

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: MCR4/9CCT5S/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:	RKSB220907004-10-2
Test Date:	2022-09-08 to 2022-09-12
Report Date:	2022-09-17
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:	MCR4/9CCT5S/DUALDIM/EXT
Manufacturer:	GREEN CREATIVE LTD
Brand Name:	GREEN CREATIVE
Product Designation:	Ceiling Mount
Burning Time Before Test:	0hour(For New Products)
Color Tunable:	White-Tunable
CCT Range:	2700K, 3000K, 3500K, 4000K, 5000K
Least Efficient Setting:	2700K
Most Consumptive Setting:	2700K
Default Setting:	3500K

Rated Values:

Rated Voltage/Frequency:	120-277V 50/60Hz
Rated Power:	8W
Nominal CCT:	2700K/3000K/3500K/4000K/5000K
Nominal Lumen Output:	580lm/600lm/630lm/660lm/690lm

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 8W

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

Test orientation: **Downward**

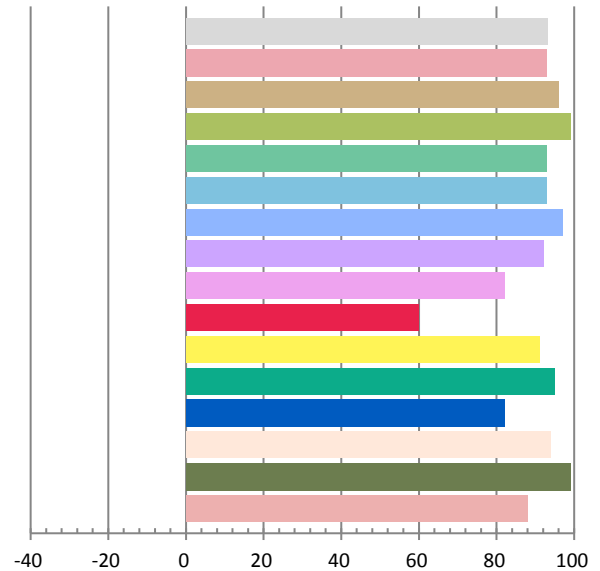
Photometric and Electrical Measurement Result

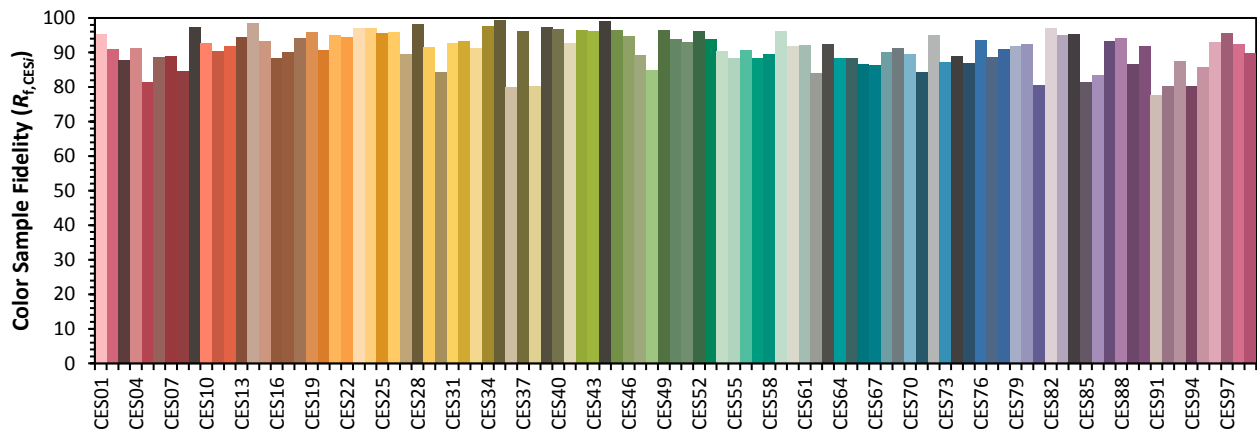
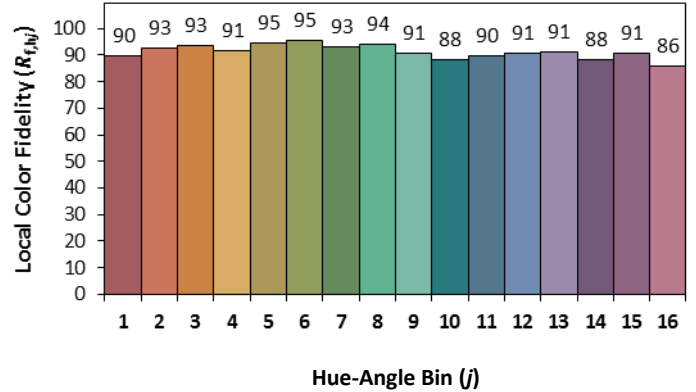
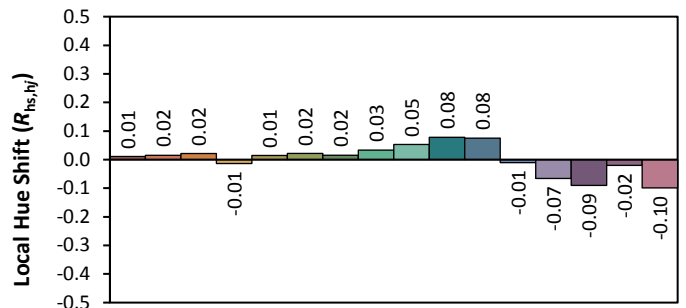
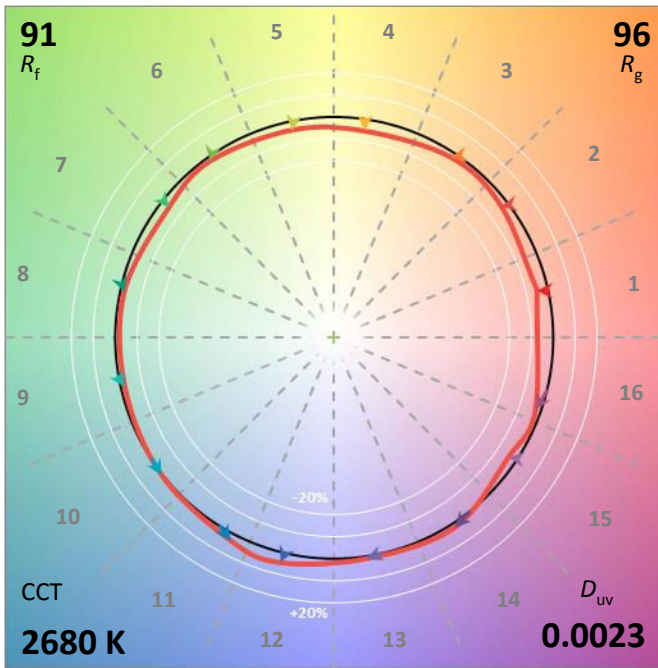
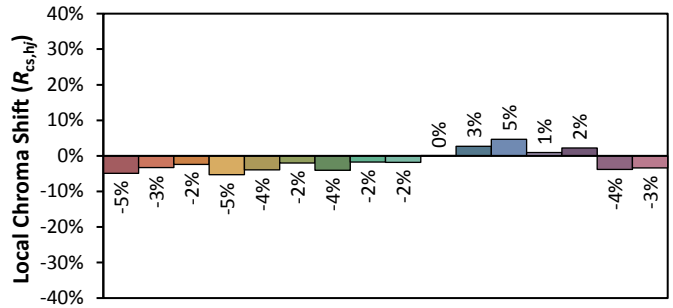
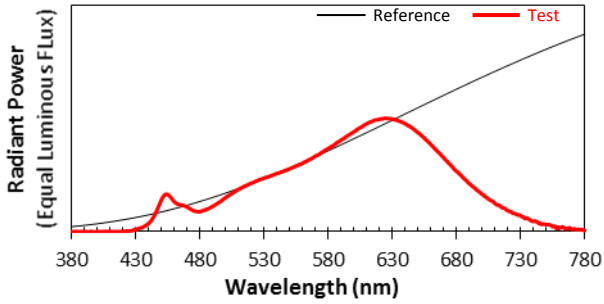
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.0709	8.31	0.9766	667.29	80.3

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
2.333	2681	0.00228	0.4655	0.4181	0.2628	0.5310

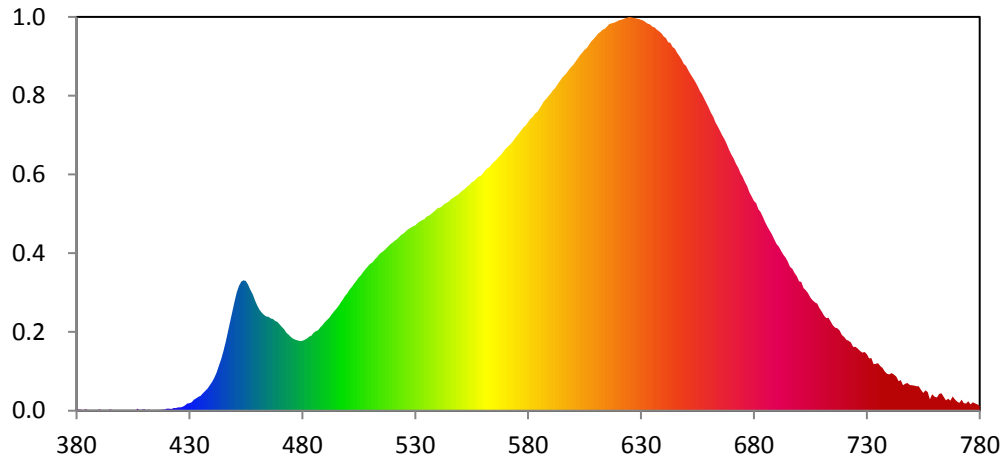
Color Rendering Index

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





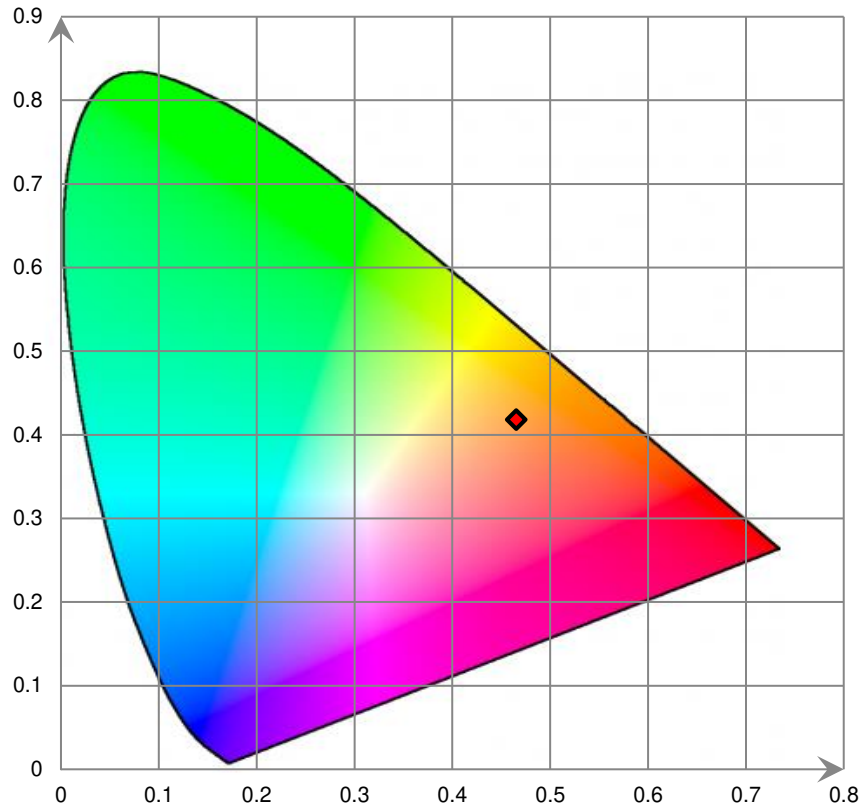
Relative Spectral Power Distribution



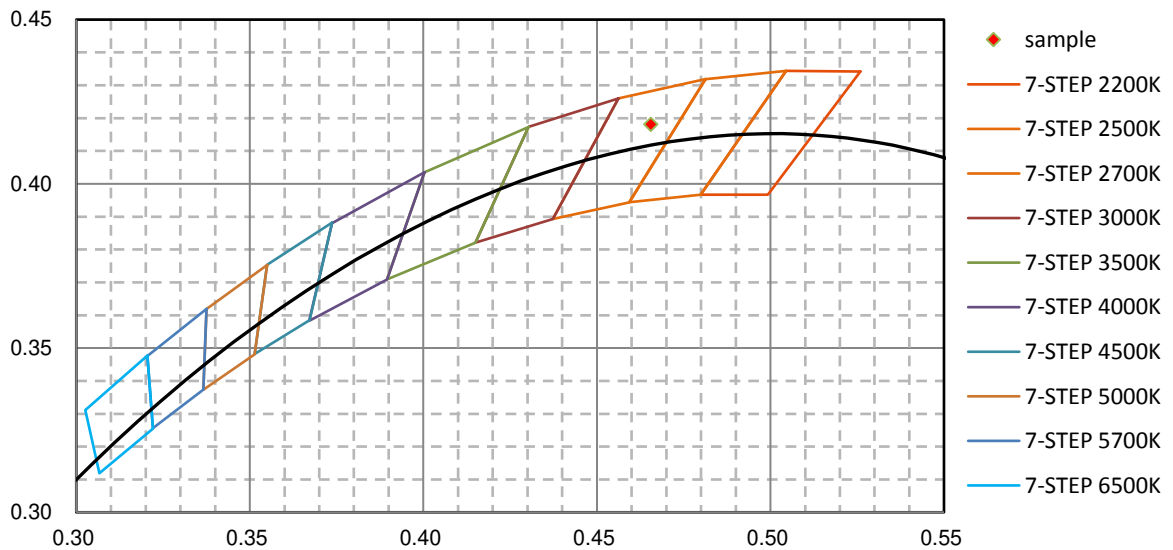
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	5.230E-02	421	7.350E-02	462	3.659E+00	503	4.748E+00	544	7.758E+00
381	3.970E-02	422	6.180E-02	463	3.579E+00	504	4.857E+00	545	7.812E+00
382	4.410E-02	423	1.016E-01	464	3.519E+00	505	4.968E+00	546	7.890E+00
383	1.110E-02	424	1.016E-01	465	3.501E+00	506	5.050E+00	547	7.953E+00
384	5.640E-02	425	1.248E-01	466	3.445E+00	507	5.176E+00	548	8.014E+00
385	3.200E-02	426	1.230E-01	467	3.419E+00	508	5.276E+00	549	8.063E+00
386	2.400E-03	427	1.510E-01	468	3.345E+00	509	5.376E+00	550	8.150E+00
387	2.530E-02	428	2.017E-01	469	3.308E+00	510	5.470E+00	551	8.215E+00
388	7.100E-03	429	2.712E-01	470	3.216E+00	511	5.537E+00	552	8.279E+00
389	9.200E-03	430	2.871E-01	471	3.128E+00	512	5.635E+00	553	8.364E+00
390	5.060E-02	431	3.194E-01	472	3.042E+00	513	5.722E+00	554	8.417E+00
391	1.650E-02	432	4.175E-01	473	2.906E+00	514	5.828E+00	555	8.516E+00
392	7.200E-03	433	4.551E-01	474	2.837E+00	515	5.906E+00	556	8.562E+00
393	3.700E-03	434	5.186E-01	475	2.741E+00	516	5.964E+00	557	8.647E+00
394	1.490E-02	435	5.603E-01	476	2.681E+00	517	6.043E+00	558	8.729E+00
395	4.850E-02	436	6.474E-01	477	2.640E+00	518	6.124E+00	559	8.756E+00
396	7.700E-03	437	7.321E-01	478	2.623E+00	519	6.217E+00	560	8.855E+00
397	1.020E-02	438	8.190E-01	479	2.600E+00	520	6.275E+00	561	8.955E+00
398	9.000E-04	439	9.392E-01	480	2.611E+00	521	6.345E+00	562	9.037E+00
399	0.000E+00	440	1.083E+00	481	2.648E+00	522	6.401E+00	563	9.087E+00
400	0.000E+00	441	1.236E+00	482	2.693E+00	523	6.488E+00	564	9.218E+00
401	1.360E-02	442	1.426E+00	483	2.770E+00	524	6.574E+00	565	9.297E+00
402	2.210E-02	443	1.674E+00	484	2.803E+00	525	6.616E+00	566	9.379E+00
403	1.190E-02	444	1.917E+00	485	2.905E+00	526	6.705E+00	567	9.475E+00
404	1.730E-02	445	2.218E+00	486	2.962E+00	527	6.774E+00	568	9.556E+00
405	3.260E-02	446	2.551E+00	487	3.006E+00	528	6.823E+00	569	9.668E+00
406	5.300E-03	447	2.930E+00	488	3.108E+00	529	6.884E+00	570	9.771E+00
407	7.230E-02	448	3.316E+00	489	3.192E+00	530	6.920E+00	571	9.855E+00
408	6.100E-03	449	3.696E+00	490	3.296E+00	531	6.995E+00	572	9.922E+00
409	4.040E-02	450	4.081E+00	491	3.380E+00	532	7.064E+00	573	1.002E+01
410	5.190E-02	451	4.425E+00	492	3.469E+00	533	7.109E+00	574	1.014E+01
411	2.130E-02	452	4.661E+00	493	3.594E+00	534	7.139E+00	575	1.025E+01
412	4.360E-02	453	4.816E+00	494	3.705E+00	535	7.236E+00	576	1.035E+01
413	1.900E-03	454	4.860E+00	495	3.805E+00	536	7.276E+00	577	1.047E+01
414	2.890E-02	455	4.839E+00	496	3.912E+00	537	7.335E+00	578	1.057E+01
415	2.180E-02	456	4.711E+00	497	4.035E+00	538	7.404E+00	579	1.064E+01
416	3.010E-02	457	4.515E+00	498	4.157E+00	539	7.476E+00	580	1.076E+01
417	2.880E-02	458	4.338E+00	499	4.288E+00	540	7.555E+00	581	1.088E+01
418	3.870E-02	459	4.116E+00	500	4.390E+00	541	7.572E+00	582	1.096E+01
419	3.640E-02	460	3.921E+00	501	4.528E+00	542	7.630E+00	583	1.108E+01
420	7.370E-02	461	3.760E+00	502	4.631E+00	543	7.720E+00	584	1.114E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.127E+01	626	1.466E+01	667	1.013E+01	708	3.992E+00	749	9.629E-01
586	1.141E+01	627	1.465E+01	668	9.950E+00	709	3.828E+00	750	9.438E-01
587	1.154E+01	628	1.463E+01	669	9.746E+00	710	3.700E+00	751	9.357E-01
588	1.163E+01	629	1.461E+01	670	9.568E+00	711	3.552E+00	752	9.181E-01
589	1.173E+01	630	1.458E+01	671	9.400E+00	712	3.457E+00	753	9.077E-01
590	1.184E+01	631	1.455E+01	672	9.211E+00	713	3.466E+00	754	7.879E-01
591	1.195E+01	632	1.449E+01	673	9.059E+00	714	3.325E+00	755	6.670E-01
592	1.204E+01	633	1.444E+01	674	8.861E+00	715	3.182E+00	756	7.569E-01
593	1.217E+01	634	1.441E+01	675	8.725E+00	716	3.102E+00	757	7.033E-01
594	1.229E+01	635	1.433E+01	676	8.525E+00	717	3.070E+00	758	4.183E-01
595	1.241E+01	636	1.429E+01	677	8.378E+00	718	2.992E+00	759	6.200E-01
596	1.250E+01	637	1.421E+01	678	8.150E+00	719	2.822E+00	760	5.147E-01
597	1.259E+01	638	1.415E+01	679	7.996E+00	720	2.747E+00	761	4.951E-01
598	1.271E+01	639	1.408E+01	680	7.823E+00	721	2.646E+00	762	6.256E-01
599	1.281E+01	640	1.396E+01	681	7.740E+00	722	2.612E+00	763	6.480E-01
600	1.291E+01	641	1.390E+01	682	7.518E+00	723	2.552E+00	764	5.205E-01
601	1.302E+01	642	1.375E+01	683	7.407E+00	724	2.385E+00	765	3.839E-01
602	1.315E+01	643	1.371E+01	684	7.223E+00	725	2.388E+00	766	4.416E-01
603	1.326E+01	644	1.357E+01	685	7.032E+00	726	2.315E+00	767	3.822E-01
604	1.337E+01	645	1.351E+01	686	6.868E+00	727	2.228E+00	768	5.283E-01
605	1.347E+01	646	1.335E+01	687	6.721E+00	728	2.163E+00	769	4.210E-01
606	1.353E+01	647	1.323E+01	688	6.582E+00	729	2.188E+00	770	3.350E-01
607	1.366E+01	648	1.311E+01	689	6.378E+00	730	2.108E+00	771	2.988E-01
608	1.378E+01	649	1.293E+01	690	6.216E+00	731	1.952E+00	772	4.077E-01
609	1.387E+01	650	1.286E+01	691	6.119E+00	732	1.968E+00	773	2.842E-01
610	1.396E+01	651	1.270E+01	692	5.961E+00	733	1.742E+00	774	2.680E-01
611	1.407E+01	652	1.256E+01	693	5.825E+00	734	1.754E+00	775	3.471E-01
612	1.413E+01	653	1.242E+01	694	5.706E+00	735	1.775E+00	776	2.345E-01
613	1.421E+01	654	1.226E+01	695	5.557E+00	736	1.667E+00	777	3.189E-01
614	1.424E+01	655	1.211E+01	696	5.361E+00	737	1.589E+00	778	2.622E-01
615	1.432E+01	656	1.193E+01	697	5.296E+00	738	1.464E+00	779	2.383E-01
616	1.442E+01	657	1.180E+01	698	5.135E+00	739	1.381E+00	780	1.838E-01
617	1.445E+01	658	1.163E+01	699	5.015E+00	740	1.355E+00		
618	1.448E+01	659	1.147E+01	700	4.828E+00	741	1.402E+00		
619	1.451E+01	660	1.130E+01	701	4.808E+00	742	1.359E+00		
620	1.456E+01	661	1.111E+01	702	4.583E+00	743	1.274E+00		
621	1.457E+01	662	1.096E+01	703	4.489E+00	744	1.102E+00		
622	1.460E+01	663	1.075E+01	704	4.386E+00	745	1.144E+00		
623	1.464E+01	664	1.060E+01	705	4.227E+00	746	9.501E-01		
624	1.467E+01	665	1.044E+01	706	4.128E+00	747	1.004E+00		
625	1.469E+01	666	1.027E+01	707	4.038E+00	748	1.031E+00		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles



Control Setting: 3000K 8W

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

Test orientation: **Downward**

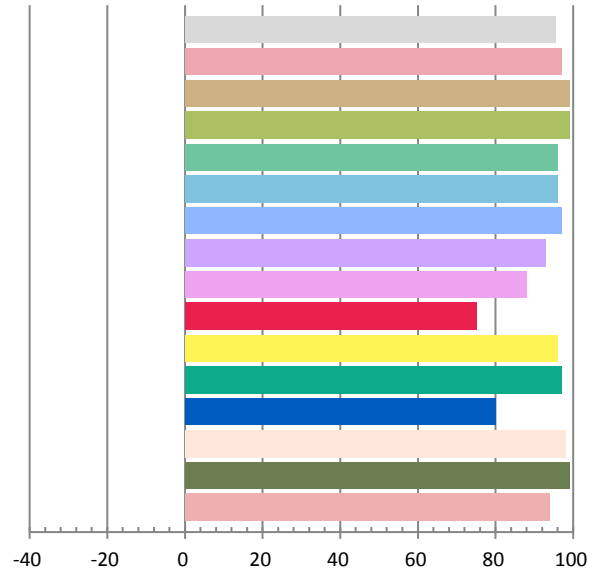
Photometric and Electrical Measurement Result

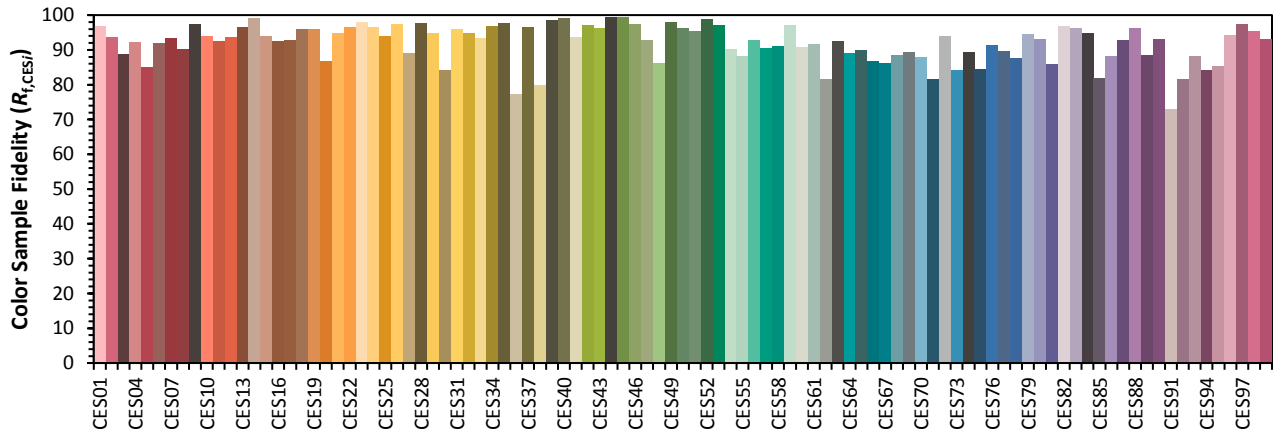
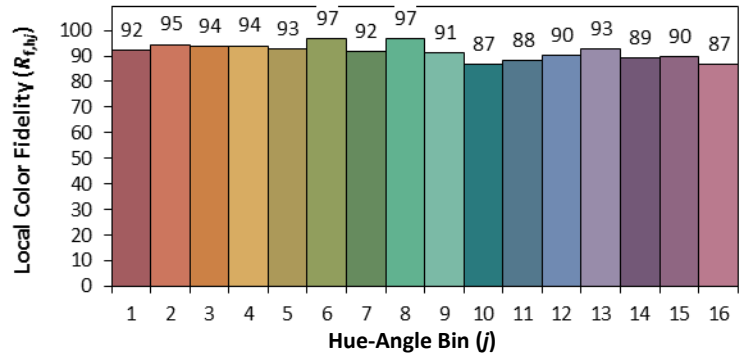
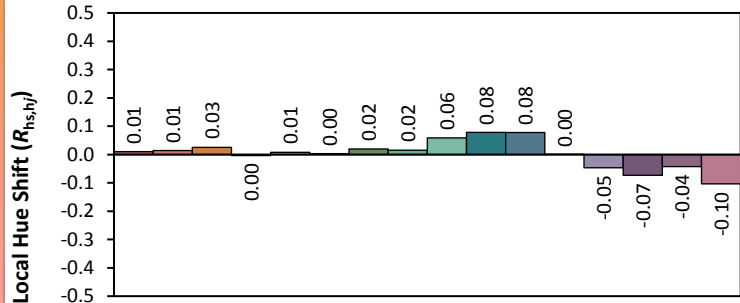
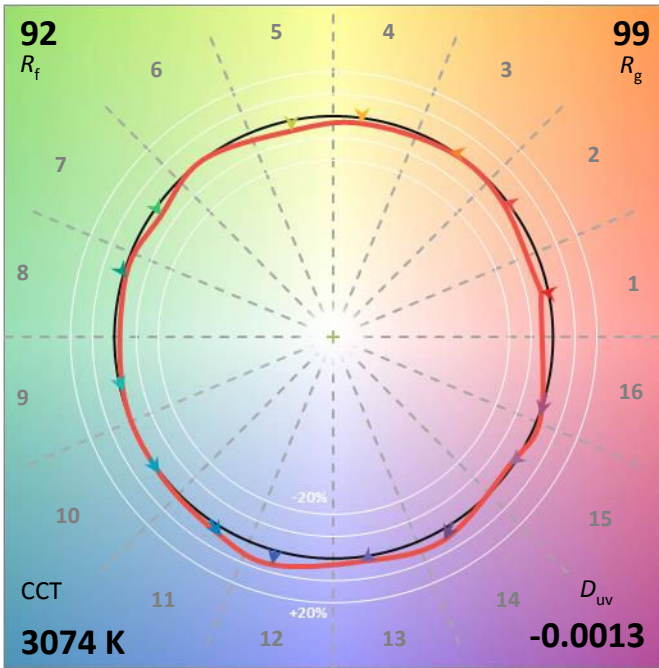
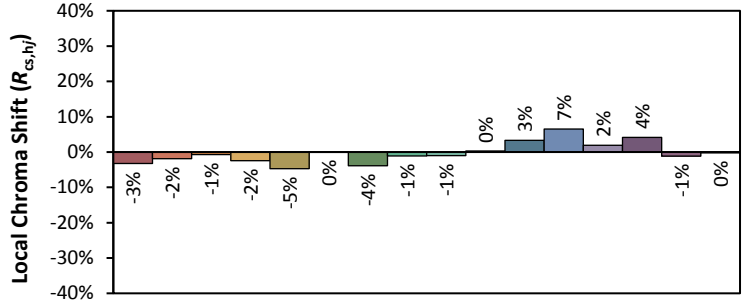
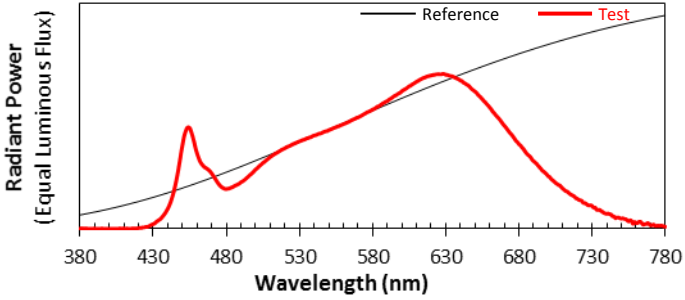
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.0703	8.24	0.9768	709.49	86.11

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
2.506	3074	-0.00135	0.4299	0.3982	0.2485	0.5180

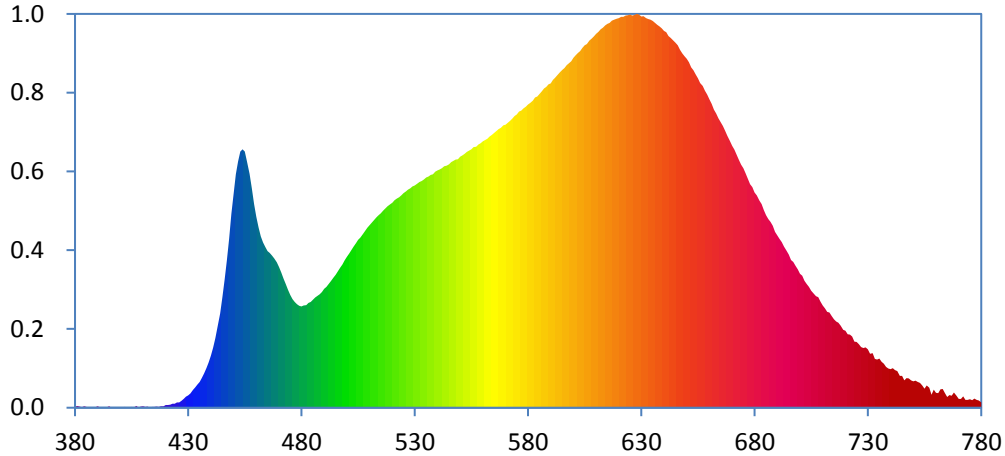
Color Rendering Index

Ra			
95.5			
R1	R2	R3	R4
97	99	99	96
R5	R6	R7	R8
96	97	93	88
R9	R10	R11	R12
75	96	97	80
R13	R14	R15	
98	99	94	





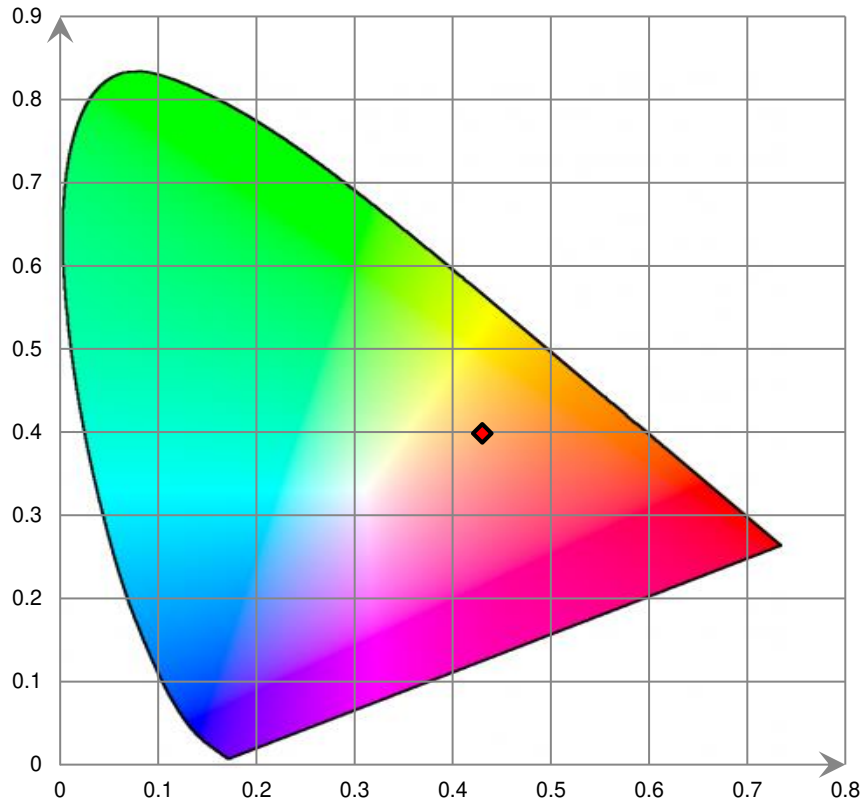
Relative Spectral Power Distribution



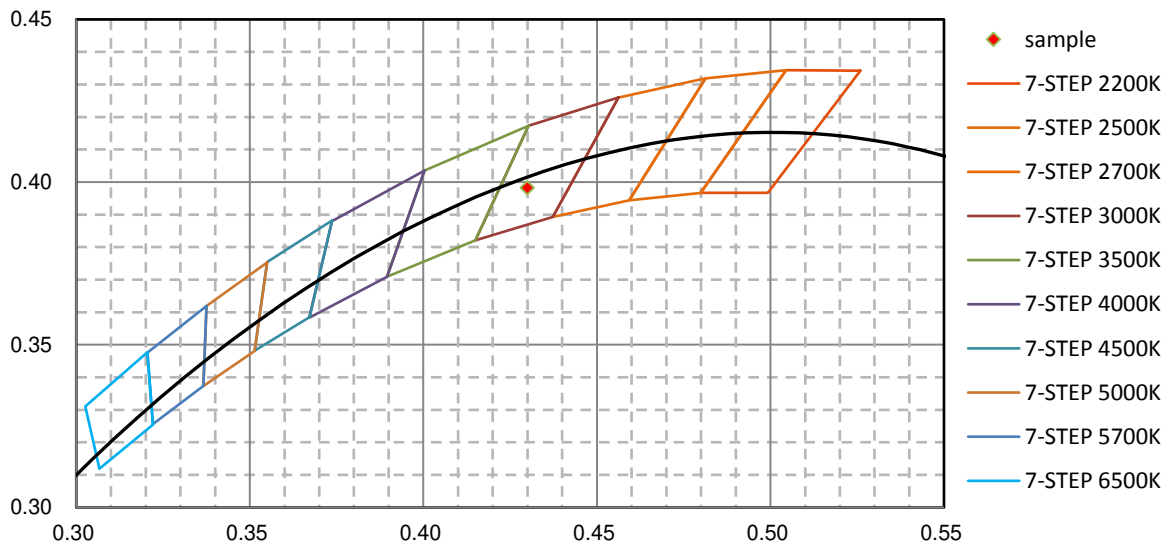
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	3.310E-02	421	1.022E-01	462	6.200E+00	503	5.835E+00	544	8.763E+00
381	6.100E-02	422	1.068E-01	463	5.986E+00	504	5.949E+00	545	8.806E+00
382	4.370E-02	423	1.457E-01	464	5.826E+00	505	6.080E+00	546	8.893E+00
383	2.180E-02	424	1.472E-01	465	5.674E+00	506	6.164E+00	547	8.941E+00
384	5.280E-02	425	1.951E-01	466	5.606E+00	507	6.288E+00	548	8.983E+00
385	2.820E-02	426	1.914E-01	467	5.511E+00	508	6.403E+00	549	9.002E+00
386	2.500E-03	427	2.443E-01	468	5.404E+00	509	6.513E+00	550	9.093E+00
387	1.770E-02	428	3.173E-01	469	5.271E+00	510	6.611E+00	551	9.142E+00
388	9.800E-03	429	3.944E-01	470	5.093E+00	511	6.704E+00	552	9.195E+00
389	1.840E-02	430	4.494E-01	471	4.895E+00	512	6.798E+00	553	9.260E+00
390	5.280E-02	431	5.165E-01	472	4.675E+00	513	6.890E+00	554	9.309E+00
391	1.330E-02	432	6.483E-01	473	4.474E+00	514	6.967E+00	555	9.352E+00
392	5.500E-03	433	7.391E-01	474	4.272E+00	515	7.043E+00	556	9.432E+00
393	9.100E-03	434	8.386E-01	475	4.081E+00	516	7.135E+00	557	9.452E+00
394	1.440E-02	435	9.298E-01	476	3.934E+00	517	7.210E+00	558	9.534E+00
395	4.670E-02	436	1.082E+00	477	3.824E+00	518	7.291E+00	559	9.573E+00
396	3.000E-03	437	1.245E+00	478	3.749E+00	519	7.361E+00	560	9.642E+00
397	1.360E-02	438	1.430E+00	479	3.685E+00	520	7.422E+00	561	9.692E+00
398	7.900E-03	439	1.641E+00	480	3.673E+00	521	7.517E+00	562	9.745E+00
399	4.000E-04	440	1.886E+00	481	3.704E+00	522	7.571E+00	563	9.814E+00
400	0.000E+00	441	2.169E+00	482	3.716E+00	523	7.616E+00	564	9.873E+00
401	1.770E-02	442	2.518E+00	483	3.790E+00	524	7.687E+00	565	9.952E+00
402	2.880E-02	443	2.934E+00	484	3.832E+00	525	7.768E+00	566	1.002E+01
403	1.820E-02	444	3.411E+00	485	3.909E+00	526	7.828E+00	567	1.008E+01
404	1.660E-02	445	3.999E+00	486	3.993E+00	527	7.893E+00	568	1.013E+01
405	2.830E-02	446	4.638E+00	487	4.045E+00	528	7.939E+00	569	1.022E+01
406	5.100E-03	447	5.333E+00	488	4.108E+00	529	8.009E+00	570	1.025E+01
407	6.570E-02	448	6.114E+00	489	4.184E+00	530	8.053E+00	571	1.032E+01
408	5.800E-03	449	7.014E+00	490	4.310E+00	531	8.110E+00	572	1.039E+01
409	3.730E-02	450	7.737E+00	491	4.373E+00	532	8.174E+00	573	1.047E+01
410	5.040E-02	451	8.453E+00	492	4.475E+00	533	8.206E+00	574	1.056E+01
411	2.810E-02	452	8.921E+00	493	4.580E+00	534	8.264E+00	575	1.062E+01
412	3.830E-02	453	9.271E+00	494	4.705E+00	535	8.339E+00	576	1.072E+01
413	8.000E-03	454	9.351E+00	495	4.814E+00	536	8.368E+00	577	1.076E+01
414	2.680E-02	455	9.276E+00	496	4.947E+00	537	8.425E+00	578	1.083E+01
415	2.490E-02	456	8.900E+00	497	5.067E+00	538	8.448E+00	579	1.089E+01
416	3.730E-02	457	8.463E+00	498	5.186E+00	539	8.551E+00	580	1.098E+01
417	3.120E-02	458	7.942E+00	499	5.333E+00	540	8.592E+00	581	1.104E+01
418	4.660E-02	459	7.370E+00	500	5.459E+00	541	8.622E+00	582	1.112E+01
419	4.780E-02	460	6.912E+00	501	5.584E+00	542	8.674E+00	583	1.123E+01
420	9.510E-02	461	6.529E+00	502	5.709E+00	543	8.746E+00	584	1.127E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.136E+01	626	1.421E+01	667	1.003E+01	708	3.998E+00	749	9.870E-01
586	1.145E+01	627	1.422E+01	668	9.843E+00	709	3.843E+00	750	9.568E-01
587	1.155E+01	628	1.426E+01	669	9.655E+00	710	3.697E+00	751	9.822E-01
588	1.162E+01	629	1.424E+01	670	9.485E+00	711	3.596E+00	752	9.286E-01
589	1.171E+01	630	1.417E+01	671	9.339E+00	712	3.472E+00	753	9.043E-01
590	1.175E+01	631	1.417E+01	672	9.158E+00	713	3.450E+00	754	8.022E-01
591	1.187E+01	632	1.411E+01	673	8.972E+00	714	3.316E+00	755	6.913E-01
592	1.195E+01	633	1.407E+01	674	8.801E+00	715	3.207E+00	756	8.091E-01
593	1.205E+01	634	1.405E+01	675	8.669E+00	716	3.119E+00	757	7.259E-01
594	1.215E+01	635	1.400E+01	676	8.483E+00	717	3.071E+00	758	4.672E-01
595	1.223E+01	636	1.393E+01	677	8.292E+00	718	2.967E+00	759	6.540E-01
596	1.229E+01	637	1.386E+01	678	8.094E+00	719	2.819E+00	760	5.364E-01
597	1.240E+01	638	1.380E+01	679	7.984E+00	720	2.783E+00	761	5.260E-01
598	1.248E+01	639	1.374E+01	680	7.793E+00	721	2.665E+00	762	6.639E-01
599	1.254E+01	640	1.364E+01	681	7.686E+00	722	2.643E+00	763	6.783E-01
600	1.268E+01	641	1.360E+01	682	7.504E+00	723	2.574E+00	764	5.300E-01
601	1.276E+01	642	1.346E+01	683	7.371E+00	724	2.395E+00	765	3.854E-01
602	1.284E+01	643	1.339E+01	684	7.152E+00	725	2.379E+00	766	4.563E-01
603	1.292E+01	644	1.330E+01	685	6.972E+00	726	2.304E+00	767	4.388E-01
604	1.303E+01	645	1.322E+01	686	6.832E+00	727	2.201E+00	768	5.462E-01
605	1.312E+01	646	1.312E+01	687	6.725E+00	728	2.158E+00	769	4.364E-01
606	1.317E+01	647	1.296E+01	688	6.586E+00	729	2.190E+00	770	3.221E-01
607	1.330E+01	648	1.284E+01	689	6.370E+00	730	2.118E+00	771	3.188E-01
608	1.336E+01	649	1.273E+01	690	6.239E+00	731	1.957E+00	772	4.099E-01
609	1.345E+01	650	1.264E+01	691	6.117E+00	732	1.977E+00	773	2.901E-01
610	1.354E+01	651	1.251E+01	692	6.001E+00	733	1.765E+00	774	2.789E-01
611	1.361E+01	652	1.233E+01	693	5.831E+00	734	1.739E+00	775	3.095E-01
612	1.370E+01	653	1.221E+01	694	5.684E+00	735	1.777E+00	776	2.738E-01
613	1.376E+01	654	1.207E+01	695	5.544E+00	736	1.659E+00	777	3.258E-01
614	1.384E+01	655	1.193E+01	696	5.344E+00	737	1.594E+00	778	2.850E-01
615	1.390E+01	656	1.176E+01	697	5.280E+00	738	1.478E+00	779	2.555E-01
616	1.394E+01	657	1.165E+01	698	5.145E+00	739	1.420E+00	780	1.916E-01
617	1.401E+01	658	1.147E+01	699	5.013E+00	740	1.394E+00		
618	1.405E+01	659	1.134E+01	700	4.844E+00	741	1.430E+00		
619	1.408E+01	660	1.116E+01	701	4.778E+00	742	1.358E+00		
620	1.411E+01	661	1.101E+01	702	4.599E+00	743	1.325E+00		
621	1.415E+01	662	1.080E+01	703	4.483E+00	744	1.158E+00		
622	1.415E+01	663	1.065E+01	704	4.369E+00	745	1.157E+00		
623	1.421E+01	664	1.049E+01	705	4.236E+00	746	9.873E-01		
624	1.422E+01	665	1.034E+01	706	4.147E+00	747	1.067E+00		
625	1.423E+01	666	1.020E+01	707	4.039E+00	748	1.057E+00		

CIE 1931xy Chromaticity Diagram



7-StepChromaticity Quadrangles



Control Setting: 3500K 8W

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

Test orientation: **Downward**

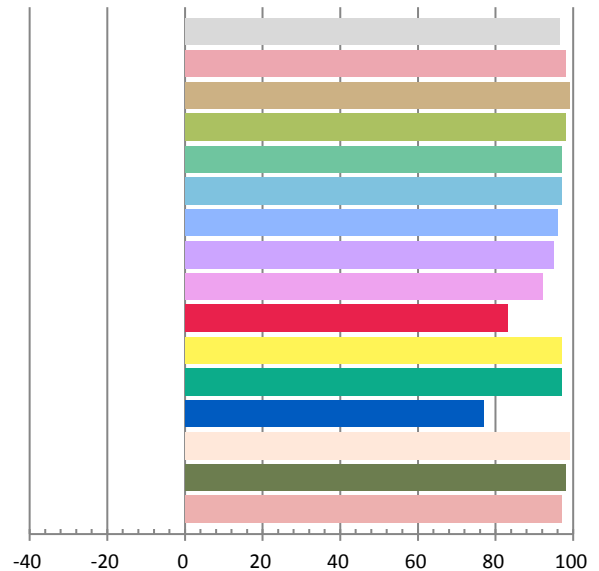
Photometric and Electrical Measurement Result

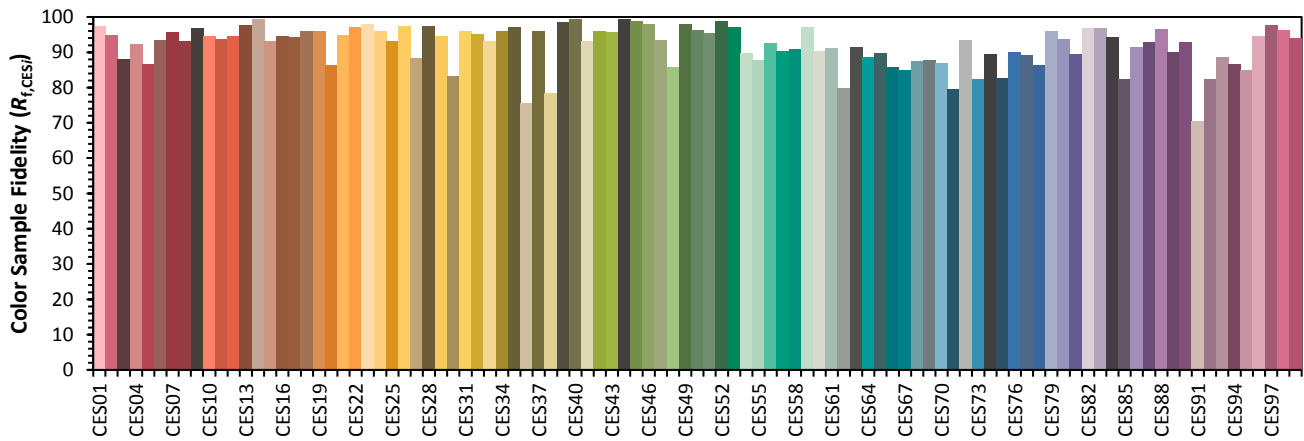
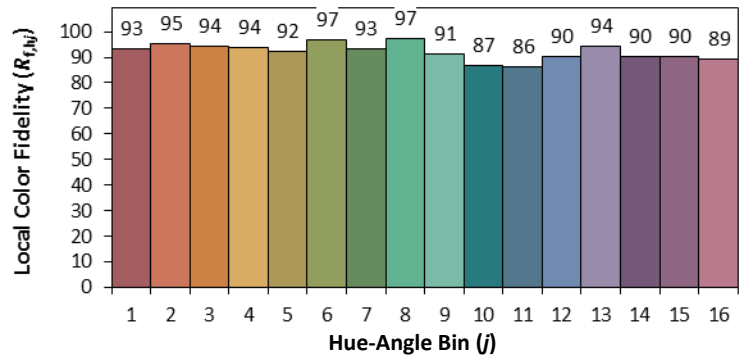
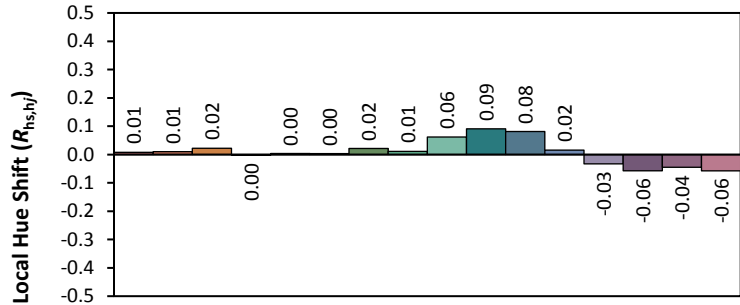
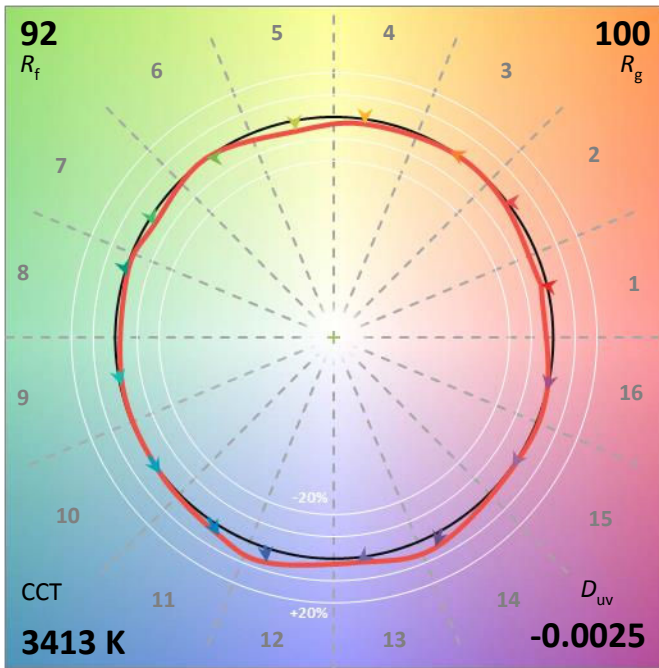
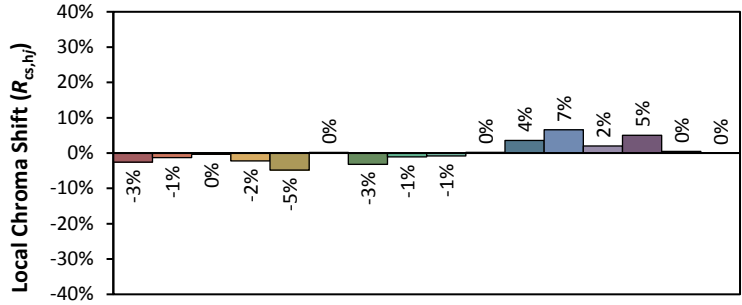
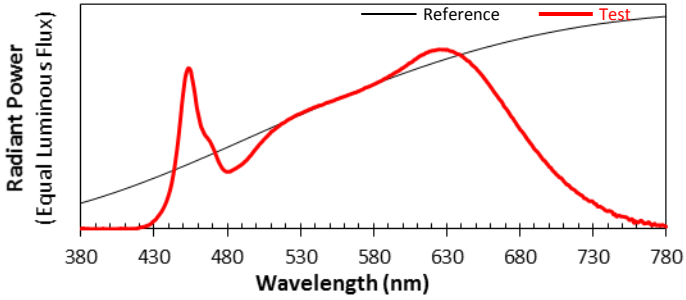
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.0705	8.25	0.9752	732.26	88.76

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
2.597	3413	-0.00247	0.4075	0.3862	0.2390	0.5097

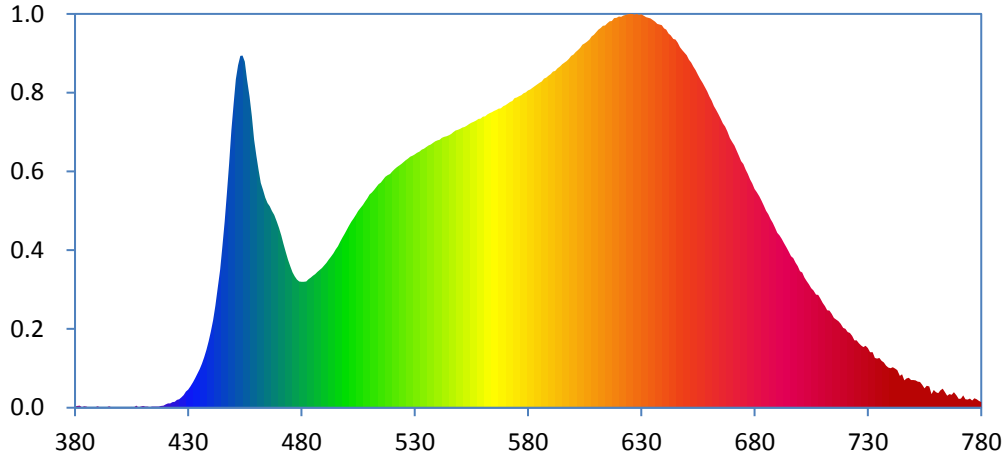
Color Rendering Index

Ra			
96.5			
R1	R2	R3	R4
98	99	98	97
R5	R6	R7	R8
97	96	95	92
R9	R10	R11	R12
83	97	97	77
R13	R14	R15	
99	98	97	





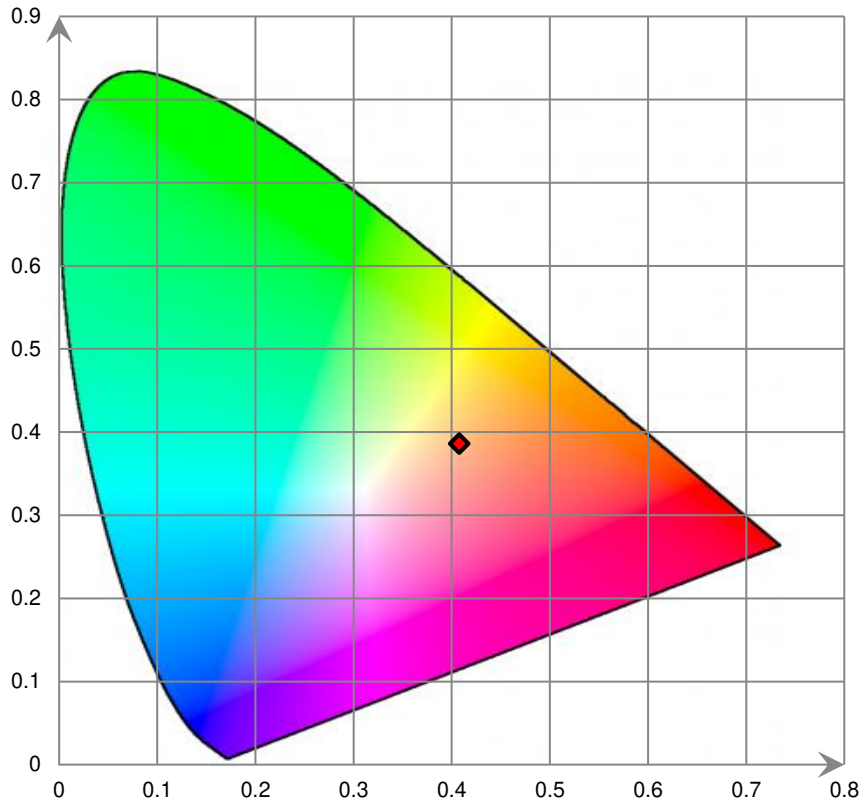
Relative Spectral Power Distribution



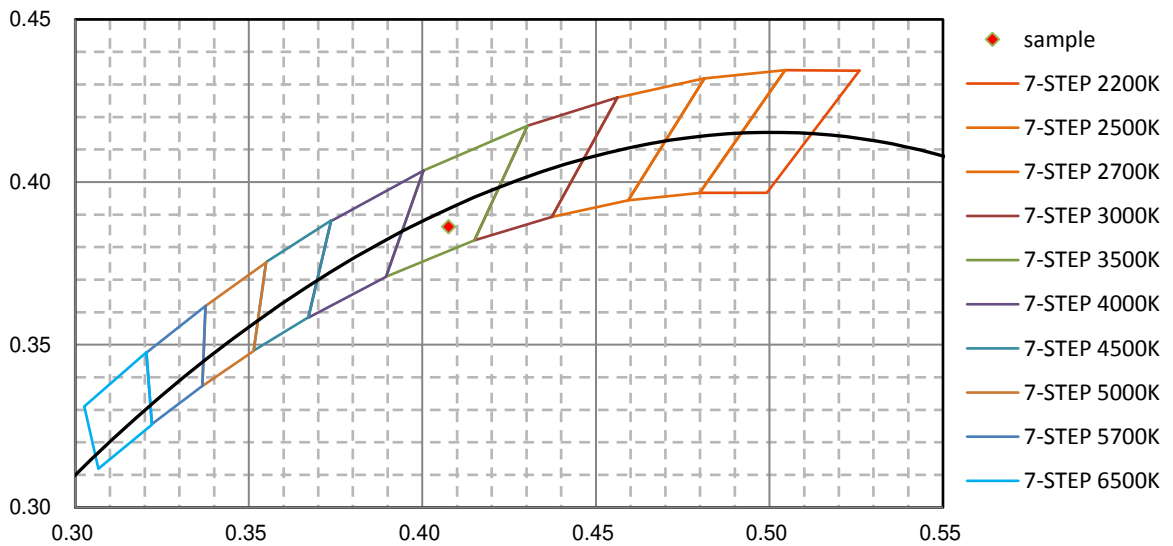
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	3.660E-02	421	1.462E-01	462	7.810E+00	503	6.577E+00	544	9.437E+00
381	6.050E-02	422	1.552E-01	463	7.566E+00	504	6.701E+00	545	9.476E+00
382	6.740E-02	423	1.920E-01	464	7.303E+00	505	6.837E+00	546	9.522E+00
383	1.380E-02	424	2.098E-01	465	7.115E+00	506	6.938E+00	547	9.586E+00
384	5.190E-02	425	2.732E-01	466	7.004E+00	507	7.049E+00	548	9.635E+00
385	4.350E-02	426	2.926E-01	467	6.836E+00	508	7.167E+00	549	9.660E+00
386	4.300E-03	427	3.568E-01	468	6.704E+00	509	7.276E+00	550	9.690E+00
387	1.890E-02	428	4.360E-01	469	6.471E+00	510	7.419E+00	551	9.735E+00
388	1.510E-02	429	5.613E-01	470	6.243E+00	511	7.487E+00	552	9.766E+00
389	1.630E-02	430	6.338E-01	471	5.992E+00	512	7.575E+00	553	9.802E+00
390	4.730E-02	431	7.364E-01	472	5.693E+00	513	7.666E+00	554	9.863E+00
391	1.750E-02	432	8.894E-01	473	5.412E+00	514	7.769E+00	555	9.912E+00
392	7.600E-03	433	1.027E+00	474	5.142E+00	515	7.823E+00	556	9.942E+00
393	4.700E-03	434	1.183E+00	475	4.919E+00	516	7.922E+00	557	9.984E+00
394	1.570E-02	435	1.337E+00	476	4.707E+00	517	8.026E+00	558	1.004E+01
395	5.540E-02	436	1.529E+00	477	4.571E+00	518	8.080E+00	559	1.005E+01
396	1.210E-02	437	1.751E+00	478	4.450E+00	519	8.128E+00	560	1.011E+01
397	1.040E-02	438	2.011E+00	479	4.389E+00	520	8.212E+00	561	1.013E+01
398	4.400E-03	439	2.308E+00	480	4.378E+00	521	8.295E+00	562	1.019E+01
399	1.100E-03	440	2.650E+00	481	4.373E+00	522	8.359E+00	563	1.024E+01
400	1.000E-04	441	3.040E+00	482	4.389E+00	523	8.419E+00	564	1.027E+01
401	1.530E-02	442	3.541E+00	483	4.466E+00	524	8.472E+00	565	1.032E+01
402	2.090E-02	443	4.136E+00	484	4.519E+00	525	8.543E+00	566	1.036E+01
403	2.220E-02	444	4.796E+00	485	4.584E+00	526	8.607E+00	567	1.040E+01
404	1.380E-02	445	5.614E+00	486	4.645E+00	527	8.661E+00	568	1.041E+01
405	2.920E-02	446	6.455E+00	487	4.724E+00	528	8.724E+00	569	1.049E+01
406	5.400E-03	447	7.444E+00	488	4.786E+00	529	8.763E+00	570	1.052E+01
407	6.950E-02	448	8.481E+00	489	4.860E+00	530	8.805E+00	571	1.057E+01
408	1.140E-02	449	9.642E+00	490	4.943E+00	531	8.862E+00	572	1.063E+01
409	3.800E-02	450	1.055E+01	491	5.037E+00	532	8.904E+00	573	1.067E+01
410	5.750E-02	451	1.142E+01	492	5.147E+00	533	8.967E+00	574	1.077E+01
411	3.800E-02	452	1.191E+01	493	5.243E+00	534	9.005E+00	575	1.078E+01
412	3.590E-02	453	1.223E+01	494	5.371E+00	535	9.060E+00	576	1.083E+01
413	1.250E-02	454	1.224E+01	495	5.504E+00	536	9.122E+00	577	1.087E+01
414	3.870E-02	455	1.203E+01	496	5.616E+00	537	9.151E+00	578	1.093E+01
415	3.620E-02	456	1.141E+01	497	5.771E+00	538	9.208E+00	579	1.097E+01
416	3.690E-02	457	1.081E+01	498	5.919E+00	539	9.266E+00	580	1.103E+01
417	3.960E-02	458	1.014E+01	499	6.051E+00	540	9.299E+00	581	1.107E+01
418	5.710E-02	459	9.331E+00	500	6.186E+00	541	9.319E+00	582	1.113E+01
419	7.640E-02	460	8.772E+00	501	6.330E+00	542	9.388E+00	583	1.119E+01
420	1.186E-01	461	8.272E+00	502	6.468E+00	543	9.417E+00	584	1.124E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.129E+01	626	1.369E+01	667	9.777E+00	708	3.922E+00	749	9.666E-01
586	1.135E+01	627	1.367E+01	668	9.611E+00	709	3.789E+00	750	9.668E-01
587	1.144E+01	628	1.369E+01	669	9.375E+00	710	3.647E+00	751	9.501E-01
588	1.147E+01	629	1.365E+01	670	9.242E+00	711	3.529E+00	752	9.114E-01
589	1.154E+01	630	1.368E+01	671	9.116E+00	712	3.390E+00	753	9.000E-01
590	1.160E+01	631	1.364E+01	672	8.944E+00	713	3.374E+00	754	7.932E-01
591	1.169E+01	632	1.357E+01	673	8.763E+00	714	3.266E+00	755	6.779E-01
592	1.171E+01	633	1.355E+01	674	8.576E+00	715	3.122E+00	756	7.599E-01
593	1.180E+01	634	1.354E+01	675	8.473E+00	716	3.060E+00	757	7.411E-01
594	1.187E+01	635	1.347E+01	676	8.286E+00	717	3.012E+00	758	4.725E-01
595	1.194E+01	636	1.342E+01	677	8.124E+00	718	2.920E+00	759	6.200E-01
596	1.200E+01	637	1.334E+01	678	7.933E+00	719	2.778E+00	760	5.367E-01
597	1.205E+01	638	1.332E+01	679	7.789E+00	720	2.746E+00	761	5.023E-01
598	1.213E+01	639	1.330E+01	680	7.601E+00	721	2.626E+00	762	6.115E-01
599	1.223E+01	640	1.319E+01	681	7.494E+00	722	2.602E+00	763	6.595E-01
600	1.227E+01	641	1.314E+01	682	7.350E+00	723	2.500E+00	764	5.396E-01
601	1.236E+01	642	1.302E+01	683	7.197E+00	724	2.343E+00	765	4.123E-01
602	1.243E+01	643	1.295E+01	684	7.021E+00	725	2.338E+00	766	4.778E-01
603	1.251E+01	644	1.282E+01	685	6.851E+00	726	2.238E+00	767	4.499E-01
604	1.262E+01	645	1.280E+01	686	6.724E+00	727	2.165E+00	768	5.443E-01
605	1.267E+01	646	1.268E+01	687	6.559E+00	728	2.112E+00	769	4.239E-01
606	1.272E+01	647	1.253E+01	688	6.428E+00	729	2.153E+00	770	3.006E-01
607	1.280E+01	648	1.244E+01	689	6.255E+00	730	2.075E+00	771	3.116E-01
608	1.291E+01	649	1.234E+01	690	6.076E+00	731	1.928E+00	772	4.252E-01
609	1.296E+01	650	1.226E+01	691	5.991E+00	732	1.927E+00	773	2.974E-01
610	1.306E+01	651	1.210E+01	692	5.873E+00	733	1.734E+00	774	2.844E-01
611	1.314E+01	652	1.200E+01	693	5.725E+00	734	1.706E+00	775	3.195E-01
612	1.320E+01	653	1.186E+01	694	5.574E+00	735	1.726E+00	776	2.513E-01
613	1.327E+01	654	1.173E+01	695	5.424E+00	736	1.629E+00	777	3.298E-01
614	1.329E+01	655	1.158E+01	696	5.267E+00	737	1.578E+00	778	2.935E-01
615	1.337E+01	656	1.143E+01	697	5.201E+00	738	1.464E+00	779	2.439E-01
616	1.344E+01	657	1.129E+01	698	5.042E+00	739	1.393E+00	780	1.945E-01
617	1.345E+01	658	1.114E+01	699	4.928E+00	740	1.371E+00		
618	1.354E+01	659	1.099E+01	700	4.741E+00	741	1.404E+00		
619	1.355E+01	660	1.082E+01	701	4.698E+00	742	1.359E+00		
620	1.360E+01	661	1.068E+01	702	4.518E+00	743	1.312E+00		
621	1.359E+01	662	1.049E+01	703	4.394E+00	744	1.107E+00		
622	1.363E+01	663	1.035E+01	704	4.289E+00	745	1.162E+00		
623	1.365E+01	664	1.021E+01	705	4.156E+00	746	9.481E-01		
624	1.367E+01	665	1.005E+01	706	4.077E+00	747	1.023E+00		
625	1.369E+01	666	9.881E+00	707	3.935E+00	748	1.041E+00		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles



Control Setting: 4000K 8W

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

Test orientation: **Downward**

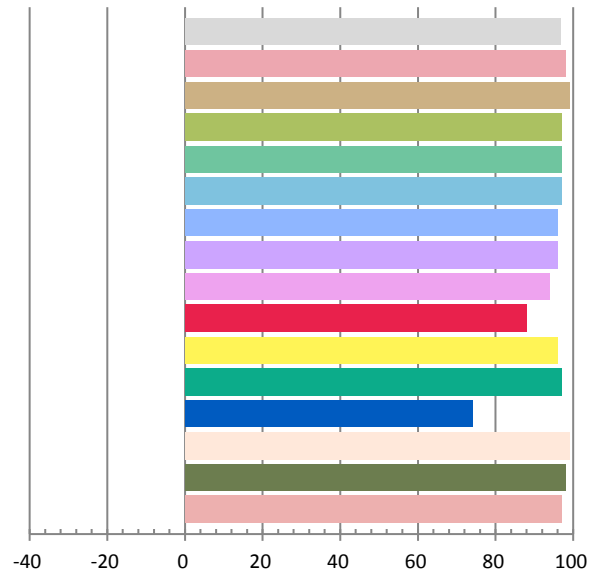
Photometric and Electrical Measurement Result

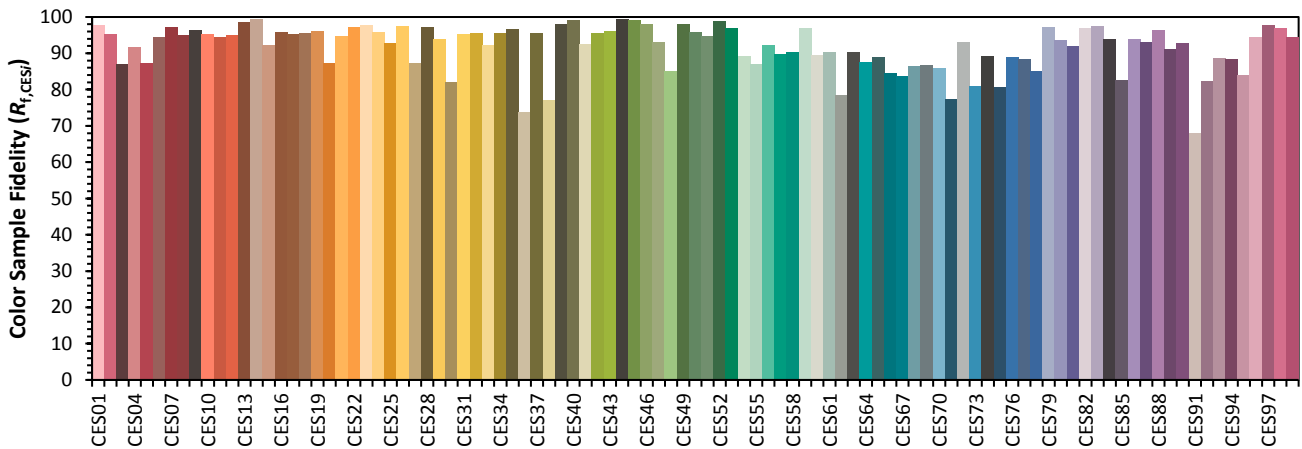
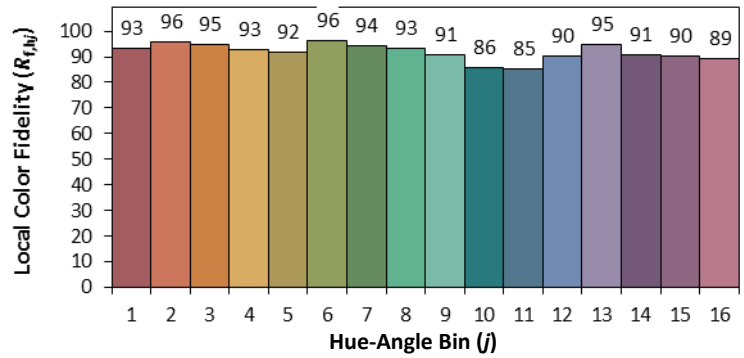
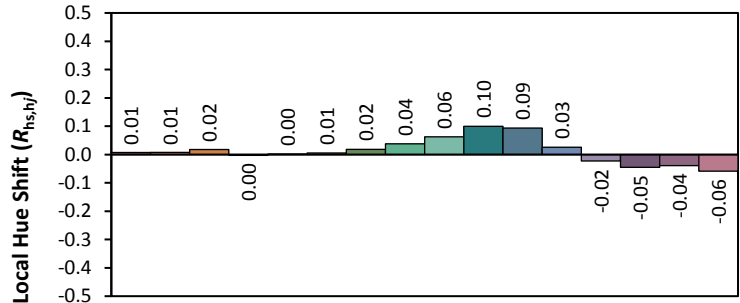
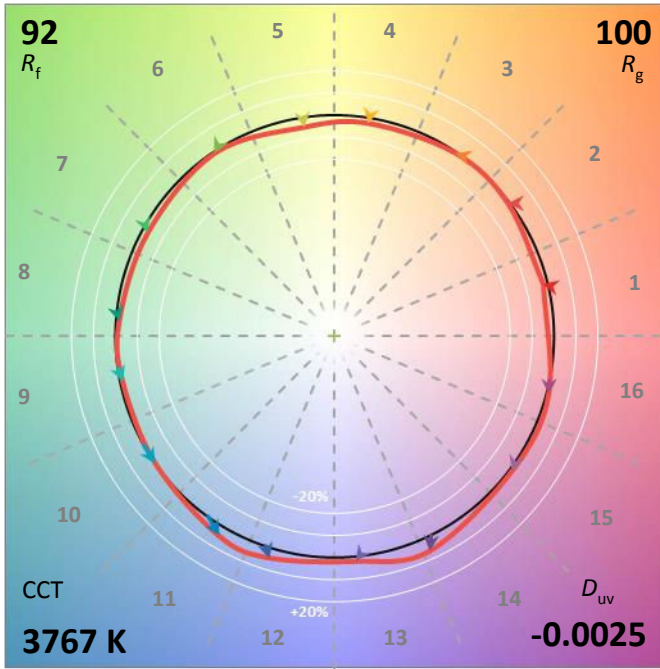
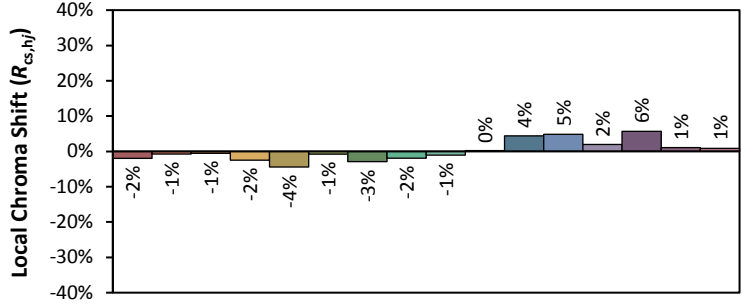
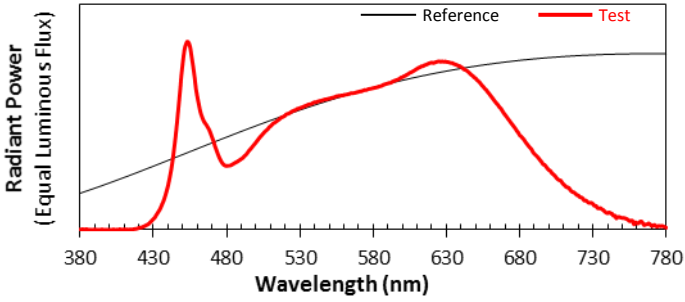
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.0698	8.18	0.9759	742.22	90.73

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
2.638	3767	-0.00248	0.3892	0.3767	0.2309	0.5029

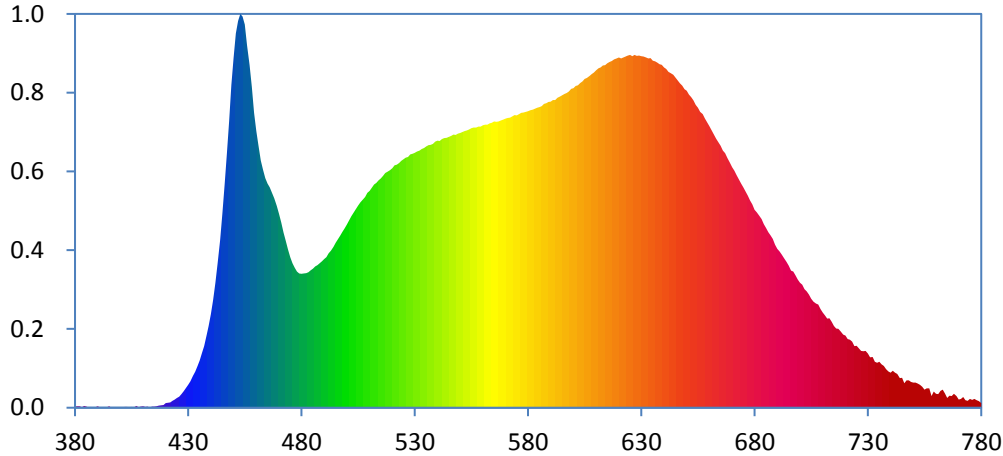
Color Rendering Index

Ra			
96.8			
R1	R2	R3	R4
98	99	97	97
R5	R6	R7	R8
97	96	96	94
R9	R10	R11	R12
88	96	97	74
R13	R14	R15	
99	98	97	





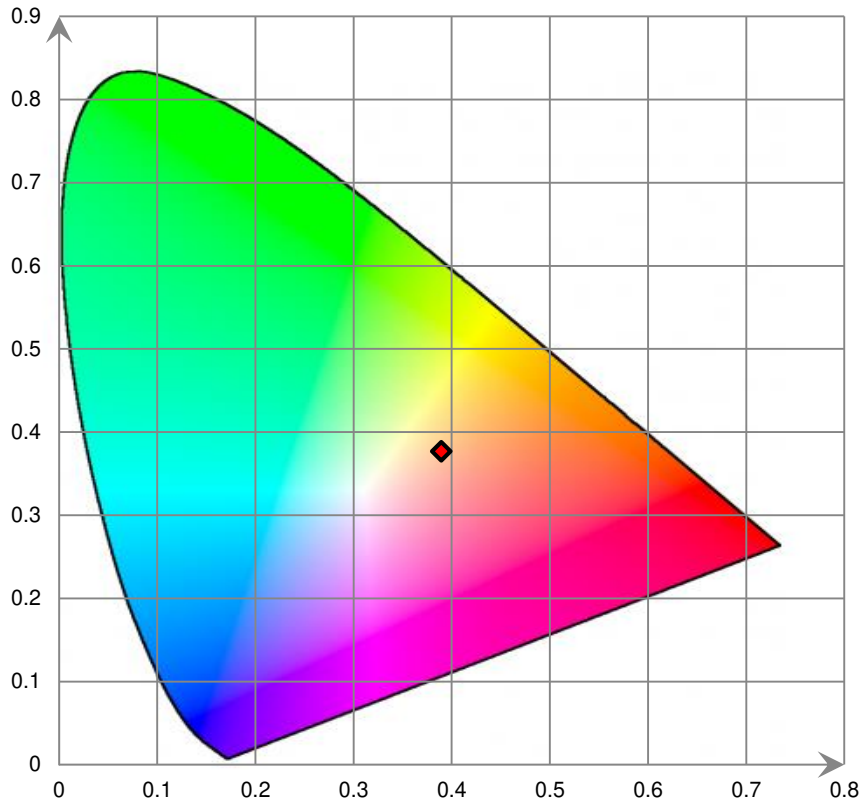
Relative Spectral Power Distribution



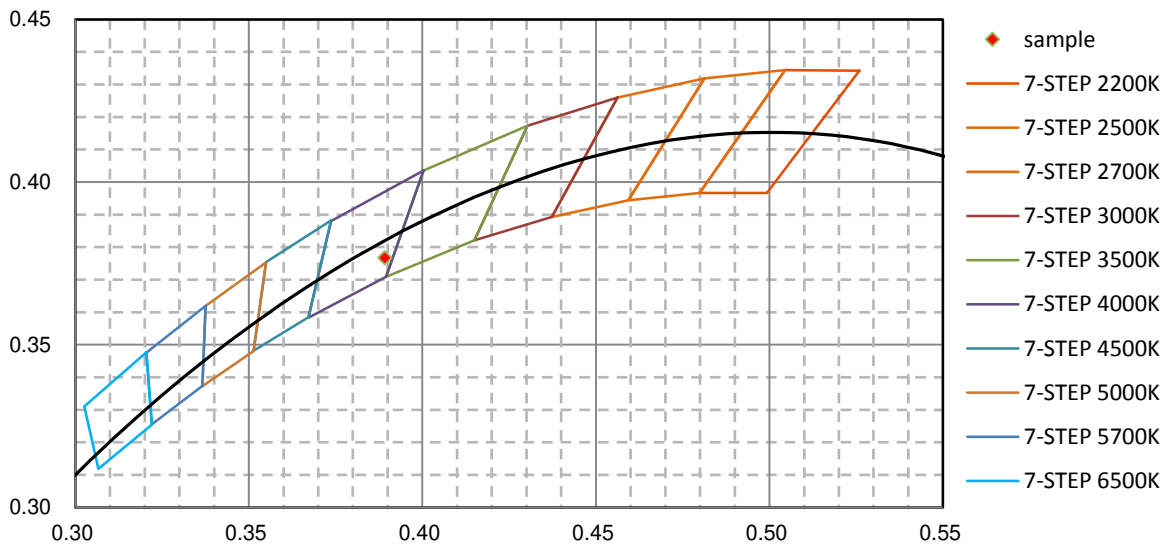
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	4.480E-02	421	1.840E-01	462	9.095E+00	503	7.179E+00	544	9.928E+00
381	5.360E-02	422	1.938E-01	463	8.753E+00	504	7.301E+00	545	9.969E+00
382	5.150E-02	423	2.552E-01	464	8.452E+00	505	7.434E+00	546	1.000E+01
383	1.740E-02	424	3.006E-01	465	8.246E+00	506	7.559E+00	547	1.005E+01
384	6.760E-02	425	3.626E-01	466	8.100E+00	507	7.659E+00	548	1.004E+01
385	4.240E-02	426	4.075E-01	467	7.900E+00	508	7.757E+00	549	1.009E+01
386	2.900E-03	427	4.948E-01	468	7.710E+00	509	7.911E+00	550	1.011E+01
387	2.610E-02	428	6.103E-01	469	7.427E+00	510	7.982E+00	551	1.014E+01
388	1.360E-02	429	7.297E-01	470	7.125E+00	511	8.097E+00	552	1.018E+01
389	1.390E-02	430	8.463E-01	471	6.809E+00	512	8.217E+00	553	1.020E+01
390	4.920E-02	431	9.739E-01	472	6.441E+00	513	8.271E+00	554	1.024E+01
391	1.740E-02	432	1.167E+00	473	6.136E+00	514	8.370E+00	555	1.029E+01
392	7.000E-04	433	1.331E+00	474	5.823E+00	515	8.441E+00	556	1.031E+01
393	0.000E+00	434	1.522E+00	475	5.544E+00	516	8.532E+00	557	1.031E+01
394	2.000E-02	435	1.740E+00	476	5.316E+00	517	8.632E+00	558	1.034E+01
395	4.870E-02	436	2.003E+00	477	5.147E+00	518	8.686E+00	559	1.034E+01
396	5.400E-03	437	2.264E+00	478	5.006E+00	519	8.738E+00	560	1.039E+01
397	9.500E-03	438	2.626E+00	479	4.941E+00	520	8.817E+00	561	1.041E+01
398	1.230E-02	439	3.013E+00	480	4.925E+00	521	8.920E+00	562	1.042E+01
399	6.000E-04	440	3.439E+00	481	4.940E+00	522	8.944E+00	563	1.046E+01
400	0.000E+00	441	3.963E+00	482	4.948E+00	523	8.996E+00	564	1.048E+01
401	1.910E-02	442	4.590E+00	483	4.987E+00	524	9.083E+00	565	1.053E+01
402	2.920E-02	443	5.303E+00	484	5.053E+00	525	9.138E+00	566	1.052E+01
403	3.190E-02	444	6.172E+00	485	5.117E+00	526	9.198E+00	567	1.053E+01
404	1.300E-02	445	7.152E+00	486	5.196E+00	527	9.226E+00	568	1.057E+01
405	2.980E-02	446	8.209E+00	487	5.240E+00	528	9.321E+00	569	1.060E+01
406	5.100E-03	447	9.347E+00	488	5.319E+00	529	9.339E+00	570	1.063E+01
407	6.190E-02	448	1.053E+01	489	5.390E+00	530	9.379E+00	571	1.066E+01
408	1.420E-02	449	1.187E+01	490	5.467E+00	531	9.428E+00	572	1.067E+01
409	3.610E-02	450	1.288E+01	491	5.542E+00	532	9.455E+00	573	1.072E+01
410	5.350E-02	451	1.377E+01	492	5.680E+00	533	9.523E+00	574	1.076E+01
411	3.120E-02	452	1.423E+01	493	5.769E+00	534	9.558E+00	575	1.076E+01
412	3.800E-02	453	1.449E+01	494	5.913E+00	535	9.610E+00	576	1.081E+01
413	9.200E-03	454	1.439E+01	495	6.072E+00	536	9.663E+00	577	1.085E+01
414	4.610E-02	455	1.409E+01	496	6.196E+00	537	9.676E+00	578	1.086E+01
415	4.230E-02	456	1.334E+01	497	6.333E+00	538	9.702E+00	579	1.088E+01
416	4.980E-02	457	1.260E+01	498	6.475E+00	539	9.784E+00	580	1.091E+01
417	7.120E-02	458	1.180E+01	499	6.604E+00	540	9.829E+00	581	1.094E+01
418	9.180E-02	459	1.085E+01	500	6.744E+00	541	9.819E+00	582	1.096E+01
419	1.003E-01	460	1.018E+01	501	6.898E+00	542	9.880E+00	583	1.100E+01
420	1.710E-01	461	9.627E+00	502	7.044E+00	543	9.917E+00	584	1.104E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.107E+01	626	1.294E+01	667	9.365E+00	708	3.802E+00	749	9.473E-01
586	1.110E+01	627	1.298E+01	668	9.191E+00	709	3.630E+00	750	9.281E-01
587	1.117E+01	628	1.294E+01	669	9.013E+00	710	3.498E+00	751	9.236E-01
588	1.120E+01	629	1.296E+01	670	8.853E+00	711	3.402E+00	752	8.929E-01
589	1.125E+01	630	1.293E+01	671	8.713E+00	712	3.280E+00	753	8.480E-01
590	1.127E+01	631	1.292E+01	672	8.551E+00	713	3.286E+00	754	7.747E-01
591	1.132E+01	632	1.289E+01	673	8.403E+00	714	3.164E+00	755	6.691E-01
592	1.132E+01	633	1.285E+01	674	8.244E+00	715	3.004E+00	756	7.114E-01
593	1.141E+01	634	1.286E+01	675	8.106E+00	716	2.919E+00	757	7.089E-01
594	1.145E+01	635	1.277E+01	676	7.954E+00	717	2.897E+00	758	4.314E-01
595	1.150E+01	636	1.274E+01	677	7.802E+00	718	2.806E+00	759	5.936E-01
596	1.155E+01	637	1.269E+01	678	7.622E+00	719	2.689E+00	760	5.175E-01
597	1.158E+01	638	1.264E+01	679	7.486E+00	720	2.659E+00	761	5.040E-01
598	1.164E+01	639	1.261E+01	680	7.287E+00	721	2.529E+00	762	6.198E-01
599	1.173E+01	640	1.253E+01	681	7.190E+00	722	2.507E+00	763	6.635E-01
600	1.176E+01	641	1.246E+01	682	7.054E+00	723	2.433E+00	764	5.286E-01
601	1.184E+01	642	1.235E+01	683	6.943E+00	724	2.266E+00	765	3.636E-01
602	1.186E+01	643	1.231E+01	684	6.749E+00	725	2.281E+00	766	4.414E-01
603	1.194E+01	644	1.225E+01	685	6.612E+00	726	2.190E+00	767	4.300E-01
604	1.201E+01	645	1.214E+01	686	6.455E+00	727	2.092E+00	768	5.104E-01
605	1.210E+01	646	1.204E+01	687	6.335E+00	728	2.083E+00	769	4.283E-01
606	1.213E+01	647	1.193E+01	688	6.207E+00	729	2.091E+00	770	3.046E-01
607	1.220E+01	648	1.185E+01	689	5.995E+00	730	2.001E+00	771	3.194E-01
608	1.227E+01	649	1.173E+01	690	5.849E+00	731	1.853E+00	772	3.951E-01
609	1.233E+01	650	1.166E+01	691	5.751E+00	732	1.862E+00	773	2.821E-01
610	1.241E+01	651	1.152E+01	692	5.636E+00	733	1.692E+00	774	2.540E-01
611	1.249E+01	652	1.143E+01	693	5.503E+00	734	1.657E+00	775	3.215E-01
612	1.252E+01	653	1.131E+01	694	5.358E+00	735	1.689E+00	776	2.838E-01
613	1.260E+01	654	1.115E+01	695	5.228E+00	736	1.598E+00	777	3.194E-01
614	1.260E+01	655	1.104E+01	696	5.041E+00	737	1.537E+00	778	2.815E-01
615	1.268E+01	656	1.088E+01	697	5.008E+00	738	1.419E+00	779	2.356E-01
616	1.272E+01	657	1.080E+01	698	4.866E+00	739	1.331E+00	780	1.675E-01
617	1.275E+01	658	1.063E+01	699	4.715E+00	740	1.286E+00		
618	1.282E+01	659	1.050E+01	700	4.604E+00	741	1.354E+00		
619	1.285E+01	660	1.035E+01	701	4.532E+00	742	1.284E+00		
620	1.288E+01	661	1.021E+01	702	4.367E+00	743	1.243E+00		
621	1.285E+01	662	1.005E+01	703	4.278E+00	744	1.088E+00		
622	1.288E+01	663	9.893E+00	704	4.166E+00	745	1.107E+00		
623	1.292E+01	664	9.766E+00	705	4.013E+00	746	8.992E-01		
624	1.296E+01	665	9.642E+00	706	3.898E+00	747	1.005E+00		
625	1.298E+01	666	9.466E+00	707	3.827E+00	748	1.002E+00		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles



Control Setting: 5000K 8W

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

Test orientation: **Downward**

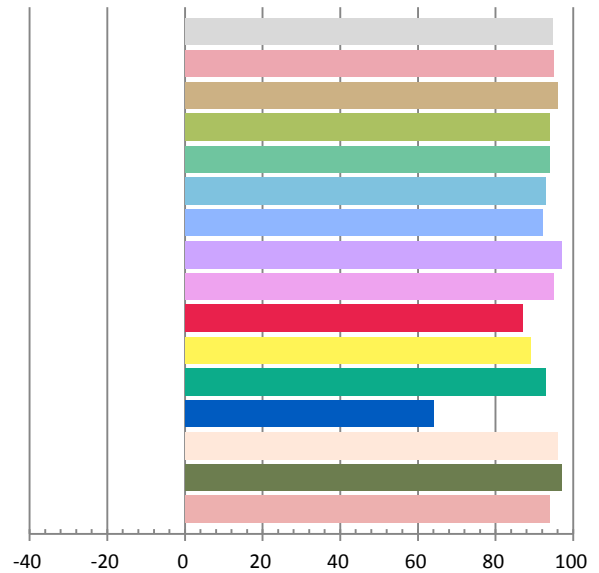
Photometric and Electrical Measurement Result

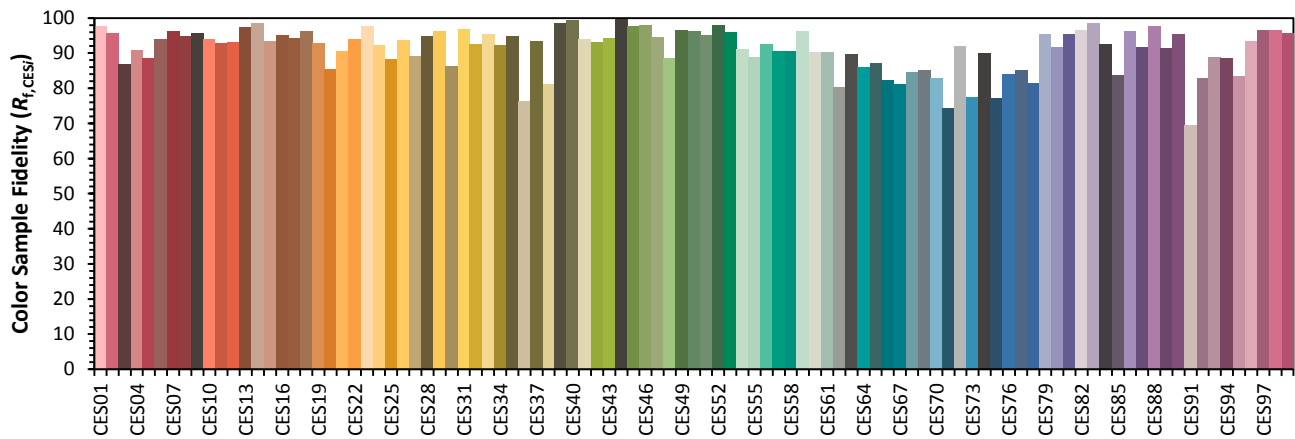
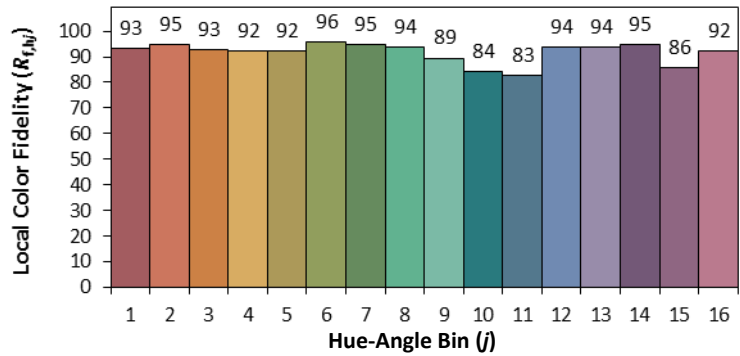
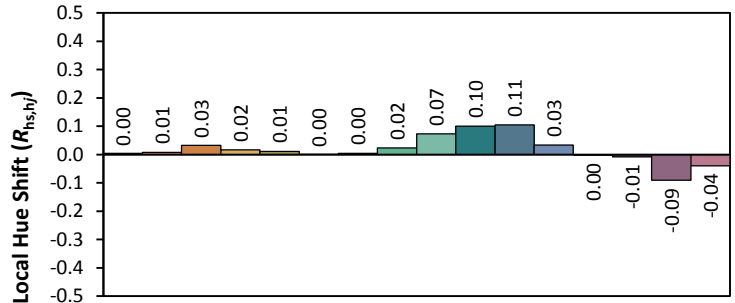
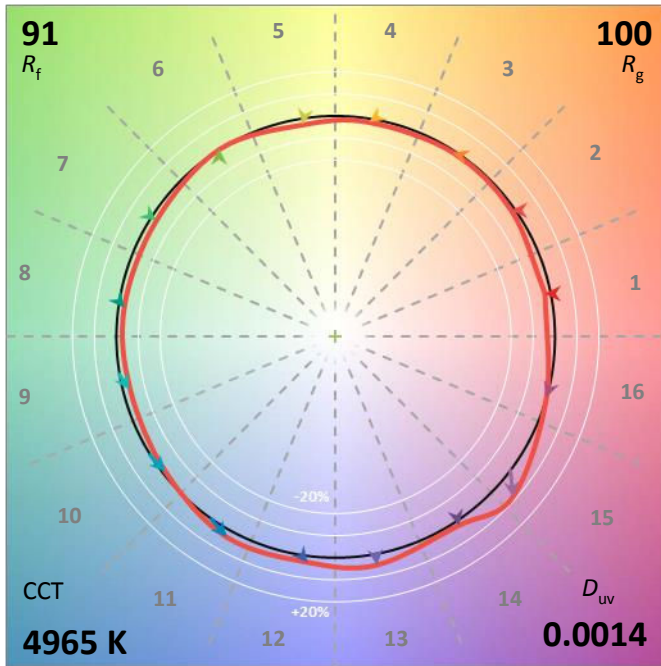
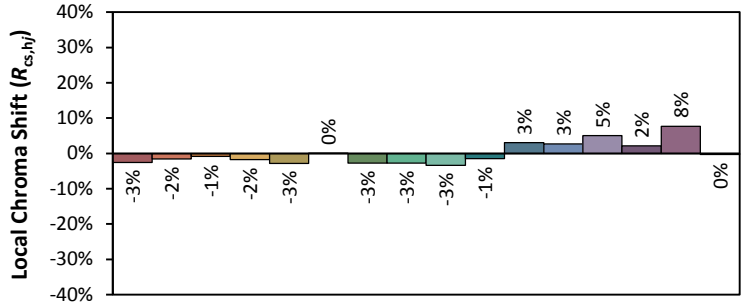
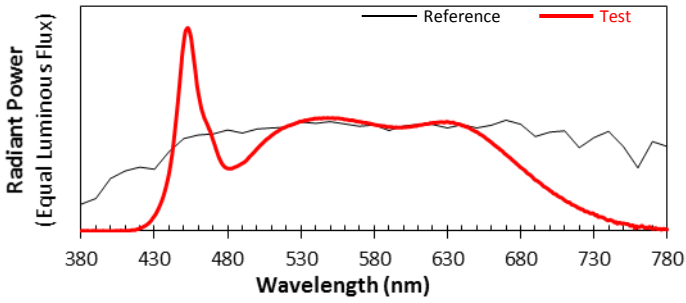
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.07	8.2	0.9759	752.63	91.78

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
2.668	4966	0.00137	0.3464	0.3554	0.2108	0.4867

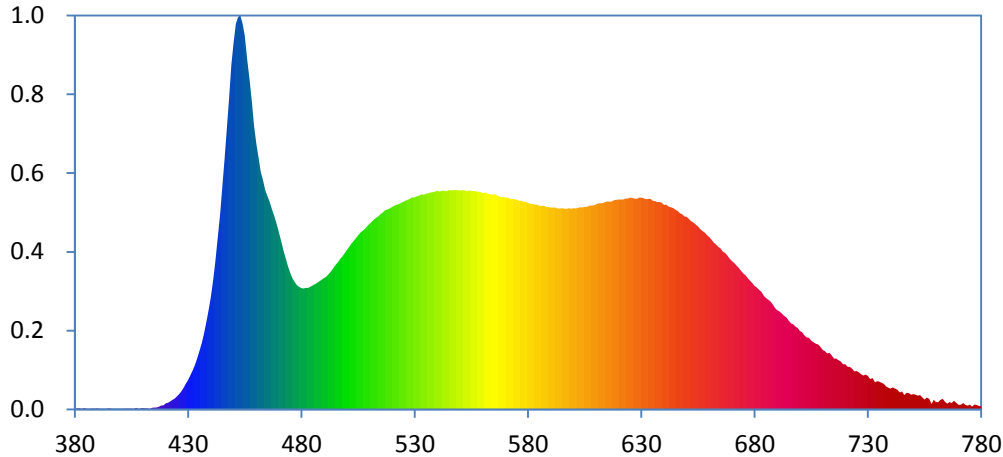
Color Rendering Index

Ra			
94.7			
R1	R2	R3	R4
95	96	94	94
R5	R6	R7	R8
93	92	97	95
R9	R10	R11	R12
87	89	93	64
R13	R14	R15	
96	97	94	





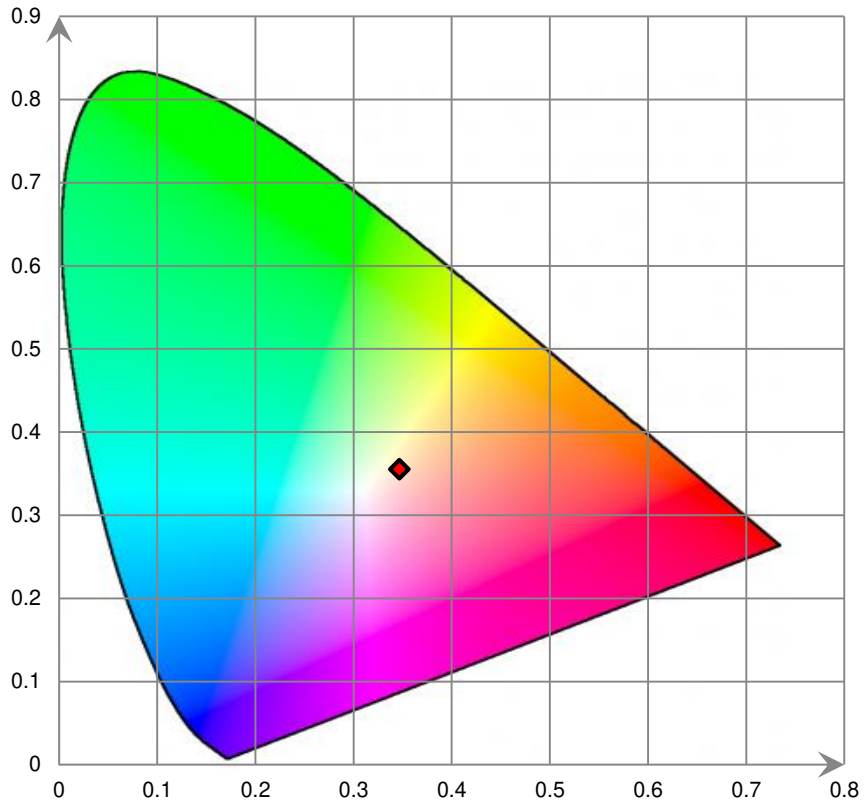
Relative Spectral Power Distribution



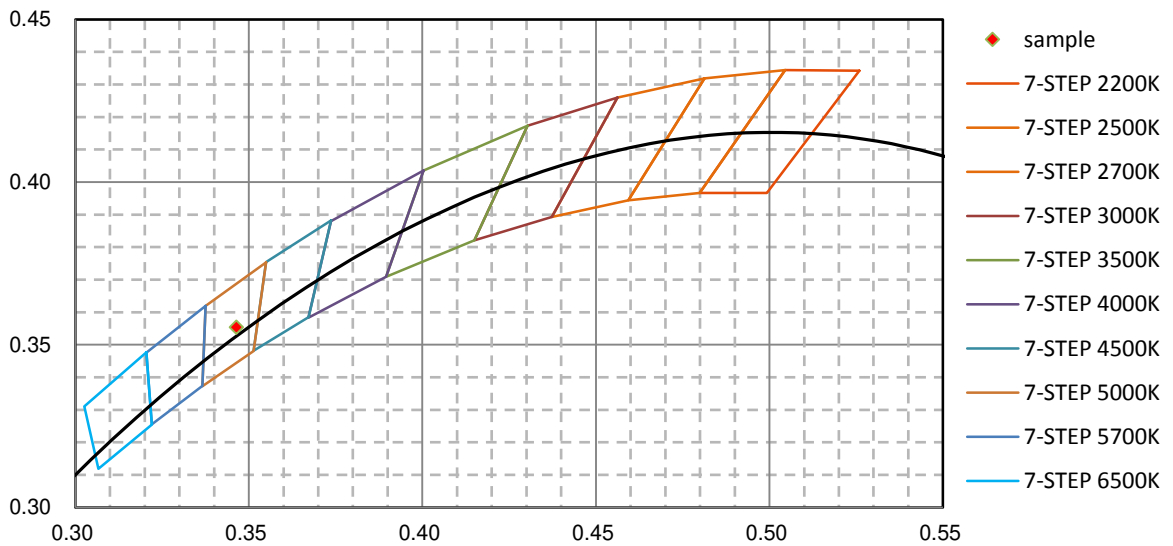
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	2.000E-02	421	3.258E-01	462	1.167E+01	503	8.270E+00	544	1.072E+01
381	5.130E-02	422	3.874E-01	463	1.125E+01	504	8.407E+00	545	1.078E+01
382	4.170E-02	423	4.700E-01	464	1.077E+01	505	8.553E+00	546	1.077E+01
383	1.800E-02	424	5.391E-01	465	1.047E+01	506	8.681E+00	547	1.077E+01
384	6.640E-02	425	6.442E-01	466	1.019E+01	507	8.796E+00	548	1.078E+01
385	3.260E-02	426	7.501E-01	467	9.822E+00	508	8.883E+00	549	1.078E+01
386	2.500E-03	427	8.899E-01	468	9.517E+00	509	9.012E+00	550	1.077E+01
387	2.830E-02	428	1.067E+00	469	9.085E+00	510	9.127E+00	551	1.078E+01
388	2.610E-02	429	1.271E+00	470	8.686E+00	511	9.229E+00	552	1.077E+01
389	3.620E-02	430	1.451E+00	471	8.253E+00	512	9.337E+00	553	1.073E+01
390	4.820E-02	431	1.675E+00	472	7.806E+00	513	9.428E+00	554	1.076E+01
391	2.030E-02	432	1.945E+00	473	7.417E+00	514	9.495E+00	555	1.074E+01
392	1.050E-02	433	2.223E+00	474	7.023E+00	515	9.608E+00	556	1.074E+01
393	1.060E-02	434	2.551E+00	475	6.721E+00	516	9.682E+00	557	1.071E+01
394	2.280E-02	435	2.909E+00	476	6.440E+00	517	9.800E+00	558	1.071E+01
395	4.410E-02	436	3.285E+00	477	6.255E+00	518	9.825E+00	559	1.067E+01
396	2.830E-02	437	3.749E+00	478	6.100E+00	519	9.887E+00	560	1.062E+01
397	1.430E-02	438	4.313E+00	479	6.026E+00	520	9.949E+00	561	1.066E+01
398	2.300E-03	439	4.884E+00	480	5.966E+00	521	1.002E+01	562	1.059E+01
399	7.900E-03	440	5.541E+00	481	5.947E+00	522	1.007E+01	563	1.058E+01
400	2.000E-04	441	6.343E+00	482	5.976E+00	523	1.010E+01	564	1.056E+01
401	2.020E-02	442	7.282E+00	483	5.970E+00	524	1.016E+01	565	1.058E+01
402	2.410E-02	443	8.371E+00	484	6.041E+00	525	1.020E+01	566	1.055E+01
403	2.570E-02	444	9.611E+00	485	6.102E+00	526	1.027E+01	567	1.048E+01
404	2.590E-02	445	1.099E+01	486	6.158E+00	527	1.030E+01	568	1.045E+01
405	3.680E-02	446	1.235E+01	487	6.219E+00	528	1.036E+01	569	1.044E+01
406	5.800E-03	447	1.383E+01	488	6.301E+00	529	1.043E+01	570	1.041E+01
407	7.620E-02	448	1.533E+01	489	6.380E+00	530	1.043E+01	571	1.040E+01
408	1.960E-02	449	1.694E+01	490	6.466E+00	531	1.047E+01	572	1.035E+01
409	4.550E-02	450	1.803E+01	491	6.530E+00	532	1.052E+01	573	1.034E+01
410	6.450E-02	451	1.895E+01	492	6.650E+00	533	1.057E+01	574	1.034E+01
411	5.220E-02	452	1.928E+01	493	6.785E+00	534	1.055E+01	575	1.031E+01
412	5.230E-02	453	1.936E+01	494	6.943E+00	535	1.060E+01	576	1.026E+01
413	1.970E-02	454	1.897E+01	495	7.102E+00	536	1.063E+01	577	1.026E+01
414	8.340E-02	455	1.837E+01	496	7.227E+00	537	1.066E+01	578	1.021E+01
415	8.630E-02	456	1.727E+01	497	7.395E+00	538	1.067E+01	579	1.020E+01
416	8.870E-02	457	1.620E+01	498	7.523E+00	539	1.072E+01	580	1.014E+01
417	1.200E-01	458	1.515E+01	499	7.682E+00	540	1.074E+01	581	1.012E+01
418	1.861E-01	459	1.392E+01	500	7.837E+00	541	1.071E+01	582	1.009E+01
419	2.010E-01	460	1.307E+01	501	7.993E+00	542	1.075E+01	583	1.006E+01
420	2.954E-01	461	1.237E+01	502	8.141E+00	543	1.075E+01	584	1.007E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.001E+01	626	1.040E+01	667	7.683E+00	708	3.186E+00	749	7.134E-01
586	1.001E+01	627	1.037E+01	668	7.562E+00	709	3.060E+00	750	7.539E-01
587	1.002E+01	628	1.036E+01	669	7.386E+00	710	2.921E+00	751	7.250E-01
588	9.960E+00	629	1.041E+01	670	7.287E+00	711	2.854E+00	752	6.802E-01
589	9.944E+00	630	1.041E+01	671	7.184E+00	712	2.755E+00	753	6.991E-01
590	9.923E+00	631	1.038E+01	672	7.059E+00	713	2.775E+00	754	5.914E-01
591	9.929E+00	632	1.033E+01	673	6.951E+00	714	2.650E+00	755	4.895E-01
592	9.928E+00	633	1.035E+01	674	6.805E+00	715	2.506E+00	756	5.866E-01
593	9.881E+00	634	1.035E+01	675	6.690E+00	716	2.493E+00	757	5.204E-01
594	9.874E+00	635	1.026E+01	676	6.590E+00	717	2.427E+00	758	2.713E-01
595	9.898E+00	636	1.024E+01	677	6.442E+00	718	2.352E+00	759	4.734E-01
596	9.861E+00	637	1.020E+01	678	6.322E+00	719	2.212E+00	760	3.594E-01
597	9.867E+00	638	1.019E+01	679	6.204E+00	720	2.208E+00	761	3.642E-01
598	9.891E+00	639	1.015E+01	680	6.067E+00	721	2.087E+00	762	4.759E-01
599	9.865E+00	640	1.004E+01	681	5.985E+00	722	2.097E+00	763	5.205E-01
600	9.899E+00	641	1.006E+01	682	5.859E+00	723	1.989E+00	764	3.768E-01
601	9.878E+00	642	9.966E+00	683	5.768E+00	724	1.862E+00	765	2.886E-01
602	9.908E+00	643	9.938E+00	684	5.584E+00	725	1.892E+00	766	3.614E-01
603	9.941E+00	644	9.886E+00	685	5.469E+00	726	1.819E+00	767	3.055E-01
604	9.924E+00	645	9.816E+00	686	5.393E+00	727	1.725E+00	768	4.303E-01
605	9.956E+00	646	9.742E+00	687	5.295E+00	728	1.667E+00	769	3.069E-01
606	9.962E+00	647	9.638E+00	688	5.152E+00	729	1.716E+00	770	2.133E-01
607	1.001E+01	648	9.594E+00	689	4.983E+00	730	1.645E+00	771	2.290E-01
608	1.002E+01	649	9.485E+00	690	4.867E+00	731	1.498E+00	772	3.188E-01
609	1.003E+01	650	9.468E+00	691	4.817E+00	732	1.541E+00	773	2.136E-01
610	1.008E+01	651	9.353E+00	692	4.714E+00	733	1.341E+00	774	1.851E-01
611	1.013E+01	652	9.249E+00	693	4.613E+00	734	1.377E+00	775	2.346E-01
612	1.012E+01	653	9.177E+00	694	4.513E+00	735	1.358E+00	776	1.327E-01
613	1.014E+01	654	9.093E+00	695	4.356E+00	736	1.298E+00	777	2.256E-01
614	1.019E+01	655	8.996E+00	696	4.231E+00	737	1.257E+00	778	2.135E-01
615	1.023E+01	656	8.873E+00	697	4.185E+00	738	1.122E+00	779	1.748E-01
616	1.021E+01	657	8.763E+00	698	4.073E+00	739	1.062E+00	780	1.623E-01
617	1.022E+01	658	8.676E+00	699	3.987E+00	740	1.018E+00		
618	1.029E+01	659	8.555E+00	700	3.849E+00	741	1.089E+00		
619	1.030E+01	660	8.456E+00	701	3.784E+00	742	1.027E+00		
620	1.032E+01	661	8.334E+00	702	3.633E+00	743	9.729E-01		
621	1.032E+01	662	8.197E+00	703	3.537E+00	744	8.344E-01		
622	1.032E+01	663	8.105E+00	704	3.520E+00	745	8.854E-01		
623	1.037E+01	664	7.993E+00	705	3.380E+00	746	7.053E-01		
624	1.036E+01	665	7.908E+00	706	3.297E+00	747	8.093E-01		
625	1.041E+01	666	7.751E+00	707	3.217E+00	748	7.928E-01		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles



[Goniophotometer System]

Control Setting: 2700K 8W

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

Test orientation: **Downward**

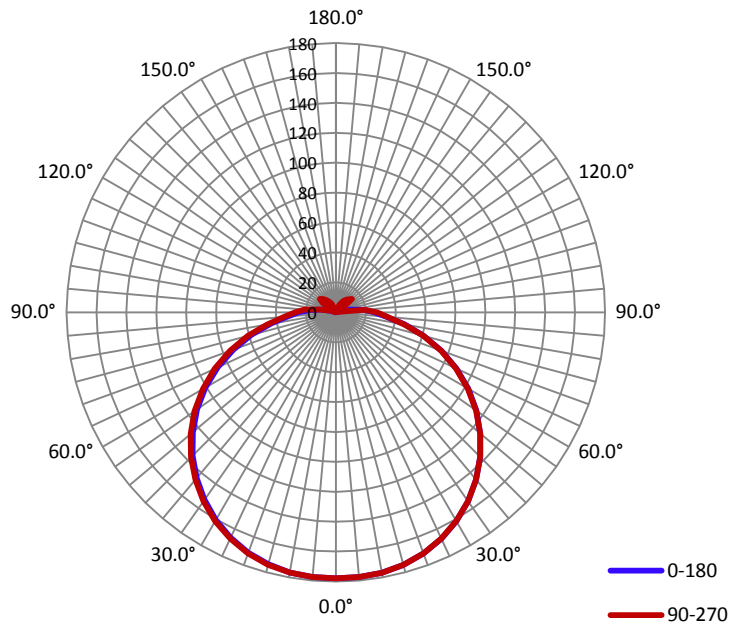
Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
120.0	60	0.0700	8.27	0.9810

Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	$I_{max}(cd)$	S/MH(C0/180)	S/MH(C90/270)
666.8	80.67	177.9	1.34	1.35

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50% I_{max}):	129.3	129.7	130.1	129.7	129.7
Field Angle(10% I_{max}):	190.3	185.8	192.8	185.8	188.7

Luminous Intensity (cd) Distribution Data

C \ y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	178	178	178	178	178	178	178	178
5.0°	178	178	178	178	178	178	178	178
10.0°	177	177	177	177	177	177	177	177
15.0°	175	175	175	175	175	175	175	175
20.0°	172	172	172	172	172	172	171	171
25.0°	167	167	167	167	167	167	167	167
30.0°	161	161	161	161	161	161	161	161
35.0°	154	154	154	154	154	154	154	154
40.0°	146	146	146	146	146	146	145	145
45.0°	137	136	136	136	137	136	136	136
50.0°	126	126	126	126	126	126	125	125
55.0°	115	115	114	115	115	114	114	114
60.0°	102	102	102	102	102	102	102	101
65.0°	89	89	89	89	89	89	88	88
70.0°	75	75	75	75	75	75	75	75
75.0°	61	61	60	60	61	61	60	60
80.0°	47	46	46	46	47	47	46	46
85.0°	34	34	34	34	35	35	34	33
90.0°	26	26	26	27	28	27	26	26
95.0°	19	15	7	11	19	10	5	16
100.0°	10	3	0	1	3	0	0	4
105.0°	4	0	0	1	2	1	0	1
110.0°	0	0	1	1	1	0	0	0
115.0°	1	1	1	1	1	1	1	1
120.0°	1	1	2	2	2	2	2	1
125.0°	1	2	3	7	8	6	4	1
130.0°	1	2	4	11	14	10	4	2
135.0°	1	3	4	11	12	9	5	2
140.0°	2	3	4	9	11	8	5	2
145.0°	2	3	4	8	9	7	4	2
150.0°	1	2	4	7	7	5	3	2
155.0°	1	2	3	5	6	4	2	1
160.0°	1	1	1	1	1	1	1	1
165.0°	1	1	1	1	1	1	1	1
170.0°	1	1	1	1	1	1	1	1
175.0°	1	1	1	1	1	1	1	1
180.0°	0	0	0	0	0	0	0	0

Luminous Intensity (cd) Distribution Data (cont.)

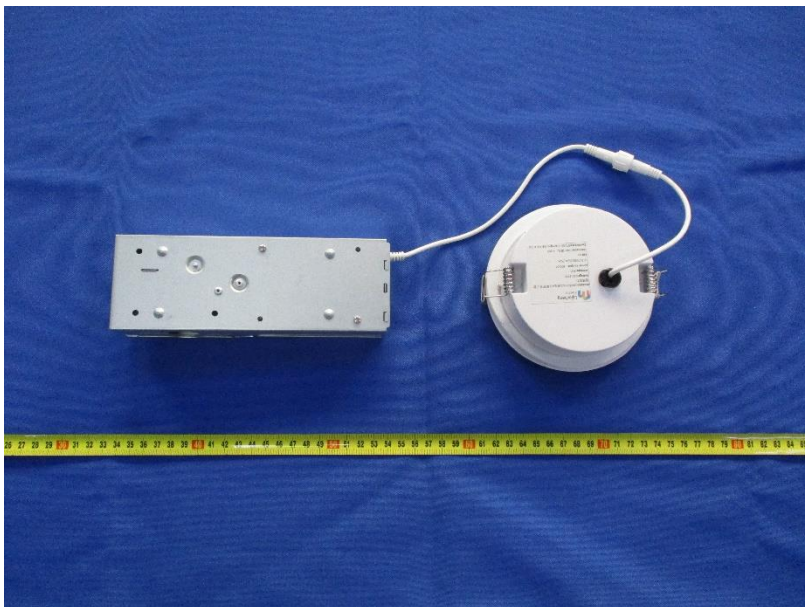
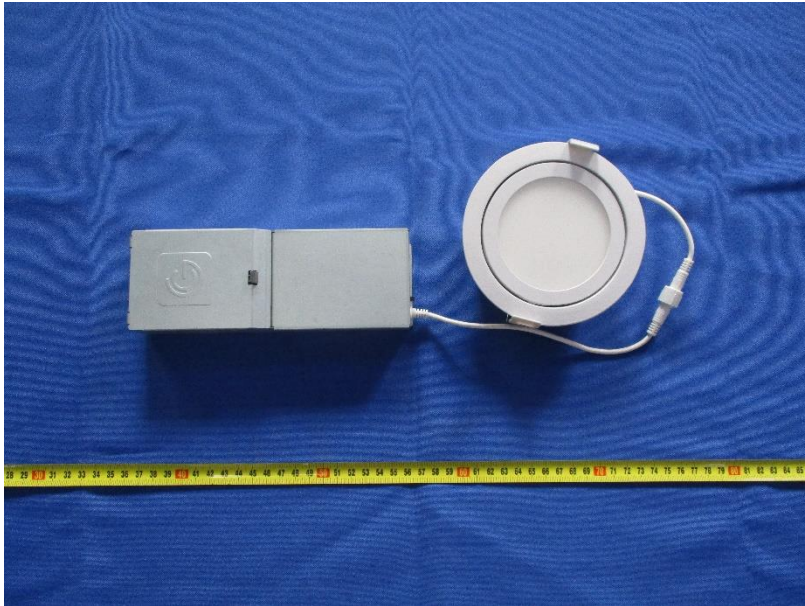
C y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	178	178	178	178	178	178	178	178
5.0°	178	178	178	178	178	178	178	177
10.0°	177	177	177	177	177	177	177	177
15.0°	174	175	175	175	175	175	175	175
20.0°	171	171	171	171	172	172	172	171
25.0°	166	166	167	167	167	167	167	167
30.0°	160	160	161	161	161	161	161	161
35.0°	153	153	154	154	154	154	154	154
40.0°	145	145	145	146	146	146	146	145
45.0°	135	136	136	137	137	137	136	136
50.0°	125	125	126	126	127	126	126	125
55.0°	113	114	114	115	115	115	114	114
60.0°	101	101	102	103	103	103	102	101
65.0°	87	88	88	89	89	89	89	88
70.0°	73	73	74	75	75	75	74	74
75.0°	58	59	60	60	61	61	60	59
80.0°	44	45	46	47	47	47	46	45
85.0°	32	33	34	34	35	35	34	33
90.0°	25	25	25	26	27	26	25	25
95.0°	18	13	8	16	21	15	8	14
100.0°	10	3	0	5	11	4	0	4
105.0°	4	0	0	3	5	3	0	1
110.0°	0	1	1	1	2	1	1	0
115.0°	1	1	1	1	1	1	1	1
120.0°	1	1	3	3	2	3	2	1
125.0°	1	2	5	8	11	8	3	2
130.0°	1	2	6	11	14	10	3	2
135.0°	2	3	6	10	13	9	4	2
140.0°	2	3	6	9	11	8	4	3
145.0°	1	2	5	8	9	7	3	2
150.0°	1	2	4	6	8	5	3	2
155.0°	1	2	3	5	6	4	2	2
160.0°	1	1	1	1	1	1	1	1
165.0°	1	1	1	1	1	1	1	1
170.0°	1	1	1	1	1	1	1	1
175.0°	1	1	1	1	1	1	1	1
180.0°	0	0	0	0	0	0	0	0

Zonal Lumen Density Measurement

Deg	Flux (lm)	%
0-5	4.3	0.65
5-10	12.7	1.90
10-15	20.9	3.13
15-20	28.5	4.28
20-25	35.5	5.32
25-30	41.4	6.23
30-35	46.3	6.96
35-40	49.9	7.49
40-45	52.2	7.84
45-50	53.0	7.95
50-55	52.2	7.84
55-60	49.9	7.49
60-65	46.3	6.93
65-70	41.3	6.19
70-75	35.2	5.28
75-80	28.3	4.25
80-85	21.5	3.22
85-90	16.2	2.43
90-95	11.4	1.71
95-100	4.0	0.60
100-105	1.4	0.21
105-110	0.6	0.09
110-115	0.3	0.05
115-120	0.6	0.08
120-125	1.4	0.21
125-130	2.4	0.36
130-135	2.5	0.36
135-140	2.1	0.32
140-145	1.7	0.26
145-150	1.3	0.19
150-155	1.0	0.13
155-160	0.4	0.07
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	4.2	0.64
0-10	16.9	2.54
0-15	37.8	5.67
0-20	66.3	9.95
0-25	101.8	15.27
0-30	143.3	21.49
0-35	189.6	28.44
0-40	239.6	35.94
0-45	291.8	43.76
0-50	344.8	51.71
0-55	397.0	59.54
0-60	446.9	67.03
0-65	493.2	73.97
0-70	534.5	80.16
0-75	569.6	85.43
0-80	597.9	89.68
0-85	619.5	92.91
0-90	635.6	95.33
0-95	647.0	97.04
0-100	651.0	97.64
0-105	652.4	97.84
0-110	653.0	97.93
0-115	653.3	97.97
0-120	653.8	98.05
0-125	655.1	98.26
0-130	657.5	98.62
0-135	660.0	98.98
0-140	662.1	99.30
0-145	663.8	99.56
0-150	665.1	99.75
0-155	666.0	99.89
0-160	666.5	99.96
0-165	666.6	99.98
0-170	666.7	99.99
0-175	666.7	100.00
0-180	666.8	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*****