

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: MGR6/9CCT5S/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:	RKSB220907003-10-2
Test Date:	2022-09-08 to 2022-09-15
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:	MGR6/9CCT5S/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:	120-277VAC 50/60Hz
Rated Power:	10W
Nominal CCT:	2700K/3000K/3500/4000K/5000K
Nominal Lumen Output:	780lm/800lm/825lm/850lm/870lm

2. Standards Used

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

3. Description of Test Equipment

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
Integrating Sphere	INVENTFINE	Dia 1.5m	JWWCV090112	2021-11-02	2022-11-01
Power Meter	INVENTFINE	WT500	GSJWQ20009	2021-11-15	2022-11-14
Spectral photometer	INVENTFINE	CMS-3S	GSGSE100017	2021-11-02	2022-11-01
AC Power Supply	INVENTFINE	CHP500	JWJSD010071	2021-11-02	2022-11-01
Standard Light Source	Osram	24V/50W	JWWCR020104	2021-09-15	2023-09-14
Thermal Meter	ANYMETRE	TH-20E	N/A	2021-12-01	2022-11-30
DC Power Supply	INVENTFINE	WL3005	JWWCP020069	2021-11-02	2022-11-01
AC Power Supply	INVENTFINE	CHP-5KVA	900511765	2021-11-02	2022-11-01
DC Power Supply	INVENTFINE	WL3010	JWDMP030001	2021-11-02	2022-11-01
Power Meter	INVENTFINE	WT500	GSDSQ200007	2021-11-15	2022-11-14
Goniophotometer	INVENTFINE	GPM-1900	YWGCF120001	2021-11-15	2022-11-14

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

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

4. Test Method

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

Integrating Sphere System

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

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

The uncertainty of power meter AC current $U_{rel}=0.48\%$ of rdg, AC Voltage $U_{rel}=0.25\%$ of rdg, Power $U_{rel}=0.44\%$, ($k=2$), at the 95% confidence level.

Goniophotometer System

The goniophotometer system is calibrated by standard light source before measurement.

Type C goniophotometer was used for measuring total luminous flux, luminous intensity distribution, and color spatial uniformity. The product was operated in its intended orientation in application and was recorded in this report. The vertical angle (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_f , R_g was calculated according to IES TM-30-18 by using calculation tools. The calculation was based on the measured SPD from 380nm to 780nm with 1nm intervals. All the colors in this report is for reference only.

5. Test Result

[Integrating Sphere System]

Control Setting: 2700K

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

Test orientation: **Downward**

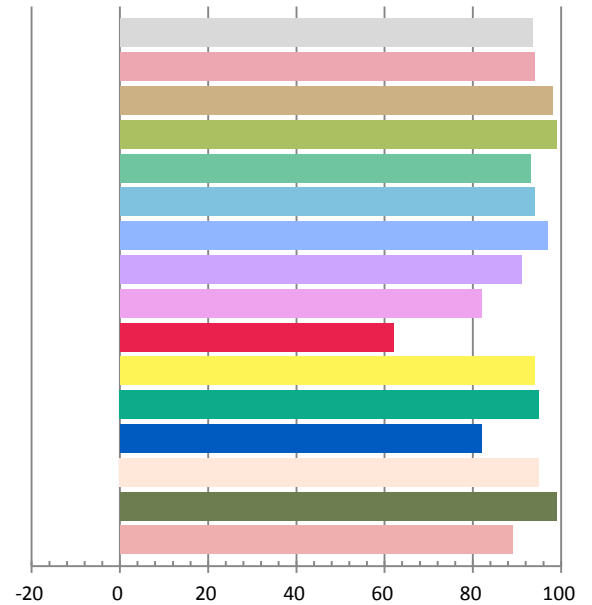
Photometric and Electrical Measurement Result

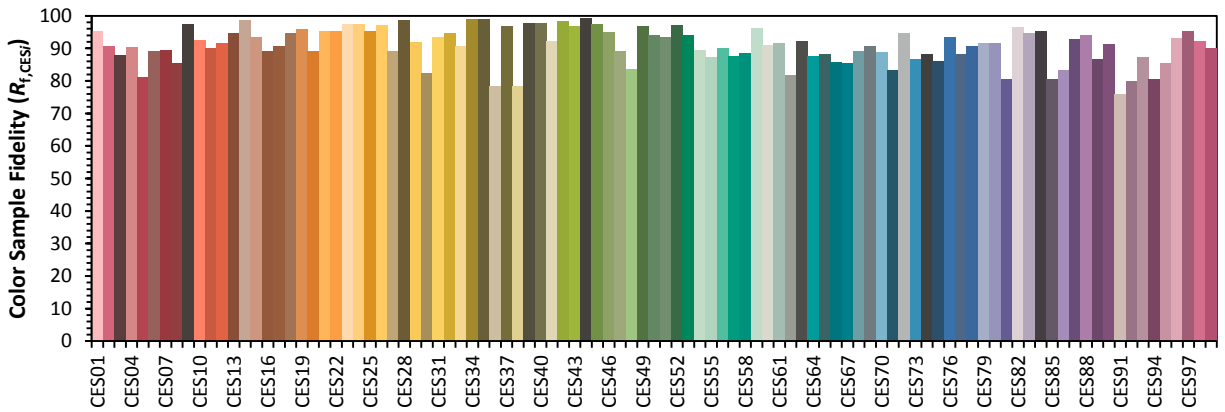
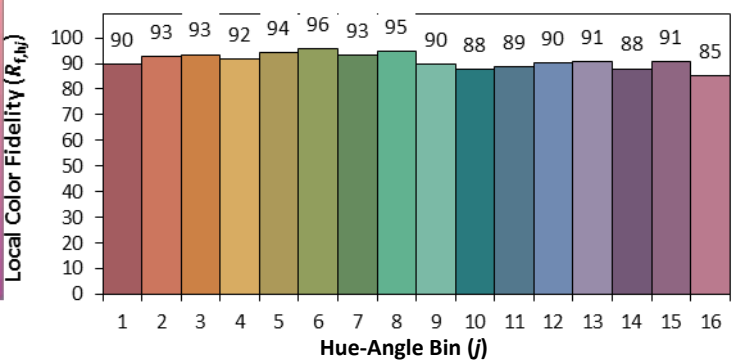
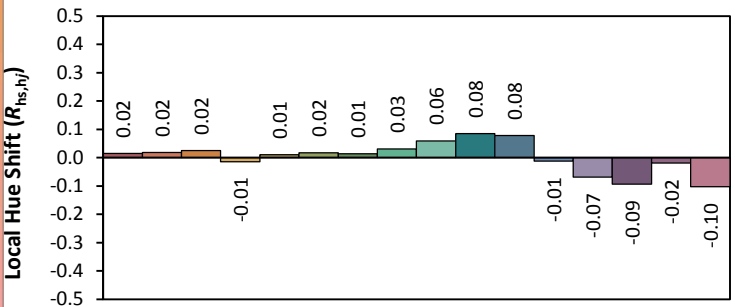
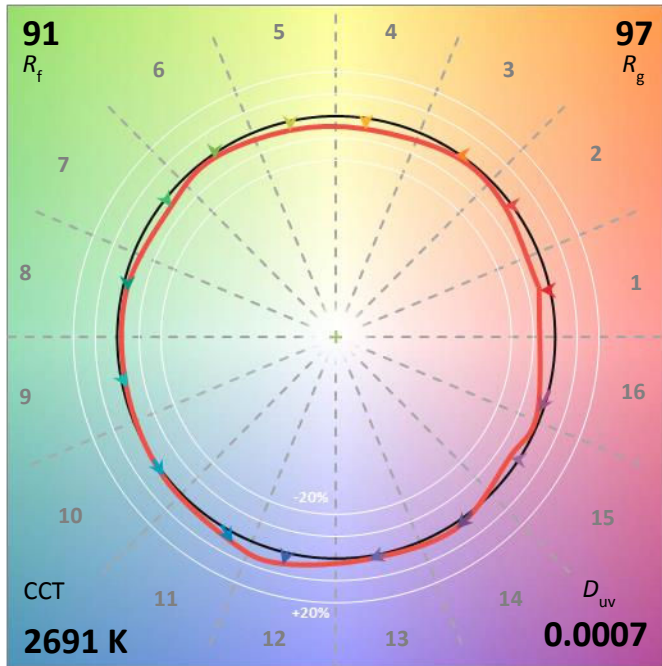
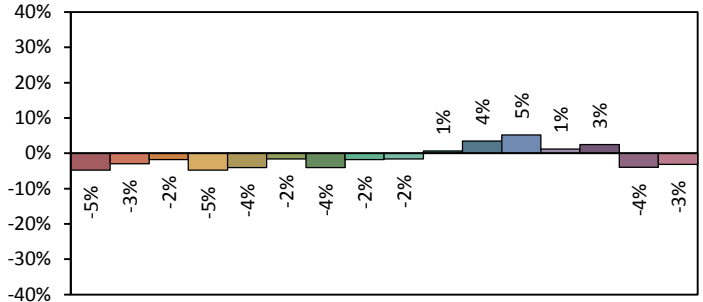
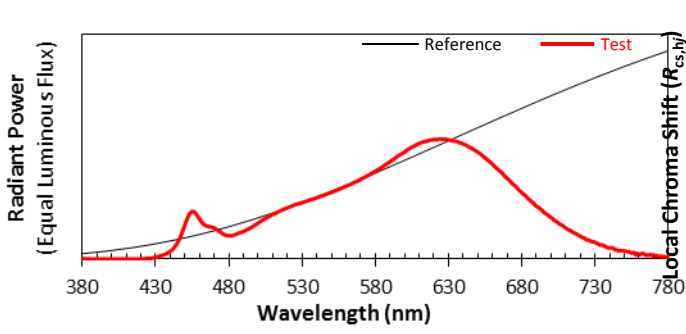
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120	60	0.0824	9.70	0.9809	877.1	90.39

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
3.106	2691	0.00067	0.4618	0.4129	0.2627	0.5285

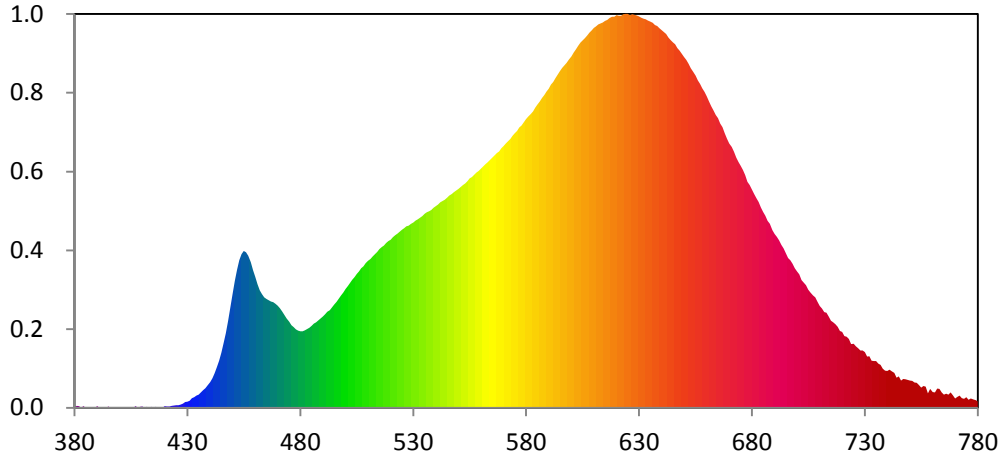
Color Rendering Index

Ra			
93.6			
R1	R2	R3	R4
94	98	99	93
R5	R6	R7	R8
94	97	91	82
R9	R10	R11	R12
62	94	95	82
R13	R14	R15	
95	99	89	





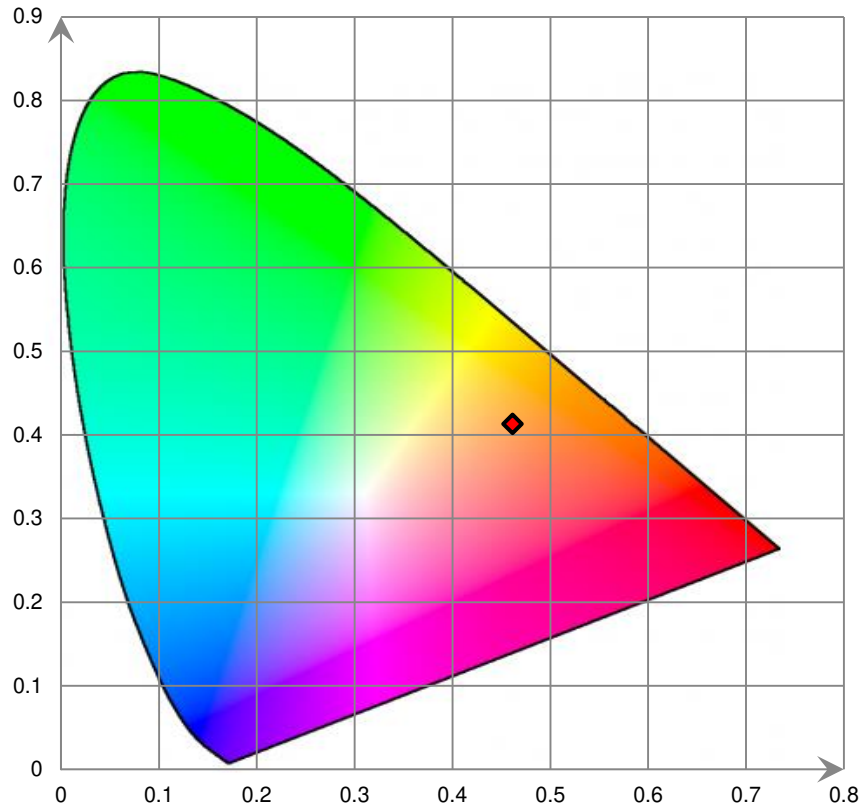
Relative Spectral Power Distribution



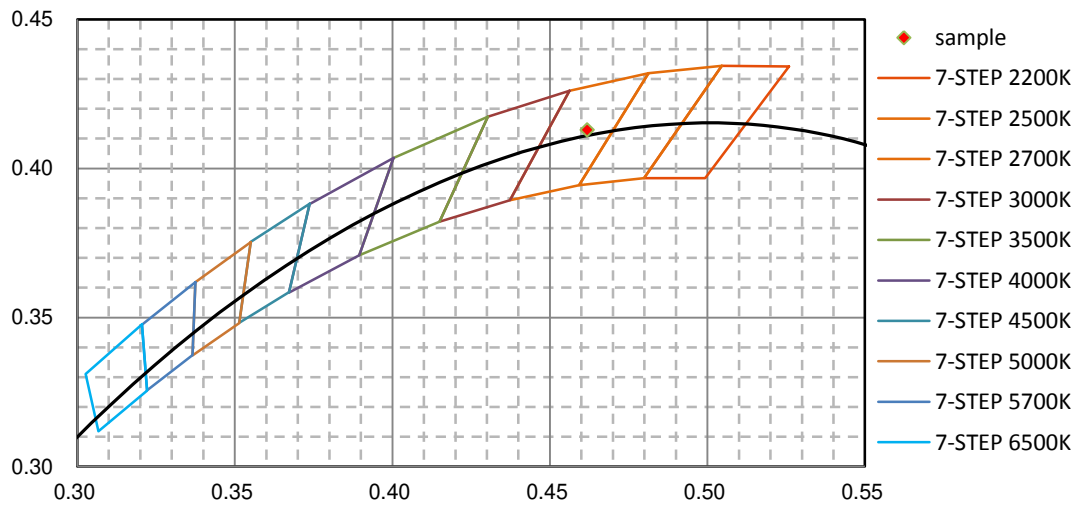
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	3.730E-02	421	6.630E-02	462	5.726E+00	503	6.226E+00	544	1.013E+01
381	9.560E-02	422	5.390E-02	463	5.536E+00	504	6.361E+00	545	1.022E+01
382	7.230E-02	423	9.220E-02	464	5.382E+00	505	6.506E+00	546	1.033E+01
383	2.480E-02	424	9.980E-02	465	5.304E+00	506	6.632E+00	547	1.041E+01
384	7.810E-02	425	1.227E-01	466	5.231E+00	507	6.797E+00	548	1.051E+01
385	3.040E-02	426	1.218E-01	467	5.174E+00	508	6.889E+00	549	1.058E+01
386	1.210E-02	427	1.495E-01	468	5.141E+00	509	7.045E+00	550	1.066E+01
387	2.930E-02	428	2.009E-01	469	5.064E+00	510	7.159E+00	551	1.076E+01
388	1.000E-02	429	2.785E-01	470	4.973E+00	511	7.253E+00	552	1.084E+01
389	5.200E-03	430	2.944E-01	471	4.842E+00	512	7.371E+00	553	1.093E+01
390	6.970E-02	431	3.463E-01	472	4.695E+00	513	7.482E+00	554	1.104E+01
391	2.090E-02	432	4.633E-01	473	4.518E+00	514	7.586E+00	555	1.118E+01
392	9.500E-03	433	5.065E-01	474	4.348E+00	515	7.730E+00	556	1.124E+01
393	4.900E-03	434	5.936E-01	475	4.184E+00	516	7.830E+00	557	1.135E+01
394	2.640E-02	435	6.395E-01	476	4.025E+00	517	7.909E+00	558	1.145E+01
395	6.130E-02	436	7.465E-01	477	3.928E+00	518	8.026E+00	559	1.154E+01
396	1.470E-02	437	8.515E-01	478	3.822E+00	519	8.112E+00	560	1.165E+01
397	5.000E-03	438	9.500E-01	479	3.760E+00	520	8.189E+00	561	1.176E+01
398	2.100E-03	439	1.092E+00	480	3.731E+00	521	8.302E+00	562	1.186E+01
399	1.000E-04	440	1.253E+00	481	3.727E+00	522	8.408E+00	563	1.195E+01
400	0.000E+00	441	1.439E+00	482	3.769E+00	523	8.471E+00	564	1.208E+01
401	1.740E-02	442	1.683E+00	483	3.836E+00	524	8.566E+00	565	1.218E+01
402	3.390E-02	443	1.973E+00	484	3.895E+00	525	8.668E+00	566	1.230E+01
403	3.240E-02	444	2.283E+00	485	3.991E+00	526	8.746E+00	567	1.240E+01
404	1.230E-02	445	2.676E+00	486	4.102E+00	527	8.837E+00	568	1.248E+01
405	2.570E-02	446	3.143E+00	487	4.162E+00	528	8.864E+00	569	1.264E+01
406	5.300E-03	447	3.628E+00	488	4.259E+00	529	8.958E+00	570	1.276E+01
407	7.170E-02	448	4.228E+00	489	4.343E+00	530	9.025E+00	571	1.287E+01
408	1.210E-02	449	4.878E+00	490	4.441E+00	531	9.115E+00	572	1.298E+01
409	4.740E-02	450	5.532E+00	491	4.542E+00	532	9.183E+00	573	1.310E+01
410	6.450E-02	451	6.170E+00	492	4.680E+00	533	9.262E+00	574	1.324E+01
411	3.610E-02	452	6.723E+00	493	4.760E+00	534	9.329E+00	575	1.337E+01
412	5.120E-02	453	7.182E+00	494	4.892E+00	535	9.450E+00	576	1.348E+01
413	4.300E-03	454	7.488E+00	495	5.035E+00	536	9.521E+00	577	1.365E+01
414	3.930E-02	455	7.636E+00	496	5.156E+00	537	9.575E+00	578	1.374E+01
415	2.900E-02	456	7.574E+00	497	5.319E+00	538	9.638E+00	579	1.390E+01
416	4.380E-02	457	7.396E+00	498	5.472E+00	539	9.746E+00	580	1.406E+01
417	3.090E-02	458	7.097E+00	499	5.604E+00	540	9.821E+00	581	1.419E+01
418	3.180E-02	459	6.703E+00	500	5.779E+00	541	9.893E+00	582	1.431E+01
419	3.300E-02	460	6.368E+00	501	5.927E+00	542	1.000E+01	583	1.444E+01
420	7.760E-02	461	6.022E+00	502	6.079E+00	543	1.006E+01	584	1.461E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.478E+01	626	1.912E+01	667	1.367E+01	708	5.377E+00	749	1.350E+00
586	1.492E+01	627	1.917E+01	668	1.337E+01	709	5.158E+00	750	1.326E+00
587	1.509E+01	628	1.914E+01	669	1.311E+01	710	4.959E+00	751	1.303E+00
588	1.523E+01	629	1.911E+01	670	1.288E+01	711	4.838E+00	752	1.236E+00
589	1.540E+01	630	1.907E+01	671	1.269E+01	712	4.654E+00	753	1.211E+00
590	1.553E+01	631	1.900E+01	672	1.247E+01	713	4.631E+00	754	1.106E+00
591	1.574E+01	632	1.895E+01	673	1.219E+01	714	4.445E+00	755	9.772E-01
592	1.586E+01	633	1.892E+01	674	1.197E+01	715	4.241E+00	756	1.057E+00
593	1.605E+01	634	1.885E+01	675	1.179E+01	716	4.157E+00	757	1.026E+00
594	1.622E+01	635	1.881E+01	676	1.157E+01	717	4.066E+00	758	6.919E-01
595	1.640E+01	636	1.875E+01	677	1.133E+01	718	3.945E+00	759	9.219E-01
596	1.654E+01	637	1.864E+01	678	1.101E+01	719	3.742E+00	760	7.642E-01
597	1.667E+01	638	1.860E+01	679	1.085E+01	720	3.687E+00	761	7.428E-01
598	1.680E+01	639	1.849E+01	680	1.062E+01	721	3.484E+00	762	9.407E-01
599	1.695E+01	640	1.839E+01	681	1.042E+01	722	3.454E+00	763	9.171E-01
600	1.711E+01	641	1.829E+01	682	1.020E+01	723	3.346E+00	764	7.522E-01
601	1.731E+01	642	1.821E+01	683	1.002E+01	724	3.100E+00	765	6.317E-01
602	1.746E+01	643	1.803E+01	684	9.757E+00	725	3.116E+00	766	6.764E-01
603	1.762E+01	644	1.790E+01	685	9.532E+00	726	2.991E+00	767	6.418E-01
604	1.778E+01	645	1.779E+01	686	9.345E+00	727	2.902E+00	768	7.438E-01
605	1.789E+01	646	1.770E+01	687	9.104E+00	728	2.786E+00	769	6.043E-01
606	1.800E+01	647	1.752E+01	688	8.966E+00	729	2.795E+00	770	4.558E-01
607	1.812E+01	648	1.739E+01	689	8.641E+00	730	2.703E+00	771	5.295E-01
608	1.827E+01	649	1.724E+01	690	8.465E+00	731	2.500E+00	772	5.871E-01
609	1.837E+01	650	1.709E+01	691	8.326E+00	732	2.511E+00	773	4.630E-01
610	1.850E+01	651	1.694E+01	692	8.155E+00	733	2.290E+00	774	4.273E-01
611	1.858E+01	652	1.676E+01	693	7.936E+00	734	2.278E+00	775	5.058E-01
612	1.868E+01	653	1.653E+01	694	7.757E+00	735	2.268E+00	776	3.843E-01
613	1.873E+01	654	1.635E+01	695	7.532E+00	736	2.145E+00	777	4.426E-01
614	1.877E+01	655	1.618E+01	696	7.289E+00	737	2.079E+00	778	4.033E-01
615	1.884E+01	656	1.594E+01	697	7.189E+00	738	1.900E+00	779	3.686E-01
616	1.889E+01	657	1.578E+01	698	7.017E+00	739	1.800E+00	780	3.127E-01
617	1.899E+01	658	1.555E+01	699	6.799E+00	740	1.794E+00		
618	1.905E+01	659	1.538E+01	700	6.636E+00	741	1.851E+00		
619	1.905E+01	660	1.516E+01	701	6.504E+00	742	1.781E+00		
620	1.912E+01	661	1.492E+01	702	6.221E+00	743	1.694E+00		
621	1.910E+01	662	1.468E+01	703	6.098E+00	744	1.461E+00		
622	1.910E+01	663	1.448E+01	704	5.965E+00	745	1.519E+00		
623	1.917E+01	664	1.427E+01	705	5.749E+00	746	1.323E+00		
624	1.918E+01	665	1.411E+01	706	5.606E+00	747	1.396E+00		
625	1.918E+01	666	1.384E+01	707	5.467E+00	748	1.390E+00		

CIE 1931xy Chromaticity Diagram



7-StepChromaticity Quadrangles



Control Setting: 3000K

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

Test orientation: **Downward**

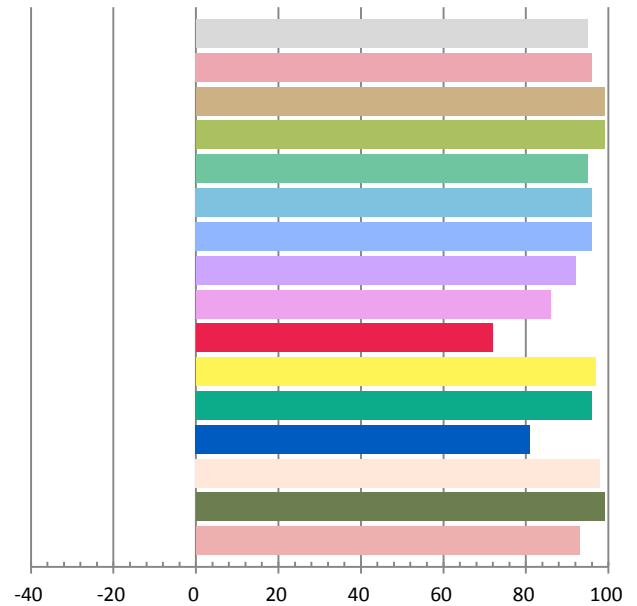
Photometric and Electrical Measurement Result

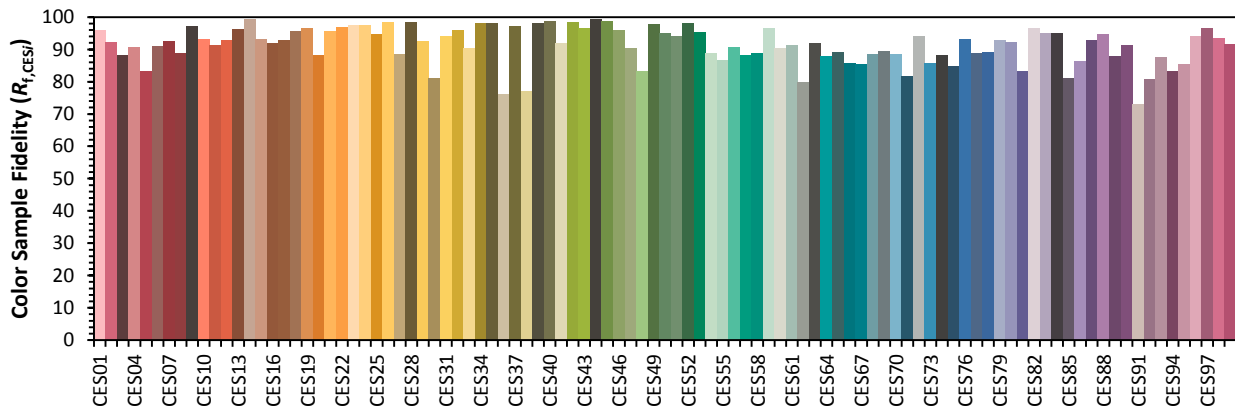
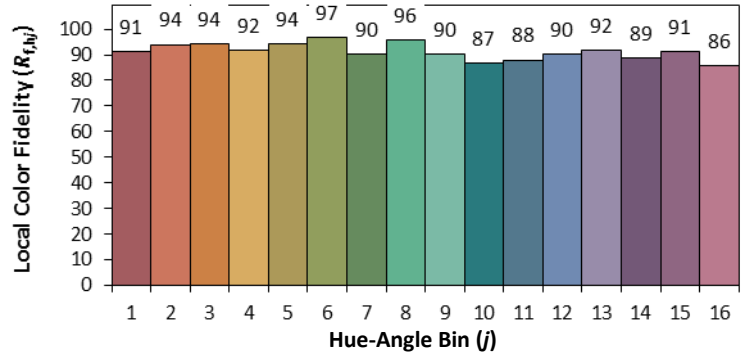
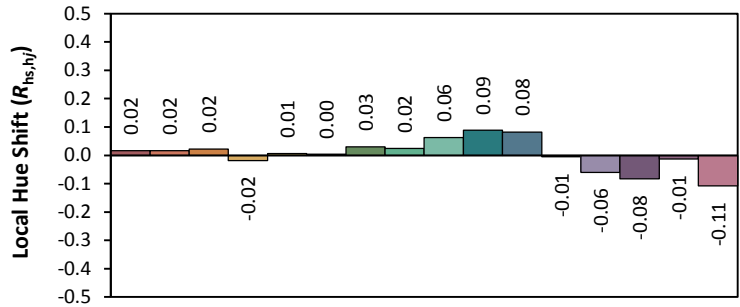
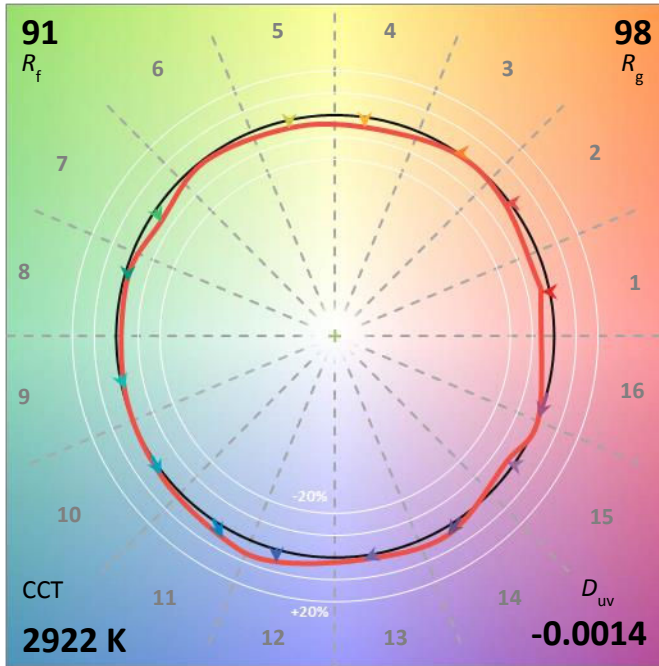
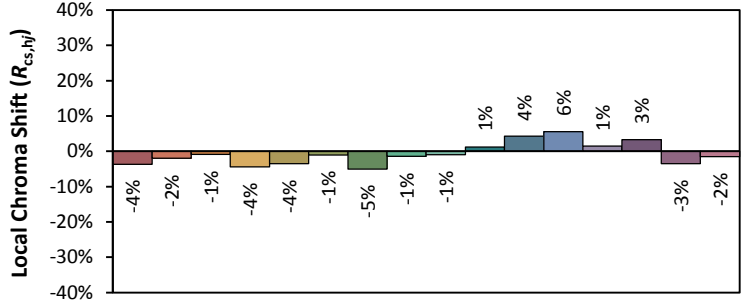
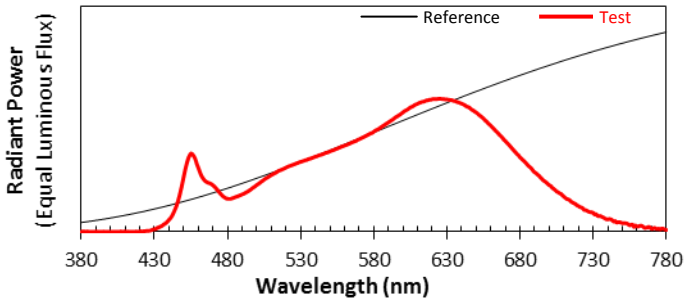
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.0822	9.68	0.9809	892.44	92.19

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
3.177	2922	-0.00144	0.4404	0.4016	0.2539	0.5209

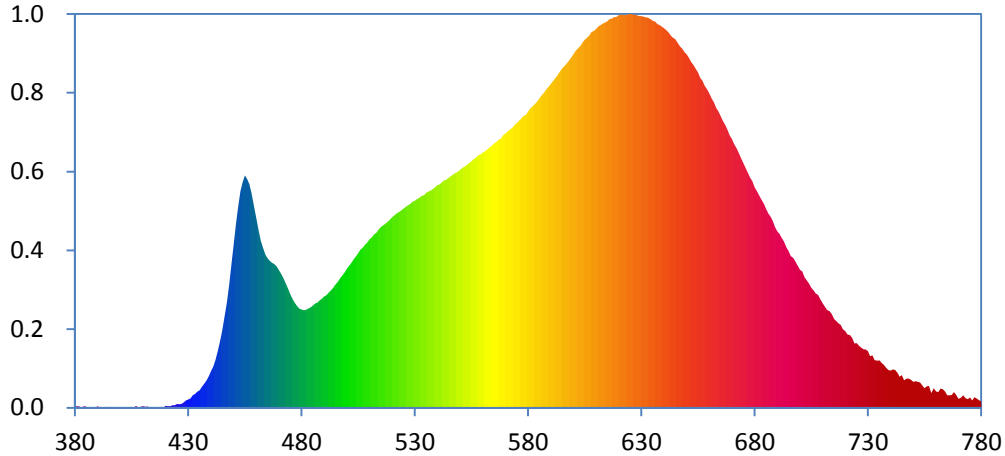
Color Rendering Index

Ra			
95.0			
R1	R2	R3	R4
96	99	99	95
R5	R6	R7	R8
96	96	92	86
R9	R10	R11	R12
72	97	96	81
R13	R14	R15	
98	99	93	





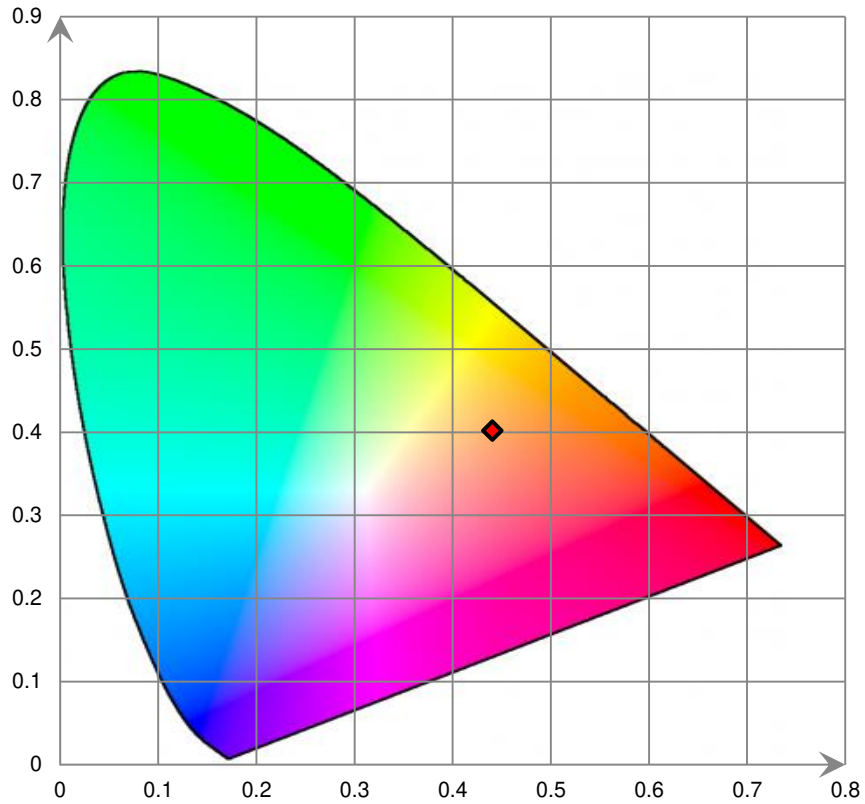
Relative Spectral Power Distribution



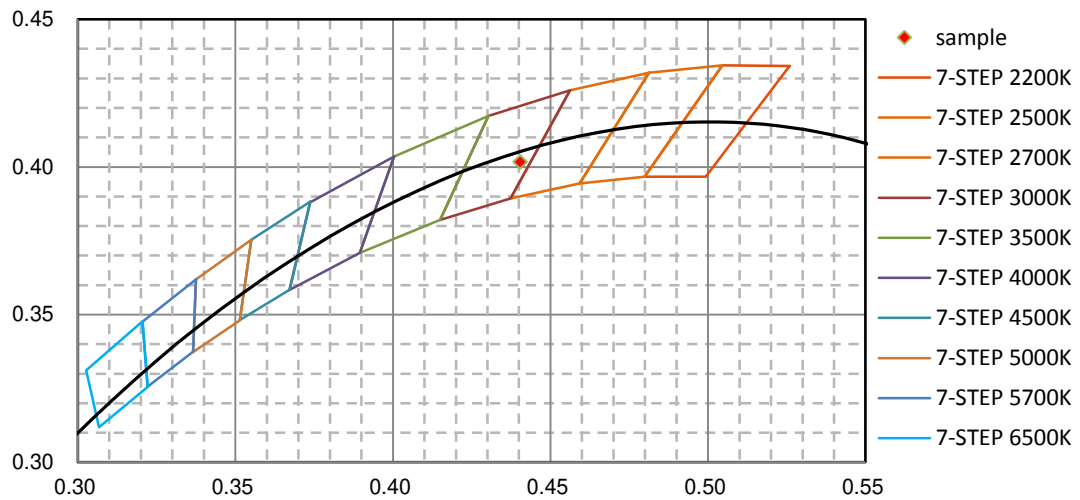
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	4.230E-02	421	7.740E-02	462	7.832E+00	503	6.971E+00	544	1.071E+01
381	6.780E-02	422	7.240E-02	463	7.496E+00	504	7.111E+00	545	1.080E+01
382	6.230E-02	423	1.124E-01	464	7.203E+00	505	7.258E+00	546	1.088E+01
383	2.200E-02	424	1.248E-01	465	7.018E+00	506	7.420E+00	547	1.096E+01
384	6.850E-02	425	1.719E-01	466	6.900E+00	507	7.520E+00	548	1.102E+01
385	3.840E-02	426	1.563E-01	467	6.804E+00	508	7.653E+00	549	1.109E+01
386	2.800E-03	427	1.814E-01	468	6.742E+00	509	7.774E+00	550	1.118E+01
387	3.310E-02	428	2.489E-01	469	6.638E+00	510	7.912E+00	551	1.127E+01
388	2.450E-02	429	3.447E-01	470	6.469E+00	511	8.008E+00	552	1.133E+01
389	8.400E-03	430	3.845E-01	471	6.295E+00	512	8.149E+00	553	1.140E+01
390	7.170E-02	431	4.359E-01	472	6.071E+00	513	8.223E+00	554	1.150E+01
391	1.800E-02	432	5.798E-01	473	5.832E+00	514	8.366E+00	555	1.157E+01
392	1.020E-02	433	6.387E-01	474	5.590E+00	515	8.487E+00	556	1.167E+01
393	8.700E-03	434	7.533E-01	475	5.336E+00	516	8.568E+00	557	1.174E+01
394	1.510E-02	435	8.267E-01	476	5.110E+00	517	8.646E+00	558	1.186E+01
395	4.690E-02	436	9.947E-01	477	4.922E+00	518	8.735E+00	559	1.190E+01
396	8.100E-03	437	1.119E+00	478	4.780E+00	519	8.839E+00	560	1.199E+01
397	3.300E-03	438	1.275E+00	479	4.659E+00	520	8.938E+00	561	1.205E+01
398	7.000E-03	439	1.466E+00	480	4.606E+00	521	9.034E+00	562	1.214E+01
399	4.000E-04	440	1.707E+00	481	4.587E+00	522	9.130E+00	563	1.222E+01
400	0.000E+00	441	1.920E+00	482	4.603E+00	523	9.190E+00	564	1.231E+01
401	2.020E-02	442	2.238E+00	483	4.661E+00	524	9.274E+00	565	1.242E+01
402	2.930E-02	443	2.644E+00	484	4.719E+00	525	9.352E+00	566	1.249E+01
403	2.500E-02	444	3.089E+00	485	4.811E+00	526	9.429E+00	567	1.259E+01
404	1.310E-02	445	3.603E+00	486	4.896E+00	527	9.514E+00	568	1.264E+01
405	4.050E-02	446	4.230E+00	487	4.944E+00	528	9.573E+00	569	1.280E+01
406	7.300E-03	447	4.954E+00	488	5.043E+00	529	9.673E+00	570	1.287E+01
407	8.150E-02	448	5.777E+00	489	5.123E+00	530	9.728E+00	571	1.297E+01
408	1.850E-02	449	6.730E+00	490	5.221E+00	531	9.791E+00	572	1.307E+01
409	5.040E-02	450	7.664E+00	491	5.291E+00	532	9.863E+00	573	1.315E+01
410	6.660E-02	451	8.614E+00	492	5.408E+00	533	9.946E+00	574	1.328E+01
411	3.770E-02	452	9.430E+00	493	5.520E+00	534	9.974E+00	575	1.337E+01
412	5.110E-02	453	1.016E+01	494	5.639E+00	535	1.009E+01	576	1.348E+01
413	7.300E-03	454	1.059E+01	495	5.783E+00	536	1.016E+01	577	1.358E+01
414	2.860E-02	455	1.090E+01	496	5.899E+00	537	1.020E+01	578	1.370E+01
415	2.720E-02	456	1.075E+01	497	6.092E+00	538	1.028E+01	579	1.375E+01
416	3.530E-02	457	1.051E+01	498	6.220E+00	539	1.036E+01	580	1.391E+01
417	3.550E-02	458	1.007E+01	499	6.361E+00	540	1.045E+01	581	1.407E+01
418	4.230E-02	459	9.420E+00	500	6.529E+00	541	1.049E+01	582	1.415E+01
419	2.990E-02	460	8.881E+00	501	6.666E+00	542	1.059E+01	583	1.426E+01
420	8.070E-02	461	8.330E+00	502	6.804E+00	543	1.068E+01	584	1.439E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.455E+01	626	1.847E+01	667	1.328E+01	708	5.300E+00	749	1.309E+00
586	1.468E+01	627	1.845E+01	668	1.306E+01	709	5.079E+00	750	1.223E+00
587	1.480E+01	628	1.844E+01	669	1.279E+01	710	4.905E+00	751	1.241E+00
588	1.495E+01	629	1.839E+01	670	1.261E+01	711	4.727E+00	752	1.219E+00
589	1.508E+01	630	1.839E+01	671	1.238E+01	712	4.580E+00	753	1.192E+00
590	1.520E+01	631	1.836E+01	672	1.218E+01	713	4.531E+00	754	1.054E+00
591	1.533E+01	632	1.833E+01	673	1.195E+01	714	4.396E+00	755	9.072E-01
592	1.547E+01	633	1.832E+01	674	1.171E+01	715	4.183E+00	756	1.006E+00
593	1.561E+01	634	1.824E+01	675	1.148E+01	716	4.075E+00	757	1.013E+00
594	1.578E+01	635	1.817E+01	676	1.125E+01	717	3.963E+00	758	6.875E-01
595	1.593E+01	636	1.813E+01	677	1.103E+01	718	3.884E+00	759	9.110E-01
596	1.604E+01	637	1.802E+01	678	1.080E+01	719	3.676E+00	760	7.704E-01
597	1.617E+01	638	1.798E+01	679	1.063E+01	720	3.605E+00	761	7.390E-01
598	1.630E+01	639	1.789E+01	680	1.035E+01	721	3.439E+00	762	8.980E-01
599	1.646E+01	640	1.781E+01	681	1.017E+01	722	3.412E+00	763	8.716E-01
600	1.660E+01	641	1.772E+01	682	9.977E+00	723	3.273E+00	764	7.604E-01
601	1.677E+01	642	1.762E+01	683	9.779E+00	724	3.022E+00	765	5.858E-01
602	1.687E+01	643	1.748E+01	684	9.576E+00	725	3.037E+00	766	5.807E-01
603	1.698E+01	644	1.737E+01	685	9.337E+00	726	2.909E+00	767	5.992E-01
604	1.715E+01	645	1.731E+01	686	9.126E+00	727	2.818E+00	768	7.280E-01
605	1.728E+01	646	1.714E+01	687	8.965E+00	728	2.747E+00	769	6.033E-01
606	1.737E+01	647	1.697E+01	688	8.754E+00	729	2.727E+00	770	4.164E-01
607	1.748E+01	648	1.686E+01	689	8.471E+00	730	2.664E+00	771	4.681E-01
608	1.763E+01	649	1.670E+01	690	8.279E+00	731	2.424E+00	772	5.761E-01
609	1.770E+01	650	1.659E+01	691	8.156E+00	732	2.467E+00	773	4.433E-01
610	1.779E+01	651	1.642E+01	692	7.960E+00	733	2.238E+00	774	4.040E-01
611	1.791E+01	652	1.623E+01	693	7.795E+00	734	2.207E+00	775	4.735E-01
612	1.797E+01	653	1.609E+01	694	7.550E+00	735	2.219E+00	776	3.485E-01
613	1.805E+01	654	1.591E+01	695	7.364E+00	736	2.101E+00	777	4.946E-01
614	1.808E+01	655	1.574E+01	696	7.126E+00	737	2.017E+00	778	4.399E-01
615	1.816E+01	656	1.549E+01	697	7.023E+00	738	1.876E+00	779	3.647E-01
616	1.826E+01	657	1.535E+01	698	6.858E+00	739	1.768E+00	780	2.876E-01
617	1.827E+01	658	1.512E+01	699	6.657E+00	740	1.744E+00		
618	1.835E+01	659	1.493E+01	700	6.470E+00	741	1.801E+00		
619	1.835E+01	660	1.475E+01	701	6.395E+00	742	1.772E+00		
620	1.843E+01	661	1.452E+01	702	6.137E+00	743	1.644E+00		
621	1.845E+01	662	1.433E+01	703	5.980E+00	744	1.452E+00		
622	1.846E+01	663	1.409E+01	704	5.825E+00	745	1.531E+00		
623	1.844E+01	664	1.391E+01	705	5.627E+00	746	1.296E+00		
624	1.847E+01	665	1.369E+01	706	5.518E+00	747	1.368E+00		
625	1.849E+01	666	1.346E+01	707	5.365E+00	748	1.365E+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**

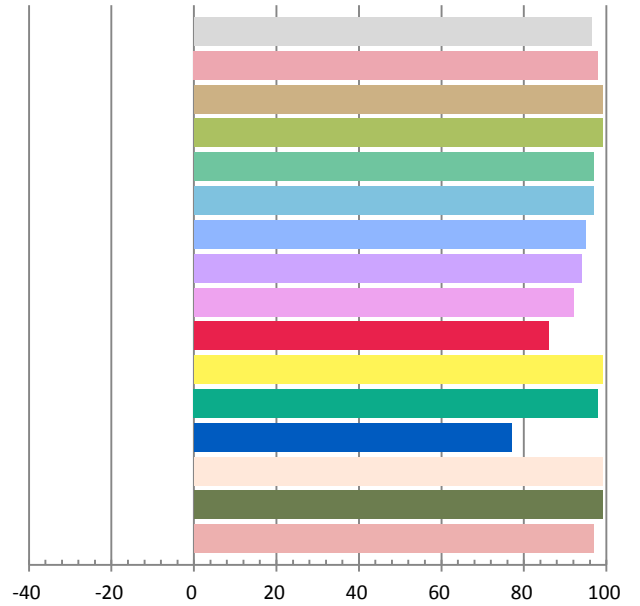
Photometric and Electrical Measurement Result

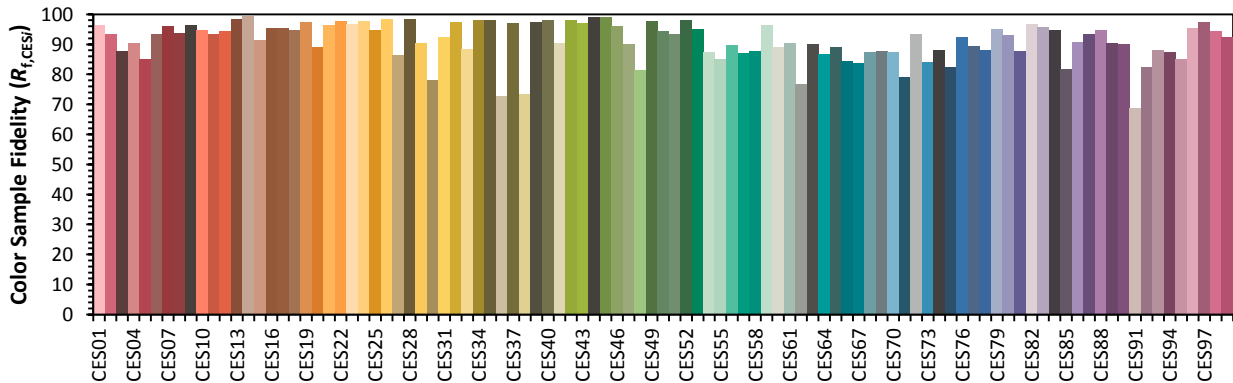
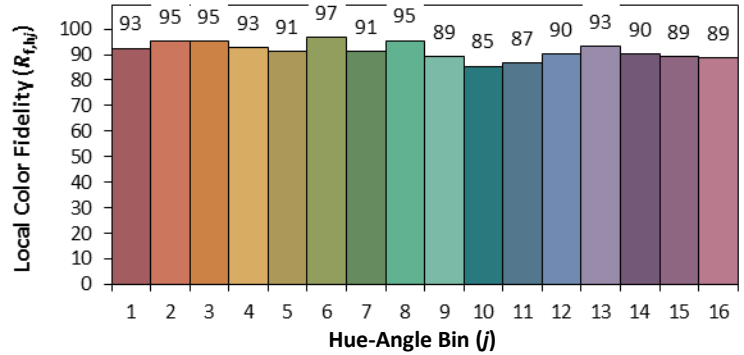
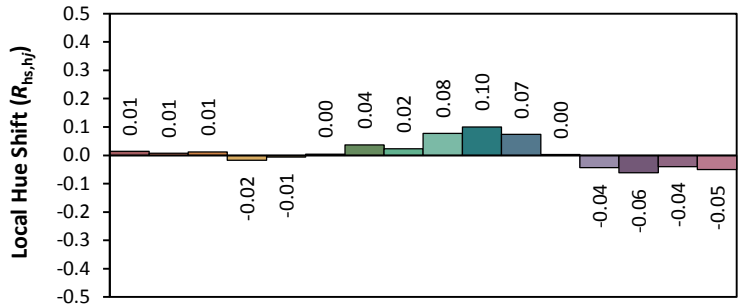
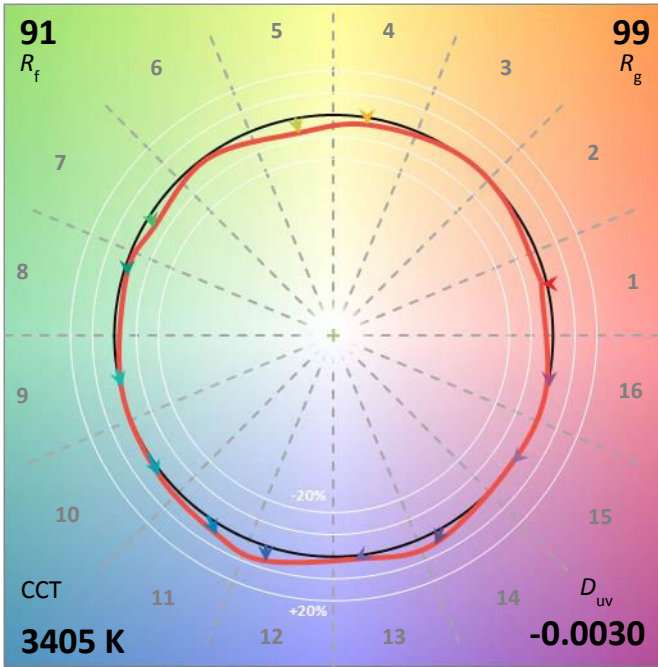
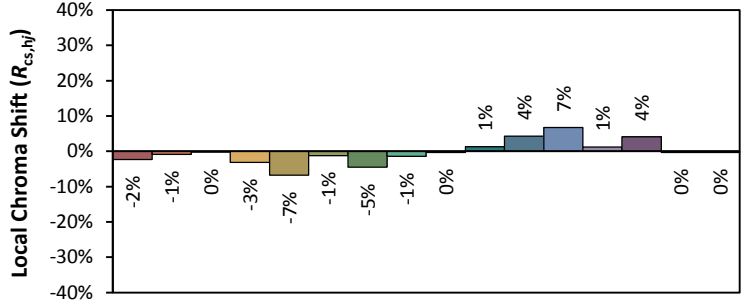
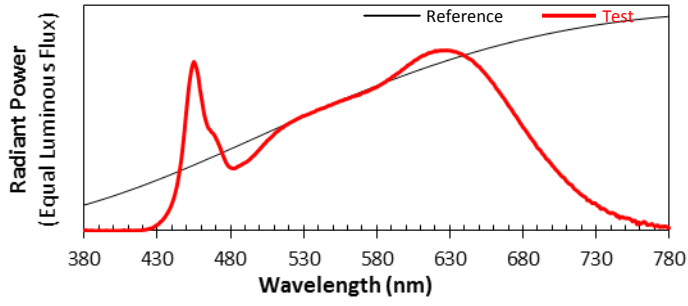
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.0822	9.69	0.9824	920.4	94.98

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
3.297	3405	-0.00302	0.4074	0.3849	0.2395	0.5091

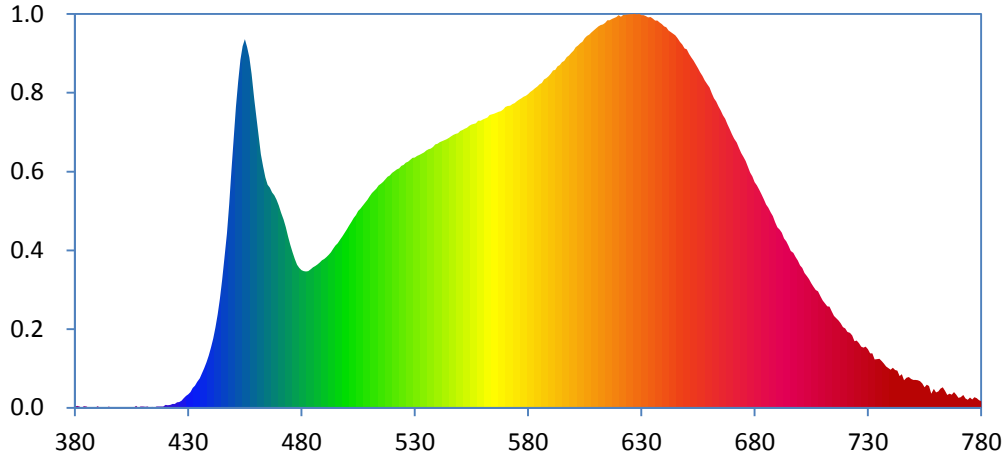
Color Rendering Index

Ra			
96.4			
R1	R2	R3	R4
98	99	99	97
R5	R6	R7	R8
97	95	94	92
R9	R10	R11	R12
86	99	98	77
R13	R14	R15	
99	99	97	





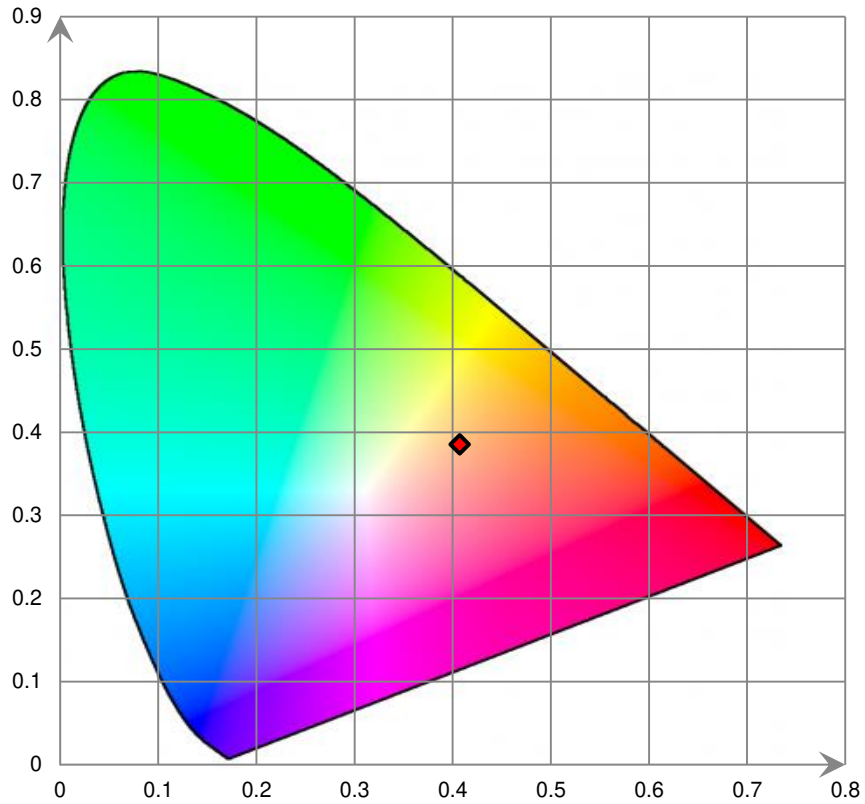
Relative Spectral Power Distribution



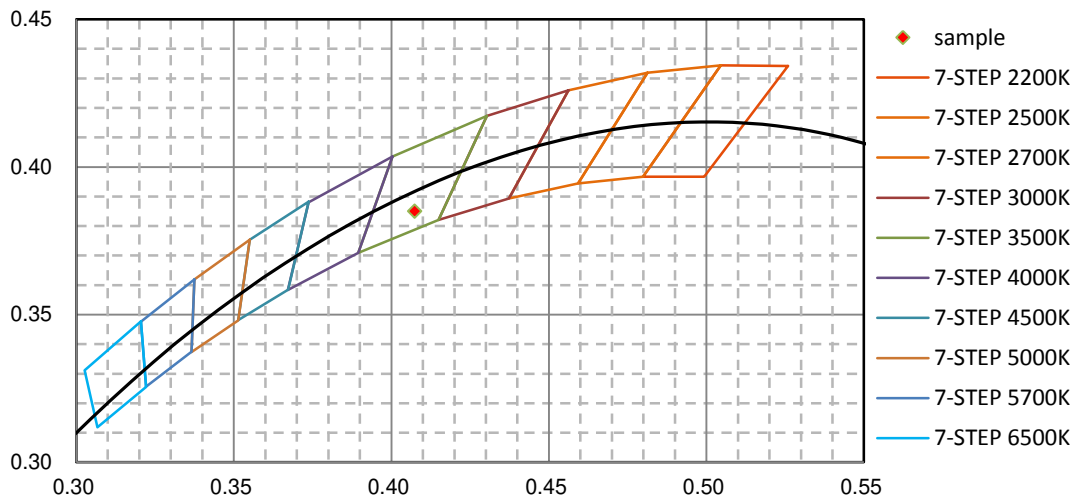
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	4.890E-02	421	1.120E-01	462	1.110E+01	503	8.299E+00	544	1.174E+01
381	7.560E-02	422	1.184E-01	463	1.055E+01	504	8.424E+00	545	1.180E+01
382	5.270E-02	423	1.597E-01	464	1.008E+01	505	8.613E+00	546	1.188E+01
383	7.700E-03	424	1.700E-01	465	9.767E+00	506	8.709E+00	547	1.195E+01
384	6.760E-02	425	2.395E-01	466	9.633E+00	507	8.842E+00	548	1.199E+01
385	5.180E-02	426	2.534E-01	467	9.421E+00	508	8.965E+00	549	1.202E+01
386	8.200E-03	427	3.088E-01	468	9.304E+00	509	9.111E+00	550	1.211E+01
387	2.690E-02	428	4.130E-01	469	9.109E+00	510	9.255E+00	551	1.215E+01
388	2.260E-02	429	5.225E-01	470	8.856E+00	511	9.399E+00	552	1.222E+01
389	6.800E-03	430	5.876E-01	471	8.546E+00	512	9.501E+00	553	1.226E+01
390	6.810E-02	431	6.917E-01	472	8.233E+00	513	9.593E+00	554	1.233E+01
391	2.260E-02	432	8.629E-01	473	7.900E+00	514	9.732E+00	555	1.239E+01
392	9.900E-03	433	9.588E-01	474	7.499E+00	515	9.799E+00	556	1.243E+01
393	5.000E-03	434	1.131E+00	475	7.129E+00	516	9.889E+00	557	1.245E+01
394	1.510E-02	435	1.293E+00	476	6.803E+00	517	9.999E+00	558	1.257E+01
395	5.960E-02	436	1.517E+00	477	6.516E+00	518	1.011E+01	559	1.256E+01
396	1.830E-02	437	1.733E+00	478	6.264E+00	519	1.017E+01	560	1.262E+01
397	8.000E-03	438	1.988E+00	479	6.114E+00	520	1.028E+01	561	1.266E+01
398	9.400E-03	439	2.276E+00	480	6.028E+00	521	1.035E+01	562	1.271E+01
399	5.000E-04	440	2.636E+00	481	5.976E+00	522	1.043E+01	563	1.281E+01
400	0.000E+00	441	3.031E+00	482	5.967E+00	523	1.047E+01	564	1.284E+01
401	1.790E-02	442	3.513E+00	483	5.977E+00	524	1.058E+01	565	1.288E+01
402	2.620E-02	443	4.088E+00	484	6.062E+00	525	1.063E+01	566	1.292E+01
403	2.270E-02	444	4.781E+00	485	6.147E+00	526	1.073E+01	567	1.296E+01
404	1.750E-02	445	5.595E+00	486	6.209E+00	527	1.078E+01	568	1.298E+01
405	3.280E-02	446	6.537E+00	487	6.277E+00	528	1.085E+01	569	1.305E+01
406	6.200E-03	447	7.632E+00	488	6.358E+00	529	1.094E+01	570	1.317E+01
407	8.680E-02	448	8.915E+00	489	6.452E+00	530	1.095E+01	571	1.321E+01
408	1.090E-02	449	1.039E+01	490	6.516E+00	531	1.102E+01	572	1.322E+01
409	4.750E-02	450	1.177E+01	491	6.591E+00	532	1.107E+01	573	1.329E+01
410	6.110E-02	451	1.316E+01	492	6.692E+00	533	1.112E+01	574	1.333E+01
411	3.800E-02	452	1.427E+01	493	6.812E+00	534	1.118E+01	575	1.341E+01
412	5.060E-02	453	1.523E+01	494	6.957E+00	535	1.126E+01	576	1.349E+01
413	5.300E-03	454	1.582E+01	495	7.097E+00	536	1.131E+01	577	1.354E+01
414	3.640E-02	455	1.613E+01	496	7.195E+00	537	1.134E+01	578	1.362E+01
415	3.160E-02	456	1.578E+01	497	7.364E+00	538	1.142E+01	579	1.366E+01
416	4.810E-02	457	1.533E+01	498	7.504E+00	539	1.152E+01	580	1.373E+01
417	5.470E-02	458	1.461E+01	499	7.657E+00	540	1.156E+01	581	1.382E+01
418	5.290E-02	459	1.355E+01	500	7.812E+00	541	1.162E+01	582	1.389E+01
419	5.500E-02	460	1.272E+01	501	7.979E+00	542	1.166E+01	583	1.398E+01
420	1.183E-01	461	1.191E+01	502	8.132E+00	543	1.171E+01	584	1.406E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.416E+01	626	1.722E+01	667	1.265E+01	708	5.101E+00	749	1.253E+00
586	1.422E+01	627	1.724E+01	668	1.241E+01	709	4.866E+00	750	1.224E+00
587	1.437E+01	628	1.721E+01	669	1.220E+01	710	4.694E+00	751	1.213E+00
588	1.442E+01	629	1.724E+01	670	1.198E+01	711	4.566E+00	752	1.211E+00
589	1.451E+01	630	1.718E+01	671	1.178E+01	712	4.435E+00	753	1.167E+00
590	1.462E+01	631	1.719E+01	672	1.162E+01	713	4.425E+00	754	1.057E+00
591	1.476E+01	632	1.714E+01	673	1.138E+01	714	4.212E+00	755	9.024E-01
592	1.479E+01	633	1.709E+01	674	1.115E+01	715	4.016E+00	756	1.002E+00
593	1.494E+01	634	1.710E+01	675	1.098E+01	716	3.917E+00	757	9.468E-01
594	1.500E+01	635	1.704E+01	676	1.079E+01	717	3.816E+00	758	6.155E-01
595	1.512E+01	636	1.695E+01	677	1.055E+01	718	3.700E+00	759	8.211E-01
596	1.518E+01	637	1.694E+01	678	1.030E+01	719	3.532E+00	760	6.755E-01
597	1.535E+01	638	1.687E+01	679	1.013E+01	720	3.472E+00	761	7.180E-01
598	1.542E+01	639	1.680E+01	680	9.875E+00	721	3.324E+00	762	8.341E-01
599	1.553E+01	640	1.669E+01	681	9.729E+00	722	3.274E+00	763	8.953E-01
600	1.563E+01	641	1.665E+01	682	9.548E+00	723	3.170E+00	764	7.358E-01
601	1.579E+01	642	1.652E+01	683	9.352E+00	724	2.908E+00	765	5.561E-01
602	1.586E+01	643	1.645E+01	684	9.122E+00	725	2.942E+00	766	6.110E-01
603	1.595E+01	644	1.637E+01	685	8.894E+00	726	2.831E+00	767	5.772E-01
604	1.603E+01	645	1.630E+01	686	8.759E+00	727	2.675E+00	768	6.794E-01
605	1.617E+01	646	1.618E+01	687	8.550E+00	728	2.634E+00	769	5.722E-01
606	1.627E+01	647	1.601E+01	688	8.386E+00	729	2.670E+00	770	4.326E-01
607	1.634E+01	648	1.590E+01	689	8.131E+00	730	2.558E+00	771	4.671E-01
608	1.643E+01	649	1.573E+01	690	7.900E+00	731	2.383E+00	772	5.525E-01
609	1.653E+01	650	1.568E+01	691	7.797E+00	732	2.376E+00	773	4.107E-01
610	1.661E+01	651	1.549E+01	692	7.655E+00	733	2.110E+00	774	3.537E-01
611	1.669E+01	652	1.533E+01	693	7.412E+00	734	2.127E+00	775	4.409E-01
612	1.675E+01	653	1.519E+01	694	7.279E+00	735	2.137E+00	776	3.613E-01
613	1.678E+01	654	1.503E+01	695	7.088E+00	736	2.044E+00	777	4.589E-01
614	1.685E+01	655	1.486E+01	696	6.860E+00	737	1.927E+00	778	4.153E-01
615	1.697E+01	656	1.468E+01	697	6.786E+00	738	1.800E+00	779	3.341E-01
616	1.696E+01	657	1.453E+01	698	6.602E+00	739	1.738E+00	780	2.788E-01
617	1.702E+01	658	1.432E+01	699	6.448E+00	740	1.673E+00		
618	1.705E+01	659	1.417E+01	700	6.231E+00	741	1.745E+00		
619	1.710E+01	660	1.402E+01	701	6.116E+00	742	1.656E+00		
620	1.719E+01	661	1.376E+01	702	5.899E+00	743	1.622E+00		
621	1.712E+01	662	1.354E+01	703	5.767E+00	744	1.391E+00		
622	1.719E+01	663	1.340E+01	704	5.632E+00	745	1.471E+00		
623	1.721E+01	664	1.320E+01	705	5.443E+00	746	1.211E+00		
624	1.721E+01	665	1.301E+01	706	5.292E+00	747	1.322E+00		
625	1.722E+01	666	1.280E+01	707	5.147E+00	748	1.344E+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**

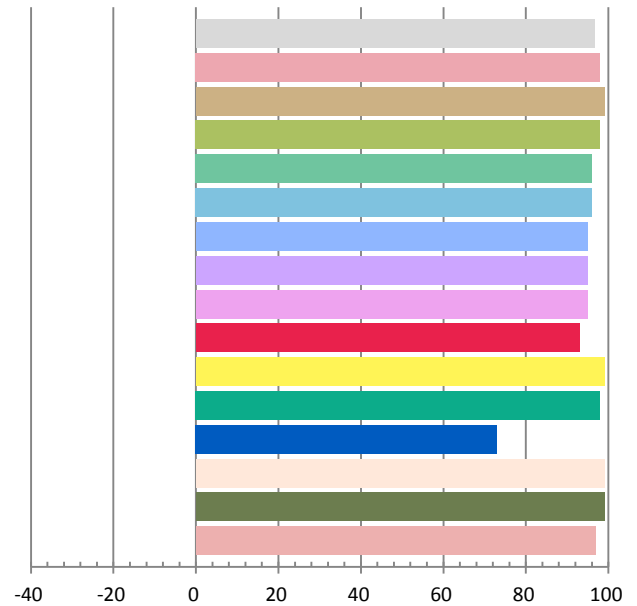
Photometric and Electrical Measurement Result

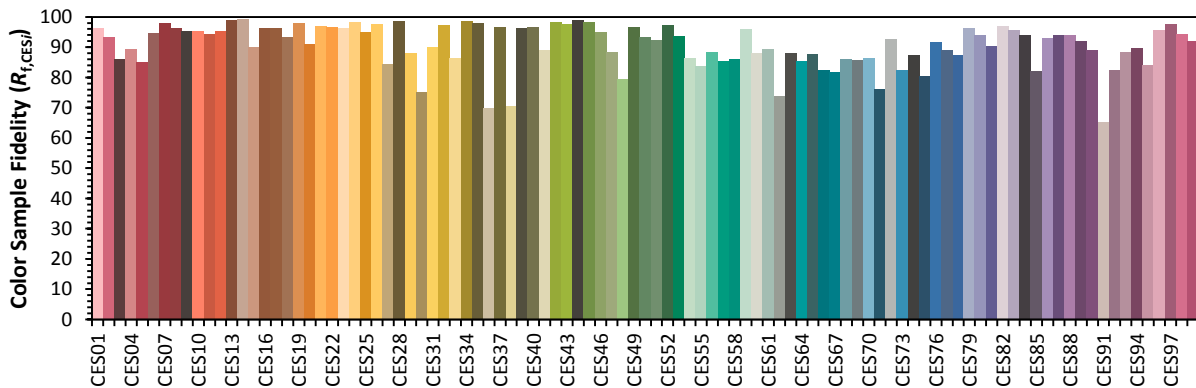
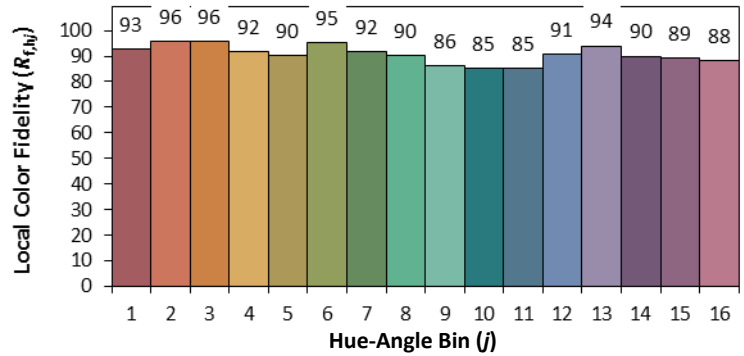
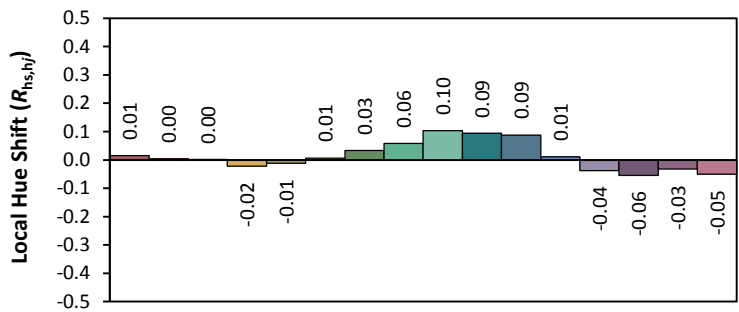
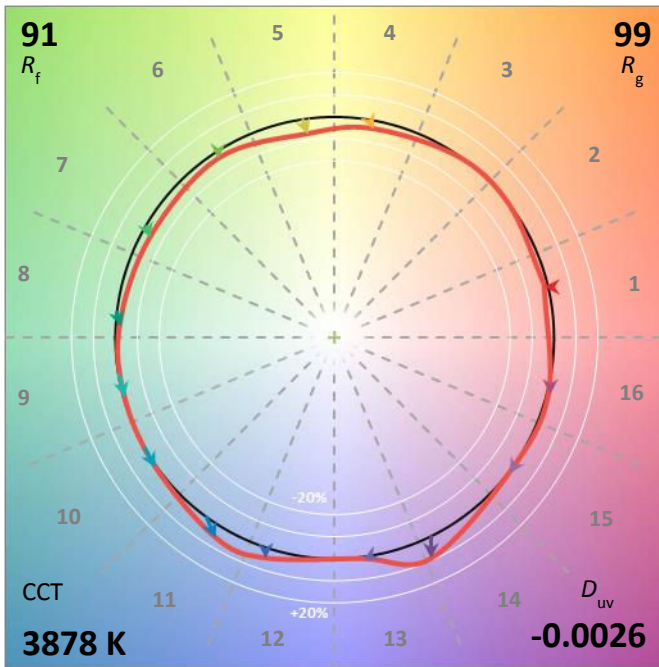
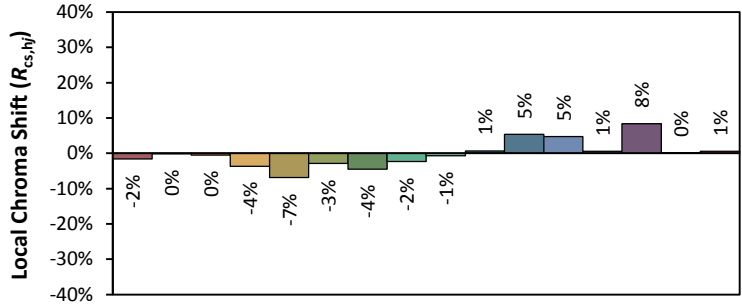
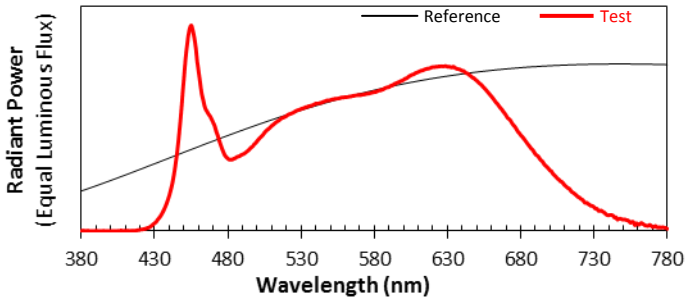
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.0821	9.67	0.981	931.49	96.33

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
3.339	3878	-0.00259	0.3840	0.3734	0.2288	0.5006

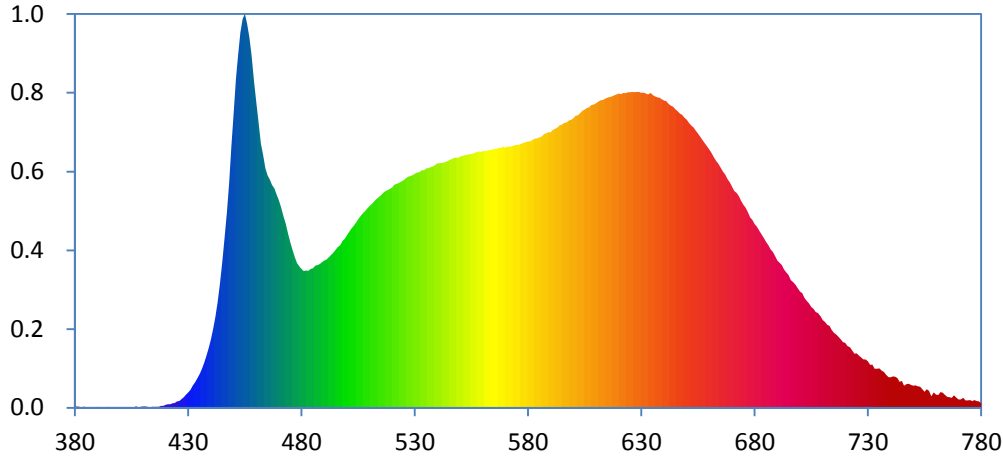
Color Rendering Index

Ra			
96.6			
R1	R2	R3	R4
98	99	98	96
R5	R6	R7	R8
96	95	95	95
R9	R10	R11	R12
93	99	98	73
R13	R14	R15	
99	99	97	





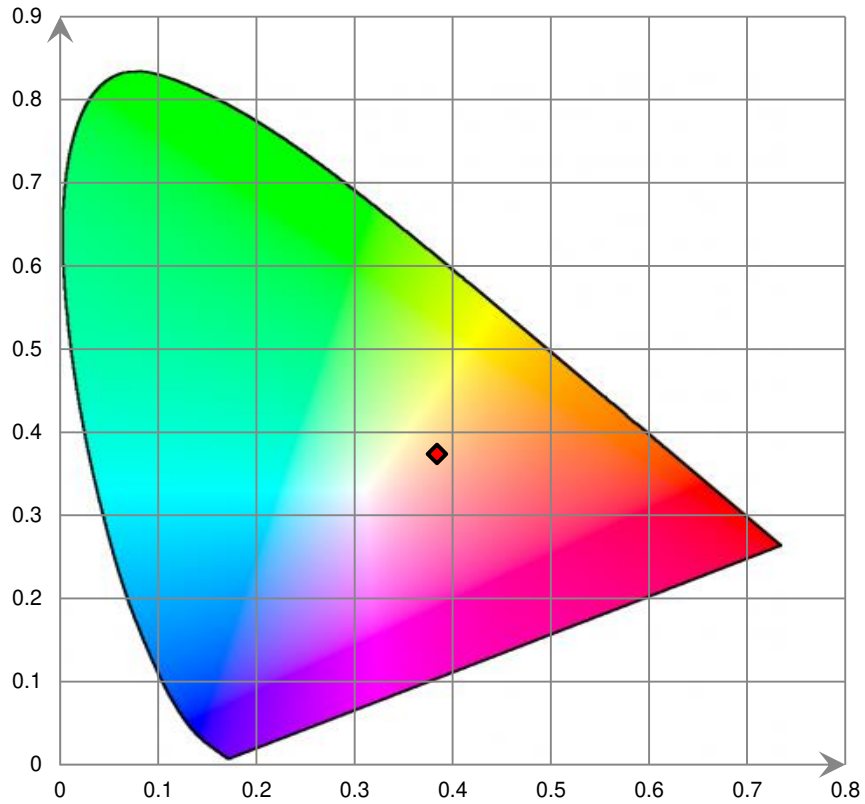
Relative Spectral Power Distribution



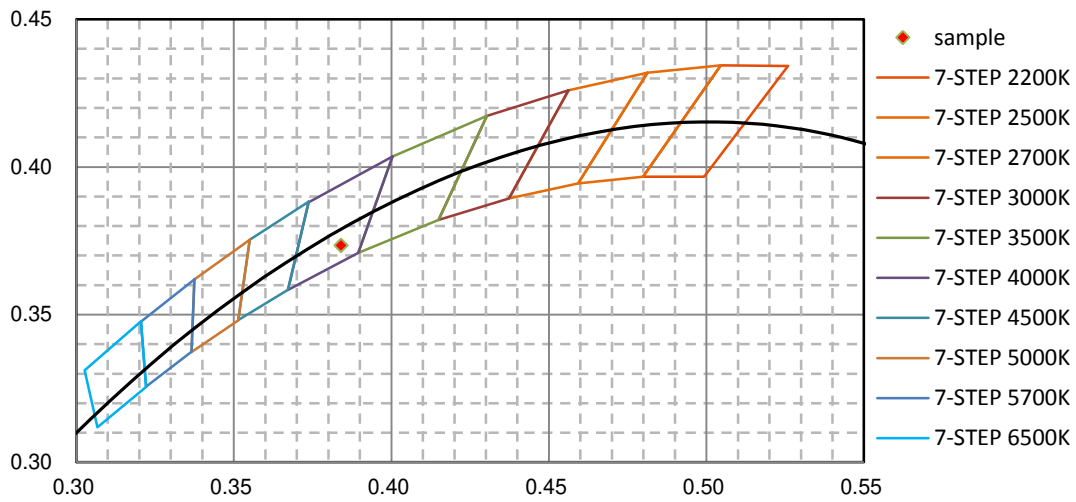
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	4.290E-02	421	1.693E-01	462	1.339E+01	503	9.199E+00	544	1.245E+01
381	6.190E-02	422	1.816E-01	463	1.280E+01	504	9.355E+00	545	1.252E+01
382	4.330E-02	423	2.232E-01	464	1.213E+01	505	9.545E+00	546	1.257E+01
383	1.620E-02	424	2.405E-01	465	1.176E+01	506	9.684E+00	547	1.264E+01
384	6.300E-02	425	3.207E-01	466	1.155E+01	507	9.831E+00	548	1.267E+01
385	3.420E-02	426	3.409E-01	467	1.128E+01	508	9.944E+00	549	1.266E+01
386	2.700E-03	427	4.344E-01	468	1.110E+01	509	1.009E+01	550	1.271E+01
387	2.570E-02	428	5.402E-01	469	1.080E+01	510	1.022E+01	551	1.276E+01
388	1.430E-02	429	6.694E-01	470	1.051E+01	511	1.031E+01	552	1.278E+01
389	1.390E-02	430	7.772E-01	471	1.016E+01	512	1.045E+01	553	1.282E+01
390	4.690E-02	431	9.009E-01	472	9.668E+00	513	1.056E+01	554	1.283E+01
391	1.650E-02	432	1.109E+00	473	9.292E+00	514	1.066E+01	555	1.285E+01
392	1.290E-02	433	1.272E+00	474	8.817E+00	515	1.075E+01	556	1.288E+01
393	9.600E-03	434	1.479E+00	475	8.375E+00	516	1.088E+01	557	1.292E+01
394	1.900E-02	435	1.713E+00	476	7.988E+00	517	1.097E+01	558	1.297E+01
395	4.140E-02	436	1.977E+00	477	7.636E+00	518	1.101E+01	559	1.296E+01
396	1.510E-02	437	2.280E+00	478	7.327E+00	519	1.108E+01	560	1.299E+01
397	1.780E-02	438	2.639E+00	479	7.154E+00	520	1.115E+01	561	1.299E+01
398	9.100E-03	439	3.035E+00	480	7.037E+00	521	1.128E+01	562	1.300E+01
399	1.100E-03	440	3.470E+00	481	6.921E+00	522	1.134E+01	563	1.305E+01
400	1.000E-04	441	3.998E+00	482	6.954E+00	523	1.139E+01	564	1.306E+01
401	2.030E-02	442	4.611E+00	483	6.937E+00	524	1.145E+01	565	1.310E+01
402	2.060E-02	443	5.367E+00	484	7.021E+00	525	1.151E+01	566	1.311E+01
403	1.380E-02	444	6.259E+00	485	7.067E+00	526	1.162E+01	567	1.316E+01
404	9.300E-03	445	7.322E+00	486	7.183E+00	527	1.169E+01	568	1.316E+01
405	3.200E-02	446	8.512E+00	487	7.231E+00	528	1.173E+01	569	1.321E+01
406	6.000E-03	447	9.910E+00	488	7.275E+00	529	1.177E+01	570	1.317E+01
407	7.900E-02	448	1.143E+01	489	7.377E+00	530	1.184E+01	571	1.321E+01
408	9.300E-03	449	1.328E+01	490	7.446E+00	531	1.190E+01	572	1.322E+01
409	4.700E-02	450	1.492E+01	491	7.499E+00	532	1.193E+01	573	1.325E+01
410	5.900E-02	451	1.663E+01	492	7.610E+00	533	1.201E+01	574	1.329E+01
411	5.530E-02	452	1.789E+01	493	7.723E+00	534	1.201E+01	575	1.332E+01
412	4.690E-02	453	1.901E+01	494	7.835E+00	535	1.212E+01	576	1.332E+01
413	1.470E-02	454	1.968E+01	495	7.988E+00	536	1.213E+01	577	1.337E+01
414	4.470E-02	455	1.994E+01	496	8.128E+00	537	1.218E+01	578	1.341E+01
415	4.000E-02	456	1.943E+01	497	8.233E+00	538	1.221E+01	579	1.344E+01
416	4.490E-02	457	1.876E+01	498	8.437E+00	539	1.229E+01	580	1.348E+01
417	5.320E-02	458	1.783E+01	499	8.548E+00	540	1.237E+01	581	1.348E+01
418	8.850E-02	459	1.646E+01	500	8.733E+00	541	1.238E+01	582	1.356E+01
419	9.210E-02	460	1.542E+01	501	8.908E+00	542	1.238E+01	583	1.362E+01
420	1.477E-01	461	1.442E+01	502	9.067E+00	543	1.243E+01	584	1.364E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.370E+01	626	1.599E+01	667	1.181E+01	708	4.792E+00	749	1.152E+00
586	1.373E+01	627	1.597E+01	668	1.159E+01	709	4.628E+00	750	1.116E+00
587	1.384E+01	628	1.599E+01	669	1.142E+01	710	4.442E+00	751	1.141E+00
588	1.390E+01	629	1.598E+01	670	1.121E+01	711	4.335E+00	752	1.076E+00
589	1.395E+01	630	1.593E+01	671	1.097E+01	712	4.194E+00	753	1.068E+00
590	1.395E+01	631	1.595E+01	672	1.087E+01	713	4.142E+00	754	9.435E-01
591	1.408E+01	632	1.591E+01	673	1.071E+01	714	3.938E+00	755	8.089E-01
592	1.412E+01	633	1.585E+01	674	1.046E+01	715	3.783E+00	756	9.313E-01
593	1.419E+01	634	1.594E+01	675	1.028E+01	716	3.712E+00	757	8.551E-01
594	1.430E+01	635	1.583E+01	676	1.012E+01	717	3.597E+00	758	5.785E-01
595	1.433E+01	636	1.576E+01	677	9.889E+00	718	3.474E+00	759	7.785E-01
596	1.442E+01	637	1.571E+01	678	9.645E+00	719	3.321E+00	760	6.614E-01
597	1.445E+01	638	1.569E+01	679	9.501E+00	720	3.280E+00	761	6.475E-01
598	1.454E+01	639	1.562E+01	680	9.301E+00	721	3.119E+00	762	7.854E-01
599	1.459E+01	640	1.554E+01	681	9.161E+00	722	3.056E+00	763	7.566E-01
600	1.467E+01	641	1.552E+01	682	8.972E+00	723	2.905E+00	764	6.445E-01
601	1.479E+01	642	1.539E+01	683	8.791E+00	724	2.734E+00	765	5.454E-01
602	1.480E+01	643	1.530E+01	684	8.585E+00	725	2.757E+00	766	5.366E-01
603	1.492E+01	644	1.525E+01	685	8.388E+00	726	2.643E+00	767	5.084E-01
604	1.503E+01	645	1.511E+01	686	8.222E+00	727	2.548E+00	768	6.267E-01
605	1.510E+01	646	1.501E+01	687	8.026E+00	728	2.447E+00	769	5.196E-01
606	1.517E+01	647	1.488E+01	688	7.891E+00	729	2.448E+00	770	4.143E-01
607	1.521E+01	648	1.482E+01	689	7.675E+00	730	2.340E+00	771	4.240E-01
608	1.532E+01	649	1.468E+01	690	7.455E+00	731	2.173E+00	772	5.077E-01
609	1.536E+01	650	1.458E+01	691	7.343E+00	732	2.184E+00	773	3.792E-01
610	1.543E+01	651	1.442E+01	692	7.222E+00	733	1.976E+00	774	3.619E-01
611	1.550E+01	652	1.429E+01	693	7.001E+00	734	1.977E+00	775	3.853E-01
612	1.556E+01	653	1.420E+01	694	6.847E+00	735	1.998E+00	776	3.428E-01
613	1.558E+01	654	1.402E+01	695	6.719E+00	736	1.878E+00	777	3.924E-01
614	1.565E+01	655	1.388E+01	696	6.467E+00	737	1.812E+00	778	3.405E-01
615	1.570E+01	656	1.372E+01	697	6.348E+00	738	1.671E+00	779	3.259E-01
616	1.574E+01	657	1.356E+01	698	6.213E+00	739	1.558E+00	780	2.294E-01
617	1.576E+01	658	1.340E+01	699	6.046E+00	740	1.539E+00		
618	1.580E+01	659	1.322E+01	700	5.874E+00	741	1.590E+00		
619	1.586E+01	660	1.305E+01	701	5.792E+00	742	1.573E+00		
620	1.590E+01	661	1.288E+01	702	5.557E+00	743	1.502E+00		
621	1.588E+01	662	1.267E+01	703	5.408E+00	744	1.314E+00		
622	1.593E+01	663	1.249E+01	704	5.279E+00	745	1.352E+00		
623	1.593E+01	664	1.234E+01	705	5.104E+00	746	1.112E+00		
624	1.597E+01	665	1.215E+01	706	5.006E+00	747	1.197E+00		
625	1.597E+01	666	1.195E+01	707	4.840E+00	748	1.221E+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**

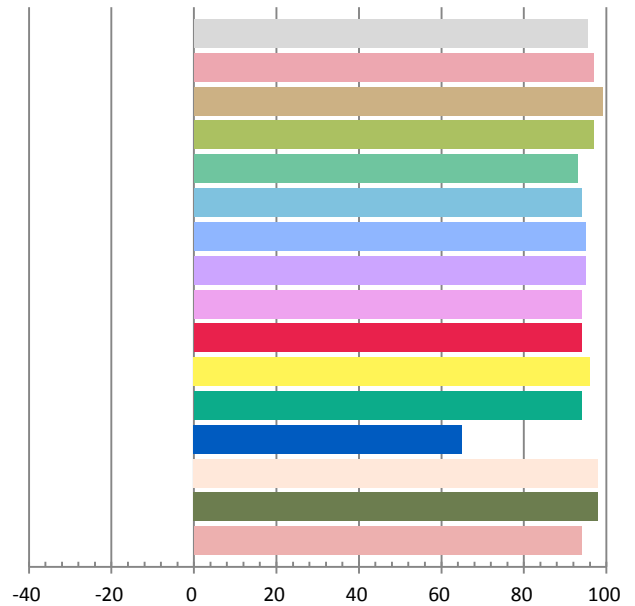
Photometric and Electrical Measurement Result

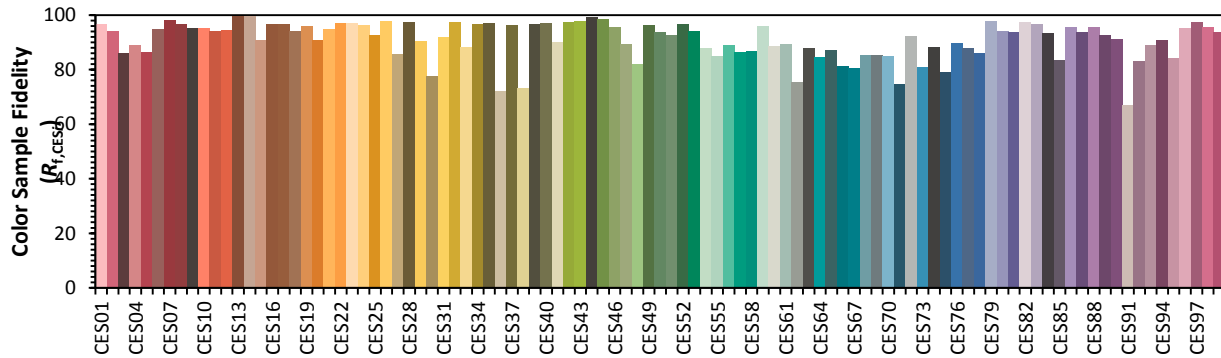
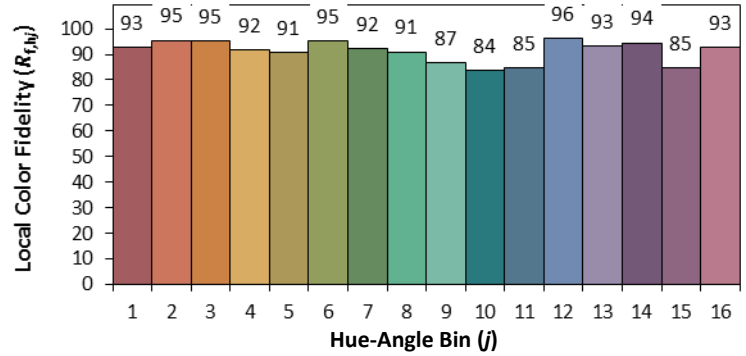
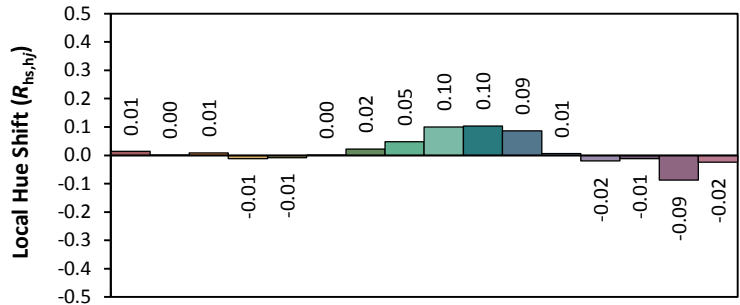
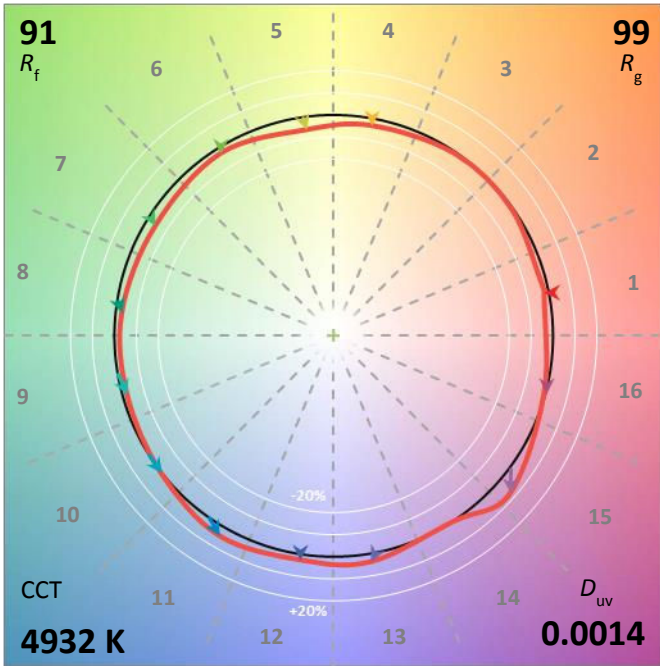
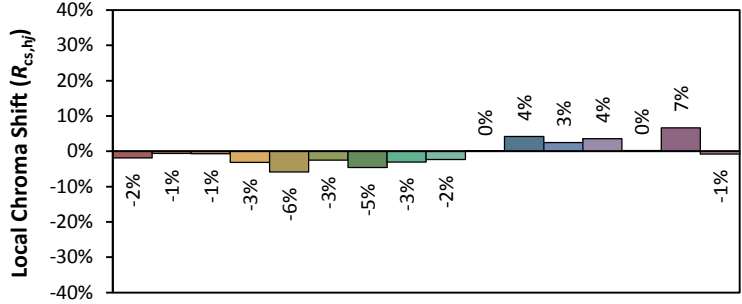
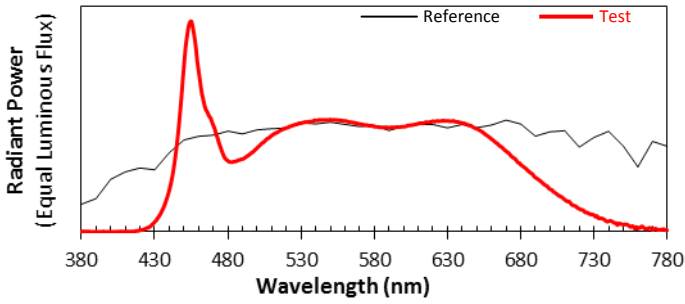
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.0824	9.69	0.9805	945.24	97.55

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
3.387	4933	0.00135	0.3473	0.3561	0.2112	0.4872

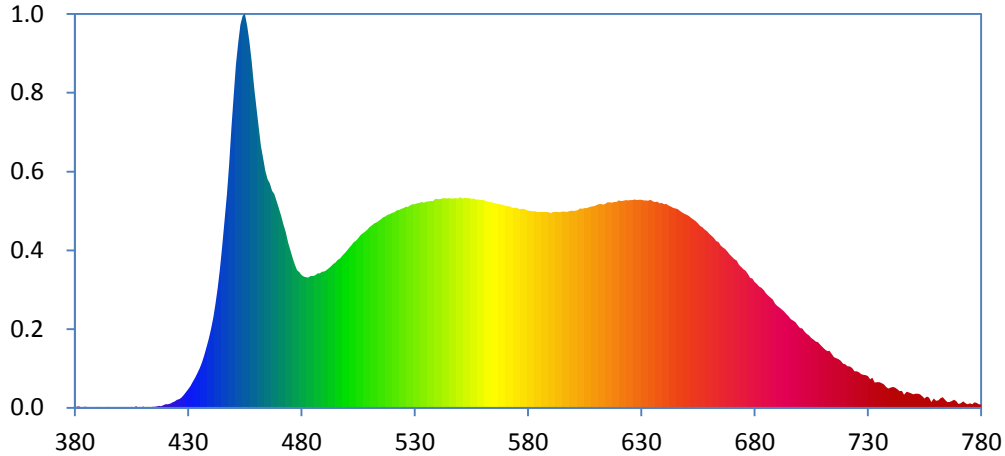
Color Rendering Index

Ra			
95.5			
R1	R2	R3	R4
97	99	97	93
R5	R6	R7	R8
94	95	95	94
R9	R10	R11	R12
94	96	94	65
R13	R14	R15	
98	98	94	





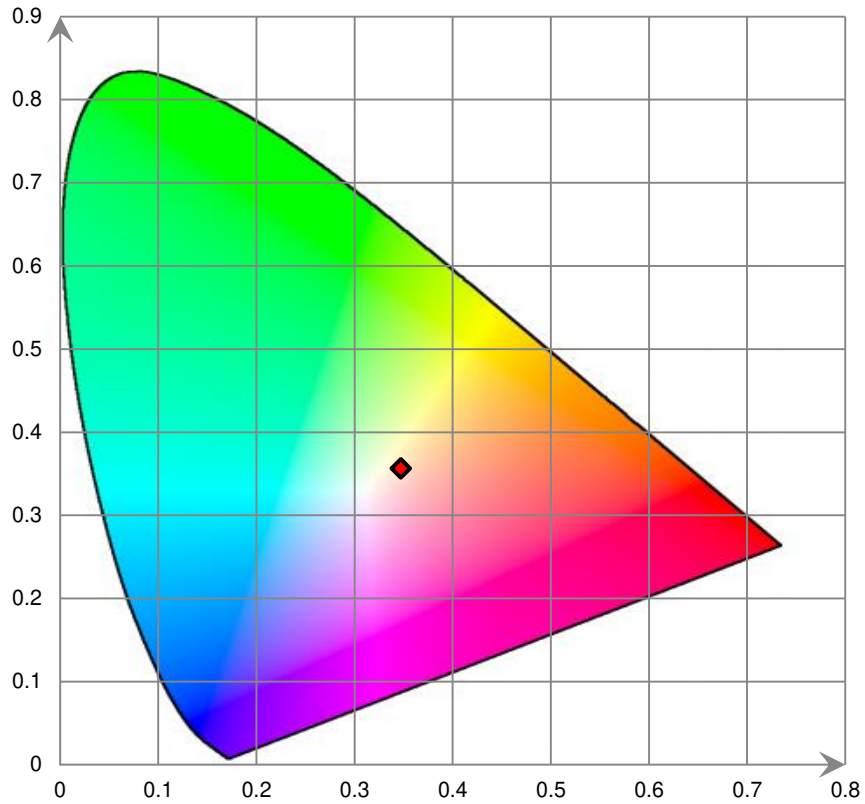
Relative Spectral Power Distribution



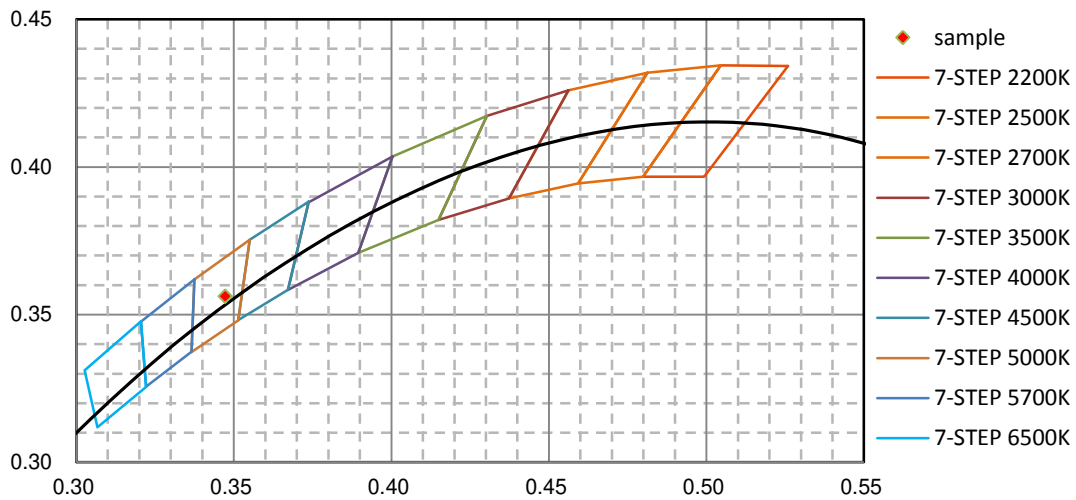
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	4.700E-02	421	2.362E-01	462	1.716E+01	503	1.083E+01	544	1.371E+01
381	7.840E-02	422	2.746E-01	463	1.634E+01	504	1.094E+01	545	1.373E+01
382	7.370E-02	423	3.508E-01	464	1.550E+01	505	1.111E+01	546	1.371E+01
383	2.580E-02	424	4.146E-01	465	1.495E+01	506	1.128E+01	547	1.370E+01
384	6.220E-02	425	5.123E-01	466	1.468E+01	507	1.143E+01	548	1.371E+01
385	7.050E-02	426	5.684E-01	467	1.421E+01	508	1.153E+01	549	1.371E+01
386	6.100E-03	427	6.765E-01	468	1.400E+01	509	1.167E+01	550	1.378E+01
387	3.760E-02	428	8.464E-01	469	1.353E+01	510	1.183E+01	551	1.371E+01
388	2.410E-02	429	1.033E+00	470	1.308E+01	511	1.194E+01	552	1.374E+01
389	2.200E-03	430	1.210E+00	471	1.260E+01	512	1.207E+01	553	1.373E+01
390	5.330E-02	431	1.414E+00	472	1.195E+01	513	1.213E+01	554	1.372E+01
391	2.450E-02	432	1.686E+00	473	1.148E+01	514	1.224E+01	555	1.369E+01
392	6.100E-03	433	1.936E+00	474	1.083E+01	515	1.234E+01	556	1.370E+01
393	2.150E-02	434	2.247E+00	475	1.033E+01	516	1.246E+01	557	1.363E+01
394	1.040E-02	435	2.591E+00	476	9.826E+00	517	1.252E+01	558	1.364E+01
395	5.860E-02	436	2.979E+00	477	9.380E+00	518	1.263E+01	559	1.360E+01
396	3.010E-02	437	3.424E+00	478	9.017E+00	519	1.267E+01	560	1.361E+01
397	1.620E-02	438	3.955E+00	479	8.74E+00	520	1.275E+01	561	1.356E+01
398	1.200E-02	439	4.512E+00	480	8.688E+00	521	1.279E+01	562	1.351E+01
399	6.000E-04	440	5.137E+00	481	8.587E+00	522	1.292E+01	563	1.347E+01
400	0.000E+00	441	5.869E+00	482	8.550E+00	523	1.295E+01	564	1.345E+01
401	2.010E-02	442	6.783E+00	483	8.536E+00	524	1.302E+01	565	1.341E+01
402	2.830E-02	443	7.838E+00	484	8.620E+00	525	1.307E+01	566	1.337E+01
403	2.760E-02	444	9.076E+00	485	8.627E+00	526	1.316E+01	567	1.335E+01
404	3.260E-02	445	1.055E+01	486	8.681E+00	527	1.315E+01	568	1.330E+01
405	5.630E-02	446	1.215E+01	487	8.792E+00	528	1.327E+01	569	1.327E+01
406	1.010E-02	447	1.400E+01	488	8.806E+00	529	1.332E+01	570	1.323E+01
407	9.670E-02	448	1.598E+01	489	8.912E+00	530	1.332E+01	571	1.319E+01
408	1.550E-02	449	1.836E+01	490	8.931E+00	531	1.339E+01	572	1.318E+01
409	4.890E-02	450	2.042E+01	491	9.002E+00	532	1.341E+01	573	1.309E+01
410	7.820E-02	451	2.247E+01	492	9.143E+00	533	1.348E+01	574	1.310E+01
411	4.430E-02	452	2.386E+01	493	9.269E+00	534	1.344E+01	575	1.310E+01
412	6.760E-02	453	2.507E+01	494	9.397E+00	535	1.350E+01	576	1.301E+01
413	2.750E-02	454	2.567E+01	495	9.520E+00	536	1.351E+01	577	1.301E+01
414	6.340E-02	455	2.579E+01	496	9.677E+00	537	1.352E+01	578	1.303E+01
415	5.140E-02	456	2.504E+01	497	9.776E+00	538	1.354E+01	579	1.296E+01
416	7.110E-02	457	2.401E+01	498	9.973E+00	539	1.369E+01	580	1.290E+01
417	1.135E-01	458	2.273E+01	499	1.012E+01	540	1.366E+01	581	1.287E+01
418	1.120E-01	459	2.098E+01	500	1.029E+01	541	1.366E+01	582	1.286E+01
419	1.584E-01	460	1.968E+01	501	1.048E+01	542	1.371E+01	583	1.286E+01
420	2.244E-01	461	1.842E+01	502	1.065E+01	543	1.372E+01	584	1.281E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.282E+01	626	1.359E+01	667	1.039E+01	708	4.289E+00	749	9.501E-01
586	1.282E+01	627	1.364E+01	668	1.022E+01	709	4.107E+00	750	8.860E-01
587	1.282E+01	628	1.360E+01	669	1.004E+01	710	3.954E+00	751	9.292E-01
588	1.282E+01	629	1.362E+01	670	9.887E+00	711	3.820E+00	752	9.181E-01
589	1.281E+01	630	1.361E+01	671	9.734E+00	712	3.715E+00	753	8.682E-01
590	1.274E+01	631	1.358E+01	672	9.632E+00	713	3.732E+00	754	7.440E-01
591	1.282E+01	632	1.357E+01	673	9.371E+00	714	3.518E+00	755	6.058E-01
592	1.283E+01	633	1.355E+01	674	9.209E+00	715	3.313E+00	756	7.288E-01
593	1.282E+01	634	1.363E+01	675	9.077E+00	716	3.253E+00	757	6.632E-01
594	1.279E+01	635	1.352E+01	676	8.976E+00	717	3.179E+00	758	3.793E-01
595	1.284E+01	636	1.346E+01	677	8.757E+00	718	3.084E+00	759	6.035E-01
596	1.284E+01	637	1.348E+01	678	8.512E+00	719	2.899E+00	760	4.576E-01
597	1.282E+01	638	1.339E+01	679	8.454E+00	720	2.857E+00	761	4.871E-01
598	1.287E+01	639	1.341E+01	680	8.234E+00	721	2.712E+00	762	6.227E-01
599	1.290E+01	640	1.333E+01	681	8.108E+00	722	2.707E+00	763	6.912E-01
600	1.289E+01	641	1.334E+01	682	7.948E+00	723	2.604E+00	764	5.144E-01
601	1.291E+01	642	1.325E+01	683	7.848E+00	724	2.391E+00	765	3.812E-01
602	1.296E+01	643	1.318E+01	684	7.682E+00	725	2.383E+00	766	3.790E-01
603	1.305E+01	644	1.309E+01	685	7.484E+00	726	2.315E+00	767	4.308E-01
604	1.303E+01	645	1.305E+01	686	7.335E+00	727	2.195E+00	768	5.203E-01
605	1.308E+01	646	1.301E+01	687	7.201E+00	728	2.155E+00	769	4.436E-01
606	1.308E+01	647	1.289E+01	688	7.082E+00	729	2.125E+00	770	2.461E-01
607	1.314E+01	648	1.278E+01	689	6.814E+00	730	2.065E+00	771	2.961E-01
608	1.318E+01	649	1.270E+01	690	6.666E+00	731	1.863E+00	772	4.264E-01
609	1.320E+01	650	1.263E+01	691	6.549E+00	732	1.968E+00	773	2.972E-01
610	1.326E+01	651	1.255E+01	692	6.422E+00	733	1.656E+00	774	2.376E-01
611	1.333E+01	652	1.243E+01	693	6.298E+00	734	1.681E+00	775	2.916E-01
612	1.335E+01	653	1.233E+01	694	6.145E+00	735	1.682E+00	776	2.330E-01
613	1.329E+01	654	1.222E+01	695	5.985E+00	736	1.615E+00	777	3.448E-01
614	1.334E+01	655	1.207E+01	696	5.797E+00	737	1.529E+00	778	3.043E-01
615	1.345E+01	656	1.190E+01	697	5.701E+00	738	1.358E+00	779	2.227E-01
616	1.344E+01	657	1.182E+01	698	5.602E+00	739	1.256E+00	780	2.010E-01
617	1.342E+01	658	1.167E+01	699	5.391E+00	740	1.311E+00		
618	1.348E+01	659	1.154E+01	700	5.210E+00	741	1.366E+00		
619	1.348E+01	660	1.137E+01	701	5.191E+00	742	1.323E+00		
620	1.358E+01	661	1.124E+01	702	4.984E+00	743	1.214E+00		
621	1.353E+01	662	1.110E+01	703	4.839E+00	744	1.082E+00		
622	1.354E+01	663	1.092E+01	704	4.730E+00	745	1.099E+00		
623	1.360E+01	664	1.084E+01	705	4.557E+00	746	8.482E-01		
624	1.357E+01	665	1.063E+01	706	4.468E+00	747	1.053E+00		
625	1.359E+01	666	1.050E+01	707	4.331E+00	748	9.942E-01		

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**

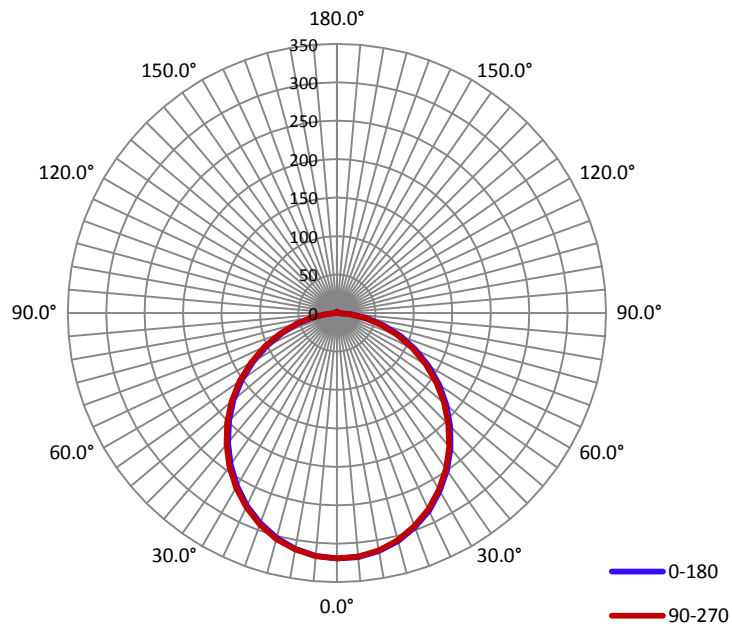
Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
120.0	60	0.0820	9.71	0.9840

Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	$I_{max}(cd)$	S/MH(C0/180)	S/MH(C90/270)
878.5	90.52	319.6	1.23	1.23

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50% I_{max}):	108.6	108.6	108.5	108.6	108.6
Field Angle(10% I_{max}):	161.4	161.1	160.9	161.3	161.2

Luminous Intensity (cd) Distribution Data

C \ y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	319	319	319	319	319	319	319	319
5.0°	319	319	318	318	318	318	318	317
10.0°	314	314	314	314	313	313	313	312
15.0°	307	307	307	306	306	305	304	303
20.0°	296	297	296	296	295	294	293	292
25.0°	284	284	283	282	282	280	280	278
30.0°	267	268	267	266	265	264	263	262
35.0°	250	250	249	248	247	246	245	244
40.0°	230	230	229	228	227	226	224	223
45.0°	208	208	208	207	205	204	202	201
50.0°	186	186	185	184	182	180	179	178
55.0°	162	162	161	160	158	157	155	154
60.0°	138	137	137	135	134	132	130	129
65.0°	113	113	112	110	108	107	106	104
70.0°	88	88	86	85	84	82	81	80
75.0°	64	63	62	61	59	58	56	56
80.0°	40	40	39	38	36	35	33	33
85.0°	19	19	18	17	15	13	12	12
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°	1	1	1	1	1	1	1	1
145.0°	1	1	1	1	1	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°	2	2	2	2	2	2	2	2
180.0°	0	0	0	0	0	0	0	0

Luminous Intensity (cd) Distribution Data (cont.)

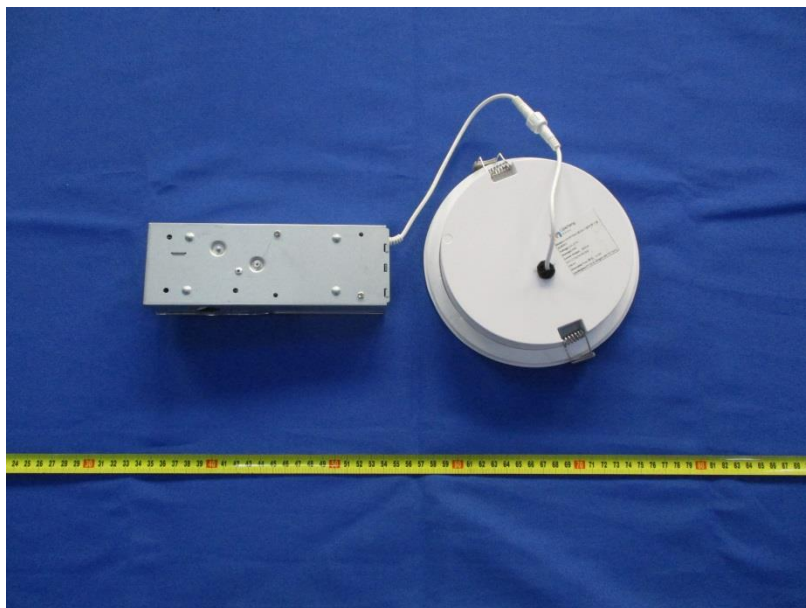
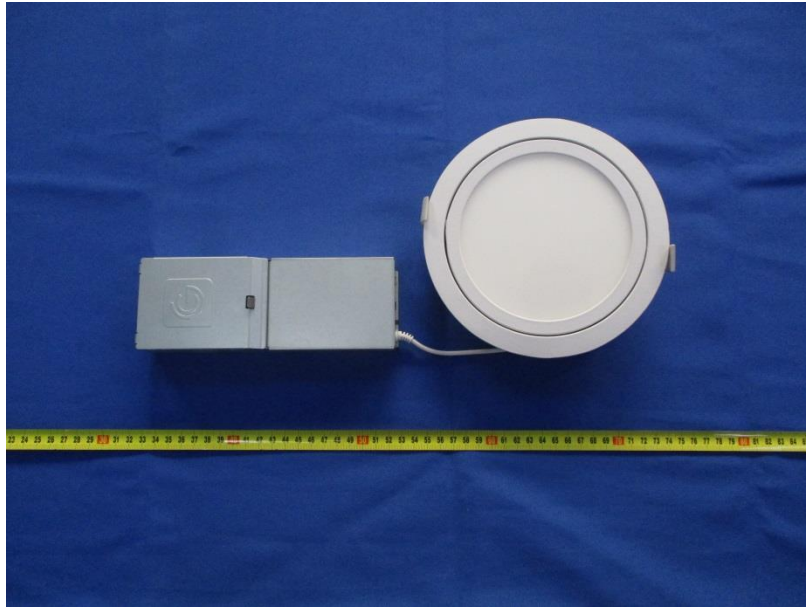
C \ Y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	319	319	319	319	319	319	319	319
5.0°	317	317	317	317	318	318	318	318
10.0°	311	311	311	312	312	313	313	313
15.0°	303	303	303	303	304	305	305	306
20.0°	291	291	291	292	293	293	295	295
25.0°	277	277	277	278	279	280	281	281
30.0°	260	260	260	261	262	263	265	265
35.0°	241	241	242	243	244	245	246	247
40.0°	220	220	221	222	223	225	226	227
45.0°	198	198	199	200	202	203	205	206
50.0°	175	175	176	177	178	180	182	183
55.0°	151	151	151	152	154	156	158	159
60.0°	125	125	126	127	129	131	133	134
65.0°	100	100	101	102	104	106	108	108
70.0°	75	75	75	77	79	81	83	84
75.0°	52	52	52	53	55	57	59	60
80.0°	29	29	30	31	32	34	36	37
85.0°	10	10	10	11	12	14	15	17
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°	1	1	0	1	1	0	0	0
145.0°	1	1	1	1	1	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°	2	2	2	2	2	2	2	2
180.0°	0	0	0	0	0	0	0	0

Zonal Lumen Density Measurement

Deg	Flux (lm)	%
0-5	7.5	0.85
5-10	22.5	2.57
10-15	36.6	4.18
15-20	49.3	5.61
20-25	60.2	6.86
25-30	68.8	7.83
30-35	75.0	8.54
35-40	78.5	8.93
40-45	79.4	9.03
45-50	77.4	8.82
50-55	73.1	8.32
55-60	66.4	7.56
60-65	57.7	6.57
65-70	47.4	5.40
70-75	36.2	4.12
75-80	24.5	2.78
80-85	13.1	1.50
85-90	3.0	0.35
90-95	0.0	0.00
95-100	0.0	0.00
100-105	0.0	0.00
105-110	0.0	0.00
110-115	0.0	0.00
115-120	0.0	0.00
120-125	0.0	0.00
125-130	0.0	0.00
130-135	0.0	0.00
135-140	0.0	0.00
140-145	0.0	0.00
145-150	0.0	0.04
150-155	0.0	0.05
155-160	0.0	0.04
160-165	0.0	0.00
165-170	0.0	0.00
170-175	0.0	0.00
175-180	0.0	0.00

Deg	Flux (lm)	%
0-5	7.6	0.87
0-10	30.2	3.43
0-15	66.8	7.60
0-20	116.1	13.22
0-25	176.3	20.07
0-30	245.1	27.90
0-35	320.0	36.43
0-40	398.5	45.37
0-45	477.8	54.39
0-50	555.3	63.22
0-55	628.4	71.54
0-60	694.9	79.10
0-65	752.5	85.67
0-70	800.0	91.07
0-75	836.1	95.18
0-80	860.6	97.97
0-85	873.7	99.46
0-90	876.7	99.80
0-95	876.7	99.80
0-100	876.7	99.80
0-105	876.7	99.80
0-110	876.7	99.80
0-115	876.7	99.80
0-120	876.7	99.80
0-125	876.7	99.81
0-130	876.8	99.81
0-135	876.9	99.83
0-140	877.1	99.85
0-145	877.3	99.87
0-150	877.5	99.89
0-155	877.7	99.92
0-160	878.0	99.94
0-165	878.2	99.97
0-170	878.3	99.98
0-175	878.4	100.00
0-180	878.5	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*****