

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: MFR6/9CCT5S/DUALDIM/EXT

Report Type:	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution
Project Engineer:	Bay Wang
Report Number:	RKSB220907008-10-2
Test Date:	2022-09-09 to 2022-09-13
Report Date:	2022-09-20
Reviewed By:	Seven Xia / EE Engineer
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:	MFR6/9CCT5S/DUALDIM/EXT
Manufacturer:	GREEN CREATIVE LTD
Brand Name:	GREEN CREATIVE
Product Designation:	LED Recessed Downlight
Burning Time Before Test:	0hour(For New Products)
Color Tunable:	White-Tunable
CCT Range:	2700K, 3000K, 3500K, 4000K, 5000K
Least Efficient Setting:	2700K
Most Consumptive Setting:	2700K
Default Setting:	3500K

Rated Values:

Rated Voltage/Frequency:	120-277V 50/60Hz
Rated Power:	10W
Nominal CCT:	2700K/3000K/3500K/4000K/5000K
Nominal Lumen Output:	780lm/800lm/820lm/840lm/850lm

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

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
Goniophotometer	INVENTFINE	GPM-1900	YWGCF120001	2021-11-15	2022-11-14
Wireless Weather Station	ZHONGXING	KG218	N/A	2021-11-02	2022-11-01
Standard Light Source	INVENTFINE	N/A	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_i , R_g was calculated according to IES TM-30-18 by using calculation tools. The calculation was based on the measured SPD from 380nm to 780nm with 1nm intervals. All the colors in this report is for reference only.

5. Test Result

[Integrating Sphere System]

Control Setting: 2700K 10W

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

Test orientation: **Downward**

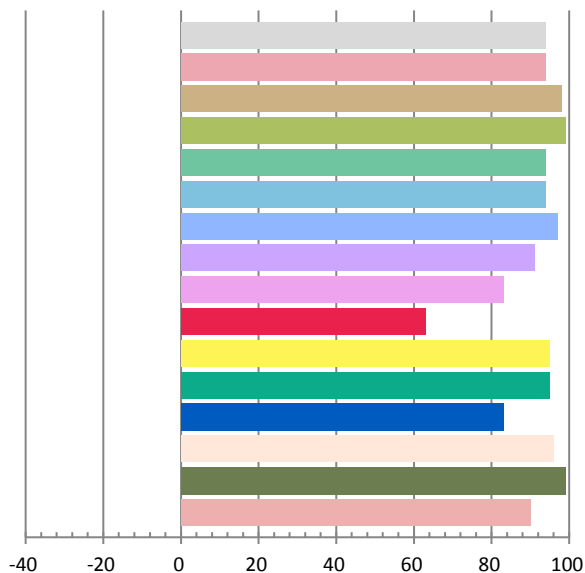
Photometric and Electrical Measurement Result

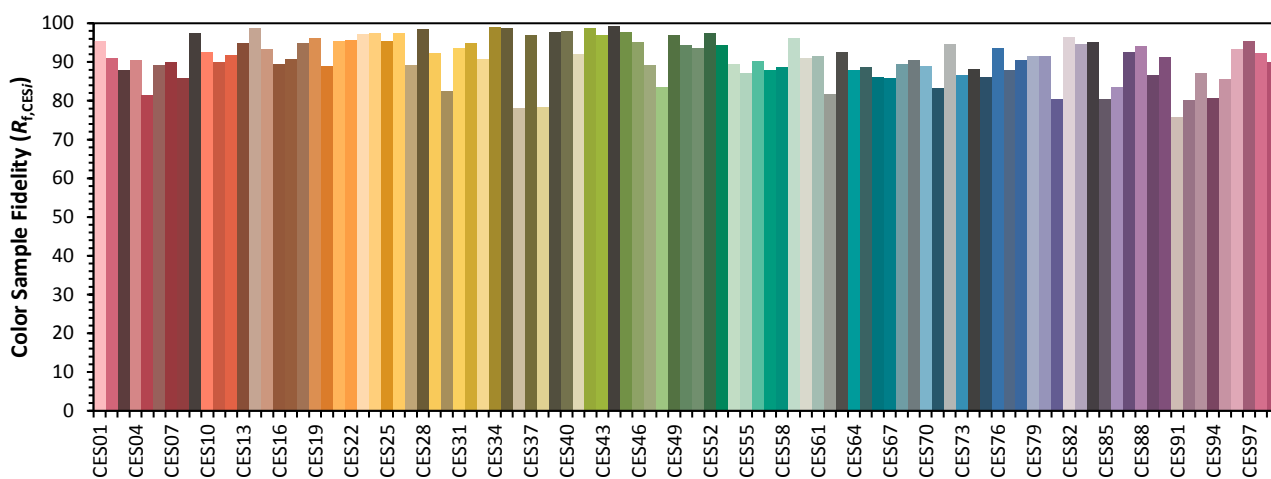
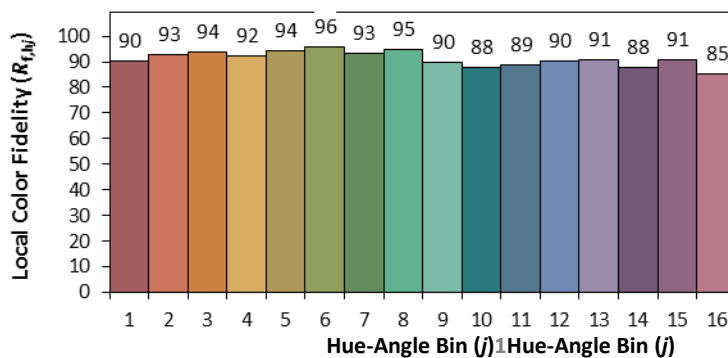
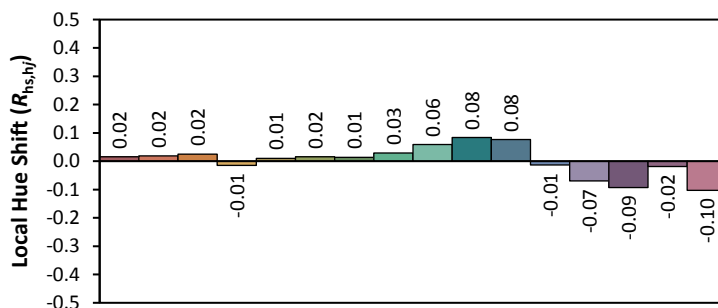
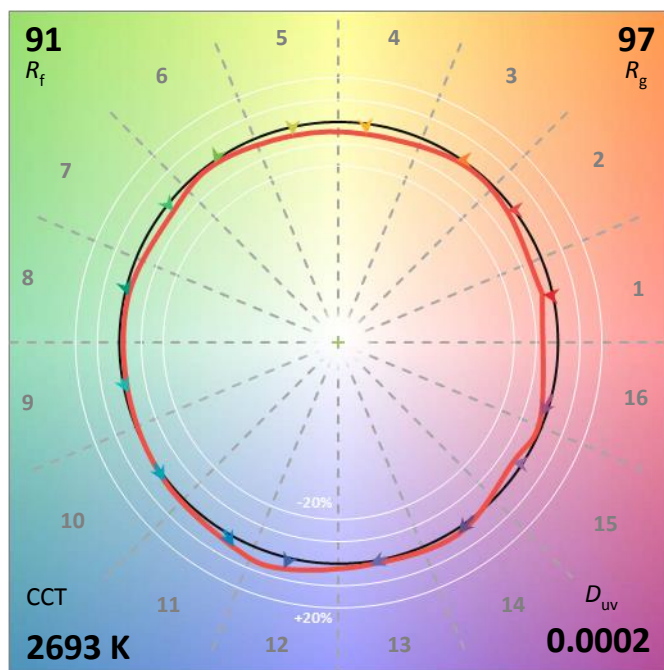
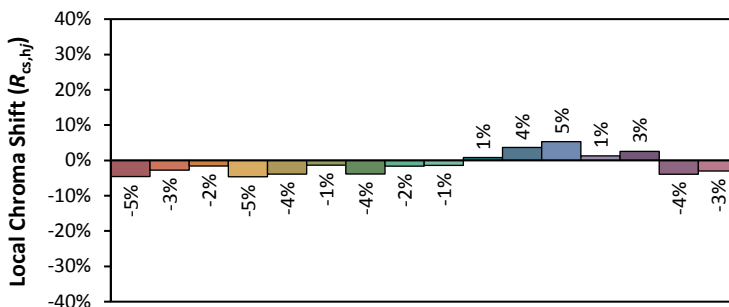
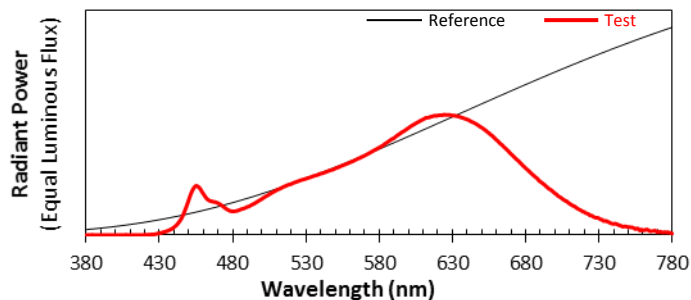
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.0812	9.54	0.9791	813.18	85.25

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
2.891	2694	0.00022	0.4608	0.4114	0.2627	0.5278

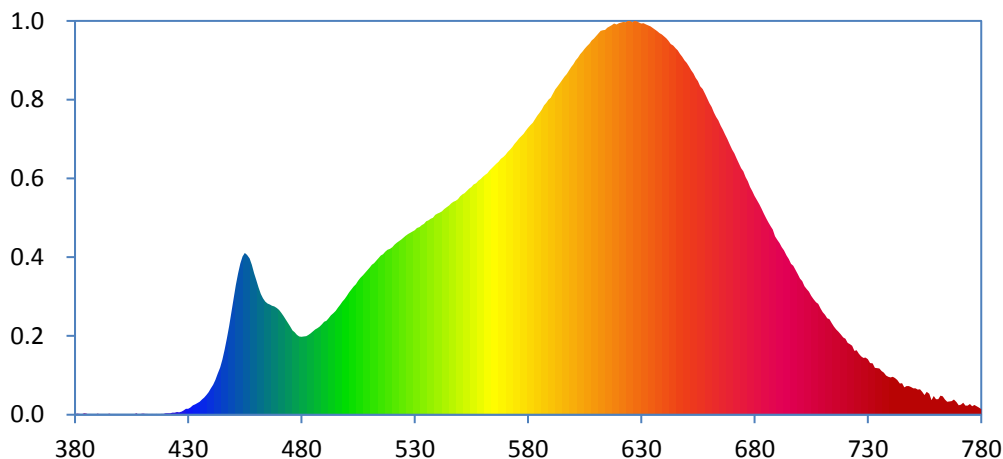
Color Rendering Index

Ra			
93.8			
R1	R2	R3	R4
94	98	99	94
R5	R6	R7	R8
94	97	91	83
R9	R10	R11	R12
63	95	95	83
R13	R14	R15	
96	99	90	





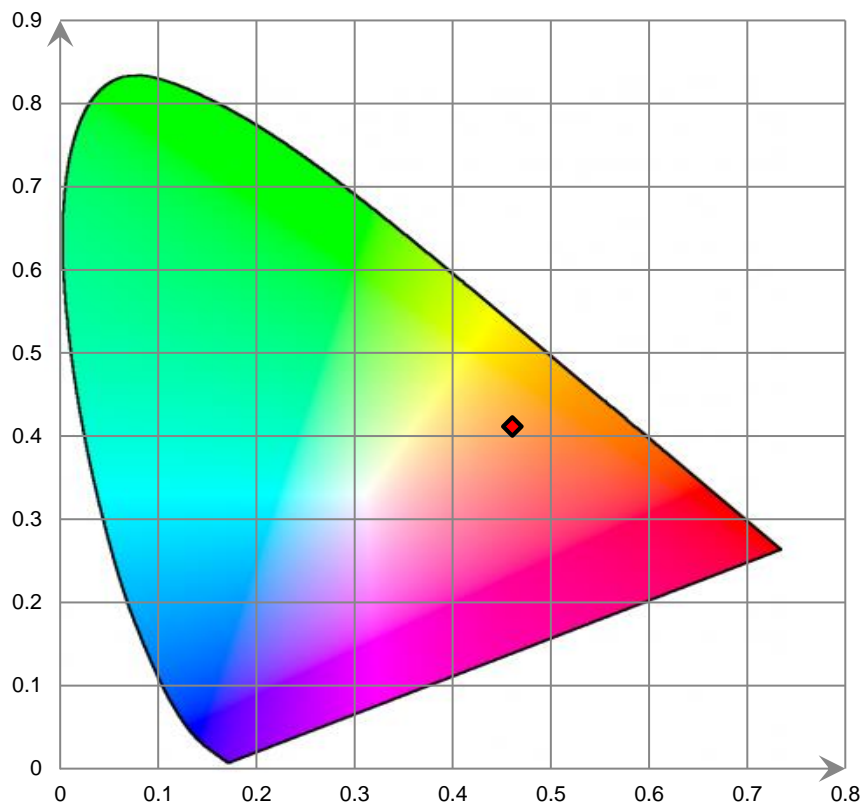
Relative Spectral Power Distribution



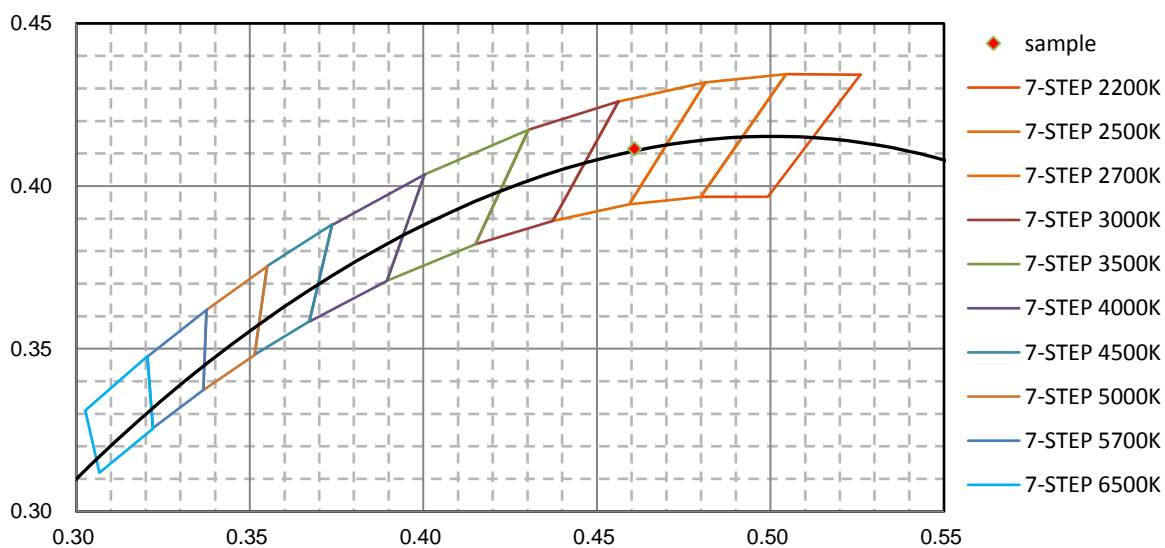
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380	2.380E-02	421	6.080E-02	462	5.475E+00	503	5.802E+00	544	9.394E+00
381	5.670E-02	422	5.870E-02	463	5.273E+00	504	5.909E+00	545	9.469E+00
382	4.210E-02	423	9.580E-02	464	5.126E+00	505	6.061E+00	546	9.572E+00
383	2.150E-02	424	8.930E-02	465	5.041E+00	506	6.187E+00	547	9.633E+00
384	5.970E-02	425	1.198E-01	466	4.994E+00	507	6.312E+00	548	9.685E+00
385	4.430E-02	426	1.065E-01	467	4.932E+00	508	6.432E+00	549	9.757E+00
386	4.900E-03	427	1.442E-01	468	4.901E+00	509	6.536E+00	550	9.887E+00
387	3.110E-02	428	1.950E-01	469	4.835E+00	510	6.662E+00	551	9.971E+00
388	8.600E-03	429	2.622E-01	470	4.740E+00	511	6.783E+00	552	1.003E+01
389	8.500E-03	430	2.723E-01	471	4.613E+00	512	6.859E+00	553	1.013E+01
390	4.460E-02	431	3.341E-01	472	4.469E+00	513	6.968E+00	554	1.023E+01
391	1.670E-02	432	4.239E-01	473	4.307E+00	514	7.093E+00	555	1.031E+01
392	1.080E-02	433	4.717E-01	474	4.151E+00	515	7.201E+00	556	1.043E+01
393	1.060E-02	434	5.280E-01	475	3.994E+00	516	7.264E+00	557	1.049E+01
394	1.440E-02	435	5.861E-01	476	3.820E+00	517	7.375E+00	558	1.059E+01
395	4.490E-02	436	6.898E-01	477	3.730E+00	518	7.461E+00	559	1.066E+01
396	1.560E-02	437	7.748E-01	478	3.612E+00	519	7.517E+00	560	1.077E+01
397	1.640E-02	438	8.963E-01	479	3.543E+00	520	7.584E+00	561	1.086E+01
398	9.200E-03	439	1.028E+00	480	3.524E+00	521	7.694E+00	562	1.094E+01
399	5.000E-04	440	1.195E+00	481	3.543E+00	522	7.789E+00	563	1.106E+01
400	0.000E+00	441	1.360E+00	482	3.558E+00	523	7.854E+00	564	1.116E+01
401	1.410E-02	442	1.570E+00	483	3.615E+00	524	7.936E+00	565	1.126E+01
402	1.960E-02	443	1.849E+00	484	3.684E+00	525	8.022E+00	566	1.137E+01
403	8.800E-03	444	2.142E+00	485	3.780E+00	526	8.098E+00	567	1.145E+01
404	9.900E-03	445	2.496E+00	486	3.860E+00	527	8.181E+00	568	1.158E+01
405	2.880E-02	446	2.941E+00	487	3.913E+00	528	8.230E+00	569	1.167E+01
406	4.800E-03	447	3.452E+00	488	3.992E+00	529	8.297E+00	570	1.178E+01
407	7.160E-02	448	4.010E+00	489	4.086E+00	530	8.344E+00	571	1.189E+01
408	1.150E-02	449	4.623E+00	490	4.203E+00	531	8.453E+00	572	1.200E+01
409	3.470E-02	450	5.256E+00	491	4.249E+00	532	8.501E+00	573	1.212E+01
410	4.890E-02	451	5.876E+00	492	4.373E+00	533	8.581E+00	574	1.226E+01
411	3.100E-02	452	6.390E+00	493	4.501E+00	534	8.642E+00	575	1.237E+01
412	3.850E-02	453	6.851E+00	494	4.599E+00	535	8.751E+00	576	1.250E+01
413	3.500E-03	454	7.161E+00	495	4.708E+00	536	8.802E+00	577	1.261E+01
414	3.230E-02	455	7.321E+00	496	4.850E+00	537	8.870E+00	578	1.271E+01
415	2.260E-02	456	7.241E+00	497	4.982E+00	538	8.923E+00	579	1.285E+01
416	3.610E-02	457	7.076E+00	498	5.121E+00	539	9.045E+00	580	1.299E+01
417	2.280E-02	458	6.790E+00	499	5.241E+00	540	9.112E+00	581	1.310E+01
418	3.500E-02	459	6.416E+00	500	5.380E+00	541	9.154E+00	582	1.321E+01
419	4.100E-02	460	6.096E+00	501	5.542E+00	542	9.208E+00	583	1.338E+01
420	5.890E-02	461	5.764E+00	502	5.676E+00	543	9.311E+00	584	1.354E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.367E+01	626	1.777E+01	667	1.268E+01	708	5.025E+00	749	1.252E+00
586	1.381E+01	627	1.783E+01	668	1.249E+01	709	4.813E+00	750	1.189E+00
587	1.399E+01	628	1.781E+01	669	1.222E+01	710	4.647E+00	751	1.195E+00
588	1.412E+01	629	1.776E+01	670	1.200E+01	711	4.525E+00	752	1.137E+00
589	1.426E+01	630	1.771E+01	671	1.183E+01	712	4.370E+00	753	1.151E+00
590	1.435E+01	631	1.772E+01	672	1.160E+01	713	4.319E+00	754	1.030E+00
591	1.454E+01	632	1.767E+01	673	1.138E+01	714	4.157E+00	755	8.975E-01
592	1.472E+01	633	1.762E+01	674	1.116E+01	715	3.985E+00	756	1.030E+00
593	1.486E+01	634	1.757E+01	675	1.101E+01	716	3.856E+00	757	9.471E-01
594	1.502E+01	635	1.751E+01	676	1.075E+01	717	3.757E+00	758	6.663E-01
595	1.516E+01	636	1.743E+01	677	1.057E+01	718	3.637E+00	759	8.505E-01
596	1.531E+01	637	1.736E+01	678	1.030E+01	719	3.493E+00	760	7.060E-01
597	1.542E+01	638	1.728E+01	679	1.013E+01	720	3.438E+00	761	7.043E-01
598	1.558E+01	639	1.722E+01	680	9.903E+00	721	3.259E+00	762	8.599E-01
599	1.574E+01	640	1.713E+01	681	9.725E+00	722	3.202E+00	763	8.359E-01
600	1.588E+01	641	1.705E+01	682	9.522E+00	723	3.115E+00	764	6.853E-01
601	1.604E+01	642	1.692E+01	683	9.316E+00	724	2.894E+00	765	5.905E-01
602	1.616E+01	643	1.679E+01	684	9.106E+00	725	2.915E+00	766	6.082E-01
603	1.631E+01	644	1.670E+01	685	8.901E+00	726	2.760E+00	767	6.138E-01
604	1.643E+01	645	1.660E+01	686	8.721E+00	727	2.652E+00	768	6.836E-01
605	1.656E+01	646	1.649E+01	687	8.536E+00	728	2.577E+00	769	5.719E-01
606	1.668E+01	647	1.634E+01	688	8.375E+00	729	2.584E+00	770	4.260E-01
607	1.679E+01	648	1.621E+01	689	8.082E+00	730	2.509E+00	771	4.613E-01
608	1.695E+01	649	1.604E+01	690	7.923E+00	731	2.333E+00	772	5.366E-01
609	1.703E+01	650	1.592E+01	691	7.772E+00	732	2.319E+00	773	4.064E-01
610	1.714E+01	651	1.577E+01	692	7.589E+00	733	2.117E+00	774	4.075E-01
611	1.726E+01	652	1.559E+01	693	7.432E+00	734	2.102E+00	775	4.850E-01
612	1.738E+01	653	1.545E+01	694	7.205E+00	735	2.101E+00	776	3.790E-01
613	1.740E+01	654	1.524E+01	695	7.053E+00	736	1.979E+00	777	4.501E-01
614	1.743E+01	655	1.510E+01	696	6.832E+00	737	1.899E+00	778	3.799E-01
615	1.753E+01	656	1.487E+01	697	6.737E+00	738	1.771E+00	779	3.339E-01
616	1.758E+01	657	1.475E+01	698	6.559E+00	739	1.714E+00	780	2.471E-01
617	1.763E+01	658	1.453E+01	699	6.371E+00	740	1.682E+00		
618	1.770E+01	659	1.431E+01	700	6.167E+00	741	1.711E+00		
619	1.766E+01	660	1.410E+01	701	6.045E+00	742	1.654E+00		
620	1.773E+01	661	1.393E+01	702	5.812E+00	743	1.567E+00		
621	1.775E+01	662	1.369E+01	703	5.683E+00	744	1.418E+00		
622	1.779E+01	663	1.348E+01	704	5.563E+00	745	1.420E+00		
623	1.776E+01	664	1.333E+01	705	5.376E+00	746	1.246E+00		
624	1.782E+01	665	1.309E+01	706	5.241E+00	747	1.302E+00		
625	1.783E+01	666	1.290E+01	707	5.095E+00	748	1.295E+00		

CIE 1931xy Chromaticity Diagram



7-StepChromaticity Quadrangles



Control Setting: 3000K 10W

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

Test orientation: **Downward**

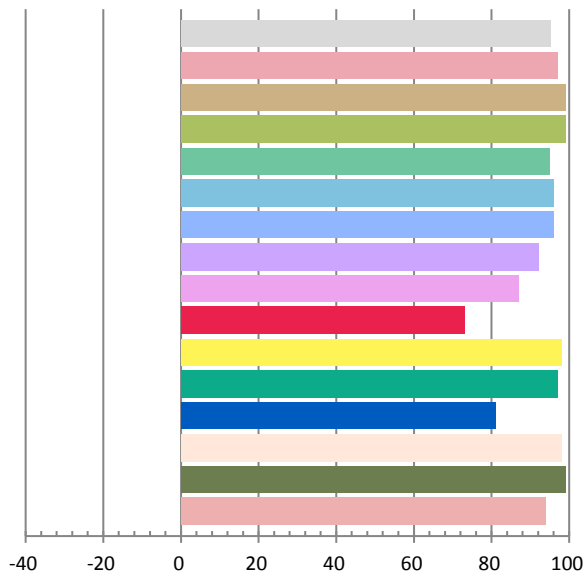
Photometric and Electrical Measurement Result

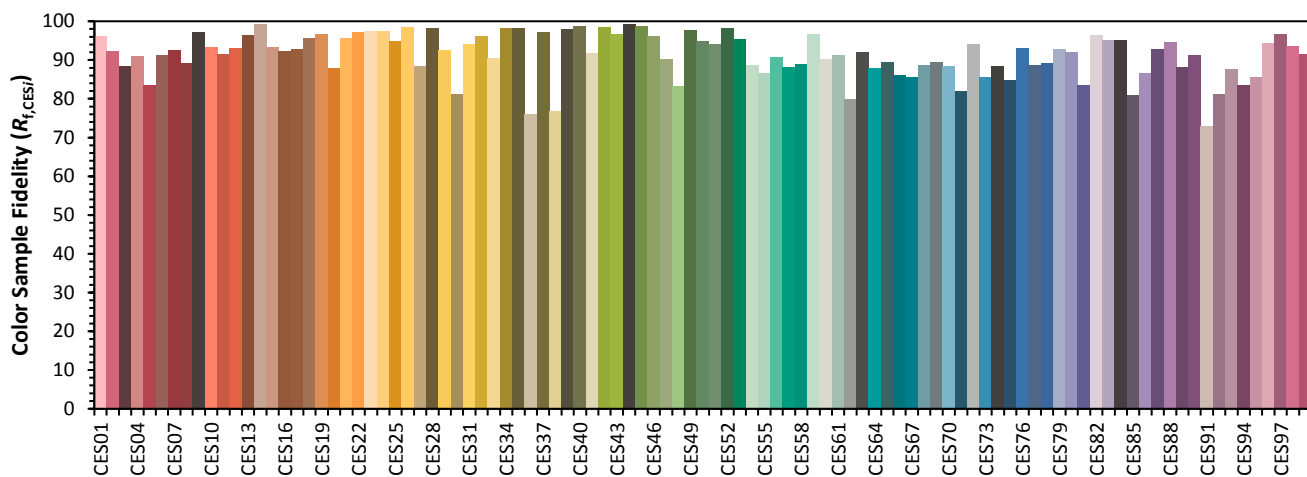
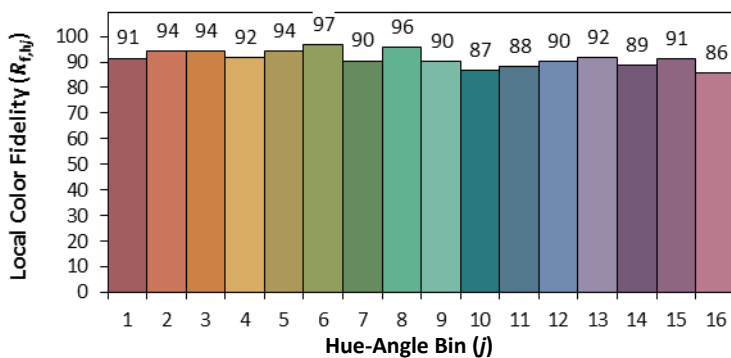
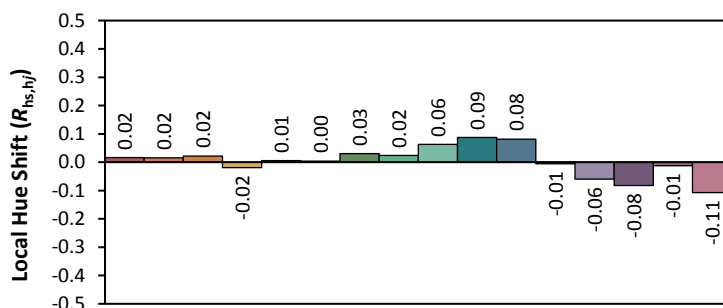
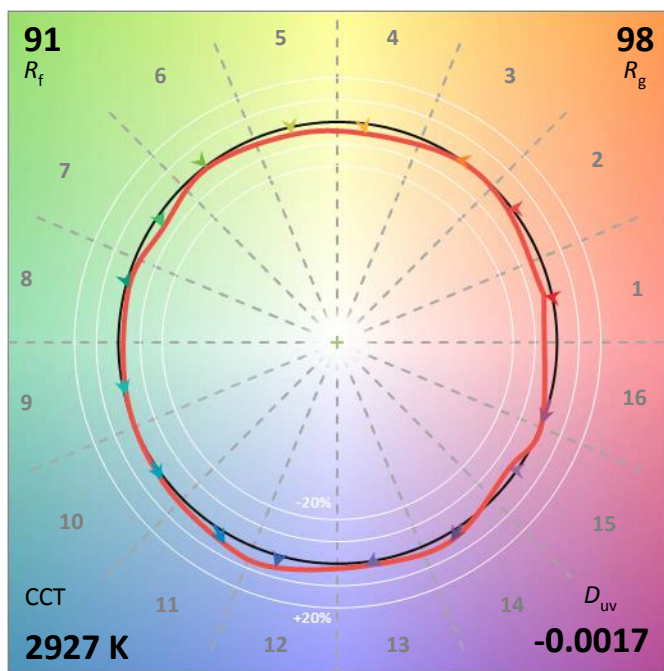
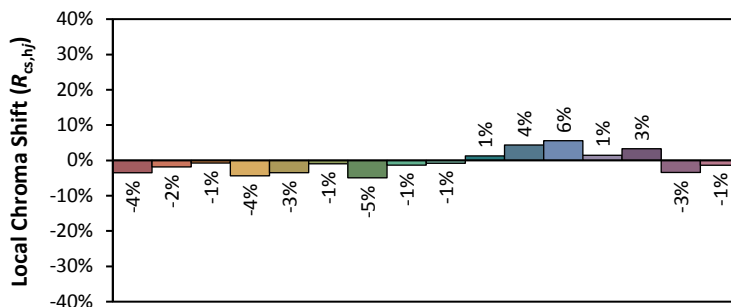
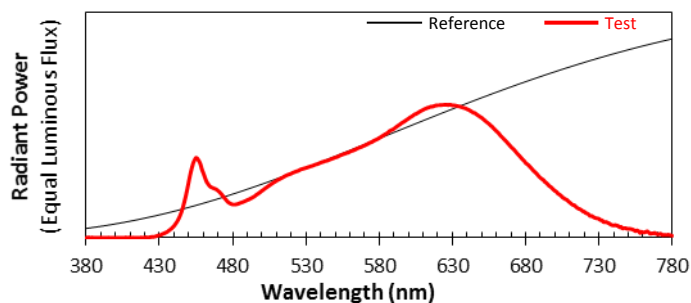
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.0809	9.53	0.9813	838.04	87.94

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
2.992	2927	-0.00167	0.4397	0.4008	0.2538	0.5205

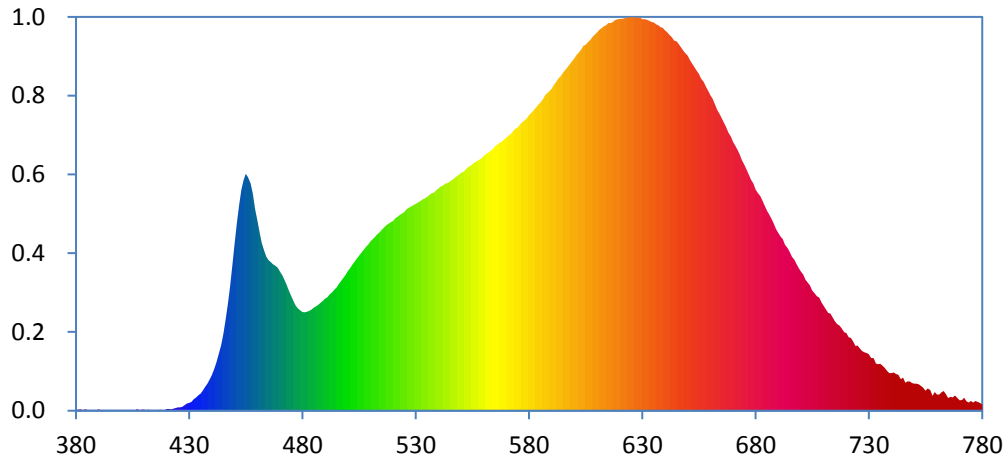
Color Rendering Index

Ra			
95.2			
R1	R2	R3	R4
97	99	99	95
R5	R6	R7	R8
96	96	92	87
R9	R10	R11	R12
73	98	97	81
R13	R14	R15	
98	99	94	





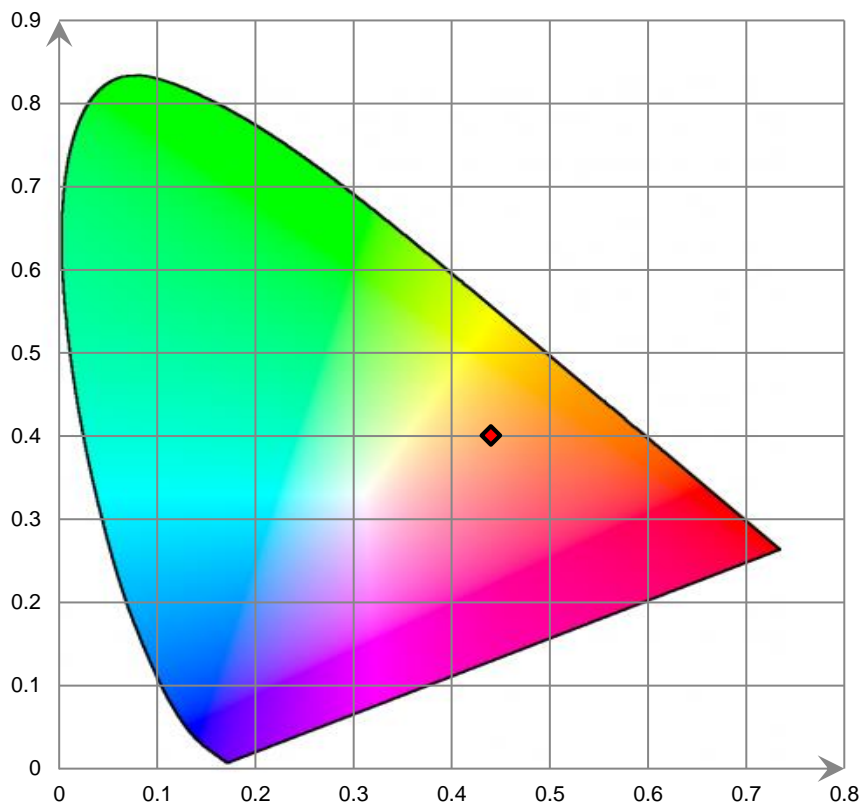
Relative Spectral Power Distribution



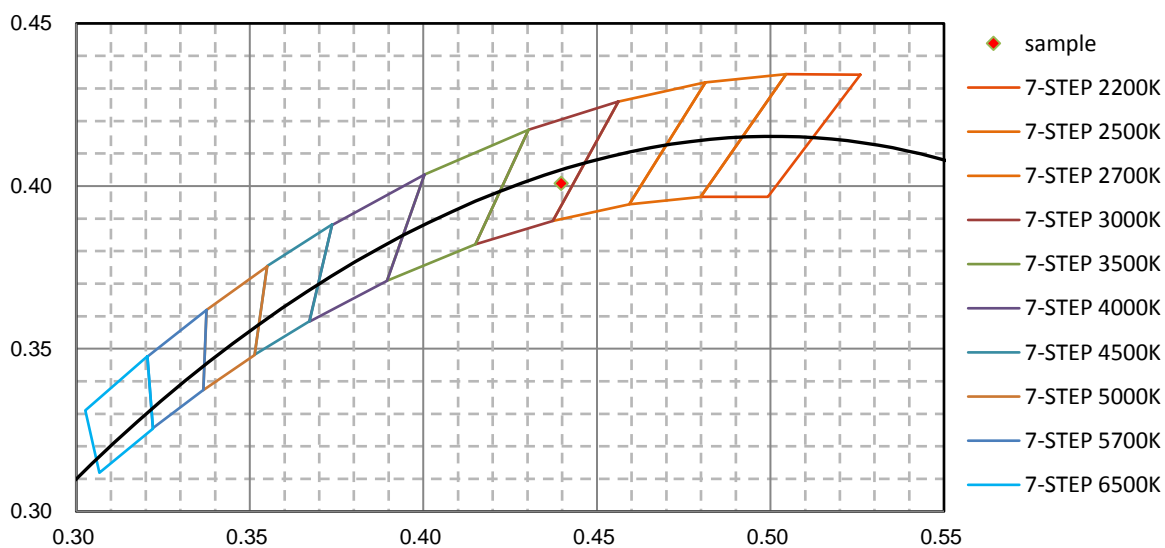
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	1.950E-02	421	7.460E-02	462	7.393E+00	503	6.566E+00	544	1.005E+01
381	5.570E-02	422	6.750E-02	463	7.080E+00	504	6.717E+00	545	1.011E+01
382	6.910E-02	423	8.920E-02	464	6.796E+00	505	6.841E+00	546	1.019E+01
383	2.240E-02	424	1.160E-01	465	6.643E+00	506	6.965E+00	547	1.026E+01
384	5.690E-02	425	1.480E-01	466	6.555E+00	507	7.111E+00	548	1.035E+01
385	3.430E-02	426	1.488E-01	467	6.463E+00	508	7.231E+00	549	1.042E+01
386	2.300E-03	427	1.787E-01	468	6.403E+00	509	7.340E+00	550	1.050E+01
387	2.320E-02	428	2.438E-01	469	6.307E+00	510	7.470E+00	551	1.054E+01
388	1.290E-02	429	3.221E-01	470	6.138E+00	511	7.572E+00	552	1.064E+01
389	1.620E-02	430	3.489E-01	471	5.978E+00	512	7.669E+00	553	1.074E+01
390	5.810E-02	431	3.948E-01	472	5.768E+00	513	7.784E+00	554	1.080E+01
391	1.820E-02	432	5.142E-01	473	5.543E+00	514	7.869E+00	555	1.088E+01
392	1.100E-02	433	5.832E-01	474	5.289E+00	515	7.983E+00	556	1.095E+01
393	8.200E-03	434	6.894E-01	475	5.064E+00	516	8.086E+00	557	1.102E+01
394	1.310E-02	435	7.615E-01	476	4.833E+00	517	8.178E+00	558	1.108E+01
395	4.170E-02	436	8.995E-01	477	4.642E+00	518	8.258E+00	559	1.114E+01
396	4.400E-03	437	1.047E+00	478	4.519E+00	519	8.324E+00	560	1.125E+01
397	4.500E-03	438	1.189E+00	479	4.424E+00	520	8.388E+00	561	1.134E+01
398	1.000E-04	439	1.376E+00	480	4.359E+00	521	8.504E+00	562	1.139E+01
399	0.000E+00	440	1.574E+00	481	4.345E+00	522	8.570E+00	563	1.147E+01
400	0.000E+00	441	1.834E+00	482	4.366E+00	523	8.648E+00	564	1.155E+01
401	1.660E-02	442	2.128E+00	483	4.411E+00	524	8.706E+00	565	1.167E+01
402	2.010E-02	443	2.480E+00	484	4.464E+00	525	8.782E+00	566	1.174E+01
403	1.800E-02	444	2.892E+00	485	4.557E+00	526	8.906E+00	567	1.182E+01
404	1.090E-02	445	3.401E+00	486	4.618E+00	527	8.966E+00	568	1.187E+01
405	3.410E-02	446	4.015E+00	487	4.689E+00	528	9.018E+00	569	1.198E+01
406	5.500E-03	447	4.704E+00	488	4.766E+00	529	9.074E+00	570	1.206E+01
407	7.750E-02	448	5.504E+00	489	4.852E+00	530	9.131E+00	571	1.215E+01
408	1.370E-02	449	6.425E+00	490	4.952E+00	531	9.187E+00	572	1.223E+01
409	4.280E-02	450	7.365E+00	491	5.009E+00	532	9.260E+00	573	1.235E+01
410	5.300E-02	451	8.273E+00	492	5.129E+00	533	9.329E+00	574	1.245E+01
411	2.750E-02	452	9.065E+00	493	5.224E+00	534	9.371E+00	575	1.250E+01
412	4.390E-02	453	9.740E+00	494	5.338E+00	535	9.447E+00	576	1.263E+01
413	9.500E-03	454	1.018E+01	495	5.437E+00	536	9.530E+00	577	1.273E+01
414	3.670E-02	455	1.045E+01	496	5.601E+00	537	9.598E+00	578	1.282E+01
415	2.370E-02	456	1.030E+01	497	5.732E+00	538	9.628E+00	579	1.291E+01
416	3.920E-02	457	1.003E+01	498	5.863E+00	539	9.727E+00	580	1.304E+01
417	3.760E-02	458	9.582E+00	499	6.001E+00	540	9.810E+00	581	1.314E+01
418	3.790E-02	459	8.908E+00	500	6.161E+00	541	9.886E+00	582	1.327E+01
419	2.760E-02	460	8.410E+00	501	6.287E+00	542	9.930E+00	583	1.338E+01
420	8.080E-02	461	7.884E+00	502	6.451E+00	543	1.002E+01	584	1.351E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.361E+01	626	1.738E+01	667	1.252E+01	708	4.986E+00	749	1.224E+00
586	1.373E+01	627	1.732E+01	668	1.228E+01	709	4.785E+00	750	1.187E+00
587	1.392E+01	628	1.736E+01	669	1.209E+01	710	4.631E+00	751	1.191E+00
588	1.402E+01	629	1.735E+01	670	1.185E+01	711	4.468E+00	752	1.162E+00
589	1.410E+01	630	1.727E+01	671	1.169E+01	712	4.320E+00	753	1.102E+00
590	1.421E+01	631	1.728E+01	672	1.150E+01	713	4.286E+00	754	1.008E+00
591	1.438E+01	632	1.725E+01	673	1.128E+01	714	4.111E+00	755	8.813E-01
592	1.451E+01	633	1.721E+01	674	1.104E+01	715	3.942E+00	756	9.876E-01
593	1.467E+01	634	1.716E+01	675	1.085E+01	716	3.826E+00	757	9.080E-01
594	1.478E+01	635	1.713E+01	676	1.064E+01	717	3.758E+00	758	6.554E-01
595	1.494E+01	636	1.706E+01	677	1.041E+01	718	3.639E+00	759	8.199E-01
596	1.505E+01	637	1.700E+01	678	1.019E+01	719	3.467E+00	760	7.148E-01
597	1.517E+01	638	1.692E+01	679	1.004E+01	720	3.423E+00	761	7.111E-01
598	1.530E+01	639	1.690E+01	680	9.762E+00	721	3.244E+00	762	8.156E-01
599	1.542E+01	640	1.678E+01	681	9.615E+00	722	3.208E+00	763	8.622E-01
600	1.556E+01	641	1.670E+01	682	9.467E+00	723	3.063E+00	764	7.319E-01
601	1.571E+01	642	1.659E+01	683	9.251E+00	724	2.853E+00	765	5.529E-01
602	1.581E+01	643	1.648E+01	684	9.037E+00	725	2.878E+00	766	6.100E-01
603	1.593E+01	644	1.633E+01	685	8.825E+00	726	2.745E+00	767	5.804E-01
604	1.610E+01	645	1.630E+01	686	8.647E+00	727	2.640E+00	768	6.748E-01
605	1.615E+01	646	1.617E+01	687	8.464E+00	728	2.577E+00	769	5.636E-01
606	1.627E+01	647	1.603E+01	688	8.258E+00	729	2.554E+00	770	4.639E-01
607	1.638E+01	648	1.590E+01	689	8.018E+00	730	2.497E+00	771	4.764E-01
608	1.650E+01	649	1.576E+01	690	7.850E+00	731	2.325E+00	772	5.698E-01
609	1.660E+01	650	1.566E+01	691	7.690E+00	732	2.320E+00	773	4.172E-01
610	1.669E+01	651	1.548E+01	692	7.571E+00	733	2.084E+00	774	3.651E-01
611	1.681E+01	652	1.532E+01	693	7.328E+00	734	2.059E+00	775	4.307E-01
612	1.688E+01	653	1.516E+01	694	7.184E+00	735	2.075E+00	776	3.643E-01
613	1.696E+01	654	1.500E+01	695	6.999E+00	736	1.978E+00	777	4.293E-01
614	1.701E+01	655	1.487E+01	696	6.784E+00	737	1.888E+00	778	3.879E-01
615	1.711E+01	656	1.465E+01	697	6.667E+00	738	1.753E+00	779	3.477E-01
616	1.710E+01	657	1.451E+01	698	6.483E+00	739	1.665E+00	780	2.719E-01
617	1.716E+01	658	1.430E+01	699	6.291E+00	740	1.653E+00		
618	1.723E+01	659	1.411E+01	700	6.134E+00	741	1.682E+00		
619	1.728E+01	660	1.391E+01	701	6.012E+00	742	1.623E+00		
620	1.729E+01	661	1.376E+01	702	5.788E+00	743	1.584E+00		
621	1.730E+01	662	1.353E+01	703	5.657E+00	744	1.396E+00		
622	1.731E+01	663	1.329E+01	704	5.525E+00	745	1.466E+00		
623	1.733E+01	664	1.311E+01	705	5.308E+00	746	1.235E+00		
624	1.734E+01	665	1.292E+01	706	5.187E+00	747	1.298E+00		
625	1.736E+01	666	1.271E+01	707	5.049E+00	748	1.287E+00		

CIE 1931xy Chromaticity Diagram



7-StepChromaticity Quadrangles



Control Setting: 3500K 10W

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

Test orientation: **Downward**

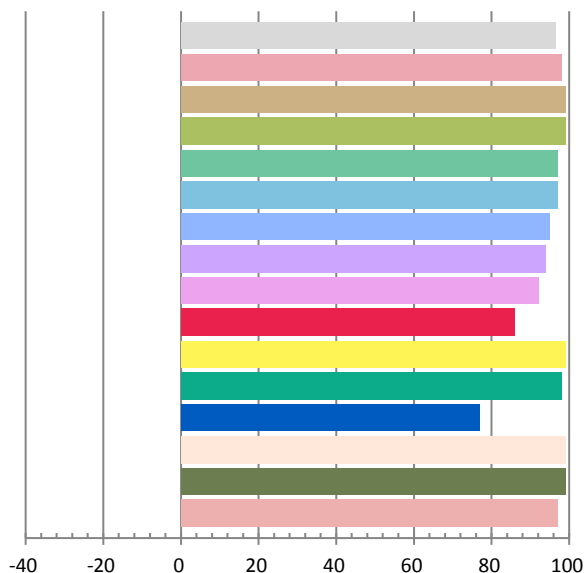
Photometric and Electrical Measurement Result

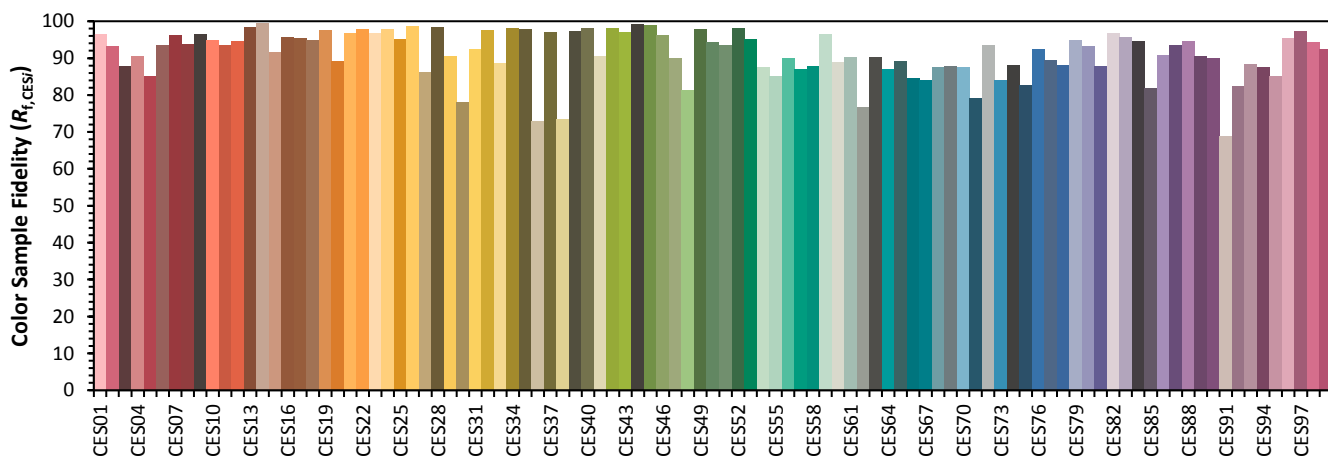
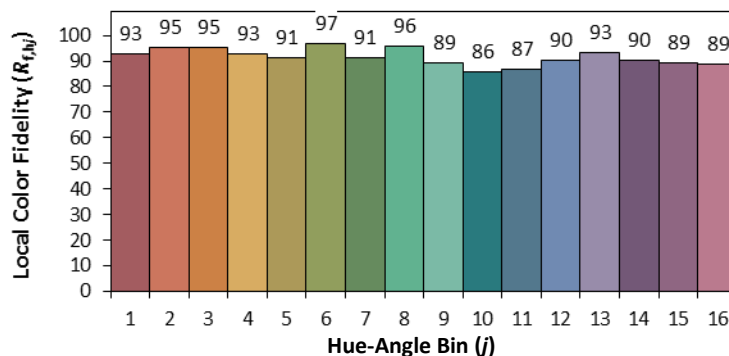
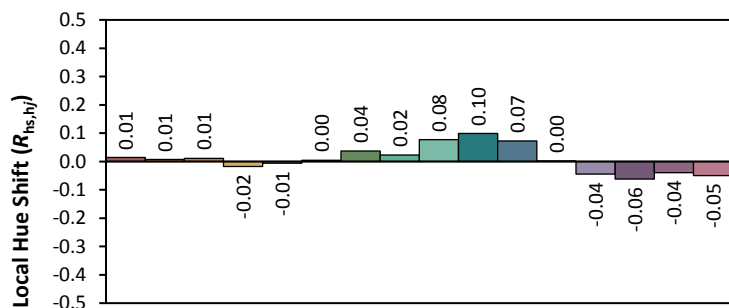
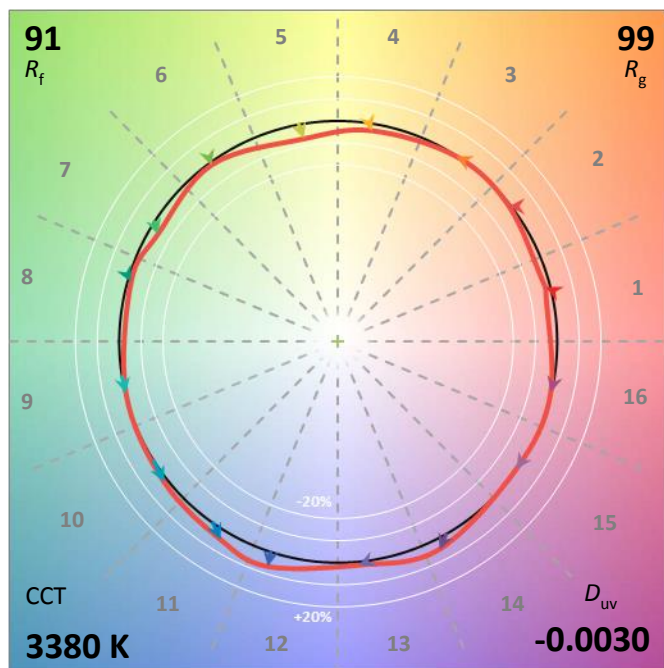
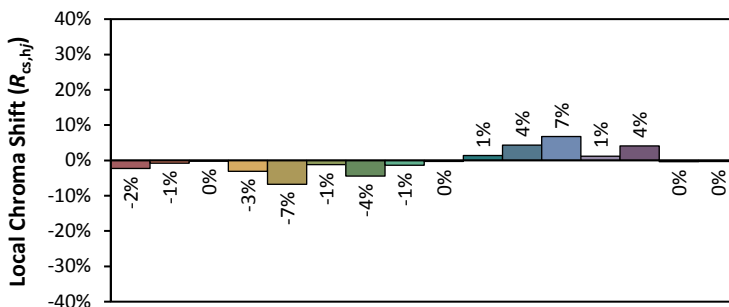
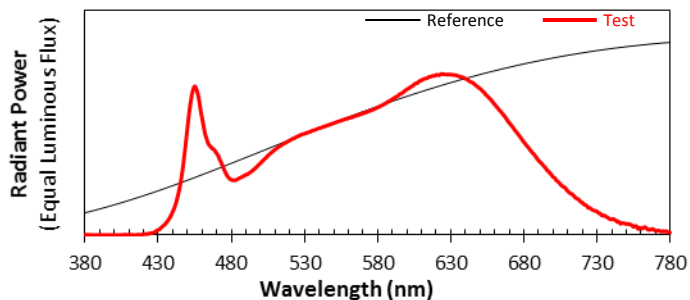
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.0804	9.48	0.9821	855.03	90.19

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
3.067	3381	-0.00303	0.4088	0.3855	0.2402	0.5096

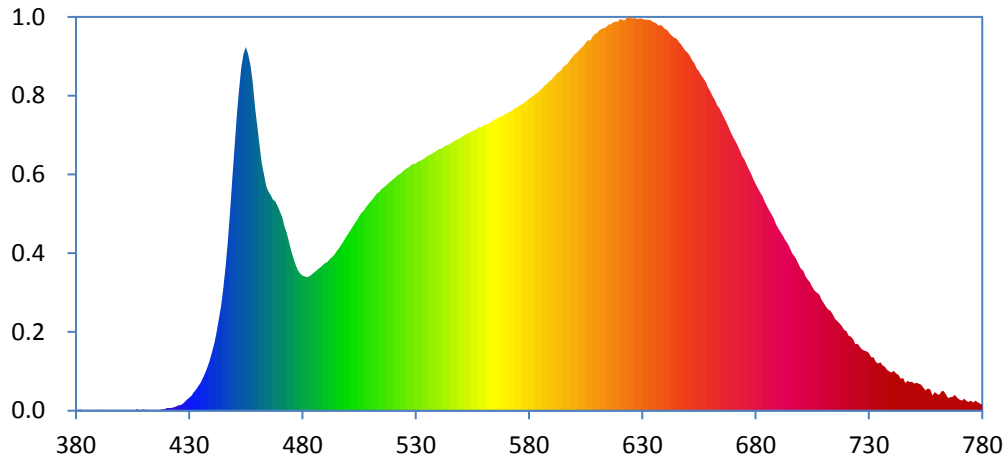
Color Rendering Index

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	





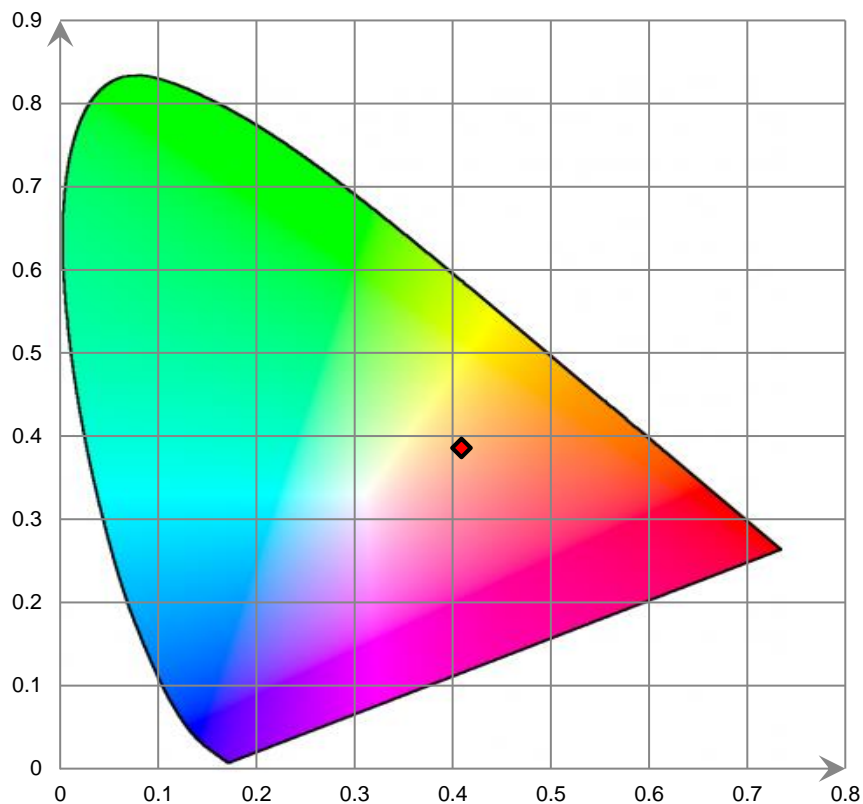
Relative Spectral Power Distribution



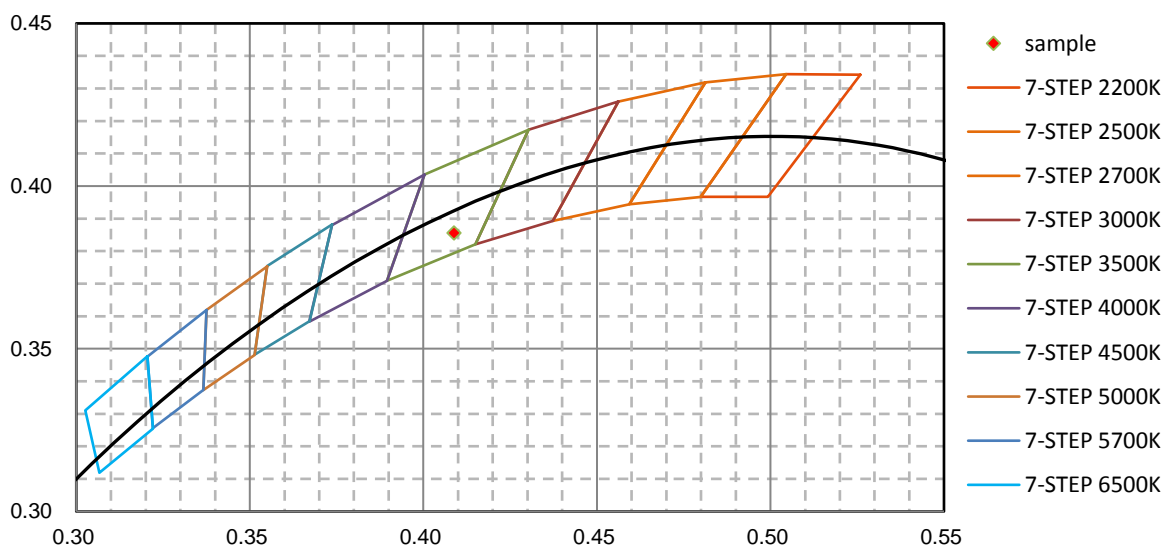
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	3.760E-02	421	1.101E-01	462	1.014E+01	503	7.664E+00	544	1.088E+01
381	3.570E-02	422	1.103E-01	463	9.676E+00	504	7.807E+00	545	1.094E+01
382	5.120E-02	423	1.437E-01	464	9.205E+00	505	7.975E+00	546	1.100E+01
383	9.300E-03	424	1.579E-01	465	8.987E+00	506	8.101E+00	547	1.105E+01
384	3.620E-02	425	2.146E-01	466	8.843E+00	507	8.212E+00	548	1.111E+01
385	2.190E-02	426	2.260E-01	467	8.651E+00	508	8.348E+00	549	1.115E+01
386	1.600E-03	427	2.659E-01	468	8.585E+00	509	8.475E+00	550	1.121E+01
387	1.660E-02	428	3.569E-01	469	8.372E+00	510	8.583E+00	551	1.126E+01
388	1.730E-02	429	4.583E-01	470	8.156E+00	511	8.673E+00	552	1.132E+01
389	6.500E-03	430	5.339E-01	471	7.935E+00	512	8.808E+00	553	1.137E+01
390	5.010E-02	431	6.060E-01	472	7.553E+00	513	8.910E+00	554	1.142E+01
391	1.530E-02	432	7.646E-01	473	7.284E+00	514	8.988E+00	555	1.146E+01
392	4.600E-03	433	8.763E-01	474	6.921E+00	515	9.094E+00	556	1.151E+01
393	3.000E-03	434	1.011E+00	475	6.556E+00	516	9.160E+00	557	1.157E+01
394	1.800E-02	435	1.154E+00	476	6.247E+00	517	9.245E+00	558	1.163E+01
395	3.830E-02	436	1.346E+00	477	5.975E+00	518	9.339E+00	559	1.163E+01
396	1.430E-02	437	1.545E+00	478	5.758E+00	519	9.413E+00	560	1.171E+01
397	2.020E-02	438	1.779E+00	479	5.625E+00	520	9.490E+00	561	1.174E+01
398	1.700E-03	439	2.052E+00	480	5.541E+00	521	9.576E+00	562	1.178E+01
399	6.000E-04	440	2.382E+00	481	5.499E+00	522	9.657E+00	563	1.182E+01
400	1.000E-04	441	2.722E+00	482	5.472E+00	523	9.701E+00	564	1.190E+01
401	1.620E-02	442	3.168E+00	483	5.513E+00	524	9.791E+00	565	1.194E+01
402	2.120E-02	443	3.696E+00	484	5.586E+00	525	9.867E+00	566	1.200E+01
403	2.250E-02	444	4.310E+00	485	5.657E+00	526	9.933E+00	567	1.204E+01
404	1.560E-02	445	5.064E+00	486	5.746E+00	527	9.994E+00	568	1.208E+01
405	3.730E-02	446	5.930E+00	487	5.812E+00	528	1.007E+01	569	1.215E+01
406	8.100E-03	447	6.965E+00	488	5.882E+00	529	1.012E+01	570	1.219E+01
407	7.140E-02	448	8.191E+00	489	5.972E+00	530	1.014E+01	571	1.224E+01
408	6.900E-03	449	9.547E+00	490	6.054E+00	531	1.022E+01	572	1.227E+01
409	4.160E-02	450	1.083E+01	491	6.096E+00	532	1.026E+01	573	1.236E+01
410	5.110E-02	451	1.213E+01	492	6.207E+00	533	1.031E+01	574	1.241E+01
411	3.370E-02	452	1.316E+01	493	6.292E+00	534	1.036E+01	575	1.246E+01
412	3.970E-02	453	1.408E+01	494	6.402E+00	535	1.044E+01	576	1.253E+01
413	8.100E-03	454	1.464E+01	495	6.545E+00	536	1.049E+01	577	1.257E+01
414	2.960E-02	455	1.491E+01	496	6.663E+00	537	1.053E+01	578	1.264E+01
415	2.480E-02	456	1.464E+01	497	6.789E+00	538	1.059E+01	579	1.271E+01
416	3.150E-02	457	1.414E+01	498	6.952E+00	539	1.065E+01	580	1.278E+01
417	3.640E-02	458	1.343E+01	499	7.086E+00	540	1.072E+01	581	1.285E+01
418	5.410E-02	459	1.243E+01	500	7.240E+00	541	1.074E+01	582	1.294E+01
419	5.400E-02	460	1.166E+01	501	7.374E+00	542	1.078E+01	583	1.300E+01
420	1.064E-01	461	1.088E+01	502	7.525E+00	543	1.087E+01	584	1.306E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.316E+01	626	1.609E+01	667	1.186E+01	708	4.776E+00	749	1.182E+00
586	1.323E+01	627	1.609E+01	668	1.165E+01	709	4.565E+00	750	1.106E+00
587	1.335E+01	628	1.605E+01	669	1.140E+01	710	4.413E+00	751	1.151E+00
588	1.342E+01	629	1.609E+01	670	1.122E+01	711	4.270E+00	752	1.111E+00
589	1.351E+01	630	1.607E+01	671	1.105E+01	712	4.155E+00	753	1.064E+00
590	1.359E+01	631	1.604E+01	672	1.087E+01	713	4.107E+00	754	9.532E-01
591	1.369E+01	632	1.603E+01	673	1.067E+01	714	3.955E+00	755	8.317E-01
592	1.379E+01	633	1.602E+01	674	1.044E+01	715	3.768E+00	756	9.140E-01
593	1.388E+01	634	1.598E+01	675	1.031E+01	716	3.687E+00	757	8.781E-01
594	1.395E+01	635	1.592E+01	676	1.010E+01	717	3.589E+00	758	6.298E-01
595	1.410E+01	636	1.589E+01	677	9.905E+00	718	3.479E+00	759	7.615E-01
596	1.416E+01	637	1.580E+01	678	9.713E+00	719	3.313E+00	760	6.919E-01
597	1.425E+01	638	1.581E+01	679	9.490E+00	720	3.259E+00	761	6.493E-01
598	1.437E+01	639	1.575E+01	680	9.308E+00	721	3.070E+00	762	7.994E-01
599	1.449E+01	640	1.565E+01	681	9.124E+00	722	3.036E+00	763	8.102E-01
600	1.461E+01	641	1.560E+01	682	8.935E+00	723	2.927E+00	764	6.665E-01
601	1.467E+01	642	1.548E+01	683	8.782E+00	724	2.722E+00	765	5.249E-01
602	1.477E+01	643	1.539E+01	684	8.561E+00	725	2.745E+00	766	5.576E-01
603	1.487E+01	644	1.530E+01	685	8.383E+00	726	2.619E+00	767	5.721E-01
604	1.495E+01	645	1.526E+01	686	8.213E+00	727	2.515E+00	768	6.444E-01
605	1.509E+01	646	1.513E+01	687	8.054E+00	728	2.463E+00	769	5.185E-01
606	1.519E+01	647	1.501E+01	688	7.878E+00	729	2.434E+00	770	4.479E-01
607	1.519E+01	648	1.488E+01	689	7.641E+00	730	2.369E+00	771	4.182E-01
608	1.535E+01	649	1.476E+01	690	7.473E+00	731	2.204E+00	772	4.947E-01
609	1.545E+01	650	1.468E+01	691	7.322E+00	732	2.184E+00	773	3.993E-01
610	1.549E+01	651	1.454E+01	692	7.187E+00	733	1.997E+00	774	3.614E-01
611	1.559E+01	652	1.436E+01	693	7.009E+00	734	1.941E+00	775	4.196E-01
612	1.566E+01	653	1.425E+01	694	6.852E+00	735	1.988E+00	776	3.303E-01
613	1.568E+01	654	1.403E+01	695	6.686E+00	736	1.855E+00	777	4.125E-01
614	1.573E+01	655	1.391E+01	696	6.456E+00	737	1.807E+00	778	3.452E-01
615	1.583E+01	656	1.376E+01	697	6.350E+00	738	1.678E+00	779	3.009E-01
616	1.585E+01	657	1.361E+01	698	6.183E+00	739	1.602E+00	780	2.434E-01
617	1.591E+01	658	1.347E+01	699	5.993E+00	740	1.565E+00		
618	1.595E+01	659	1.324E+01	700	5.812E+00	741	1.638E+00		
619	1.594E+01	660	1.309E+01	701	5.743E+00	742	1.525E+00		
620	1.605E+01	661	1.289E+01	702	5.519E+00	743	1.471E+00		
621	1.603E+01	662	1.273E+01	703	5.378E+00	744	1.307E+00		
622	1.600E+01	663	1.253E+01	704	5.267E+00	745	1.345E+00		
623	1.610E+01	664	1.240E+01	705	5.080E+00	746	1.135E+00		
624	1.615E+01	665	1.222E+01	706	4.929E+00	747	1.228E+00		
625	1.610E+01	666	1.202E+01	707	4.833E+00	748	1.178E+00		

CIE 1931xy Chromaticity Diagram



7-StepChromaticity Quadrangles



Control Setting: 4000K 10W

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

Test orientation: **Downward**

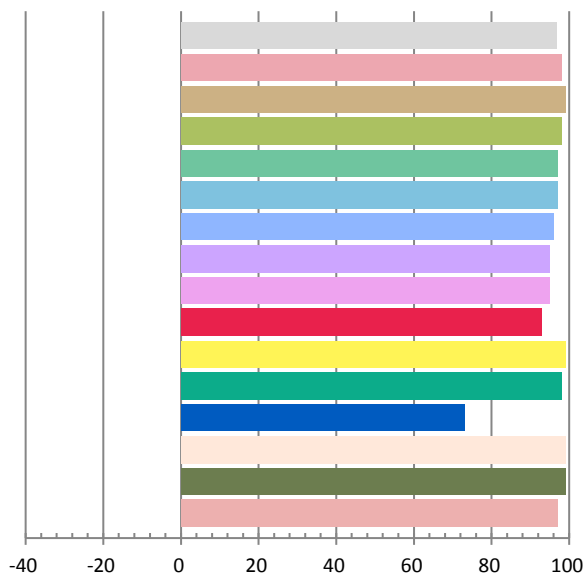
Photometric and Electrical Measurement Result

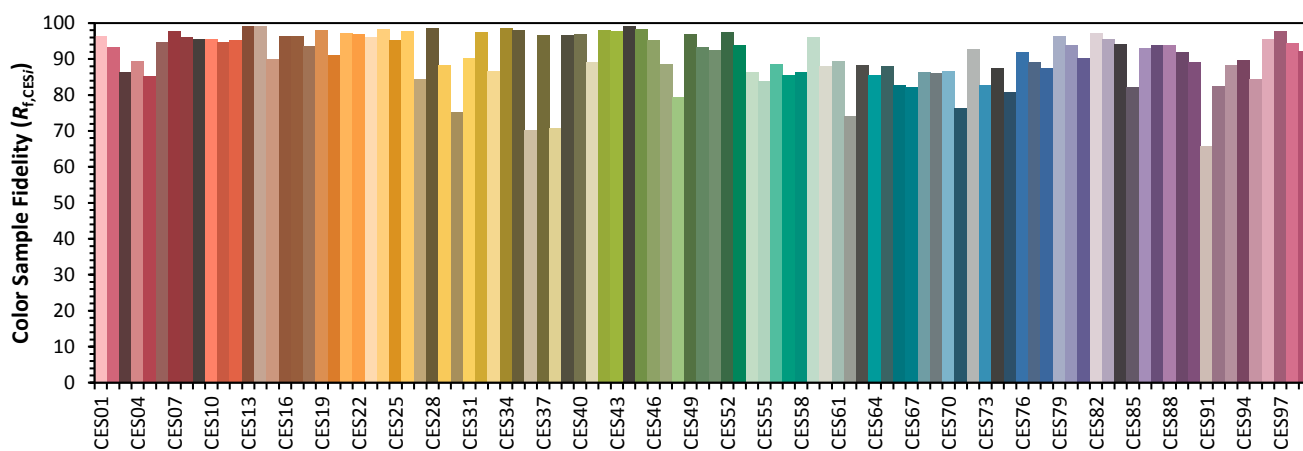
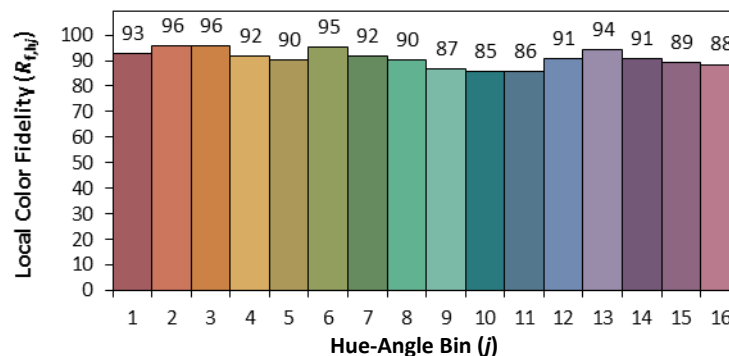
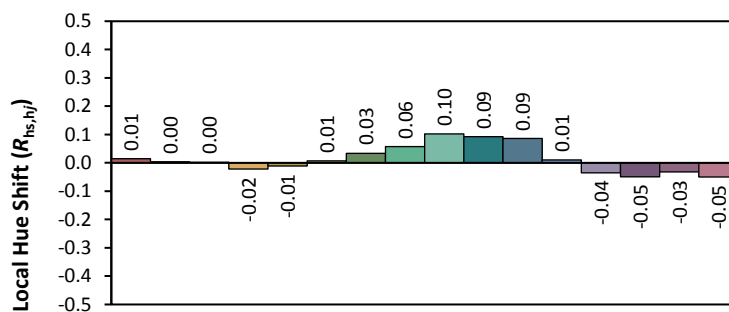
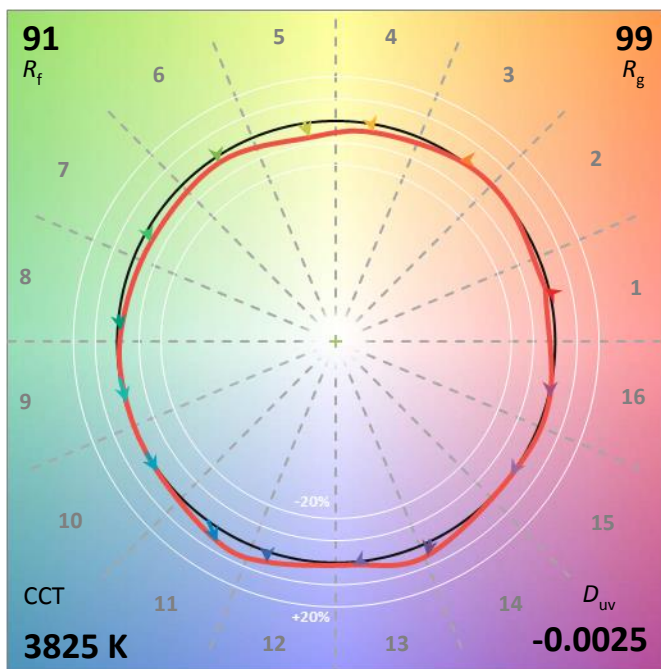
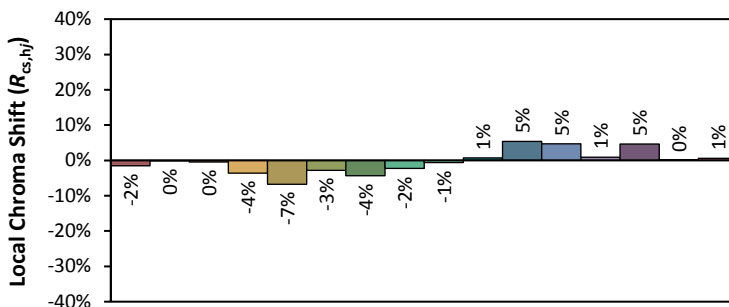
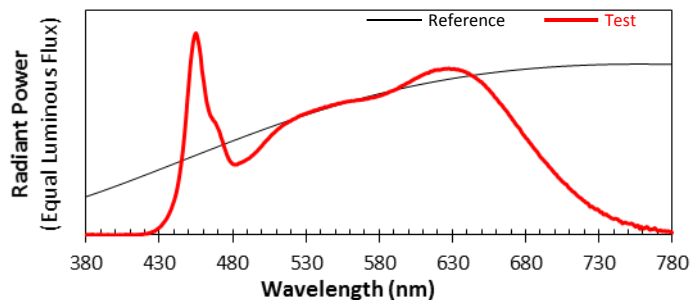
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.0809	9.52	0.9809	869.44	91.33

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
3.120	3825	-0.00255	0.3864	0.3749	0.2298	0.5017

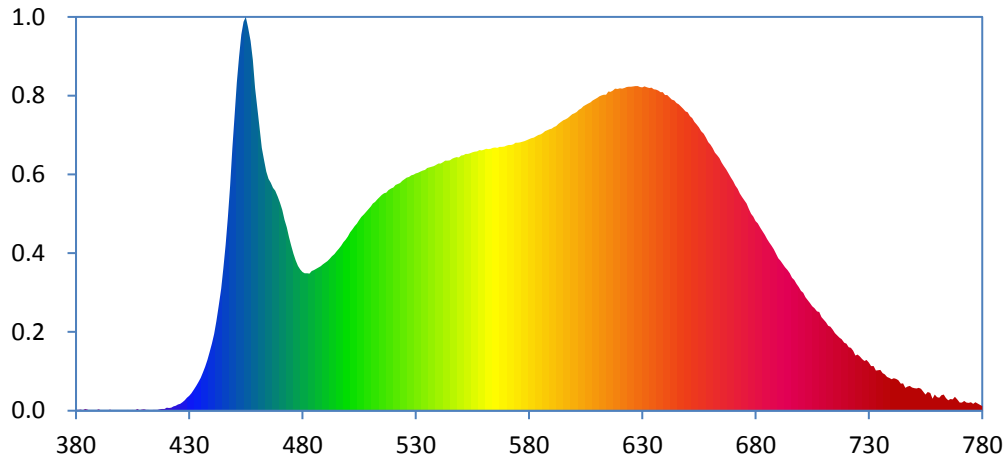
Color Rendering Index

Ra			
96.7			
R1	R2	R3	R4
98	99	98	97
R5	R6	R7	R8
97	96	95	95
R9	R10	R11	R12
93	99	98	73
R13	R14	R15	
99	99	97	





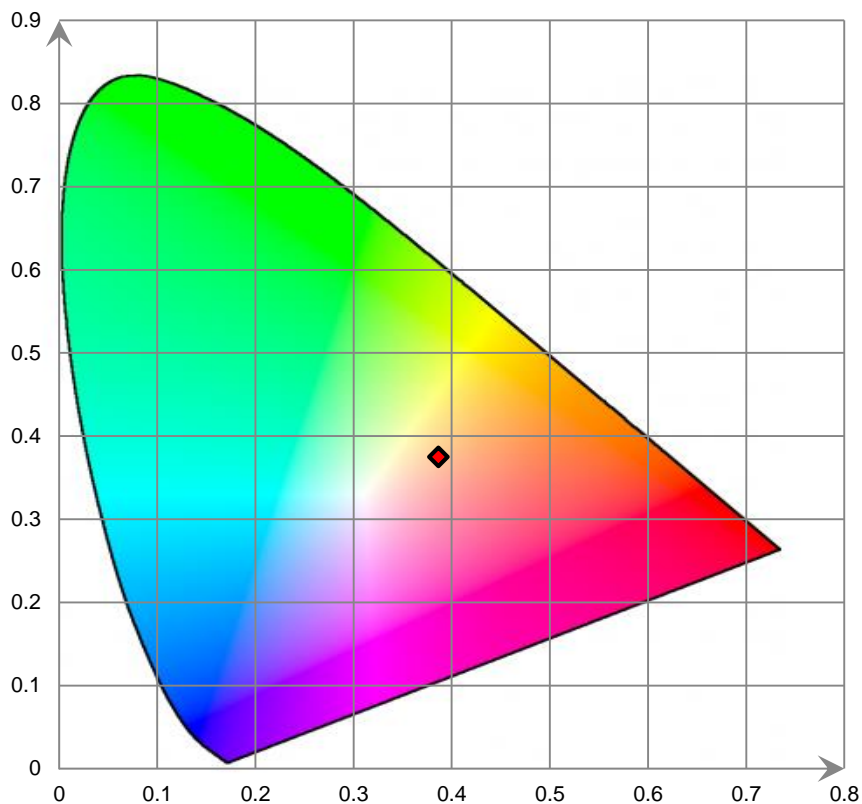
Relative Spectral Power Distribution



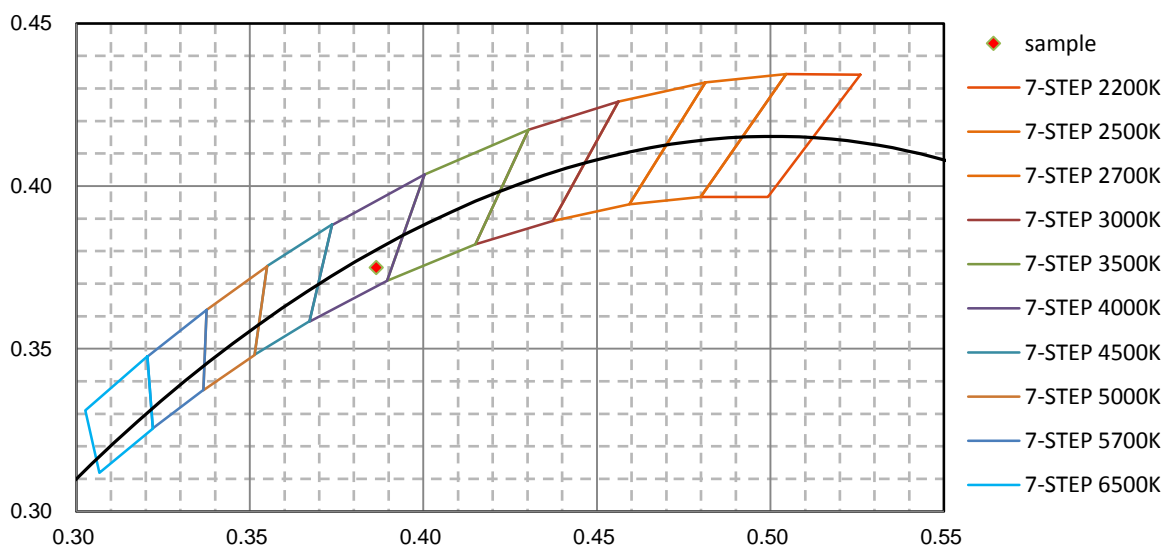
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	3.280E-02	421	1.265E-01	462	1.220E+01	503	8.564E+00	544	1.160E+01
381	4.160E-02	422	1.436E-01	463	1.163E+01	504	8.683E+00	545	1.162E+01
382	4.910E-02	423	1.992E-01	464	1.110E+01	505	8.833E+00	546	1.169E+01
383	2.010E-02	424	2.276E-01	465	1.076E+01	506	8.983E+00	547	1.174E+01
384	7.950E-02	425	2.953E-01	466	1.057E+01	507	9.110E+00	548	1.177E+01
385	4.670E-02	426	3.192E-01	467	1.034E+01	508	9.227E+00	549	1.175E+01
386	4.200E-03	427	3.958E-01	468	1.020E+01	509	9.352E+00	550	1.183E+01
387	2.790E-02	428	4.874E-01	469	9.923E+00	510	9.471E+00	551	1.185E+01
388	2.160E-02	429	6.063E-01	470	9.637E+00	511	9.605E+00	552	1.191E+01
389	2.680E-02	430	6.874E-01	471	9.321E+00	512	9.691E+00	553	1.191E+01
390	6.490E-02	431	8.141E-01	472	8.854E+00	513	9.803E+00	554	1.194E+01
391	1.790E-02	432	9.894E-01	473	8.517E+00	514	9.909E+00	555	1.199E+01
392	5.900E-03	433	1.148E+00	474	8.050E+00	515	1.002E+01	556	1.202E+01
393	2.900E-03	434	1.324E+00	475	7.651E+00	516	1.008E+01	557	1.204E+01
394	1.710E-02	435	1.519E+00	476	7.277E+00	517	1.012E+01	558	1.209E+01
395	5.260E-02	436	1.776E+00	477	6.973E+00	518	1.024E+01	559	1.208E+01
396	1.230E-02	437	2.048E+00	478	6.712E+00	519	1.030E+01	560	1.211E+01
397	2.270E-02	438	2.358E+00	479	6.561E+00	520	1.036E+01	561	1.215E+01
398	7.400E-03	439	2.727E+00	480	6.434E+00	521	1.047E+01	562	1.214E+01
399	4.000E-04	440	3.113E+00	481	6.373E+00	522	1.052E+01	563	1.215E+01
400	0.000E+00	441	3.556E+00	482	6.382E+00	523	1.057E+01	564	1.220E+01
401	1.680E-02	442	4.155E+00	483	6.369E+00	524	1.067E+01	565	1.221E+01
402	2.620E-02	443	4.838E+00	484	6.481E+00	525	1.073E+01	566	1.219E+01
403	3.610E-02	444	5.657E+00	485	6.517E+00	526	1.081E+01	567	1.224E+01
404	1.250E-02	445	6.623E+00	486	6.580E+00	527	1.085E+01	568	1.223E+01
405	3.210E-02	446	7.695E+00	487	6.645E+00	528	1.092E+01	569	1.226E+01
406	5.700E-03	447	8.977E+00	488	6.709E+00	529	1.094E+01	570	1.230E+01
407	7.740E-02	448	1.042E+01	489	6.789E+00	530	1.100E+01	571	1.233E+01
408	2.100E-02	449	1.218E+01	490	6.872E+00	531	1.104E+01	572	1.233E+01
409	4.810E-02	450	1.370E+01	491	6.934E+00	532	1.110E+01	573	1.237E+01
410	6.610E-02	451	1.524E+01	492	7.037E+00	533	1.114E+01	574	1.243E+01
411	3.270E-02	452	1.643E+01	493	7.169E+00	534	1.117E+01	575	1.243E+01
412	4.080E-02	453	1.745E+01	494	7.268E+00	535	1.126E+01	576	1.245E+01
413	7.200E-03	454	1.804E+01	495	7.402E+00	536	1.129E+01	577	1.248E+01
414	4.100E-02	455	1.827E+01	496	7.517E+00	537	1.132E+01	578	1.251E+01
415	3.370E-02	456	1.780E+01	497	7.653E+00	538	1.135E+01	579	1.255E+01
416	4.120E-02	457	1.715E+01	498	7.812E+00	539	1.141E+01	580	1.260E+01
417	7.060E-02	458	1.628E+01	499	7.941E+00	540	1.146E+01	581	1.263E+01
418	8.280E-02	459	1.497E+01	500	8.079E+00	541	1.147E+01	582	1.267E+01
419	7.740E-02	460	1.405E+01	501	8.275E+00	542	1.153E+01	583	1.272E+01
420	1.402E-01	461	1.313E+01	502	8.412E+00	543	1.160E+01	584	1.278E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.281E+01	626	1.504E+01	667	1.121E+01	708	4.577E+00	749	1.080E+00
586	1.288E+01	627	1.506E+01	668	1.102E+01	709	4.343E+00	750	1.044E+00
587	1.296E+01	628	1.506E+01	669	1.081E+01	710	4.219E+00	751	1.030E+00
588	1.301E+01	629	1.501E+01	670	1.065E+01	711	4.097E+00	752	1.065E+00
589	1.306E+01	630	1.500E+01	671	1.045E+01	712	3.940E+00	753	1.018E+00
590	1.309E+01	631	1.505E+01	672	1.029E+01	713	3.900E+00	754	8.853E-01
591	1.316E+01	632	1.500E+01	673	1.007E+01	714	3.761E+00	755	7.507E-01
592	1.320E+01	633	1.497E+01	674	9.905E+00	715	3.596E+00	756	8.689E-01
593	1.331E+01	634	1.499E+01	675	9.757E+00	716	3.492E+00	757	8.318E-01
594	1.340E+01	635	1.491E+01	676	9.615E+00	717	3.389E+00	758	5.624E-01
595	1.347E+01	636	1.489E+01	677	9.362E+00	718	3.317E+00	759	7.547E-01
596	1.352E+01	637	1.485E+01	678	9.142E+00	719	3.150E+00	760	6.317E-01
597	1.358E+01	638	1.478E+01	679	9.007E+00	720	3.105E+00	761	5.949E-01
598	1.367E+01	639	1.477E+01	680	8.799E+00	721	2.947E+00	762	7.247E-01
599	1.375E+01	640	1.465E+01	681	8.688E+00	722	2.914E+00	763	7.464E-01
600	1.380E+01	641	1.465E+01	682	8.478E+00	723	2.782E+00	764	5.835E-01
601	1.386E+01	642	1.454E+01	683	8.324E+00	724	2.561E+00	765	4.767E-01
602	1.397E+01	643	1.444E+01	684	8.158E+00	725	2.610E+00	766	5.453E-01
603	1.403E+01	644	1.440E+01	685	7.965E+00	726	2.510E+00	767	5.243E-01
604	1.412E+01	645	1.428E+01	686	7.800E+00	727	2.403E+00	768	6.531E-01
605	1.418E+01	646	1.421E+01	687	7.657E+00	728	2.306E+00	769	5.182E-01
606	1.424E+01	647	1.410E+01	688	7.495E+00	729	2.356E+00	770	3.842E-01
607	1.430E+01	648	1.401E+01	689	7.283E+00	730	2.233E+00	771	3.804E-01
608	1.439E+01	649	1.389E+01	690	7.081E+00	731	2.072E+00	772	4.503E-01
609	1.445E+01	650	1.384E+01	691	6.954E+00	732	2.075E+00	773	3.726E-01
610	1.451E+01	651	1.366E+01	692	6.812E+00	733	1.867E+00	774	3.580E-01
611	1.459E+01	652	1.357E+01	693	6.657E+00	734	1.874E+00	775	3.916E-01
612	1.463E+01	653	1.339E+01	694	6.531E+00	735	1.899E+00	776	3.134E-01
613	1.466E+01	654	1.327E+01	695	6.375E+00	736	1.748E+00	777	3.864E-01
614	1.466E+01	655	1.314E+01	696	6.167E+00	737	1.689E+00	778	3.267E-01
615	1.481E+01	656	1.297E+01	697	6.068E+00	738	1.573E+00	779	2.781E-01
616	1.480E+01	657	1.284E+01	698	5.894E+00	739	1.517E+00	780	2.203E-01
617	1.486E+01	658	1.267E+01	699	5.734E+00	740	1.469E+00		
618	1.495E+01	659	1.246E+01	700	5.561E+00	741	1.502E+00		
619	1.492E+01	660	1.235E+01	701	5.476E+00	742	1.473E+00		
620	1.496E+01	661	1.218E+01	702	5.256E+00	743	1.424E+00		
621	1.494E+01	662	1.198E+01	703	5.134E+00	744	1.250E+00		
622	1.497E+01	663	1.185E+01	704	4.992E+00	745	1.262E+00		
623	1.501E+01	664	1.171E+01	705	4.846E+00	746	1.055E+00		
624	1.503E+01	665	1.151E+01	706	4.751E+00	747	1.128E+00		
625	1.503E+01	666	1.135E+01	707	4.614E+00	748	1.155E+00		

CIE 1931xy Chromaticity Diagram



7-StepChromaticity Quadrangles



Control Setting: 5000K 10W

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

Test orientation: **Downward**

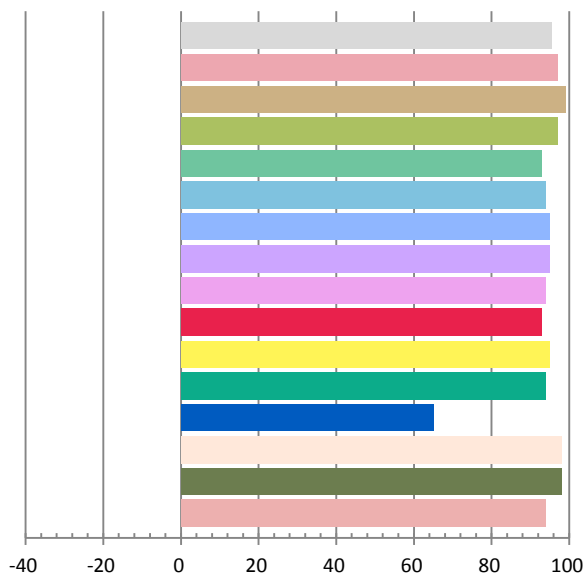
Photometric and Electrical Measurement Result

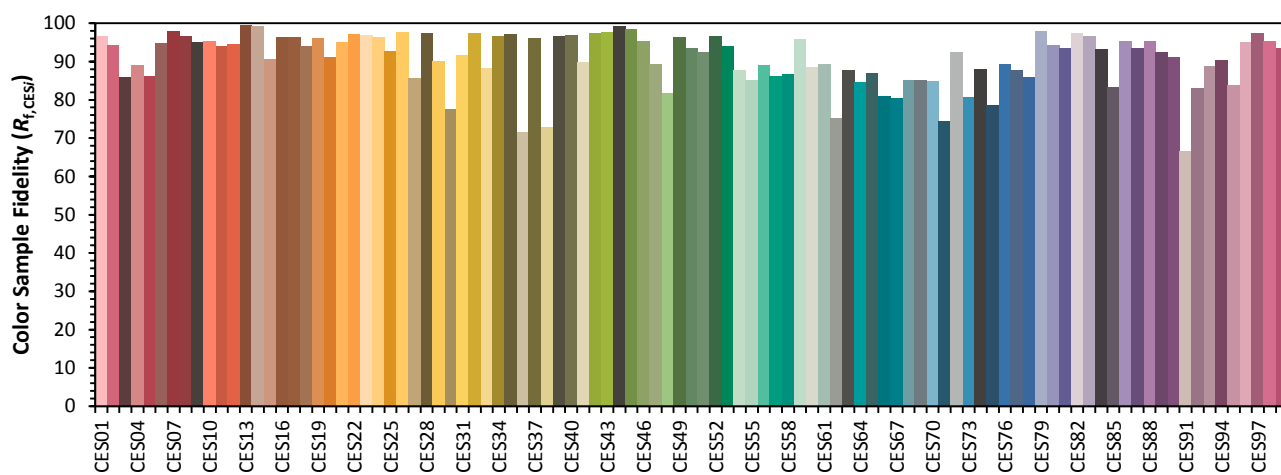
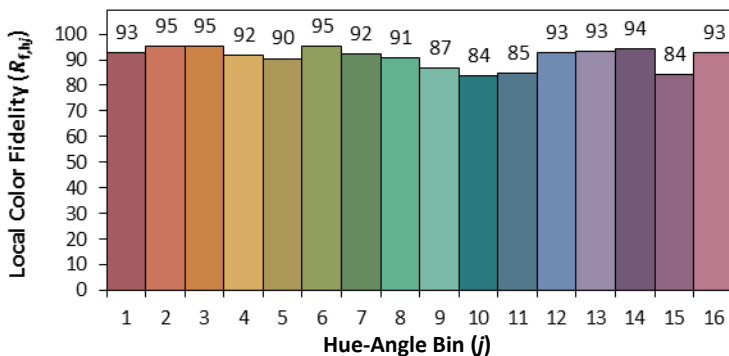
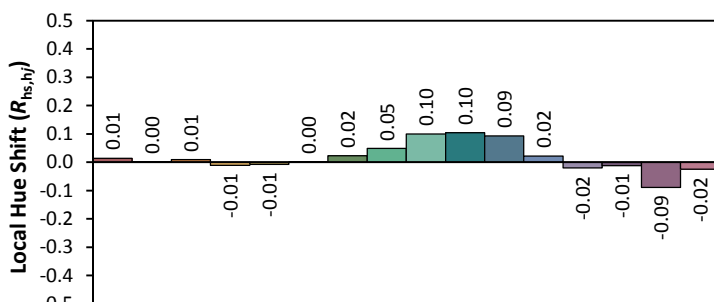
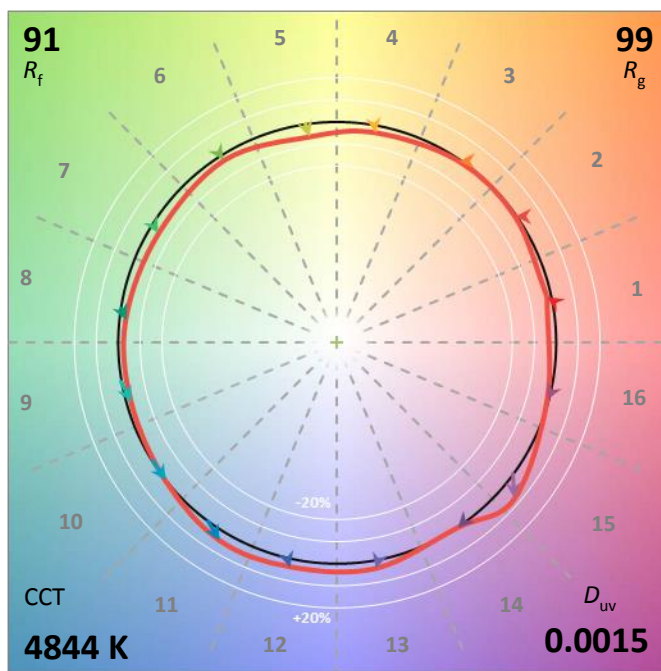
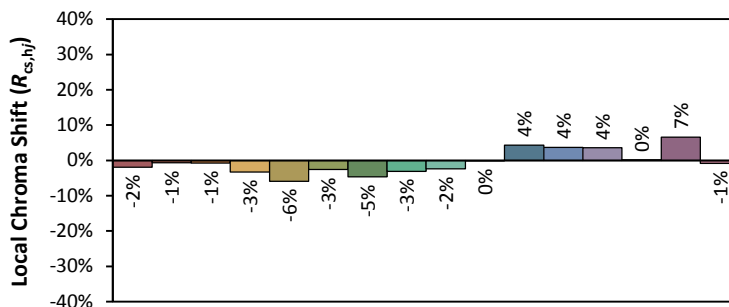
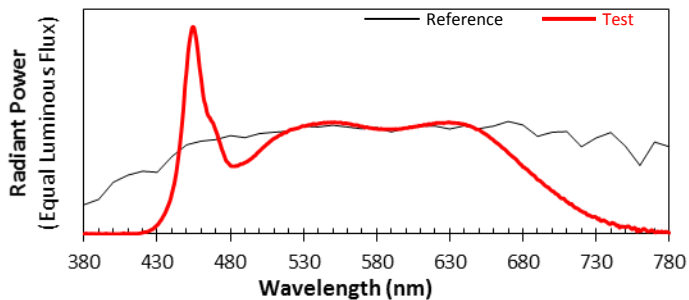
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.0	60	0.0808	9.51	0.9808	889.41	93.52

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
3.178	4845	0.00148	0.3500	0.3585	0.2121	0.4887

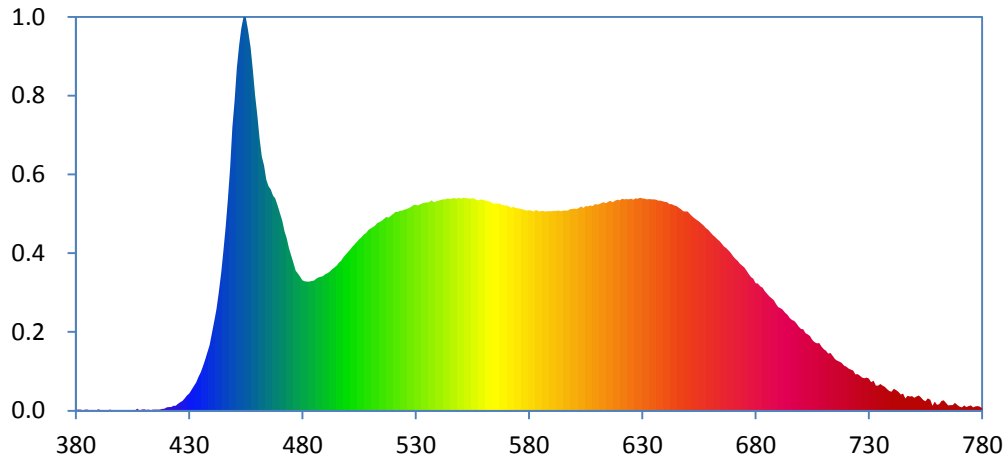
Color Rendering Index

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





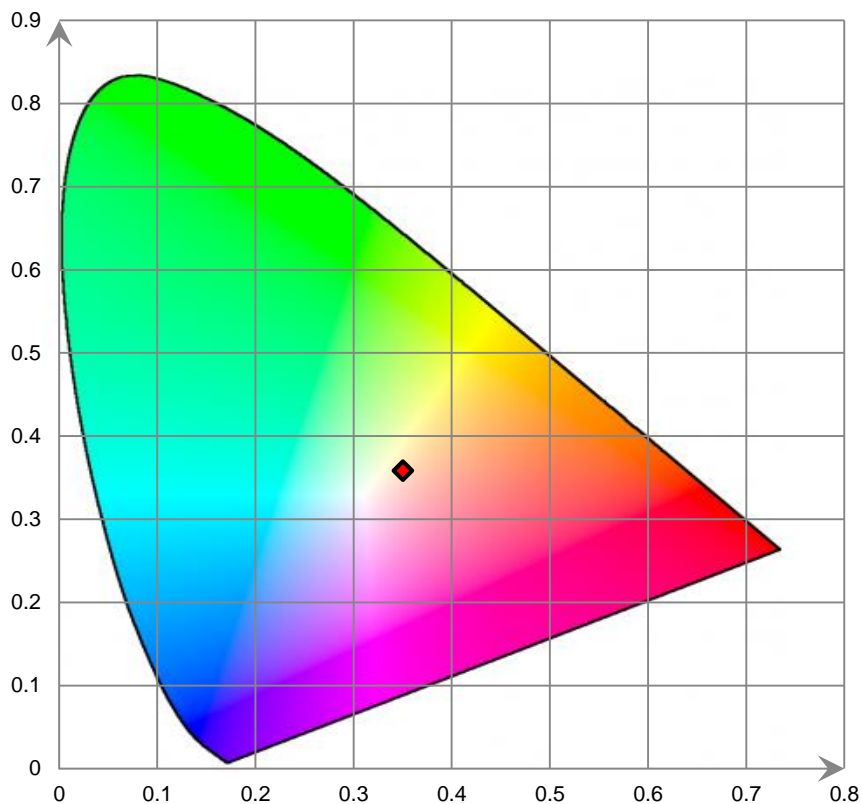
Relative Spectral Power Distribution



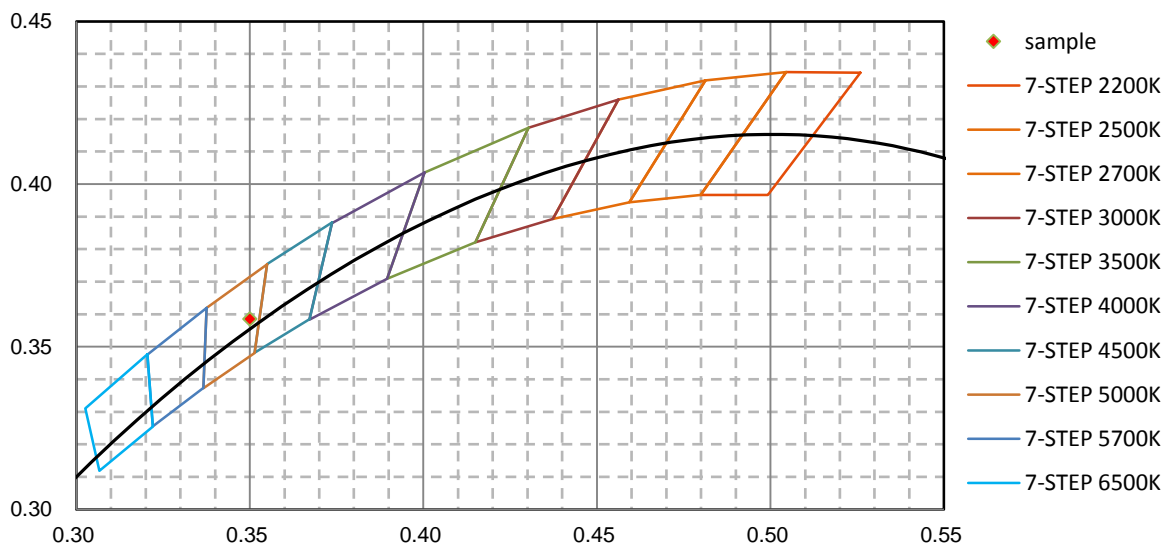
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	4.310E-02	421	2.214E-01	462	1.545E+01	503	1.011E+01	544	1.291E+01
381	6.480E-02	422	2.268E-01	463	1.490E+01	504	1.025E+01	545	1.287E+01
382	6.930E-02	423	2.943E-01	464	1.406E+01	505	1.042E+01	546	1.291E+01
383	8.900E-03	424	3.108E-01	465	1.364E+01	506	1.053E+01	547	1.292E+01
384	6.110E-02	425	4.209E-01	466	1.345E+01	507	1.072E+01	548	1.289E+01
385	6.780E-02	426	5.096E-01	467	1.308E+01	508	1.081E+01	549	1.294E+01
386	2.570E-02	427	5.845E-01	468	1.291E+01	509	1.098E+01	550	1.289E+01
387	5.350E-02	428	7.489E-01	469	1.244E+01	510	1.107E+01	551	1.295E+01
388	3.130E-02	429	9.158E-01	470	1.199E+01	511	1.116E+01	552	1.292E+01
389	3.410E-02	430	1.040E+00	471	1.155E+01	512	1.126E+01	553	1.290E+01
390	9.320E-02	431	1.253E+00	472	1.091E+01	513	1.140E+01	554	1.289E+01
391	3.470E-02	432	1.500E+00	473	1.048E+01	514	1.147E+01	555	1.292E+01
392	7.800E-03	433	1.716E+00	474	9.882E+00	515	1.154E+01	556	1.289E+01
393	3.400E-03	434	2.054E+00	475	9.432E+00	516	1.166E+01	557	1.280E+01
394	2.790E-02	435	2.333E+00	476	8.986E+00	517	1.177E+01	558	1.282E+01
395	7.670E-02	436	2.689E+00	477	8.505E+00	518	1.174E+01	559	1.284E+01
396	3.530E-02	437	3.097E+00	478	8.329E+00	519	1.186E+01	560	1.279E+01
397	1.010E-02	438	3.554E+00	479	8.131E+00	520	1.198E+01	561	1.277E+01
398	4.300E-03	439	4.008E+00	480	7.929E+00	521	1.208E+01	562	1.273E+01
399	2.000E-03	440	4.701E+00	481	7.863E+00	522	1.210E+01	563	1.269E+01
400	3.000E-04	441	5.395E+00	482	7.846E+00	523	1.214E+01	564	1.260E+01
401	2.550E-02	442	6.137E+00	483	7.856E+00	524	1.218E+01	565	1.260E+01
402	2.430E-02	443	7.111E+00	484	7.896E+00	525	1.222E+01	566	1.260E+01
403	2.370E-02	444	8.355E+00	485	7.907E+00	526	1.227E+01	567	1.260E+01
404	2.590E-02	445	9.726E+00	486	8.017E+00	527	1.232E+01	568	1.252E+01
405	4.530E-02	446	1.116E+01	487	8.104E+00	528	1.240E+01	569	1.248E+01
406	9.400E-03	447	1.285E+01	488	8.133E+00	529	1.249E+01	570	1.249E+01
407	1.219E-01	448	1.475E+01	489	8.174E+00	530	1.251E+01	571	1.241E+01
408	1.110E-02	449	1.722E+01	490	8.291E+00	531	1.249E+01	572	1.234E+01
409	5.980E-02	450	1.885E+01	491	8.361E+00	532	1.255E+01	573	1.239E+01
410	8.360E-02	451	2.084E+01	492	8.459E+00	533	1.261E+01	574	1.233E+01
411	5.620E-02	452	2.218E+01	493	8.589E+00	534	1.265E+01	575	1.229E+01
412	6.650E-02	453	2.325E+01	494	8.701E+00	535	1.265E+01	576	1.228E+01
413	2.310E-02	454	2.394E+01	495	8.818E+00	536	1.270E+01	577	1.225E+01
414	6.720E-02	455	2.391E+01	496	8.994E+00	537	1.279E+01	578	1.221E+01
415	5.880E-02	456	2.314E+01	497	9.111E+00	538	1.268E+01	579	1.218E+01
416	6.960E-02	457	2.209E+01	498	9.324E+00	539	1.274E+01	580	1.218E+01
417	7.590E-02	458	2.072E+01	499	9.479E+00	540	1.277E+01	581	1.217E+01
418	1.010E-01	459	1.918E+01	500	9.637E+00	541	1.281E+01	582	1.211E+01
419	1.180E-01	460	1.796E+01	501	9.795E+00	542	1.285E+01	583	1.220E+01
420	2.020E-01	461	1.657E+01	502	9.962E+00	543	1.286E+01	584	1.212E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.213E+01	626	1.284E+01	667	9.889E+00	708	4.121E+00	749	8.920E-01
586	1.215E+01	627	1.290E+01	668	9.764E+00	709	3.898E+00	750	7.982E-01
587	1.211E+01	628	1.289E+01	669	9.579E+00	710	3.745E+00	751	8.651E-01
588	1.213E+01	629	1.295E+01	670	9.394E+00	711	3.648E+00	752	9.307E-01
589	1.213E+01	630	1.290E+01	671	9.233E+00	712	3.465E+00	753	8.147E-01
590	1.213E+01	631	1.289E+01	672	9.108E+00	713	3.519E+00	754	6.431E-01
591	1.215E+01	632	1.285E+01	673	8.938E+00	714	3.331E+00	755	5.793E-01
592	1.214E+01	633	1.287E+01	674	8.827E+00	715	3.146E+00	756	7.463E-01
593	1.217E+01	634	1.285E+01	675	8.700E+00	716	3.044E+00	757	6.686E-01
594	1.213E+01	635	1.284E+01	676	8.520E+00	717	2.992E+00	758	2.946E-01
595	1.216E+01	636	1.284E+01	677	8.302E+00	718	2.905E+00	759	5.474E-01
596	1.216E+01	637	1.277E+01	678	8.112E+00	719	2.731E+00	760	3.589E-01
597	1.217E+01	638	1.276E+01	679	8.023E+00	720	2.673E+00	761	3.915E-01
598	1.224E+01	639	1.273E+01	680	7.759E+00	721	2.552E+00	762	5.977E-01
599	1.226E+01	640	1.270E+01	681	7.726E+00	722	2.505E+00	763	6.333E-01
600	1.228E+01	641	1.268E+01	682	7.551E+00	723	2.437E+00	764	4.828E-01
601	1.226E+01	642	1.255E+01	683	7.484E+00	724	2.217E+00	765	3.279E-01
602	1.232E+01	643	1.255E+01	684	7.273E+00	725	2.220E+00	766	3.346E-01
603	1.241E+01	644	1.249E+01	685	7.103E+00	726	2.130E+00	767	3.326E-01
604	1.233E+01	645	1.244E+01	686	6.953E+00	727	2.020E+00	768	4.865E-01
605	1.243E+01	646	1.235E+01	687	6.840E+00	728	1.983E+00	769	3.459E-01
606	1.242E+01	647	1.225E+01	688	6.729E+00	729	2.019E+00	770	2.361E-01
607	1.248E+01	648	1.213E+01	689	6.491E+00	730	1.963E+00	771	2.047E-01
608	1.244E+01	649	1.210E+01	690	6.294E+00	731	1.750E+00	772	3.267E-01
609	1.255E+01	650	1.210E+01	691	6.237E+00	732	1.814E+00	773	2.274E-01
610	1.253E+01	651	1.194E+01	692	6.131E+00	733	1.537E+00	774	2.742E-01
611	1.256E+01	652	1.182E+01	693	5.967E+00	734	1.528E+00	775	3.285E-01
612	1.263E+01	653	1.171E+01	694	5.822E+00	735	1.624E+00	776	2.084E-01
613	1.267E+01	654	1.161E+01	695	5.635E+00	736	1.526E+00	777	2.704E-01
614	1.261E+01	655	1.151E+01	696	5.511E+00	737	1.450E+00	778	2.821E-01
615	1.271E+01	656	1.139E+01	697	5.452E+00	738	1.312E+00	779	2.344E-01
616	1.276E+01	657	1.125E+01	698	5.292E+00	739	1.201E+00	780	1.505E-01
617	1.268E+01	658	1.109E+01	699	5.107E+00	740	1.166E+00		
618	1.276E+01	659	1.100E+01	700	4.973E+00	741	1.333E+00		
619	1.282E+01	660	1.084E+01	701	4.944E+00	742	1.252E+00		
620	1.279E+01	661	1.069E+01	702	4.722E+00	743	1.161E+00		
621	1.288E+01	662	1.057E+01	703	4.641E+00	744	9.834E-01		
622	1.285E+01	663	1.044E+01	704	4.542E+00	745	1.033E+00		
623	1.287E+01	664	1.033E+01	705	4.317E+00	746	7.436E-01		
624	1.285E+01	665	1.016E+01	706	4.181E+00	747	8.978E-01		
625	1.288E+01	666	9.991E+00	707	4.104E+00	748	8.635E-01		

CIE 1931xy Chromaticity Diagram



7-StepChromaticity Quadrangles



[Goniophotometer System]

Control Setting: 2700K 10W

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

Test orientation: **Downward**

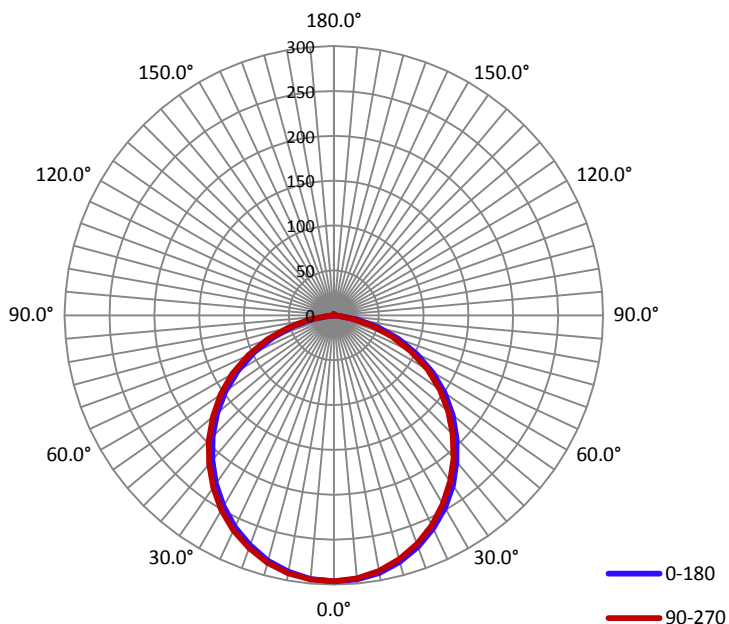
Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
120.0	60	0.0810	9.61	0.9850

Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	$I_{max}(cd)$	S/MH(C0/180)	S/MH(C90/270)
813.7	84.72	296.7	1.24	1.24

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50% I_{max}):	110.2	110.3	110.3	110.3	110.3
Field Angle(10% I_{max}):	158.0	158.1	157.3	157.2	157.7

Luminous Intensity (cd) Distribution Data

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	297	297	297	297	297	297	297	297
5.0°	295	295	295	295	294	294	295	295
10.0°	292	291	289	290	289	290	290	290
15.0°	284	283	283	282	282	282	282	283
20.0°	275	273	272	272	271	271	272	273
25.0°	262	261	260	259	258	258	259	260
30.0°	248	247	245	244	243	244	244	245
35.0°	231	229	228	227	226	226	227	229
40.0°	213	211	210	208	208	208	209	210
45.0°	194	191	190	188	187	187	189	190
50.0°	173	170	168	167	166	166	167	169
55.0°	151	148	146	145	144	144	145	147
60.0°	128	125	123	121	121	121	122	124
65.0°	102	100	98	96	95	95	96	99
70.0°	77	74	72	71	69	69	70	73
75.0°	51	48	46	45	43	43	44	48
80.0°	27	24	23	21	19	19	20	22
85.0°	5	4	3	2	2	2	2	3
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	1	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°	1	1	1	2	1	1	2	1
180.0°	0	0	0	0	0	0	0	0

Luminous Intensity (cd) Distribution Data (cont.)

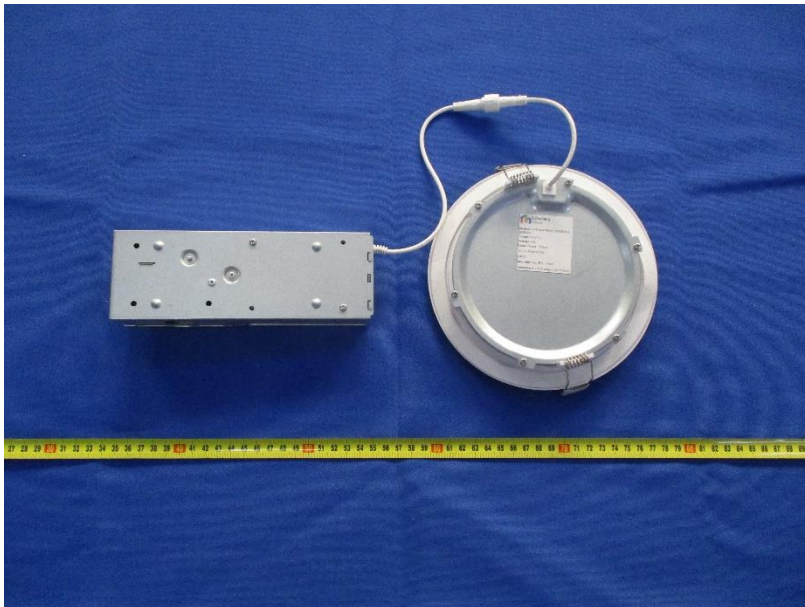
C y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	297	297	297	297	297	297	297	297
5.0°	295	295	295	296	296	296	296	295
10.0°	290	291	291	292	292	292	292	291
15.0°	283	284	285	285	286	286	285	284
20.0°	273	274	275	276	276	276	276	275
25.0°	261	262	263	264	264	264	264	263
30.0°	246	247	249	250	251	250	250	248
35.0°	229	231	233	234	234	234	233	232
40.0°	211	213	215	216	216	216	216	214
45.0°	191	193	195	196	197	197	196	194
50.0°	170	172	174	176	176	176	175	173
55.0°	147	149	151	153	154	154	153	151
60.0°	123	126	128	130	131	130	130	127
65.0°	98	101	103	105	105	104	104	102
70.0°	72	75	77	79	79	78	77	76
75.0°	47	49	52	53	52	52	51	50
80.0°	23	25	28	29	28	27	26	26
85.0°	4	5	7	8	7	7	6	5
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	0	1	1	1	0	0	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°	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	7.1	0.85
5-10	21.0	2.58
10-15	34.0	4.19
15-20	46.0	5.65
20-25	56.1	6.90
25-30	64.4	7.91
30-35	70.2	8.63
35-40	73.9	9.07
40-45	74.9	9.19
45-50	73.4	9.03
50-55	69.5	8.55
55-60	63.4	7.81
60-65	54.9	6.74
65-70	44.1	5.42
70-75	32.0	3.93
75-80	19.3	2.37
80-85	7.6	0.91
85-90	0.7	0.08
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	0.01
145-150	0.0	0.05
150-155	0.0	0.05
155-160	0.0	0.05
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	7.1	0.87
0-10	28.0	3.44
0-15	62.1	7.63
0-20	108.0	13.28
0-25	164.1	20.17
0-30	228.5	28.08
0-35	298.7	36.71
0-40	372.5	45.78
0-45	447.3	54.97
0-50	520.7	63.99
0-55	590.2	72.54
0-60	653.7	80.34
0-65	708.5	87.08
0-70	752.6	92.49
0-75	784.5	96.42
0-80	803.8	98.79
0-85	811.3	99.70
0-90	811.9	99.79
0-95	811.9	99.79
0-100	811.9	99.79
0-105	811.9	99.79
0-110	811.9	99.79
0-115	811.9	99.79
0-120	811.9	99.79
0-125	812.0	99.79
0-130	812.1	99.80
0-135	812.2	99.82
0-140	812.4	99.84
0-145	812.6	99.86
0-150	812.8	99.89
0-155	813.0	99.92
0-160	813.2	99.94
0-165	813.4	99.97
0-170	813.5	99.98
0-175	813.6	100.00
0-180	813.7	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*****