

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: SLFT9.5/9CCT5S/DUALDIM

Report Type:	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution
Project Engineer:	Bay Wang <i>Bay Wang</i>
Report Number:	RKSB221207006-10-2
Test Date:	2022-12-09 to 2022-12-12
Report Date:	2022-12-23
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 2022-12-07 and used for testing.

Model Tested:	SLFT9.5/9CCT5S/DUALDIM
Manufacturer:	GREEN CREATIVE LTD
Brand Name:	GREEN CREATIVE
Product Designation:	LED Recessed Downlight
Burning Time Before Test:	0hour(For New Products)
Color Tunable:	White-Tunable
CCT Range:	2700K, 3000K, 3500K, 4000K, 5000K
Least Efficient Setting:	2700K
Most Consumptive Setting:	2700K
Default Setting:	3500K

Rated Values:

Rated Voltage/Frequency:	120-277VAC 50/60Hz
Rated Power:	40W/32W/24W
Nominal CCT:	2700K/3000K/3500K/4000K/5000K
Nominal Lumen Output:	3600lm/3700lm/4000lm/4000lm/4000lm @ 40W

2. Standards Used

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

3. Description of Test Equipment

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

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

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Kunshan) attested that all calibration has been performed using suitable standards traceable to National Primary Standards and International System of Units (SI).

4. Test Method

Product was tested with no seasoning. All stabilization and measurements were made in compliance with IES LM-79-08. The product was operated at rated voltage or at voltage required by manufacturer. The ambient temperature of the sample was maintained at $25^{\circ}\text{C}\pm 1^{\circ}\text{C}$ during measurement. And relative humidity is less than 65%.

Integrating Sphere System

The system includes AC power source, digital power meter, DC power supply, Spectroradiometer, and integrating sphere. The integrating sphere system is calibrated by standard spectrum light source before measurement.

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_t , 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**

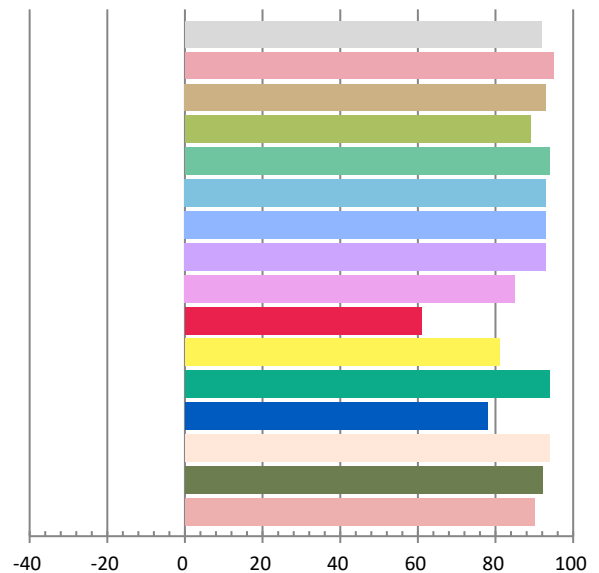
Photometric and Electrical Measurement Result

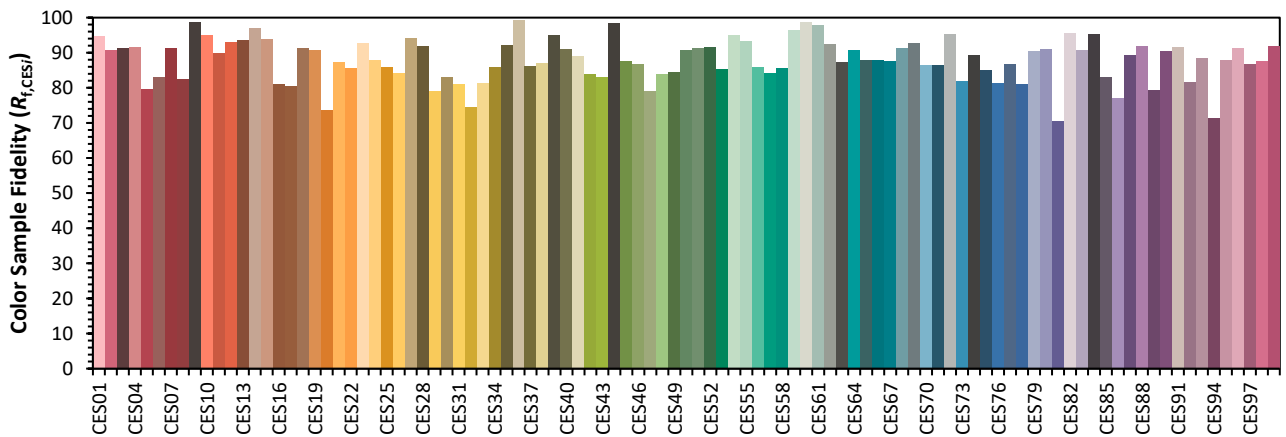
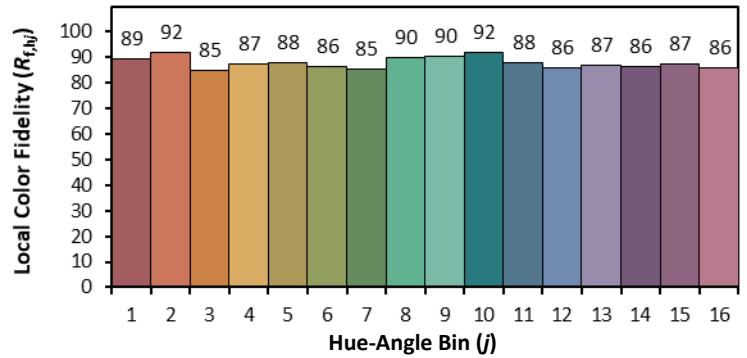
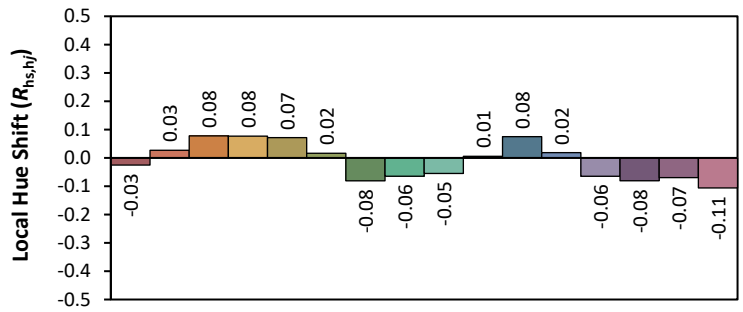
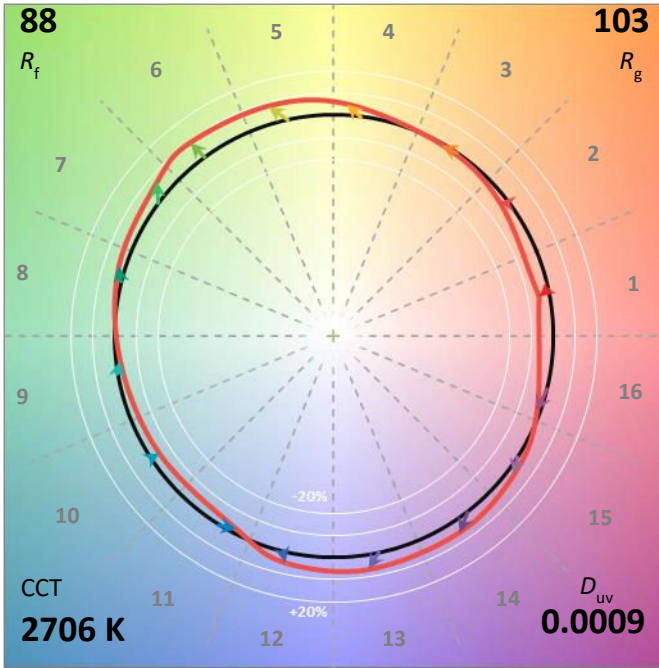
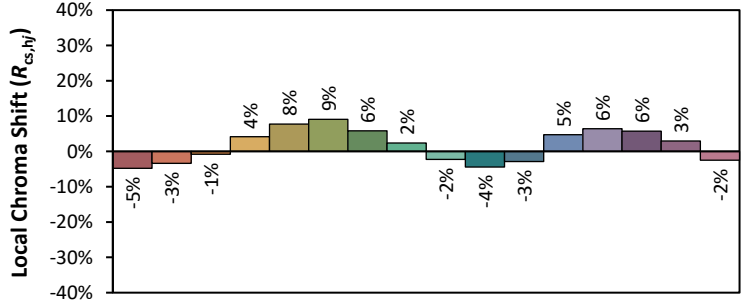
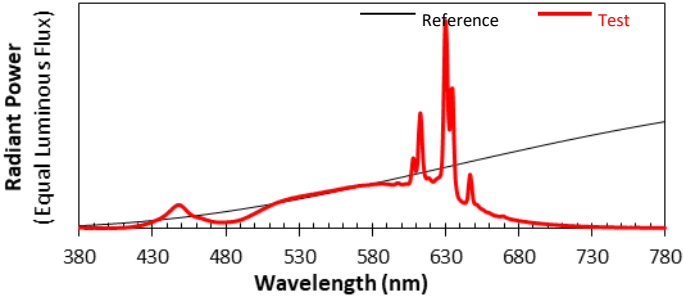
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.3258	38.68	0.9896	4590.7	118.67

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
13.485	2707	0.000932	0.4609	0.4134	0.2619	0.5286

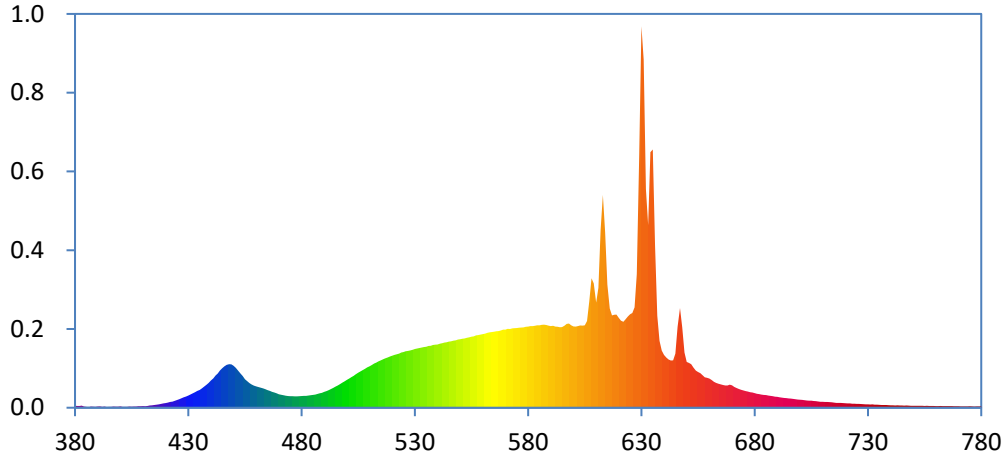
Color Rendering Index

Ra			
91.8			
R1	R2	R3	R4
95	93	89	94
R5	R6	R7	R8
93	93	93	85
R9	R10	R11	R12
61	81	94	78
R13	R14	R15	
94	92	90	





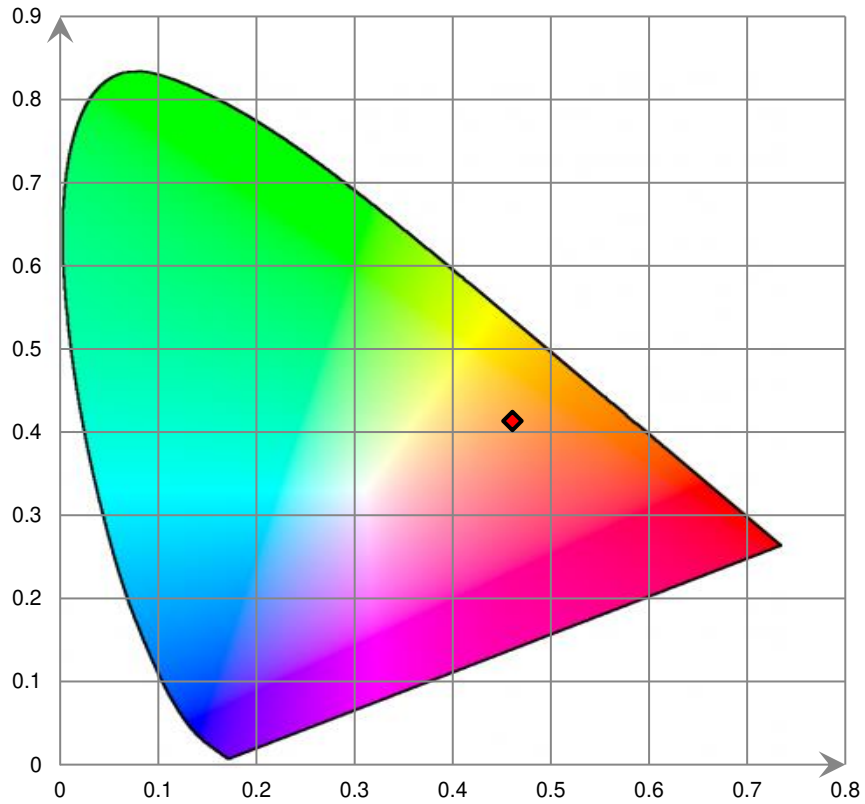
Relative Spectral Power Distribution



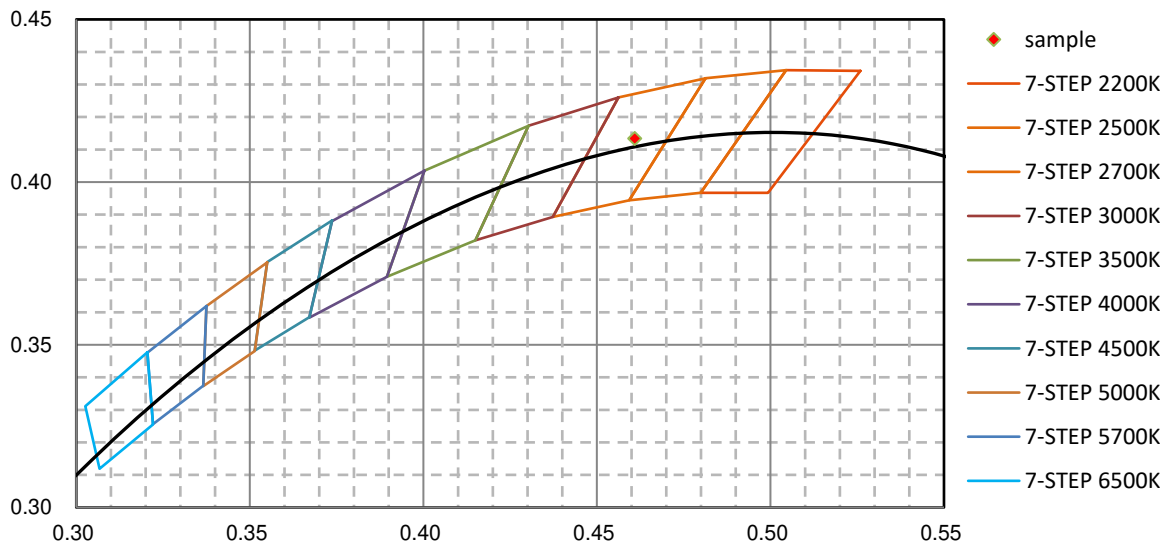
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	1.713E+00	421	4.523E+00	462	1.753E+01	503	2.782E+01	544	5.720E+01
381	1.600E+00	422	5.034E+00	463	1.685E+01	504	2.943E+01	545	5.772E+01
382	1.560E+00	423	5.380E+00	464	1.628E+01	505	3.063E+01	546	5.804E+01
383	1.828E+00	424	6.067E+00	465	1.541E+01	506	3.178E+01	547	5.863E+01
384	9.746E-01	425	6.770E+00	466	1.468E+01	507	3.282E+01	548	5.892E+01
385	7.277E-01	426	7.418E+00	467	1.390E+01	508	3.394E+01	549	5.963E+01
386	4.155E-01	427	8.227E+00	468	1.326E+01	509	3.524E+01	550	5.987E+01
387	1.046E+00	428	9.142E+00	469	1.254E+01	510	3.629E+01	551	6.027E+01
388	8.242E-01	429	9.790E+00	470	1.169E+01	511	3.740E+01	552	6.060E+01
389	6.421E-01	430	1.059E+01	471	1.129E+01	512	3.860E+01	553	6.106E+01
390	9.565E-01	431	1.165E+01	472	1.089E+01	513	3.952E+01	554	6.154E+01
391	1.134E+00	432	1.254E+01	473	1.051E+01	514	4.059E+01	555	6.207E+01
392	6.929E-01	433	1.358E+01	474	1.021E+01	515	4.145E+01	556	6.238E+01
393	9.941E-01	434	1.469E+01	475	1.009E+01	516	4.234E+01	557	6.314E+01
394	5.508E-01	435	1.556E+01	476	1.004E+01	517	4.317E+01	558	6.343E+01
395	6.495E-01	436	1.690E+01	477	9.995E+00	518	4.395E+01	559	6.393E+01
396	6.785E-01	437	1.841E+01	478	9.966E+00	519	4.473E+01	560	6.436E+01
397	9.593E-01	438	2.000E+01	479	1.005E+01	520	4.548E+01	561	6.474E+01
398	8.123E-01	439	2.166E+01	480	1.021E+01	521	4.620E+01	562	6.539E+01
399	8.124E-01	440	2.371E+01	481	1.029E+01	522	4.676E+01	563	6.583E+01
400	1.064E+00	441	2.559E+01	482	1.037E+01	523	4.731E+01	564	6.622E+01
401	7.461E-01	442	2.811E+01	483	1.056E+01	524	4.818E+01	565	6.648E+01
402	7.667E-01	443	2.998E+01	484	1.096E+01	525	4.874E+01	566	6.688E+01
403	6.760E-01	444	3.252E+01	485	1.116E+01	526	4.941E+01	567	6.703E+01
404	9.549E-01	445	3.451E+01	486	1.144E+01	527	4.965E+01	568	6.757E+01
405	7.921E-01	446	3.628E+01	487	1.201E+01	528	5.011E+01	569	6.821E+01
406	9.123E-01	447	3.755E+01	488	1.251E+01	529	5.065E+01	570	6.829E+01
407	1.001E+00	448	3.802E+01	489	1.304E+01	530	5.131E+01	571	6.895E+01
408	1.228E+00	449	3.794E+01	490	1.379E+01	531	5.170E+01	572	6.885E+01
409	1.261E+00	450	3.667E+01	491	1.449E+01	532	5.222E+01	573	6.933E+01
410	1.353E+00	451	3.484E+01	492	1.538E+01	533	5.263E+01	574	6.950E+01
411	1.325E+00	452	3.243E+01	493	1.634E+01	534	5.299E+01	575	6.970E+01
412	1.586E+00	453	3.000E+01	494	1.738E+01	535	5.336E+01	576	6.989E+01
413	1.995E+00	454	2.767E+01	495	1.848E+01	536	5.393E+01	577	7.003E+01
414	2.147E+00	455	2.496E+01	496	1.947E+01	537	5.415E+01	578	7.026E+01
415	2.376E+00	456	2.322E+01	497	2.070E+01	538	5.483E+01	579	7.078E+01
416	2.677E+00	457	2.151E+01	498	2.203E+01	539	5.505E+01	580	7.085E+01
417	2.970E+00	458	2.028E+01	499	2.308E+01	540	5.531E+01	581	7.135E+01
418	3.289E+00	459	1.935E+01	500	2.429E+01	541	5.592E+01	582	7.129E+01
419	3.733E+00	460	1.866E+01	501	2.549E+01	542	5.630E+01	583	7.161E+01
420	4.081E+00	461	1.798E+01	502	2.678E+01	543	5.685E+01	584	7.205E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	7.208E+01	626	8.284E+01	667	1.949E+01	708	5.474E+00	749	1.748E+00
586	7.237E+01	627	8.768E+01	668	1.951E+01	709	5.220E+00	750	1.625E+00
587	7.262E+01	628	1.168E+02	669	2.020E+01	710	5.179E+00	751	1.706E+00
588	7.227E+01	629	2.202E+02	670	1.965E+01	711	5.059E+00	752	1.608E+00
589	7.180E+01	630	3.333E+02	671	1.824E+01	712	4.993E+00	753	1.619E+00
590	7.135E+01	631	3.042E+02	672	1.724E+01	713	4.836E+00	754	1.626E+00
591	7.154E+01	632	1.910E+02	673	1.638E+01	714	4.713E+00	755	1.507E+00
592	7.086E+01	633	1.595E+02	674	1.566E+01	715	4.529E+00	756	1.631E+00
593	7.080E+01	634	2.234E+02	675	1.504E+01	716	4.184E+00	757	1.533E+00
594	7.038E+01	635	2.257E+02	676	1.457E+01	717	4.257E+00	758	1.506E+00
595	7.047E+01	636	1.420E+02	677	1.407E+01	718	4.182E+00	759	1.513E+00
596	7.160E+01	637	8.047E+01	678	1.364E+01	719	4.028E+00	760	1.428E+00
597	7.324E+01	638	5.847E+01	679	1.324E+01	720	3.872E+00	761	1.428E+00
598	7.353E+01	639	4.990E+01	680	1.268E+01	721	3.710E+00	762	1.474E+00
599	7.204E+01	640	4.621E+01	681	1.221E+01	722	3.748E+00	763	1.410E+00
600	7.111E+01	641	4.376E+01	682	1.195E+01	723	3.546E+00	764	1.388E+00
601	7.086E+01	642	4.217E+01	683	1.153E+01	724	3.523E+00	765	1.359E+00
602	7.138E+01	643	4.130E+01	684	1.123E+01	725	3.403E+00	766	1.354E+00
603	7.188E+01	644	4.145E+01	685	1.102E+01	726	3.352E+00	767	1.375E+00
604	7.180E+01	645	4.729E+01	686	1.055E+01	727	3.184E+00	768	1.295E+00
605	7.206E+01	646	7.080E+01	687	1.029E+01	728	3.122E+00	769	1.256E+00
606	7.583E+01	647	8.710E+01	688	1.006E+01	729	2.950E+00	770	1.189E+00
607	9.298E+01	648	7.022E+01	689	9.632E+00	730	2.901E+00	771	1.165E+00
608	1.131E+02	649	4.827E+01	690	9.464E+00	731	2.821E+00	772	1.172E+00
609	1.087E+02	650	4.003E+01	691	9.139E+00	732	2.947E+00	773	1.167E+00
610	9.189E+01	651	3.917E+01	692	8.826E+00	733	2.667E+00	774	1.155E+00
611	1.048E+02	652	3.807E+01	693	8.582E+00	734	2.690E+00	775	1.212E+00
612	1.556E+02	653	3.510E+01	694	8.384E+00	735	2.593E+00	776	1.088E+00
613	1.860E+02	654	3.248E+01	695	8.162E+00	736	2.431E+00	777	1.039E+00
614	1.535E+02	655	3.125E+01	696	7.899E+00	737	2.445E+00	778	1.065E+00
615	1.076E+02	656	3.016E+01	697	7.663E+00	738	2.333E+00	779	1.067E+00
616	8.671E+01	657	2.838E+01	698	7.474E+00	739	2.312E+00	780	1.069E+00
617	8.068E+01	658	2.659E+01	699	7.124E+00	740	2.138E+00		
618	8.117E+01	659	2.610E+01	700	6.949E+00	741	2.185E+00		
619	8.140E+01	660	2.545E+01	701	6.822E+00	742	2.047E+00		
620	7.863E+01	661	2.422E+01	702	6.536E+00	743	2.068E+00		
621	7.610E+01	662	2.264E+01	703	6.344E+00	744	2.046E+00		
622	7.515E+01	663	2.167E+01	704	6.117E+00	745	2.041E+00		
623	7.736E+01	664	2.091E+01	705	6.176E+00	746	1.847E+00		
624	7.977E+01	665	2.046E+01	706	5.879E+00	747	1.968E+00		
625	8.159E+01	666	1.981E+01	707	5.738E+00	748	1.885E+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**

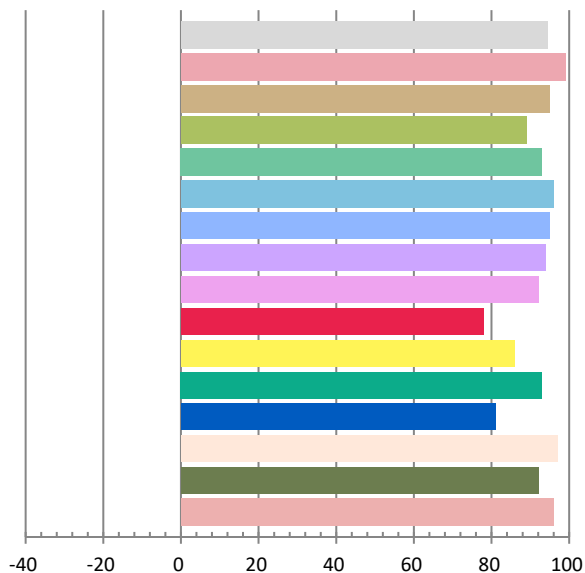
Photometric and Electrical Measurement Result

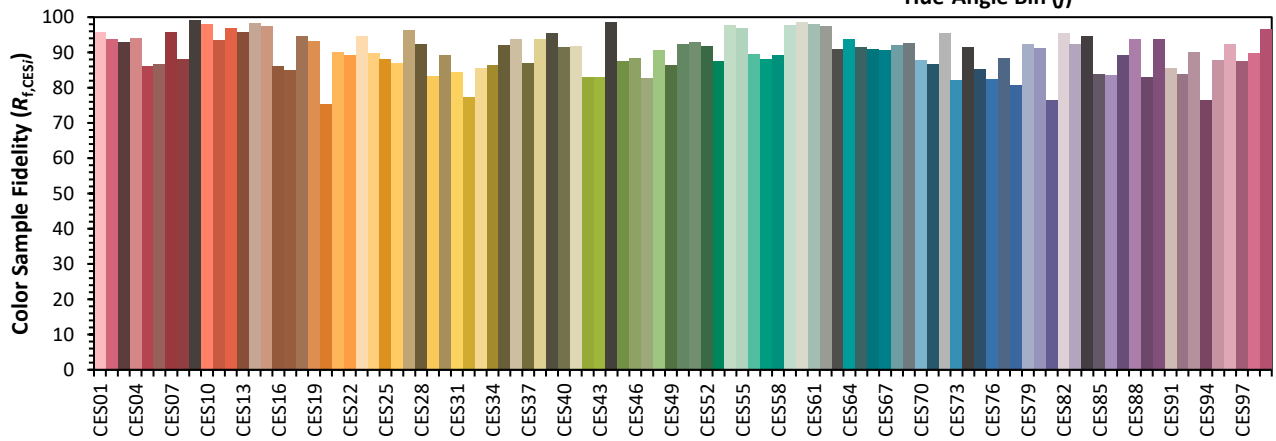
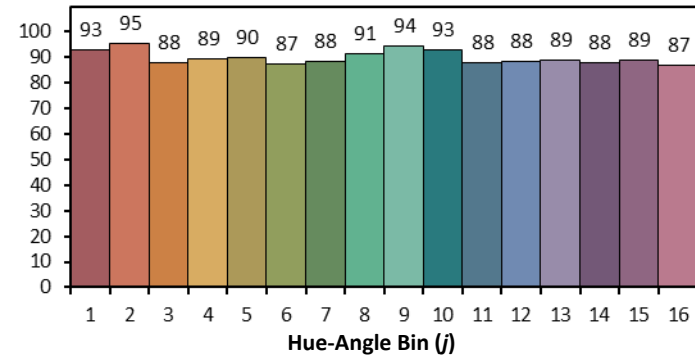
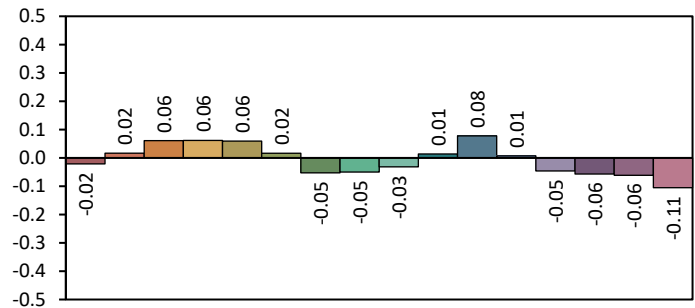
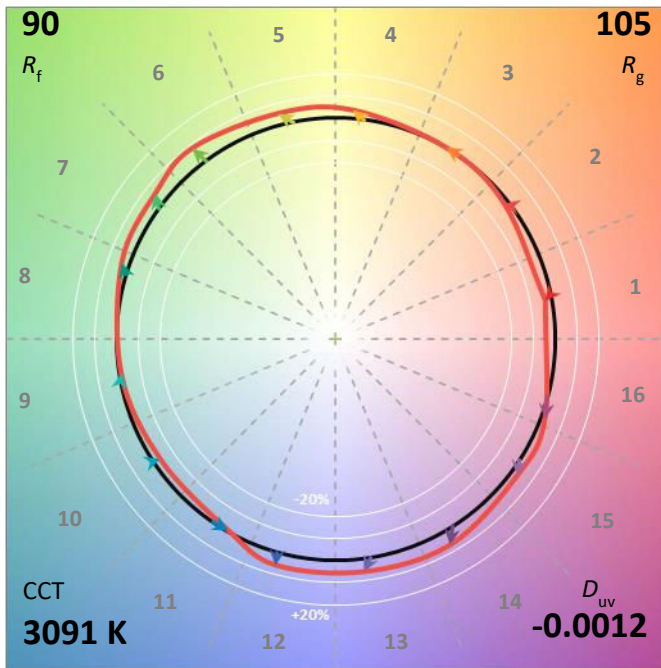
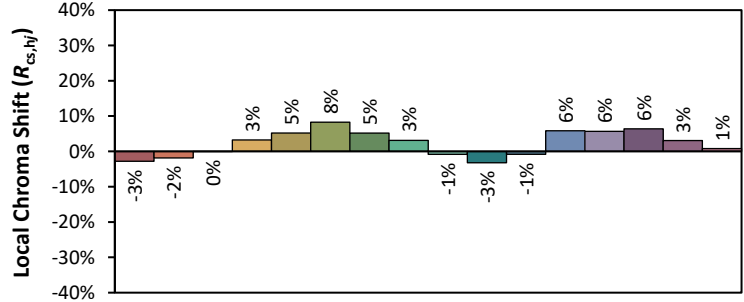
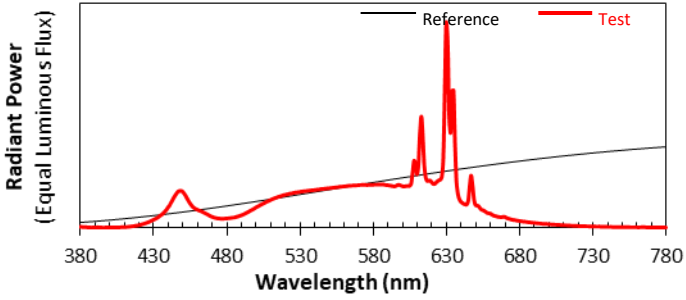
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.3189	37.85	0.989	4779.3	126.26

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
14.274	3092	-0.00111	0.4290	0.3985	0.2478	0.5180

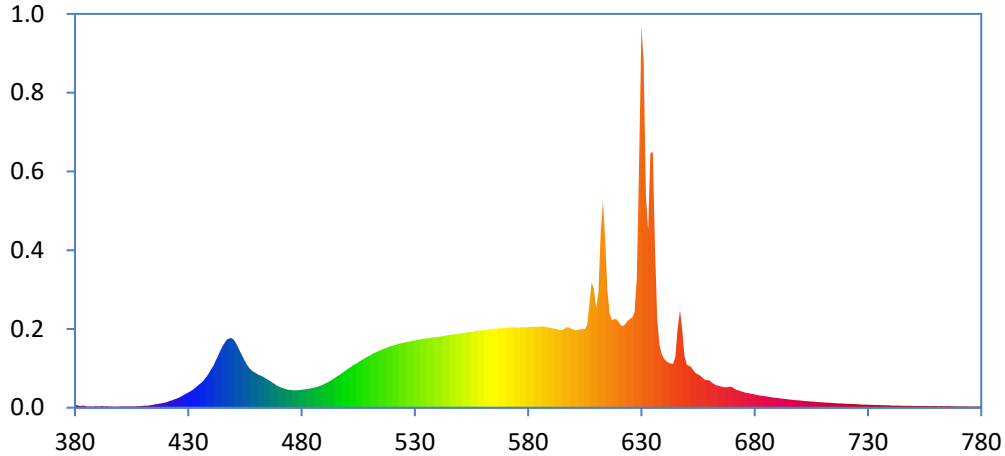
Color Rendering Index

Ra			
94.4			
R1	R2	R3	R4
99	95	89	93
R5	R6	R7	R8
96	95	94	92
R9	R10	R11	R12
78	86	93	81
R13	R14	R15	
97	92	96	





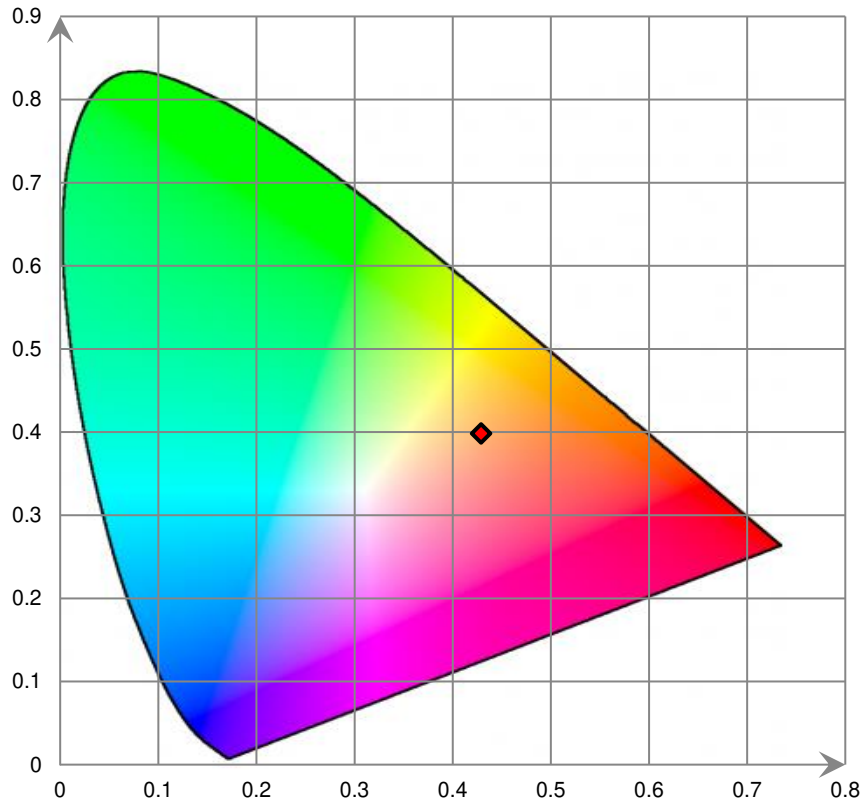
Relative Spectral Power Distribution



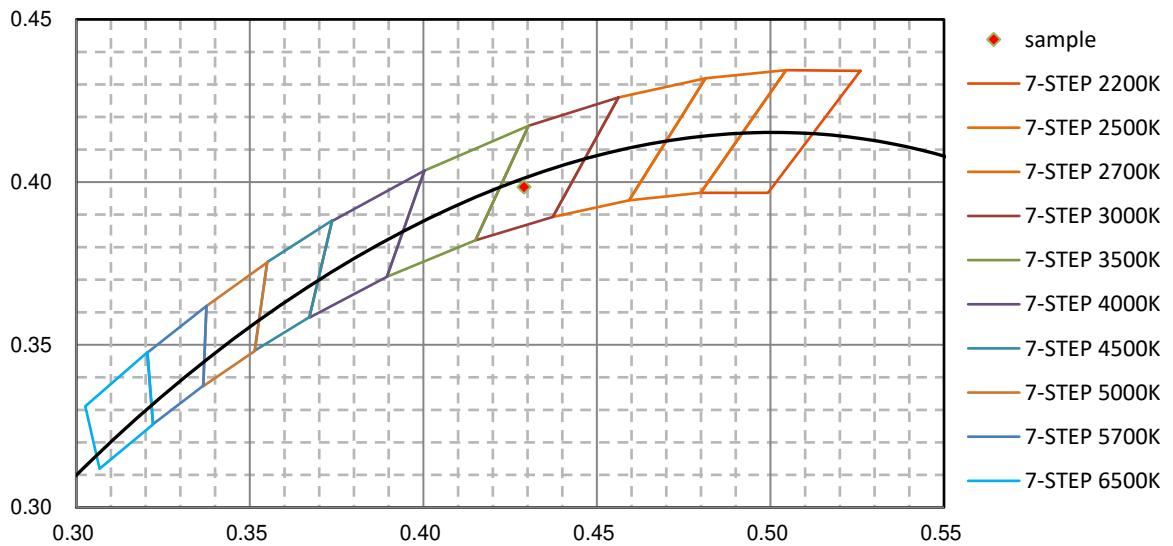
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	2.022E+00	421	5.106E+00	462	2.782E+01	503	3.728E+01	544	6.284E+01
381	2.265E+00	422	5.996E+00	463	2.694E+01	504	3.821E+01	545	6.329E+01
382	1.482E+00	423	6.504E+00	464	2.573E+01	505	3.964E+01	546	6.340E+01
383	1.741E+00	424	7.335E+00	465	2.450E+01	506	4.068E+01	547	6.373E+01
384	1.778E+00	425	8.021E+00	466	2.337E+01	507	4.206E+01	548	6.400E+01
385	1.154E+00	426	8.923E+00	467	2.199E+01	508	4.311E+01	549	6.444E+01
386	8.983E-01	427	9.837E+00	468	2.081E+01	509	4.423E+01	550	6.452E+01
387	1.122E+00	428	1.097E+01	469	1.938E+01	510	4.538E+01	551	6.478E+01
388	8.247E-01	429	1.219E+01	470	1.840E+01	511	4.654E+01	552	6.507E+01
389	1.183E+00	430	1.319E+01	471	1.749E+01	512	4.743E+01	553	6.539E+01
390	1.111E+00	431	1.439E+01	472	1.671E+01	513	4.840E+01	554	6.560E+01
391	9.171E-01	432	1.563E+01	473	1.621E+01	514	4.922E+01	555	6.603E+01
392	1.455E+00	433	1.706E+01	474	1.557E+01	515	5.021E+01	556	6.622E+01
393	9.111E-01	434	1.880E+01	475	1.553E+01	516	5.087E+01	557	6.671E+01
394	1.207E+00	435	2.057E+01	476	1.524E+01	517	5.162E+01	558	6.683E+01
395	9.440E-01	436	2.219E+01	477	1.519E+01	518	5.252E+01	559	6.713E+01
396	8.311E-01	437	2.440E+01	478	1.524E+01	519	5.332E+01	560	6.730E+01
397	8.356E-01	438	2.685E+01	479	1.548E+01	520	5.373E+01	561	6.756E+01
398	7.664E-01	439	2.961E+01	480	1.554E+01	521	5.441E+01	562	6.786E+01
399	8.669E-01	440	3.308E+01	481	1.586E+01	522	5.485E+01	563	6.820E+01
400	1.056E+00	441	3.614E+01	482	1.611E+01	523	5.575E+01	564	6.852E+01
401	1.009E+00	442	4.055E+01	483	1.637E+01	524	5.603E+01	565	6.848E+01
402	1.104E+00	443	4.458E+01	484	1.686E+01	525	5.637E+01	566	6.876E+01
403	1.007E+00	444	4.901E+01	485	1.706E+01	526	5.702E+01	567	6.909E+01
404	1.153E+00	445	5.294E+01	486	1.771E+01	527	5.747E+01	568	6.896E+01
405	9.280E-01	446	5.621E+01	487	1.827E+01	528	5.762E+01	569	6.916E+01
406	9.795E-01	447	5.917E+01	488	1.895E+01	529	5.822E+01	570	6.948E+01
407	1.270E+00	448	6.016E+01	489	1.966E+01	530	5.845E+01	571	6.969E+01
408	1.417E+00	449	6.042E+01	490	2.060E+01	531	5.903E+01	572	6.964E+01
409	1.450E+00	450	5.923E+01	491	2.152E+01	532	5.918E+01	573	6.978E+01
410	1.698E+00	451	5.627E+01	492	2.263E+01	533	5.966E+01	574	6.987E+01
411	1.784E+00	452	5.269E+01	493	2.381E+01	534	5.984E+01	575	6.980E+01
412	1.876E+00	453	4.838E+01	494	2.500E+01	535	6.026E+01	576	6.959E+01
413	2.077E+00	454	4.418E+01	495	2.628E+01	536	6.056E+01	577	6.989E+01
414	2.352E+00	455	4.044E+01	496	2.773E+01	537	6.069E+01	578	6.985E+01
415	2.773E+00	456	3.713E+01	497	2.892E+01	538	6.115E+01	579	6.979E+01
416	3.027E+00	457	3.430E+01	498	3.025E+01	539	6.127E+01	580	7.014E+01
417	3.475E+00	458	3.245E+01	499	3.167E+01	540	6.155E+01	581	7.029E+01
418	3.810E+00	459	3.097E+01	500	3.312E+01	541	6.178E+01	582	7.017E+01
419	4.196E+00	460	2.993E+01	501	3.444E+01	542	6.233E+01	583	7.017E+01
420	4.639E+00	461	2.865E+01	502	3.569E+01	543	6.236E+01	584	7.042E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	7.053E+01	626	7.832E+01	667	1.777E+01	708	4.932E+00	749	1.594E+00
586	7.049E+01	627	8.300E+01	668	1.784E+01	709	4.719E+00	750	1.536E+00
587	7.068E+01	628	1.123E+02	669	1.839E+01	710	4.690E+00	751	1.565E+00
588	7.001E+01	629	2.172E+02	670	1.813E+01	711	4.511E+00	752	1.533E+00
589	6.962E+01	630	3.316E+02	671	1.657E+01	712	4.524E+00	753	1.488E+00
590	6.943E+01	631	3.006E+02	672	1.566E+01	713	4.334E+00	754	1.534E+00
591	6.889E+01	632	1.849E+02	673	1.507E+01	714	4.145E+00	755	1.488E+00
592	6.861E+01	633	1.541E+02	674	1.414E+01	715	4.080E+00	756	1.395E+00
593	6.805E+01	634	2.210E+02	675	1.363E+01	716	3.969E+00	757	1.434E+00
594	6.758E+01	635	2.225E+02	676	1.313E+01	717	3.749E+00	758	1.348E+00
595	6.747E+01	636	1.376E+02	677	1.281E+01	718	3.695E+00	759	1.367E+00
596	6.846E+01	637	7.597E+01	678	1.228E+01	719	3.617E+00	760	1.465E+00
597	6.994E+01	638	5.448E+01	679	1.193E+01	720	3.436E+00	761	1.271E+00
598	6.977E+01	639	4.656E+01	680	1.153E+01	721	3.341E+00	762	1.333E+00
599	6.874E+01	640	4.261E+01	681	1.117E+01	722	3.285E+00	763	1.332E+00
600	6.792E+01	641	4.053E+01	682	1.079E+01	723	3.244E+00	764	1.306E+00
601	6.724E+01	642	3.900E+01	683	1.041E+01	724	3.162E+00	765	1.332E+00
602	6.763E+01	643	3.836E+01	684	1.021E+01	725	3.090E+00	766	1.336E+00
603	6.814E+01	644	3.812E+01	685	9.919E+00	726	2.907E+00	767	1.266E+00
604	6.823E+01	645	4.434E+01	686	9.536E+00	727	2.849E+00	768	1.195E+00
605	6.824E+01	646	6.817E+01	687	9.331E+00	728	2.706E+00	769	1.165E+00
606	7.148E+01	647	8.493E+01	688	8.982E+00	729	2.698E+00	770	1.087E+00
607	8.867E+01	648	6.761E+01	689	8.659E+00	730	2.627E+00	771	1.117E+00
608	1.088E+02	649	4.523E+01	690	8.570E+00	731	2.577E+00	772	1.147E+00
609	1.039E+02	650	3.732E+01	691	8.260E+00	732	2.459E+00	773	1.025E+00
610	8.689E+01	651	3.644E+01	692	7.981E+00	733	2.408E+00	774	1.105E+00
611	1.000E+02	652	3.549E+01	693	7.689E+00	734	2.363E+00	775	1.038E+00
612	1.505E+02	653	3.237E+01	694	7.541E+00	735	2.319E+00	776	1.029E+00
613	1.804E+02	654	2.988E+01	695	7.223E+00	736	2.172E+00	777	9.750E-01
614	1.479E+02	655	2.907E+01	696	6.941E+00	737	2.205E+00	778	9.945E-01
615	1.021E+02	656	2.772E+01	697	6.863E+00	738	2.050E+00	779	9.964E-01
616	8.132E+01	657	2.613E+01	698	6.519E+00	739	2.075E+00	780	9.983E-01
617	7.611E+01	658	2.440E+01	699	6.471E+00	740	1.954E+00		
618	7.698E+01	659	2.403E+01	700	6.326E+00	741	1.883E+00		
619	7.690E+01	660	2.360E+01	701	6.066E+00	742	1.819E+00		
620	7.422E+01	661	2.205E+01	702	5.874E+00	743	1.869E+00		
621	7.156E+01	662	2.062E+01	703	5.750E+00	744	1.778E+00		
622	7.108E+01	663	1.968E+01	704	5.571E+00	745	1.740E+00		
623	7.322E+01	664	1.917E+01	705	5.479E+00	746	1.653E+00		
624	7.559E+01	665	1.847E+01	706	5.326E+00	747	1.597E+00		
625	7.736E+01	666	1.802E+01	707	4.966E+00	748	1.626E+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**

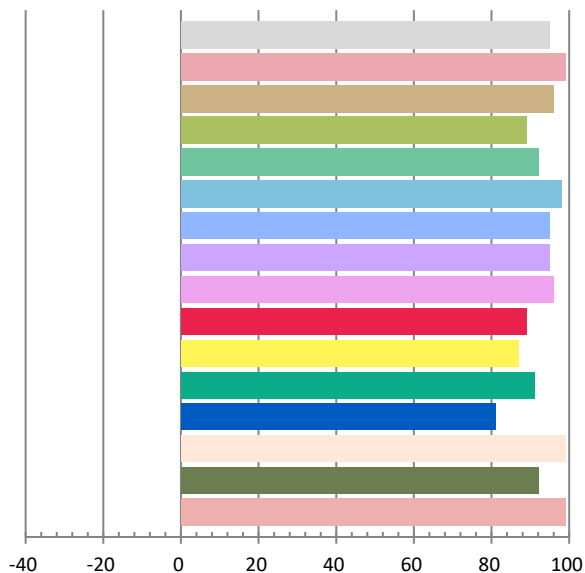
Photometric and Electrical Measurement Result

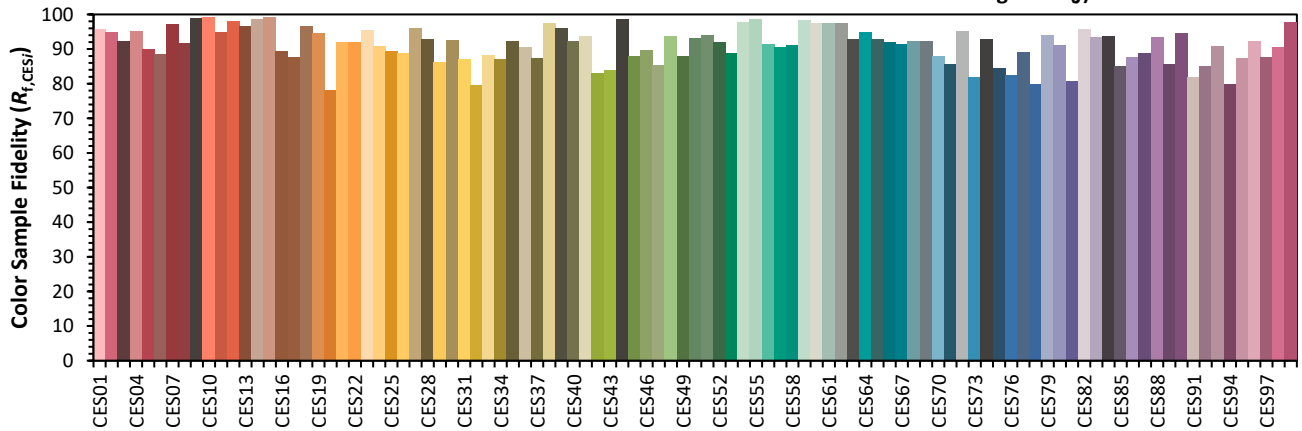
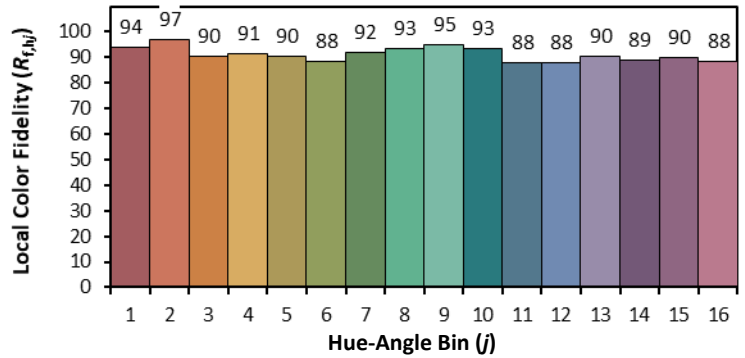
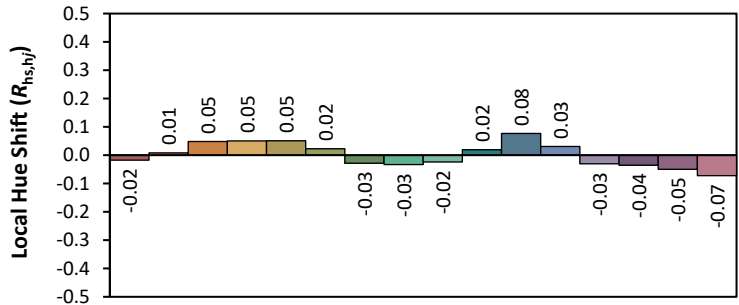
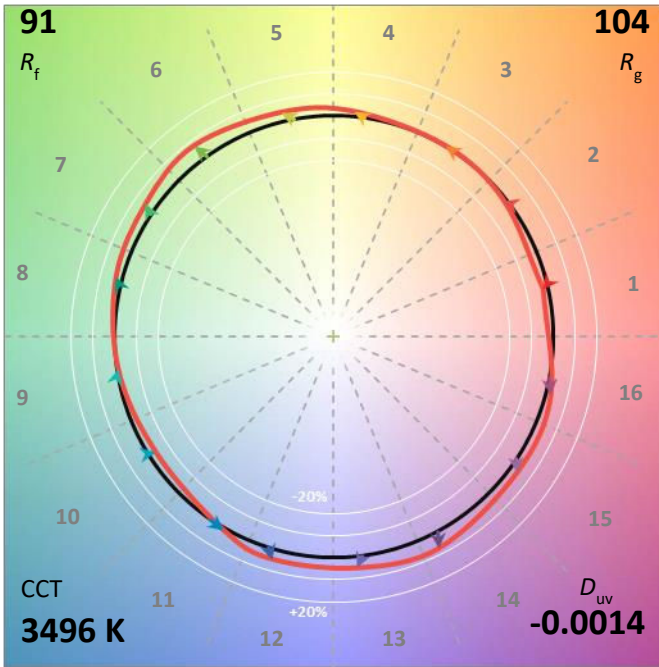
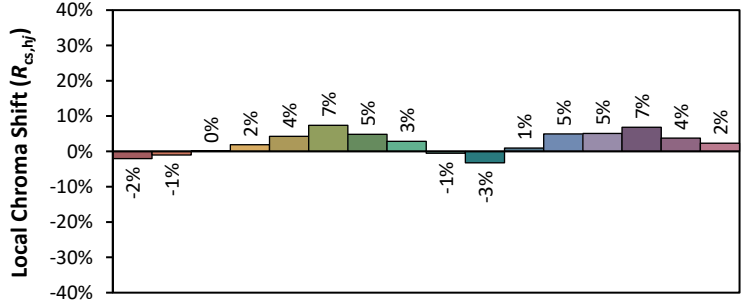
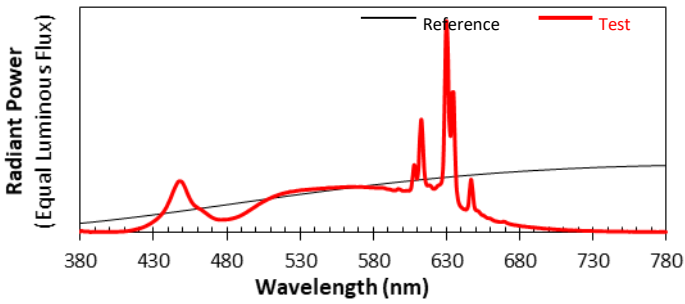
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.312	37.01	0.9886	4866.3	131.48

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
14.724	3496	-0.0014	0.4041	0.3869	0.2365	0.5095

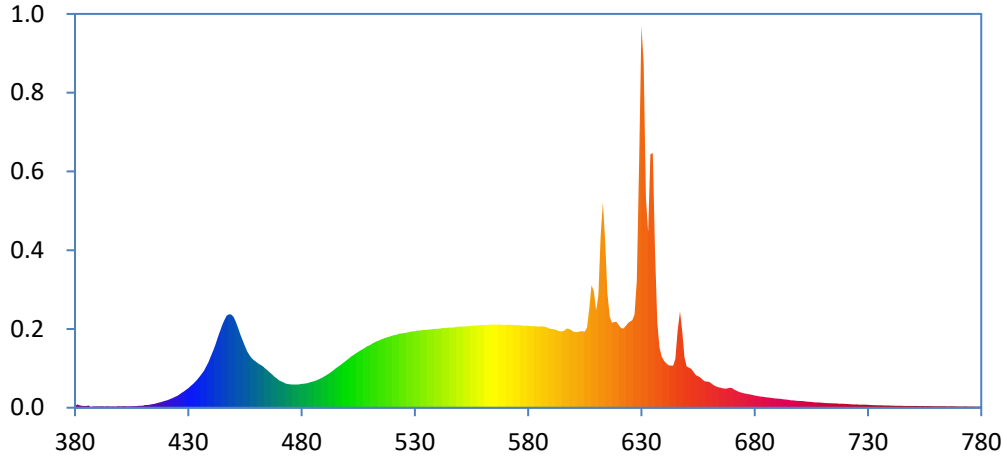
Color Rendering Index

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





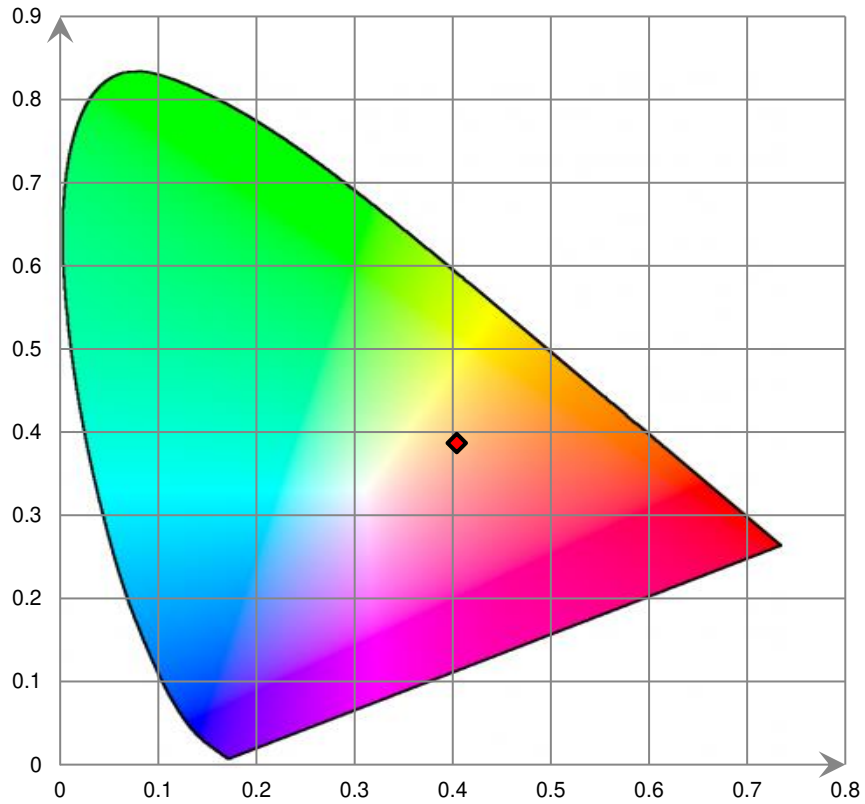
Relative Spectral Power Distribution



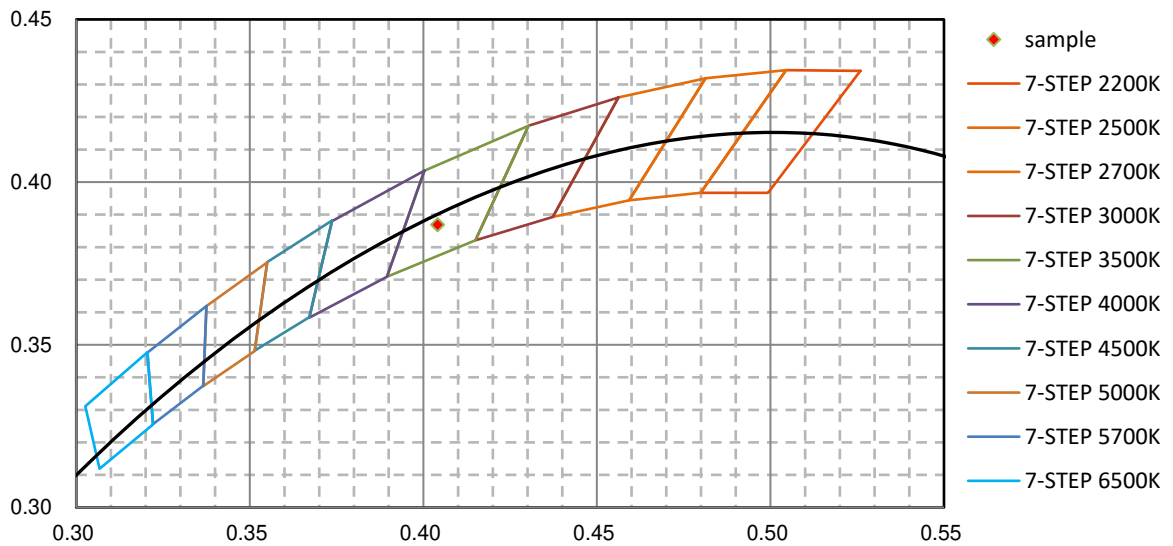
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	1.109E+00	421	6.432E+00	462	3.570E+01	503	4.417E+01	544	6.681E+01
381	2.789E+00	422	7.239E+00	463	3.449E+01	504	4.551E+01	545	6.699E+01
382	2.084E+00	423	7.982E+00	464	3.274E+01	505	4.671E+01	546	6.708E+01
383	1.554E+00	424	9.033E+00	465	3.114E+01	506	4.795E+01	547	6.704E+01
384	1.521E+00	425	9.804E+00	466	2.942E+01	507	4.901E+01	548	6.748E+01
385	1.447E+00	426	1.095E+01	467	2.780E+01	508	5.023E+01	549	6.779E+01
386	1.900E+00	427	1.231E+01	468	2.601E+01	509	5.134E+01	550	6.791E+01
387	4.594E-01	428	1.347E+01	469	2.458E+01	510	5.216E+01	551	6.796E+01
388	1.088E+00	429	1.494E+01	470	2.304E+01	511	5.340E+01	552	6.804E+01
389	1.008E+00	430	1.634E+01	471	2.204E+01	512	5.446E+01	553	6.817E+01
390	1.055E+00	431	1.801E+01	472	2.114E+01	513	5.539E+01	554	6.830E+01
391	1.011E+00	432	1.968E+01	473	2.026E+01	514	5.602E+01	555	6.851E+01
392	1.233E+00	433	2.154E+01	474	1.984E+01	515	5.700E+01	556	6.858E+01
393	9.602E-01	434	2.356E+01	475	1.961E+01	516	5.772E+01	557	6.870E+01
394	1.164E+00	435	2.604E+01	476	1.945E+01	517	5.847E+01	558	6.892E+01
395	1.049E+00	436	2.848E+01	477	1.946E+01	518	5.905E+01	559	6.898E+01
396	9.511E-01	437	3.114E+01	478	1.936E+01	519	5.962E+01	560	6.906E+01
397	1.048E+00	438	3.473E+01	479	1.956E+01	520	6.020E+01	561	6.916E+01
398	8.661E-01	439	3.848E+01	480	1.995E+01	521	6.076E+01	562	6.912E+01
399	1.301E+00	440	4.312E+01	481	2.004E+01	522	6.099E+01	563	6.938E+01
400	1.071E+00	441	4.788E+01	482	2.037E+01	523	6.194E+01	564	6.946E+01
401	1.159E+00	442	5.300E+01	483	2.082E+01	524	6.206E+01	565	6.961E+01
402	1.281E+00	443	5.870E+01	484	2.137E+01	525	6.239E+01	566	6.943E+01
403	1.071E+00	444	6.400E+01	485	2.196E+01	526	6.264E+01	567	6.966E+01
404	1.206E+00	445	6.913E+01	486	2.252E+01	527	6.307E+01	568	6.939E+01
405	1.164E+00	446	7.349E+01	487	2.328E+01	528	6.360E+01	569	6.922E+01
406	1.354E+00	447	7.705E+01	488	2.410E+01	529	6.378E+01	570	6.928E+01
407	1.305E+00	448	7.808E+01	489	2.505E+01	530	6.402E+01	571	6.930E+01
408	1.593E+00	449	7.791E+01	490	2.615E+01	531	6.451E+01	572	6.938E+01
409	1.658E+00	450	7.583E+01	491	2.731E+01	532	6.448E+01	573	6.928E+01
410	1.776E+00	451	7.193E+01	492	2.853E+01	533	6.473E+01	574	6.899E+01
411	2.285E+00	452	6.682E+01	493	2.983E+01	534	6.500E+01	575	6.891E+01
412	2.250E+00	453	6.128E+01	494	3.113E+01	535	6.497E+01	576	6.899E+01
413	2.587E+00	454	5.618E+01	495	3.277E+01	536	6.543E+01	577	6.878E+01
414	2.905E+00	455	5.152E+01	496	3.409E+01	537	6.546E+01	578	6.845E+01
415	3.264E+00	456	4.712E+01	497	3.550E+01	538	6.578E+01	579	6.859E+01
416	3.757E+00	457	4.402E+01	498	3.704E+01	539	6.598E+01	580	6.846E+01
417	4.315E+00	458	4.149E+01	499	3.837E+01	540	6.597E+01	581	6.824E+01
418	4.742E+00	459	3.977E+01	500	3.994E+01	541	6.616E+01	582	6.806E+01
419	5.390E+00	460	3.824E+01	501	4.138E+01	542	6.658E+01	583	6.819E+01
420	5.859E+00	461	3.675E+01	502	4.290E+01	543	6.660E+01	584	6.801E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	6.789E+01	626	7.314E+01	667	1.595E+01	708	4.452E+00	749	1.453E+00
586	6.810E+01	627	7.799E+01	668	1.614E+01	709	4.266E+00	750	1.422E+00
587	6.778E+01	628	1.062E+02	669	1.678E+01	710	4.169E+00	751	1.418E+00
588	6.741E+01	629	2.085E+02	670	1.649E+01	711	3.951E+00	752	1.417E+00
589	6.647E+01	630	3.194E+02	671	1.512E+01	712	3.879E+00	753	1.326E+00
590	6.599E+01	631	2.876E+02	672	1.422E+01	713	3.826E+00	754	1.418E+00
591	6.570E+01	632	1.758E+02	673	1.329E+01	714	3.715E+00	755	1.280E+00
592	6.541E+01	633	1.468E+02	674	1.276E+01	715	3.617E+00	756	1.296E+00
593	6.441E+01	634	2.119E+02	675	1.218E+01	716	3.541E+00	757	1.299E+00
594	6.401E+01	635	2.131E+02	676	1.174E+01	717	3.358E+00	758	1.282E+00
595	6.387E+01	636	1.303E+02	677	1.138E+01	718	3.337E+00	759	1.262E+00
596	6.452E+01	637	7.125E+01	678	1.108E+01	719	3.331E+00	760	1.264E+00
597	6.620E+01	638	5.031E+01	679	1.072E+01	720	3.151E+00	761	1.266E+00
598	6.593E+01	639	4.265E+01	680	1.019E+01	721	3.023E+00	762	1.176E+00
599	6.486E+01	640	3.915E+01	681	9.910E+00	722	2.946E+00	763	1.226E+00
600	6.361E+01	641	3.702E+01	682	9.567E+00	723	2.864E+00	764	1.205E+00
601	6.332E+01	642	3.549E+01	683	9.221E+00	724	2.743E+00	765	1.119E+00
602	6.329E+01	643	3.514E+01	684	9.152E+00	725	2.791E+00	766	1.105E+00
603	6.384E+01	644	3.518E+01	685	8.747E+00	726	2.612E+00	767	1.147E+00
604	6.396E+01	645	4.095E+01	686	8.633E+00	727	2.531E+00	768	1.050E+00
605	6.366E+01	646	6.408E+01	687	8.380E+00	728	2.535E+00	769	1.135E+00
606	6.715E+01	647	8.059E+01	688	8.075E+00	729	2.521E+00	770	9.760E-01
607	8.318E+01	648	6.387E+01	689	7.756E+00	730	2.358E+00	771	9.959E-01
608	1.025E+02	649	4.202E+01	690	7.685E+00	731	2.342E+00	772	9.889E-01
609	9.767E+01	650	3.437E+01	691	7.532E+00	732	2.165E+00	773	1.094E+00
610	8.167E+01	651	3.359E+01	692	7.217E+00	733	2.222E+00	774	9.245E-01
611	9.417E+01	652	3.251E+01	693	6.974E+00	734	2.081E+00	775	8.700E-01
612	1.435E+02	653	2.994E+01	694	6.794E+00	735	1.990E+00	776	8.803E-01
613	1.719E+02	654	2.736E+01	695	6.614E+00	736	2.041E+00	777	8.569E-01
614	1.399E+02	655	2.643E+01	696	6.234E+00	737	1.938E+00	778	8.360E-01
615	9.582E+01	656	2.525E+01	697	6.149E+00	738	1.875E+00	779	8.376E-01
616	7.615E+01	657	2.360E+01	698	5.869E+00	739	1.936E+00	780	8.392E-01
617	7.108E+01	658	2.209E+01	699	5.774E+00	740	1.782E+00		
618	7.168E+01	659	2.186E+01	700	5.680E+00	741	1.809E+00		
619	7.171E+01	660	2.158E+01	701	5.573E+00	742	1.681E+00		
620	6.928E+01	661	2.009E+01	702	5.327E+00	743	1.645E+00		
621	6.659E+01	662	1.877E+01	703	5.045E+00	744	1.598E+00		
622	6.625E+01	663	1.776E+01	704	4.998E+00	745	1.571E+00		
623	6.809E+01	664	1.716E+01	705	4.828E+00	746	1.490E+00		
624	7.070E+01	665	1.669E+01	706	4.622E+00	747	1.529E+00		
625	7.211E+01	666	1.623E+01	707	4.478E+00	748	1.466E+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**

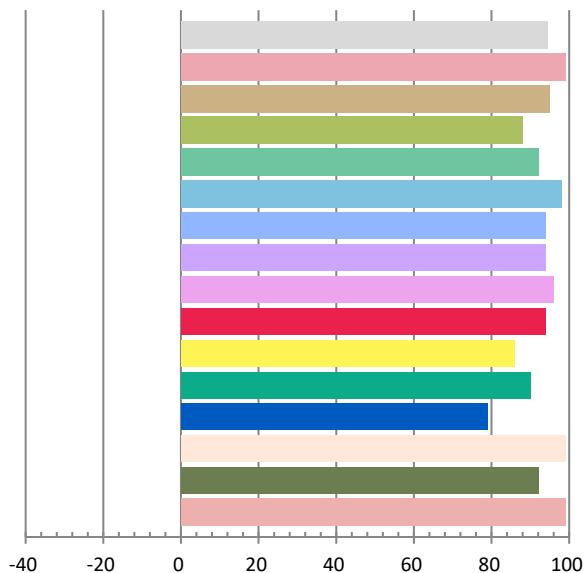
Photometric and Electrical Measurement Result

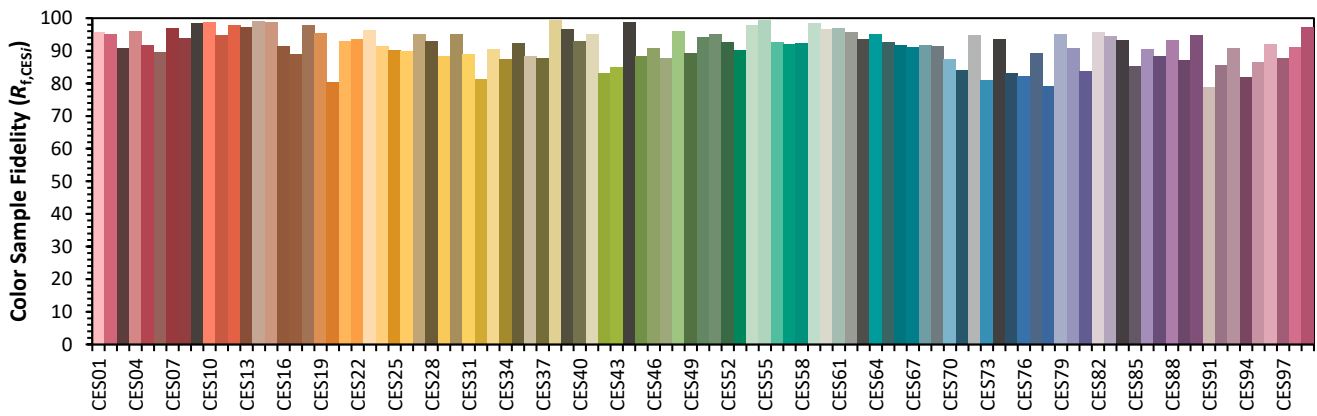
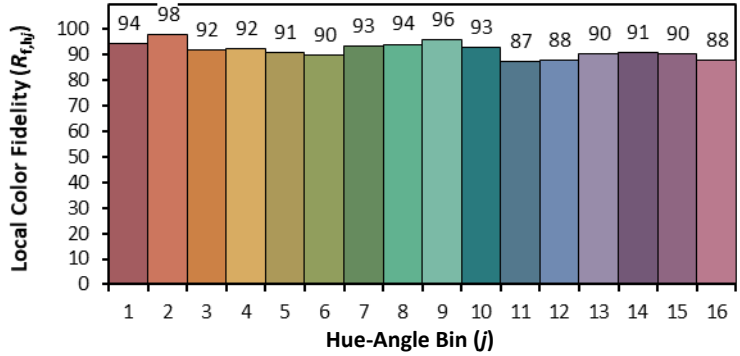
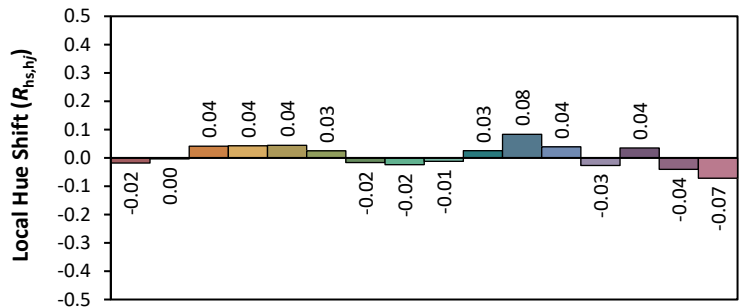
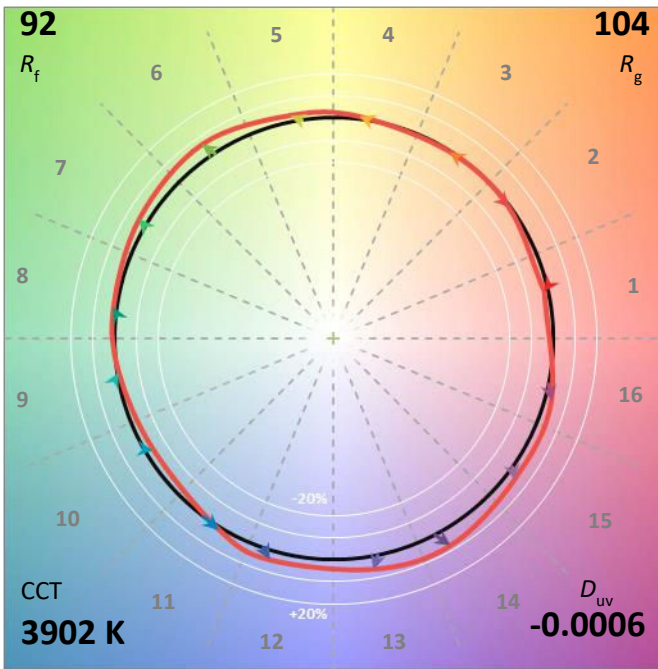
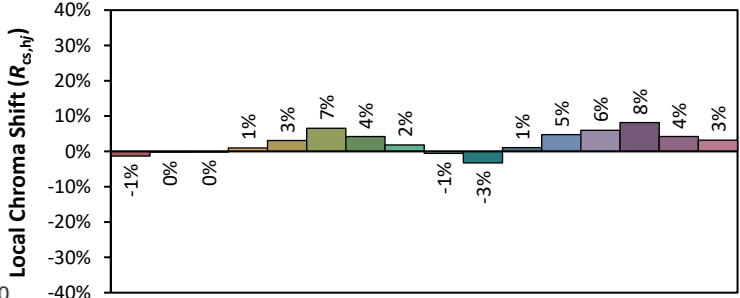
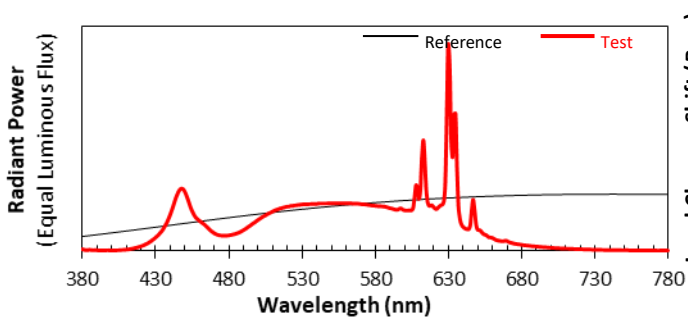
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.3123	37.06	0.9888	4875.3	131.57

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
14.894	3902	-0.000508	0.3845	0.3781	0.2272	0.5028

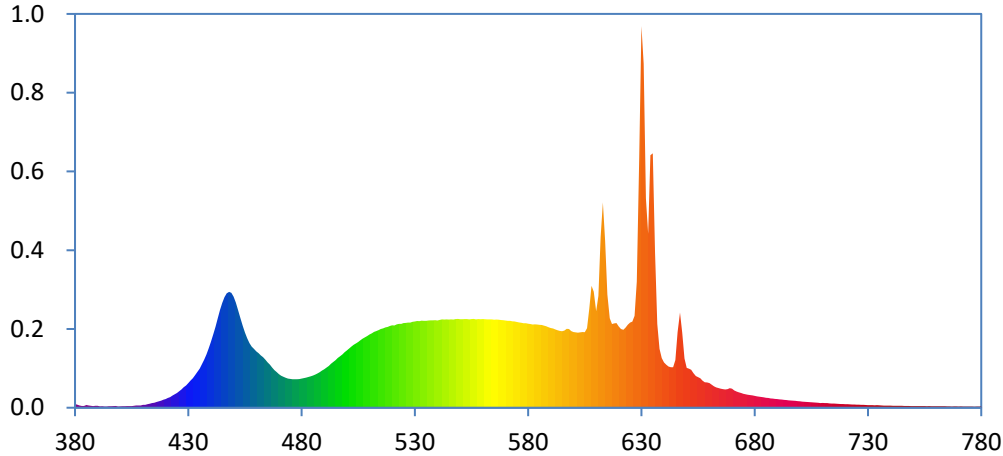
Color Rendering Index

Ra			
94.5			
R1	R2	R3	R4
99	95	88	92
R5	R6	R7	R8
98	94	94	96
R9	R10	R11	R12
94	86	90	79
R13	R14	R15	
99	92	99	





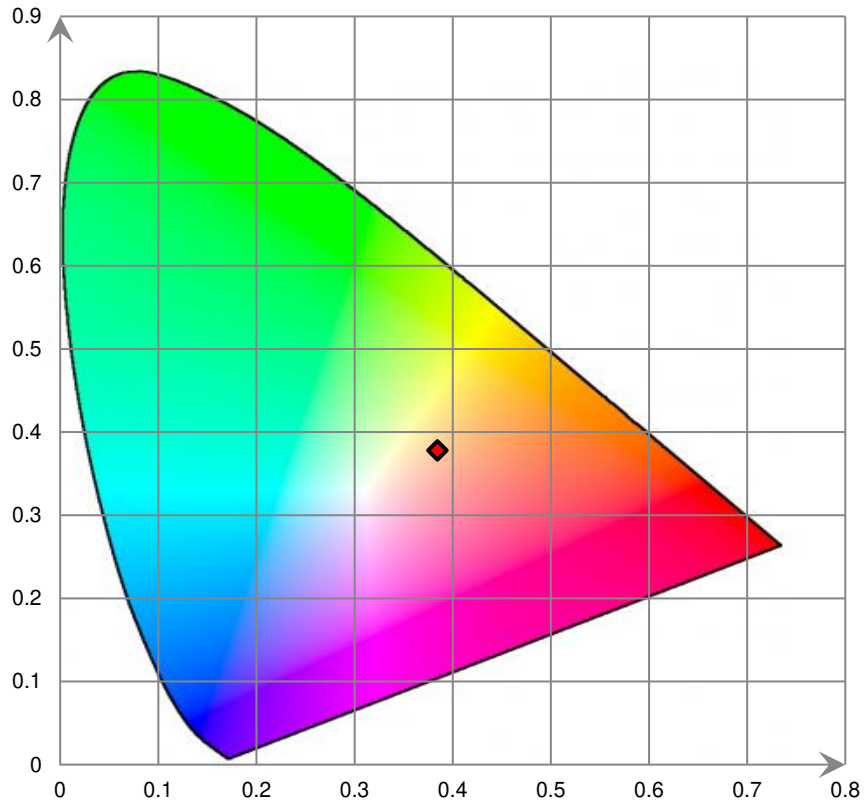
Relative Spectral Power Distribution



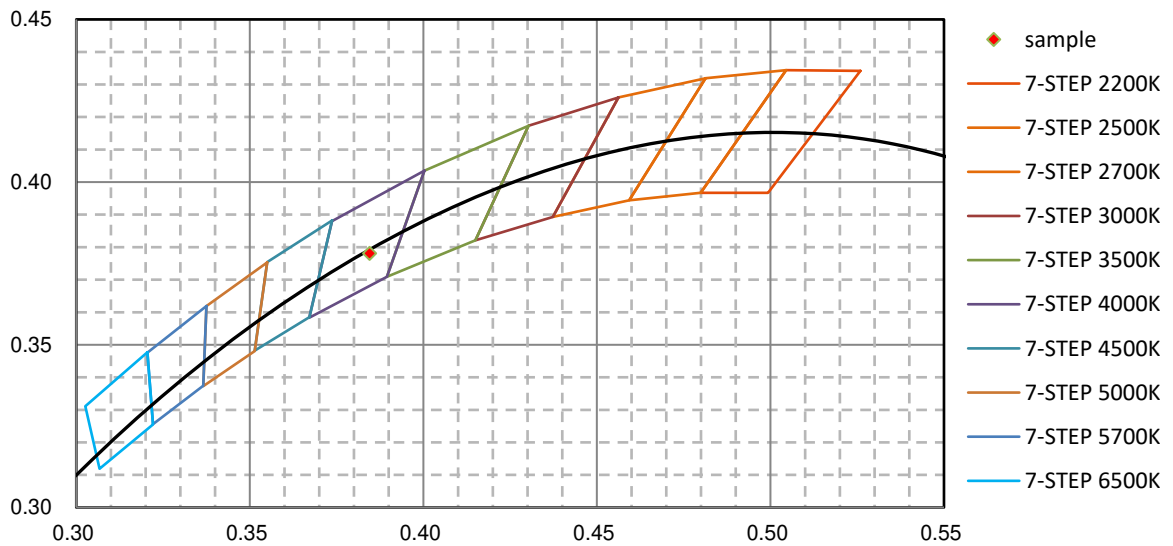
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	2.928E+00	421	7.712E+00	462	4.117E+01	503	4.952E+01	544	6.954E+01
381	2.350E+00	422	8.369E+00	463	3.979E+01	504	5.067E+01	545	6.940E+01
382	1.788E+00	423	9.562E+00	464	3.787E+01	505	5.180E+01	546	6.949E+01
383	1.420E+00	424	1.054E+01	465	3.575E+01	506	5.316E+01	547	6.941E+01
384	1.412E+00	425	1.152E+01	466	3.385E+01	507	5.443E+01	548	6.974E+01
385	2.113E+00	426	1.295E+01	467	3.164E+01	508	5.542E+01	549	6.986E+01
386	1.799E+00	427	1.431E+01	468	2.961E+01	509	5.647E+01	550	6.969E+01
387	1.469E+00	428	1.609E+01	469	2.805E+01	510	5.773E+01	551	6.966E+01
388	1.293E+00	429	1.746E+01	470	2.642E+01	511	5.860E+01	552	6.978E+01
389	1.580E+00	430	1.940E+01	471	2.514E+01	512	5.968E+01	553	6.985E+01
390	1.469E+00	431	2.135E+01	472	2.429E+01	513	6.030E+01	554	6.954E+01
391	9.899E-01	432	2.316E+01	473	2.354E+01	514	6.109E+01	555	6.975E+01
392	1.138E+00	433	2.565E+01	474	2.297E+01	515	6.198E+01	556	6.989E+01
393	9.005E-01	434	2.807E+01	475	2.270E+01	516	6.247E+01	557	6.948E+01
394	9.097E-01	435	3.072E+01	476	2.242E+01	517	6.320E+01	558	6.982E+01
395	1.114E+00	436	3.425E+01	477	2.244E+01	518	6.362E+01	559	6.958E+01
396	1.152E+00	437	3.774E+01	478	2.241E+01	519	6.439E+01	560	6.974E+01
397	1.268E+00	438	4.189E+01	479	2.260E+01	520	6.488E+01	561	6.970E+01
398	1.364E+00	439	4.662E+01	480	2.290E+01	521	6.477E+01	562	6.957E+01
399	8.789E-01	440	5.172E+01	481	2.335E+01	522	6.566E+01	563	6.955E+01
400	9.943E-01	441	5.778E+01	482	2.365E+01	523	6.596E+01	564	6.955E+01
401	1.078E+00	442	6.378E+01	483	2.424E+01	524	6.596E+01	565	6.922E+01
402	1.113E+00	443	7.047E+01	484	2.473E+01	525	6.658E+01	566	6.940E+01
403	1.199E+00	444	7.697E+01	485	2.532E+01	526	6.671E+01	567	6.931E+01
404	1.302E+00	445	8.249E+01	486	2.607E+01	527	6.704E+01	568	6.896E+01
405	1.286E+00	446	8.708E+01	487	2.698E+01	528	6.703E+01	569	6.887E+01
406	1.477E+00	447	9.009E+01	488	2.792E+01	529	6.768E+01	570	6.868E+01
407	1.755E+00	448	9.114E+01	489	2.920E+01	530	6.789E+01	571	6.837E+01
408	1.807E+00	449	9.046E+01	490	3.023E+01	531	6.829E+01	572	6.838E+01
409	1.816E+00	450	8.744E+01	491	3.168E+01	532	6.812E+01	573	6.805E+01
410	2.217E+00	451	8.276E+01	492	3.286E+01	533	6.846E+01	574	6.787E+01
411	2.258E+00	452	7.687E+01	493	3.458E+01	534	6.835E+01	575	6.753E+01
412	2.718E+00	453	7.073E+01	494	3.601E+01	535	6.845E+01	576	6.714E+01
413	3.124E+00	454	6.448E+01	495	3.740E+01	536	6.861E+01	577	6.683E+01
414	3.648E+00	455	5.919E+01	496	3.919E+01	537	6.878E+01	578	6.652E+01
415	3.896E+00	456	5.468E+01	497	4.055E+01	538	6.880E+01	579	6.647E+01
416	4.546E+00	457	5.090E+01	498	4.200E+01	539	6.891E+01	580	6.613E+01
417	4.991E+00	458	4.815E+01	499	4.370E+01	540	6.866E+01	581	6.590E+01
418	5.484E+00	459	4.636E+01	500	4.514E+01	541	6.914E+01	582	6.549E+01
419	6.293E+00	460	4.428E+01	501	4.663E+01	542	6.953E+01	583	6.564E+01
420	6.757E+00	461	4.296E+01	502	4.807E+01	543	6.940E+01	584	6.543E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	6.519E+01	626	6.773E+01	667	1.438E+01	708	3.971E+00	749	1.297E+00
586	6.506E+01	627	7.224E+01	668	1.456E+01	709	3.732E+00	750	1.231E+00
587	6.462E+01	628	9.920E+01	669	1.531E+01	710	3.781E+00	751	1.237E+00
588	6.409E+01	629	1.960E+02	670	1.497E+01	711	3.657E+00	752	1.281E+00
589	6.339E+01	630	3.004E+02	671	1.359E+01	712	3.628E+00	753	1.253E+00
590	6.266E+01	631	2.706E+02	672	1.271E+01	713	3.411E+00	754	1.196E+00
591	6.238E+01	632	1.647E+02	673	1.212E+01	714	3.286E+00	755	1.229E+00
592	6.164E+01	633	1.369E+02	674	1.155E+01	715	3.232E+00	756	1.149E+00
593	6.097E+01	634	1.987E+02	675	1.096E+01	716	3.125E+00	757	1.225E+00
594	6.043E+01	635	2.003E+02	676	1.057E+01	717	3.010E+00	758	1.104E+00
595	6.021E+01	636	1.222E+02	677	1.023E+01	718	2.923E+00	759	1.156E+00
596	6.075E+01	637	6.587E+01	678	9.950E+00	719	2.907E+00	760	1.145E+00
597	6.208E+01	638	4.635E+01	679	9.715E+00	720	2.783E+00	761	1.132E+00
598	6.202E+01	639	3.906E+01	680	9.268E+00	721	2.764E+00	762	1.132E+00
599	6.036E+01	640	3.565E+01	681	8.906E+00	722	2.625E+00	763	1.126E+00
600	5.954E+01	641	3.372E+01	682	8.634E+00	723	2.493E+00	764	1.084E+00
601	5.927E+01	642	3.240E+01	683	8.401E+00	724	2.508E+00	765	1.026E+00
602	5.911E+01	643	3.193E+01	684	8.159E+00	725	2.440E+00	766	9.971E-01
603	5.933E+01	644	3.187E+01	685	7.879E+00	726	2.357E+00	767	9.089E-01
604	5.951E+01	645	3.752E+01	686	7.669E+00	727	2.311E+00	768	1.027E+00
605	5.942E+01	646	5.948E+01	687	7.357E+00	728	2.263E+00	769	9.761E-01
606	6.264E+01	647	7.499E+01	688	7.162E+00	729	2.132E+00	770	9.038E-01
607	7.794E+01	648	5.899E+01	689	6.937E+00	730	2.062E+00	771	9.691E-01
608	9.600E+01	649	3.879E+01	690	6.838E+00	731	2.014E+00	772	9.256E-01
609	9.136E+01	650	3.136E+01	691	6.599E+00	732	2.022E+00	773	8.635E-01
610	7.596E+01	651	3.070E+01	692	6.419E+00	733	1.957E+00	774	8.371E-01
611	8.810E+01	652	2.981E+01	693	6.213E+00	734	1.979E+00	775	8.537E-01
612	1.344E+02	653	2.714E+01	694	6.031E+00	735	1.856E+00	776	8.429E-01
613	1.615E+02	654	2.493E+01	695	5.773E+00	736	1.746E+00	777	7.610E-01
614	1.313E+02	655	2.408E+01	696	5.722E+00	737	1.675E+00	778	8.216E-01
615	8.920E+01	656	2.317E+01	697	5.580E+00	738	1.693E+00	779	8.231E-01
616	7.038E+01	657	2.131E+01	698	5.365E+00	739	1.614E+00	780	8.247E-01
617	6.594E+01	658	2.006E+01	699	5.121E+00	740	1.601E+00		
618	6.639E+01	659	1.994E+01	700	5.051E+00	741	1.469E+00		
619	6.668E+01	660	1.938E+01	701	4.839E+00	742	1.554E+00		
620	6.403E+01	661	1.816E+01	702	4.707E+00	743	1.568E+00		
621	6.202E+01	662	1.688E+01	703	4.582E+00	744	1.469E+00		
622	6.127E+01	663	1.599E+01	704	4.440E+00	745	1.443E+00		
623	6.307E+01	664	1.547E+01	705	4.332E+00	746	1.345E+00		
624	6.531E+01	665	1.504E+01	706	4.157E+00	747	1.343E+00		
625	6.695E+01	666	1.466E+01	707	4.018E+00	748	1.357E+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**

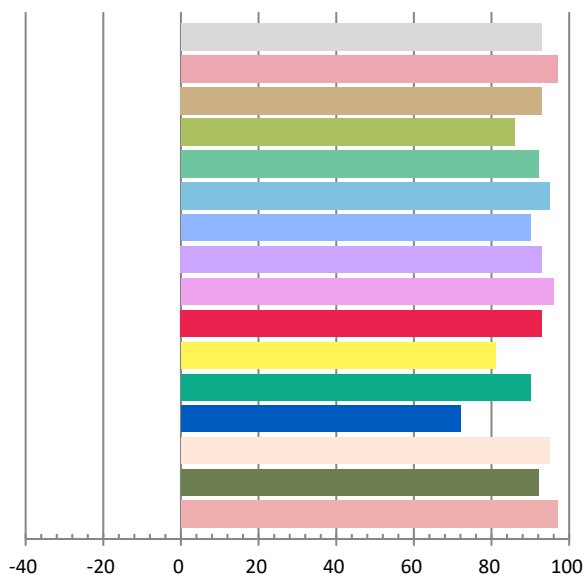
Photometric and Electrical Measurement Result

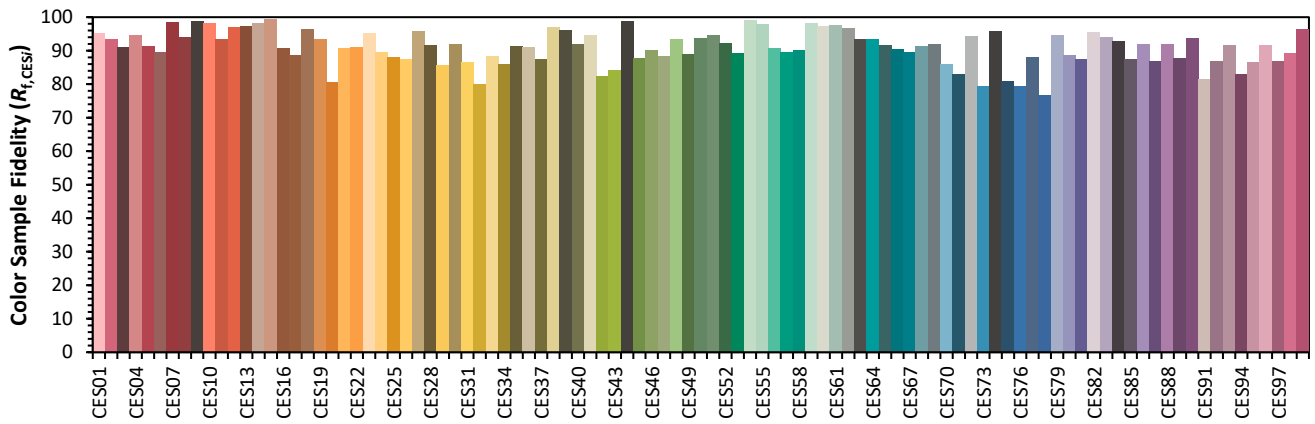
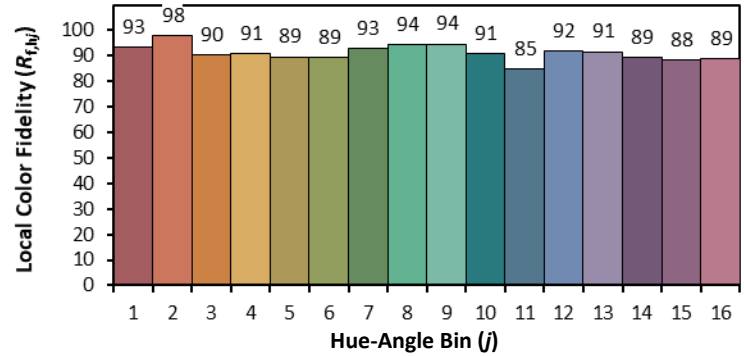
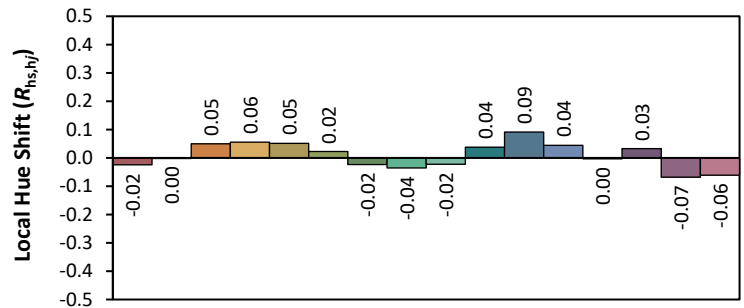
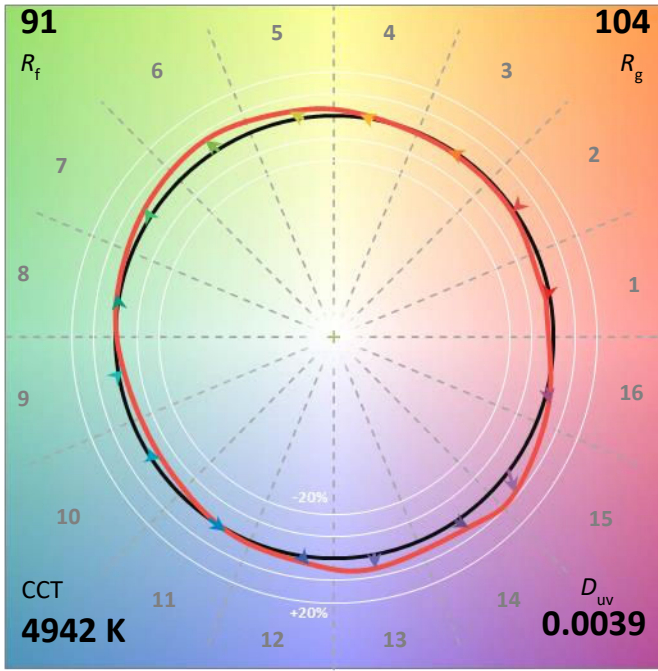
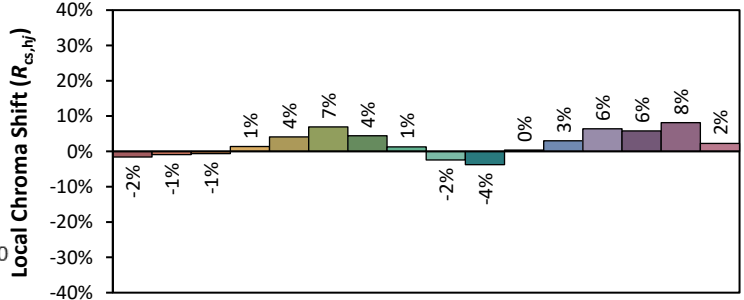
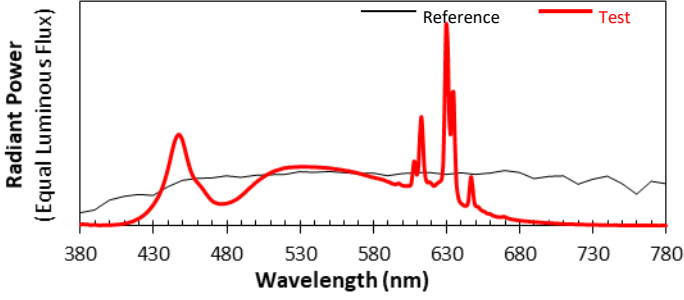
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.3133	37.2	0.9895	4898.2	131.68

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
15.250	4940	0.00395	0.3477	0.3616	0.2093	0.4899

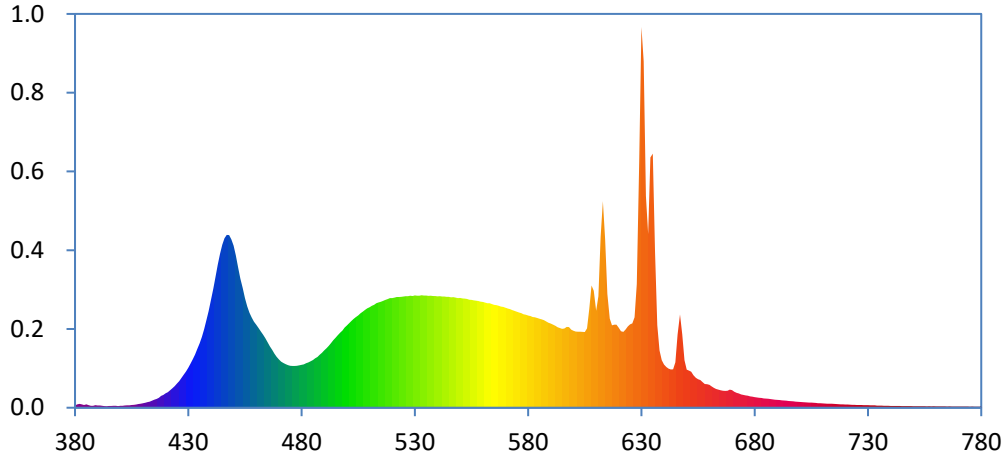
Color Rendering Index

Ra			
92.8			
R1	R2	R3	R4
97	93	86	92
R5	R6	R7	R8
95	90	93	96
R9	R10	R11	R12
93	81	90	72
R13	R14	R15	
95	92	97	





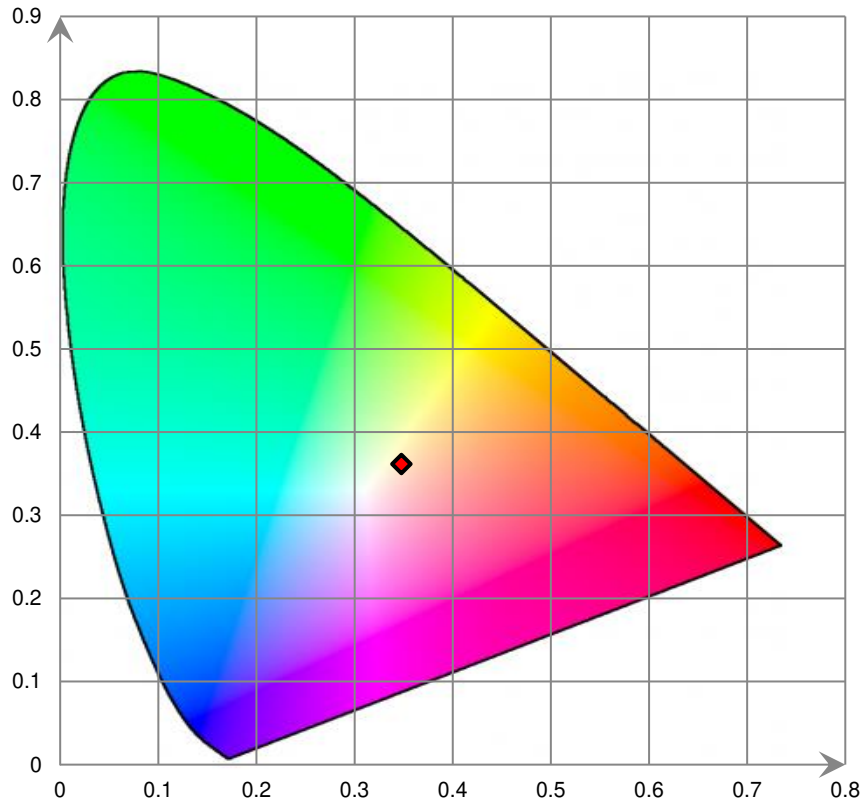
Relative Spectral Power Distribution



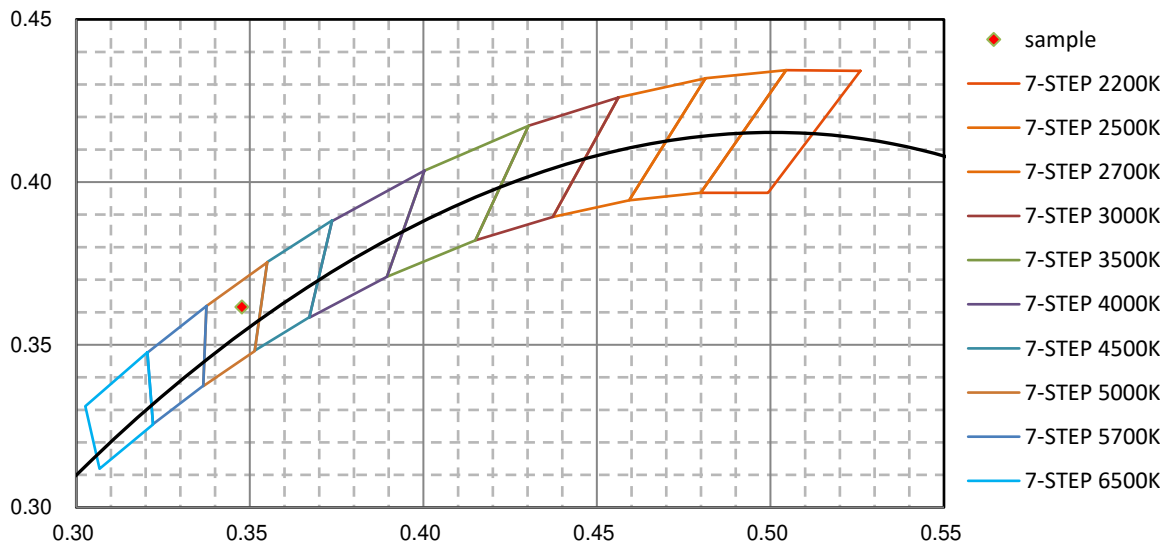
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	1.501E+00	421	1.047E+01	462	5.143E+01	503	5.986E+01	544	7.466E+01
381	2.285E+00	422	1.178E+01	463	4.929E+01	504	6.107E+01	545	7.462E+01
382	2.590E+00	423	1.316E+01	464	4.683E+01	505	6.218E+01	546	7.434E+01
383	2.316E+00	424	1.454E+01	465	4.415E+01	506	6.356E+01	547	7.441E+01
384	1.881E+00	425	1.624E+01	466	4.129E+01	507	6.465E+01	548	7.419E+01
385	2.292E+00	426	1.786E+01	467	3.901E+01	508	6.587E+01	549	7.380E+01
386	1.774E+00	427	2.009E+01	468	3.643E+01	509	6.691E+01	550	7.388E+01
387	1.260E+00	428	2.221E+01	469	3.430E+01	510	6.764E+01	551	7.356E+01
388	1.300E+00	429	2.449E+01	470	3.257E+01	511	6.870E+01	552	7.345E+01
389	1.729E+00	430	2.689E+01	471	3.101E+01	512	6.929E+01	553	7.322E+01
390	1.516E+00	431	2.971E+01	472	3.003E+01	513	7.037E+01	554	7.277E+01
391	1.483E+00	432	3.264E+01	473	2.931E+01	514	7.095E+01	555	7.265E+01
392	1.317E+00	433	3.574E+01	474	2.869E+01	515	7.128E+01	556	7.231E+01
393	1.068E+00	434	3.957E+01	475	2.827E+01	516	7.196E+01	557	7.212E+01
394	9.878E-01	435	4.348E+01	476	2.816E+01	517	7.262E+01	558	7.185E+01
395	1.220E+00	436	4.773E+01	477	2.814E+01	518	7.314E+01	559	7.144E+01
396	1.222E+00	437	5.288E+01	478	2.822E+01	519	7.378E+01	560	7.118E+01
397	1.296E+00	438	5.891E+01	479	2.852E+01	520	7.381E+01	561	7.077E+01
398	1.334E+00	439	6.514E+01	480	2.885E+01	521	7.410E+01	562	7.035E+01
399	1.080E+00	440	7.234E+01	481	2.925E+01	522	7.461E+01	563	7.034E+01
400	1.274E+00	441	8.005E+01	482	2.993E+01	523	7.458E+01	564	6.988E+01
401	1.361E+00	442	8.812E+01	483	3.047E+01	524	7.470E+01	565	6.925E+01
402	1.506E+00	443	9.633E+01	484	3.127E+01	525	7.494E+01	566	6.912E+01
403	1.614E+00	444	1.035E+02	485	3.215E+01	526	7.511E+01	567	6.866E+01
404	1.583E+00	445	1.097E+02	486	3.325E+01	527	7.516E+01	568	6.815E+01
405	1.888E+00	446	1.141E+02	487	3.417E+01	528	7.544E+01	569	6.783E+01
406	1.958E+00	447	1.164E+02	488	3.566E+01	529	7.521E+01	570	6.732E+01
407	2.204E+00	448	1.162E+02	489	3.691E+01	530	7.563E+01	571	6.681E+01
408	2.440E+00	449	1.134E+02	490	3.857E+01	531	7.540E+01	572	6.642E+01
409	2.724E+00	450	1.092E+02	491	4.004E+01	532	7.545E+01	573	6.569E+01
410	2.994E+00	451	1.026E+02	492	4.175E+01	533	7.573E+01	574	6.523E+01
411	3.320E+00	452	9.463E+01	493	4.350E+01	534	7.558E+01	575	6.471E+01
412	3.784E+00	453	8.712E+01	494	4.544E+01	535	7.553E+01	576	6.415E+01
413	4.139E+00	454	8.060E+01	495	4.711E+01	536	7.534E+01	577	6.366E+01
414	4.729E+00	455	7.378E+01	496	4.877E+01	537	7.541E+01	578	6.288E+01
415	5.399E+00	456	6.833E+01	497	5.050E+01	538	7.518E+01	579	6.258E+01
416	5.915E+00	457	6.400E+01	498	5.192E+01	539	7.526E+01	580	6.208E+01
417	6.742E+00	458	6.080E+01	499	5.398E+01	540	7.498E+01	581	6.173E+01
418	7.919E+00	459	5.800E+01	500	5.544E+01	541	7.511E+01	582	6.108E+01
419	8.588E+00	460	5.585E+01	501	5.690E+01	542	7.493E+01	583	6.086E+01
420	9.648E+00	461	5.369E+01	502	5.838E+01	543	7.484E+01	584	6.046E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	5.987E+01	626	5.683E+01	667	1.126E+01	708	3.032E+00	749	1.056E+00
586	5.944E+01	627	6.087E+01	668	1.146E+01	709	2.977E+00	750	9.823E-01
587	5.898E+01	628	8.326E+01	669	1.219E+01	710	2.901E+00	751	1.000E+00
588	5.812E+01	629	1.653E+02	670	1.186E+01	711	2.835E+00	752	1.007E+00
589	5.726E+01	630	2.564E+02	671	1.077E+01	712	2.734E+00	753	9.424E-01
590	5.665E+01	631	2.332E+02	672	1.008E+01	713	2.644E+00	754	9.278E-01
591	5.594E+01	632	1.425E+02	673	9.561E+00	714	2.667E+00	755	9.289E-01
592	5.522E+01	633	1.169E+02	674	8.912E+00	715	2.545E+00	756	8.738E-01
593	5.416E+01	634	1.685E+02	675	8.581E+00	716	2.448E+00	757	9.440E-01
594	5.371E+01	635	1.711E+02	676	8.346E+00	717	2.388E+00	758	8.479E-01
595	5.310E+01	636	1.048E+02	677	8.024E+00	718	2.251E+00	759	9.326E-01
596	5.330E+01	637	5.559E+01	678	7.613E+00	719	2.255E+00	760	8.709E-01
597	5.438E+01	638	3.860E+01	679	7.451E+00	720	2.186E+00	761	9.064E-01
598	5.430E+01	639	3.202E+01	680	7.130E+00	721	2.120E+00	762	8.373E-01
599	5.257E+01	640	2.914E+01	681	6.903E+00	722	2.092E+00	763	8.612E-01
600	5.179E+01	641	2.738E+01	682	6.687E+00	723	2.000E+00	764	8.639E-01
601	5.129E+01	642	2.630E+01	683	6.538E+00	724	1.977E+00	765	7.903E-01
602	5.116E+01	643	2.577E+01	684	6.286E+00	725	1.892E+00	766	8.349E-01
603	5.118E+01	644	2.585E+01	685	6.186E+00	726	1.856E+00	767	7.868E-01
604	5.113E+01	645	3.064E+01	686	5.991E+00	727	1.837E+00	768	7.613E-01
605	5.091E+01	646	4.938E+01	687	5.796E+00	728	1.744E+00	769	7.405E-01
606	5.346E+01	647	6.279E+01	688	5.598E+00	729	1.729E+00	770	7.117E-01
607	6.663E+01	648	4.949E+01	689	5.403E+00	730	1.708E+00	771	7.276E-01
608	8.233E+01	649	3.197E+01	690	5.265E+00	731	1.627E+00	772	7.598E-01
609	7.877E+01	650	2.563E+01	691	5.184E+00	732	1.616E+00	773	7.398E-01
610	6.527E+01	651	2.496E+01	692	4.994E+00	733	1.585E+00	774	7.434E-01
611	7.512E+01	652	2.428E+01	693	4.878E+00	734	1.472E+00	775	7.019E-01
612	1.151E+02	653	2.193E+01	694	4.766E+00	735	1.422E+00	776	7.207E-01
613	1.392E+02	654	2.013E+01	695	4.541E+00	736	1.380E+00	777	6.404E-01
614	1.136E+02	655	1.918E+01	696	4.419E+00	737	1.332E+00	778	6.998E-01
615	7.658E+01	656	1.861E+01	697	4.294E+00	738	1.307E+00	779	7.012E-01
616	6.008E+01	657	1.723E+01	698	4.122E+00	739	1.302E+00	780	7.025E-01
617	5.551E+01	658	1.593E+01	699	4.000E+00	740	1.224E+00		
618	5.595E+01	659	1.579E+01	700	3.910E+00	741	1.142E+00		
619	5.594E+01	660	1.547E+01	701	3.779E+00	742	1.227E+00		
620	5.391E+01	661	1.437E+01	702	3.646E+00	743	1.136E+00		
621	5.156E+01	662	1.340E+01	703	3.604E+00	744	1.135E+00		
622	5.110E+01	663	1.265E+01	704	3.429E+00	745	1.076E+00		
623	5.275E+01	664	1.216E+01	705	3.412E+00	746	1.075E+00		
624	5.476E+01	665	1.180E+01	706	3.335E+00	747	1.070E+00		
625	5.610E+01	666	1.147E+01	707	3.210E+00	748	1.035E+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**

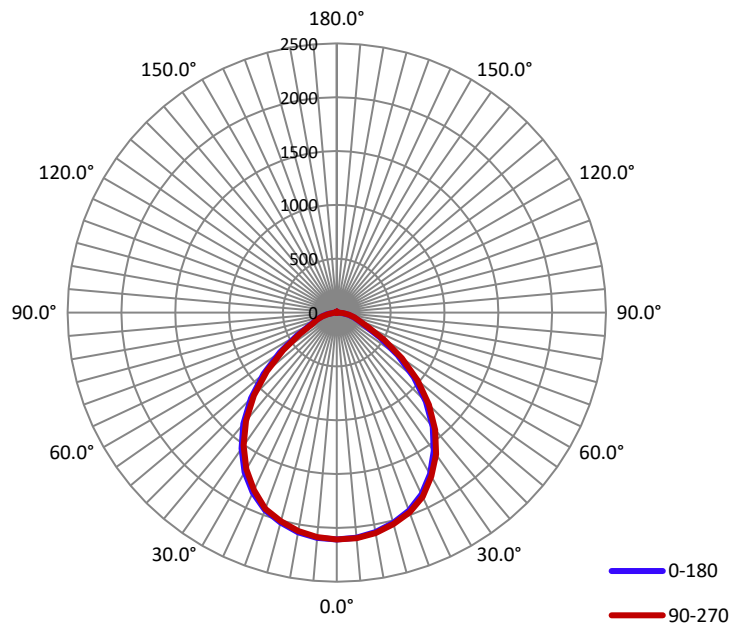
Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
120.0	60	0.3260	38.71	0.9910

Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	$I_{max}(cd)$	S/MH(C0/180)	S/MH(C90/270)
4592.5	118.69	2111.4	1.21	1.21

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50% I_{max}):	94.1	94.2	94.1	94.2	94.2
Field Angle(10% I_{max}):	139.1	139.2	139.3	139.5	139.3

Luminous Intensity (cd) Distribution Data

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	2107	2107	2107	2107	2107	2107	2107	2107
5.0°	2099	2098	2106	2100	2103	2106	2103	2098
10.0°	2071	2078	2081	2077	2080	2078	2075	2067
15.0°	2023	2031	2036	2030	2034	2038	2036	2022
20.0°	1958	1969	1972	1974	1975	1977	1968	1959
25.0°	1863	1874	1880	1884	1887	1882	1878	1858
30.0°	1732	1741	1754	1756	1756	1754	1741	1728
35.0°	1570	1588	1600	1600	1608	1600	1588	1567
40.0°	1386	1406	1417	1423	1422	1414	1401	1381
45.0°	1170	1193	1210	1213	1211	1204	1188	1167
50.0°	934	954	976	981	979	972	958	930
55.0°	690	710	730	732	738	730	714	688
60.0°	464	481	493	502	509	501	483	465
65.0°	294	305	314	320	324	319	308	294
70.0°	211	215	219	221	221	220	217	212
75.0°	160	164	168	170	171	170	166	162
80.0°	106	111	115	117	118	116	112	108
85.0°	48	53	57	59	60	59	55	49
90.0°	0	0	0	1	2	1	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°	1	2	1	1	2	1	2	2
140.0°	2	3	2	2	3	2	2	2
145.0°	4	4	3	4	4	4	4	4
150.0°	5	5	5	5	5	5	5	5
155.0°	6	6	6	6	7	6	6	6
160.0°	6	7	7	7	7	7	6	7
165.0°	7	7	7	7	8	8	7	7
170.0°	8	8	8	8	8	8	8	8
175.0°	9	9	9	9	9	9	9	9
180.0°	0	0	0	0	0	0	0	0

Luminous Intensity (cd) Distribution Data (cont.)

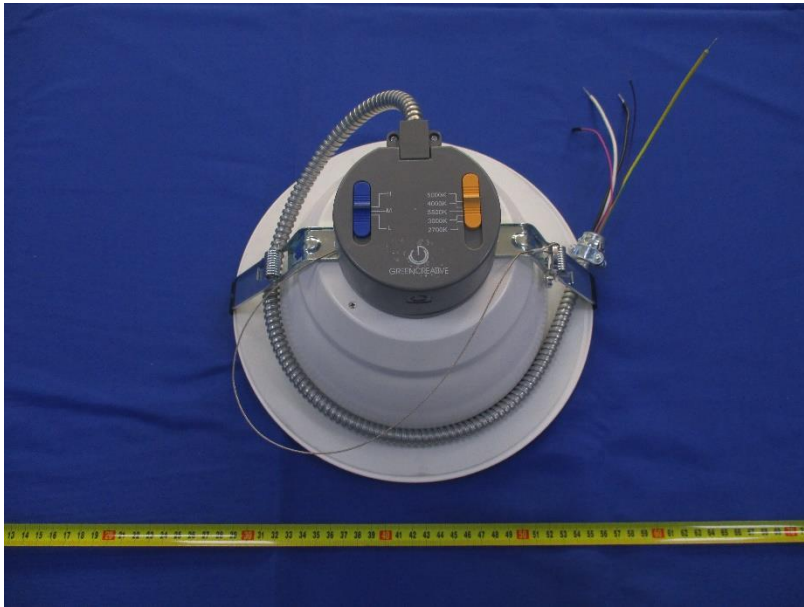
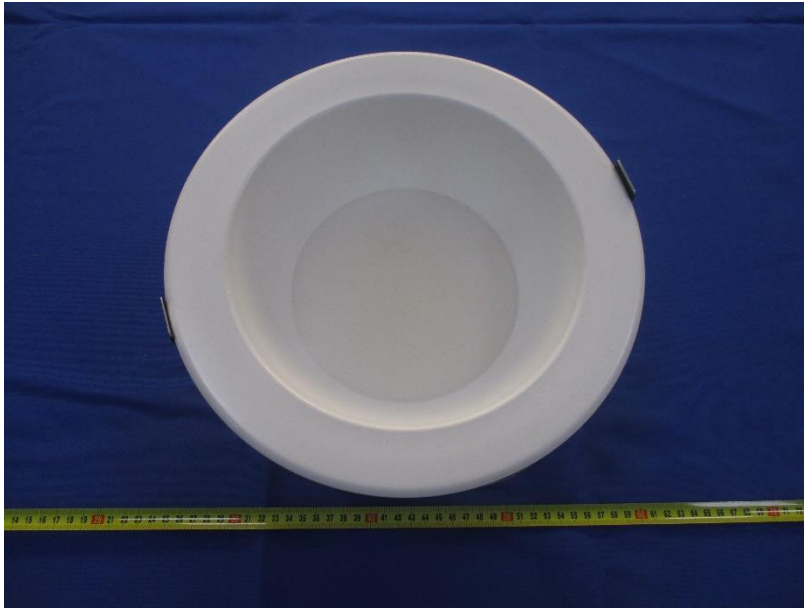
C y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	2107	2107	2107	2107	2107	2107	2107	2107
5.0°	2100	2097	2098	2098	2093	2097	2098	2091
10.0°	2072	2067	2067	2063	2060	2065	2065	2064
15.0°	2019	2015	2014	2008	2007	2013	2013	2012
20.0°	1951	1946	1941	1937	1940	1936	1946	1945
25.0°	1845	1838	1832	1822	1819	1824	1834	1842
30.0°	1711	1698	1687	1679	1680	1685	1695	1705
35.0°	1542	1529	1520	1512	1508	1515	1529	1539
40.0°	1351	1336	1324	1309	1311	1318	1334	1346
45.0°	1126	1114	1098	1087	1089	1093	1111	1132
50.0°	886	869	853	847	849	856	871	893
55.0°	643	624	611	606	609	619	634	652
60.0°	425	409	398	390	395	404	417	428
65.0°	271	263	257	252	253	258	265	271
70.0°	202	197	195	193	194	195	198	202
75.0°	150	145	142	140	141	141	145	149
80.0°	95	90	86	84	84	86	90	94
85.0°	36	31	27	25	25	28	32	35
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°	1	1	1	2	1	1	1	1
140.0°	2	2	2	3	3	2	2	2
145.0°	3	3	3	4	3	3	3	4
150.0°	4	4	4	5	4	4	4	4
155.0°	5	5	5	6	5	6	5	5
160.0°	6	6	6	7	7	7	6	7
165.0°	7	7	7	7	7	8	7	7
170.0°	8	8	8	8	8	9	9	8
175.0°	8	9	9	9	9	9	9	9
180.0°	0	0	0	0	0	0	0	0

Zonal Lumen Density Measurement

Deg	Flux (lm)	%
0-5	50.3	1.09
5-10	149.1	3.25
10-15	242.8	5.29
15-20	327.9	7.15
20-25	399.8	8.72
25-30	452.1	9.84
30-35	482.4	10.51
35-40	488.0	10.62
40-45	466.6	10.16
45-50	417.1	9.07
50-55	343.5	7.49
55-60	256.8	5.58
60-65	174.7	3.81
65-70	121.4	2.64
70-75	94.9	2.06
75-80	68.6	1.49
80-85	39.1	0.85
85-90	9.1	0.19
90-95	0.0	0.00
95-100	0.0	0.00
100-105	0.0	0.00
105-110	0.0	0.00
110-115	0.0	0.00
115-120	0.0	0.00
120-125	0.0	0.00
125-130	0.0	0.00
130-135	0.3	0.00
135-140	0.6	0.00
140-145	1.0	0.00
145-150	1.0	0.04
150-155	1.5	0.05
155-160	1.4	0.05
160-165	1.0	0.02
165-170	1.0	0.00
170-175	0.5	0.00
175-180	0.2	0.00

Deg	Flux (lm)	%
0-5	50.3	1.10
0-10	199.4	4.34
0-15	442.2	9.63
0-20	770.1	16.77
0-25	1170.0	25.48
0-30	1622.2	35.32
0-35	2104.6	45.83
0-40	2592.6	56.45
0-45	3059.2	66.61
0-50	3476.2	75.69
0-55	3819.7	83.17
0-60	4076.4	88.76
0-65	4251.1	92.57
0-70	4372.5	95.21
0-75	4467.3	97.28
0-80	4535.9	98.77
0-85	4575.0	99.62
0-90	4584.0	99.82
0-95	4584.0	99.82
0-100	4584.0	99.82
0-105	4584.0	99.82
0-110	4584.0	99.82
0-115	4584.0	99.82
0-120	4584.0	99.82
0-125	4584.0	99.82
0-130	4584.0	99.82
0-135	4584.3	99.82
0-140	4585.0	99.84
0-145	4585.9	99.86
0-150	4587.1	99.88
0-155	4588.4	99.91
0-160	4589.6	99.94
0-165	4590.8	99.96
0-170	4591.7	99.98
0-175	4592.3	100.00
0-180	4592.5	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*****