	38	39
80.0°	26	25	25	22	20	19	21	23
85.0°	11	11	10	9	6	6	8	9
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	1	0	1	1	1
150.0°	1	1	1	1	1	1	1	1
155.0°	1	1	1	1	1	1	1	1
160.0°	1	1	1	1	1	1	1	1
165.0°	1	1	1	1	1	1	1	1
170.0°	1	1	1	1	1	1	1	1
175.0°	1	1	1	1	1	1	1	1
180.0°	0	0	0	0	0	0	0	0

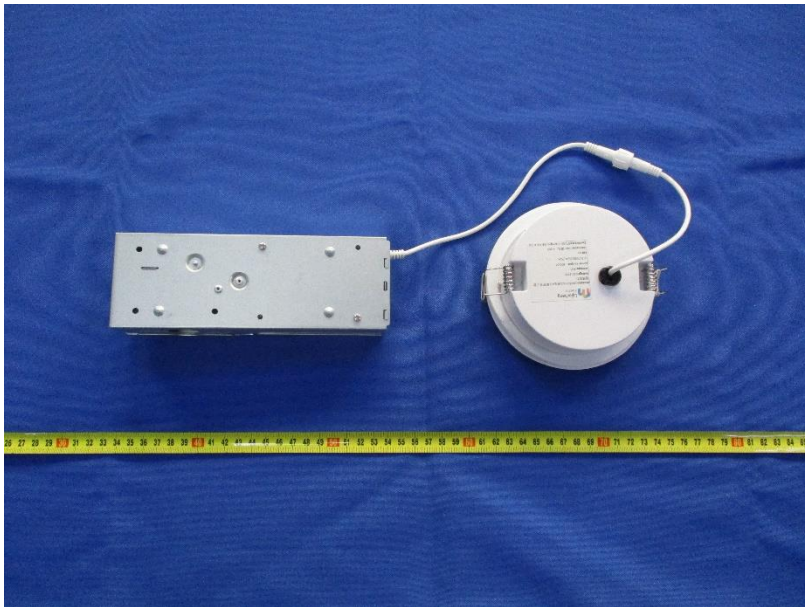
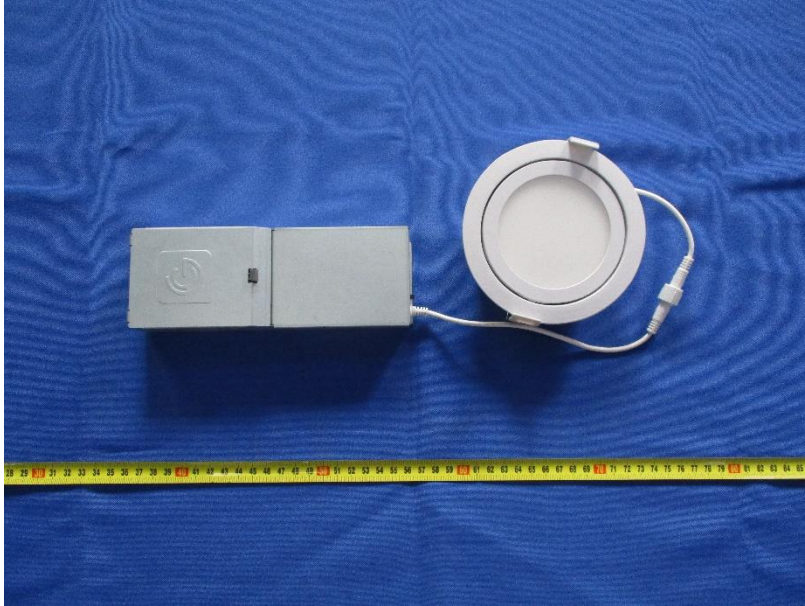
Luminous Intensity (cd) Distribution Data (cont.)

C \ Y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	221	221	221	221	221	221	221	221
5.0°	219	220	220	220	220	220	220	220
10.0°	216	216	216	216	217	217	217	217
15.0°	210	210	211	211	211	211	212	212
20.0°	202	203	203	203	204	204	205	204
25.0°	193	193	194	194	194	195	195	195
30.0°	181	182	183	183	183	184	184	184
35.0°	169	169	170	170	171	171	172	172
40.0°	155	155	156	156	157	158	158	158
45.0°	139	140	141	141	142	142	143	143
50.0°	124	124	125	126	126	127	127	127
55.0°	107	107	108	109	109	110	110	110
60.0°	90	90	91	92	93	93	93	93
65.0°	72	73	74	74	75	76	76	76
70.0°	55	55	56	57	57	58	58	58
75.0°	37	38	39	40	39	39	41	41
80.0°	22	23	23	23	21	22	23	25
85.0°	8	8	9	9	7	7	9	10
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°	1	1	1	1	1	1	0	1
155.0°	1	1	1	1	1	1	1	1
160.0°	1	1	1	1	1	1	1	1
165.0°	1	1	1	1	1	1	1	1
170.0°	1	1	1	1	1	1	1	1
175.0°	1	1	1	1	1	1	1	1
180.0°	0	0	0	0	0	0	0	0

Zonal Lumen Density Measurement

Deg	Flux (lm)	%	Deg	Flux (lm)	%
0-5	5.3	0.85	0-5	5.3	0.86
5-10	15.5	2.56	0-10	20.9	3.42
10-15	25.3	4.15	0-15	46.2	7.57
15-20	34.2	5.60	0-20	80.4	13.17
20-25	41.8	6.82	0-25	122.1	20.00
25-30	47.8	7.82	0-30	169.8	27.82
30-35	52.1	8.54	0-35	221.9	36.36
35-40	54.6	8.95	0-40	276.5	45.31
40-45	55.4	9.07	0-45	331.8	54.37
45-50	54.1	8.87	0-50	385.9	63.24
50-55	51.2	8.39	0-55	437.1	71.63
55-60	46.5	7.62	0-60	483.7	79.27
60-65	40.5	6.64	0-65	524.2	85.91
65-70	33.4	5.45	0-70	557.6	91.37
70-75	25.1	4.11	0-75	582.7	95.48
75-80	16.5	2.70	0-80	599.2	98.19
80-85	8.3	1.35	0-85	607.5	99.55
85-90	1.7	0.28	0-90	609.2	99.83
90-95	0.0	0.00	0-95	609.2	99.83
95-100	0.0	0.00	0-100	609.2	99.83
100-105	0.0	0.00	0-105	609.2	99.83
105-110	0.0	0.00	0-110	609.2	99.83
110-115	0.0	0.00	0-115	609.2	99.83
115-120	0.0	0.00	0-120	609.2	99.83
120-125	0.0	0.00	0-125	609.2	99.83
125-130	0.0	0.00	0-130	609.2	99.83
130-135	0.0	0.00	0-135	609.3	99.84
135-140	0.0	0.00	0-140	609.4	99.86
140-145	0.0	0.00	0-145	609.5	99.88
145-150	0.0	0.00	0-150	609.6	99.90
150-155	0.0	0.00	0-155	609.8	99.92
155-160	0.0	0.00	0-160	609.9	99.95
160-165	0.0	0.00	0-165	610.0	99.97
165-170	0.0	0.00	0-170	610.2	99.99
170-175	0.0	0.00	0-175	610.2	100.00
175-180	0.0	0.00	0-180	610.2	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*****