IES LM-79-08

MEASUREMENT AND TEST REPORT

For

AOK LED Light Company Limited

Building 1, ST George's Science and Technology Industrial Park, Shajin Street, Shenzhen

Test Model: AOK-75WiC

Report Type:	Electrical and Photometric tests including: Luminous Flux, Power Factor, Chromaticity, Luminous Intensity Distribution
Test Engineer:	Hexy He
Report Number:	R2DG170601050-10
Test Date:	2017-07-19
Report Date:	2017-07-26
Reviewed By:	Blake Zhang / EE Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008
Test Facility:	Test facility was located at No.69,Pulongcun ,Puxinhu Industrial Area, Tangxia , Dongguan, Guangdong, China.
Accreditation:	The NVLAP Lab Code is 200707-0.

1. Product Description

General Information:

Three samples were received on 2017-06-01 and used for testing. The samples were designed with different construction and installation option. The samples were numbered R2DG170601050-S01 through R2DG170601050-S03. Refer to section 6 for more information.

Model Tested:	AOK-75WiC
Manufacturer:	AOK LED Light Company Limited
Brand Name:	AOK
Product Designation:	LED Canopy Light
Burning Time Before Test:	0hour(For New Products)
Driver Brand:	MW
Driver Model:	HLG-80H-48

Rated Values:

Rated Voltage/Frequency:	100-240VAC 50/60Hz
Rated Power:	75W
Nominal CCT:	5000K
Nominal Lumen Output:	9750lm

2. Standards Used

- IES LM-79-08: Approved Method: Electrical & Photometric Measurement of Solid-state Lighting Products
- ANSI C82.77-2002: Harmonic Emission Limits – Related Power Quality Requirements for Lighting
- IES TM-30-15: IES Method for Evaluating Light Source Color Rendition (This method is not in NVLAP accreditation scope)

3. Description of Test Equipment

Device	Manufacture	Model No	Serial No	Test Range	Calibration date	Calibration due date
1.5m temperature integrating sphere	SENSING	SPR-600	S09008	25～50°C	2017-03-09	2018-03-09
High-precision rapid spectral analysis system	EVERFINE	HAAS-2000	M112048CA1361125	380-780nm	2017-07-07	2018-07-07
Digital power meter	YOKOGAWA	WT310	13398	N/A	2016-12-05	2017-12-05
Programmable Precision DC Power Supply	ITECH	IT6154	0061 0417 6471 0010 19	0~32V	2017-03-03	2018-03-03
thermometer	SENSING	NA	NA	25、50°C	2017-03-09	2018-03-09
Standard Light Source	SENSING	NA	LSD090808	N/A	2016-12-05	2017-12-05
Precision frequency power supply	ALL Power	APW-105N	970613	220V±10% 50Hz	2017-03-03	2018-03-03
AC POWER SUPPLY	EVERFINE	VPS1030 PWM	1012017	0-150V，0-300V	2017-03-03	2018-03-03
Digital CC&CV DC Power Supply	EVERFINE	WY12010	1009009	30V/5A	2017-03-03	2018-03-03

Device	Manufacture	Model No	Serial No	Test Range	Calibration date	Calibration due date
Digital power meter	YOKOGAWA	WT-210	91KB35700	15/30/60/150/ 300/600 V	2017-03-03	2018-03-03
full-field speed goniophotometer	EVERFINE	GO-R5000	YG108492N101 20001	1600mm, 3000W/10A	2017-03-09	2018-03-09
Wireless Remote Sensor	N/A	433MHz	N/A	0°C~50°C; -20°C~60°C	2017-03-20	2018-03-20
Standard Light Source	EVERFINE	D908	1012003	N/A	2016-12-17	2017-12-17

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Shenzhen) 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°C±1°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=2.1% (K=2), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is U=32K (K=2), at the 95% confidence level. The uncertainty of the CRI is U=2.1 (K=2) , at the 95% confidence level.

The uncertainty of power meter AC current U=0.19 % of rdg, AC Voltage U=0.15% of rdg, Power U=0.20%) (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 intensity is U=1.6% (K=2) , at the 95% confidence level.

Fidelity Index and Gamut Index Calculation

The R_f, R_g was calculated according to IES TM-30-15 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]

Sample No.: R2DG170601050-S01

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)
240.0	50	0.3327	77.48	0.9705	9844.9	127.06

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
30.174	5200	-0.00157	0.3395	0.3440	0.2106	0.4801

Color Rendering Index

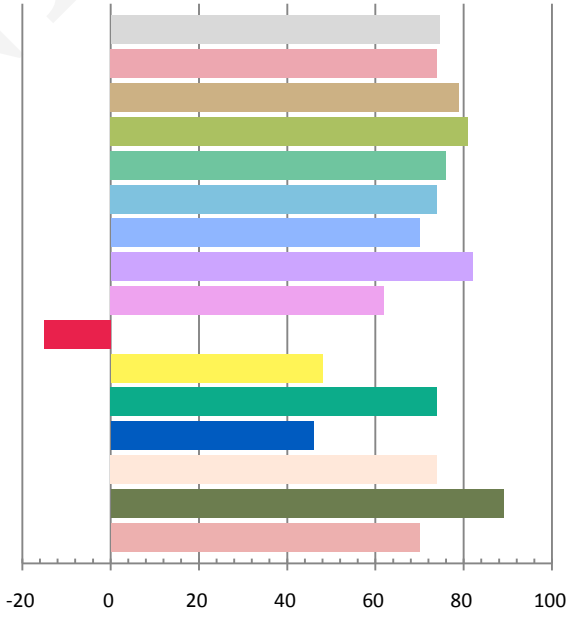
Ra
74.5

R1	R2	R3	R4
74	79	81	76

R5	R6	R7	R8
74	70	82	62

R9	R10	R11	R12
-15	48	74	46

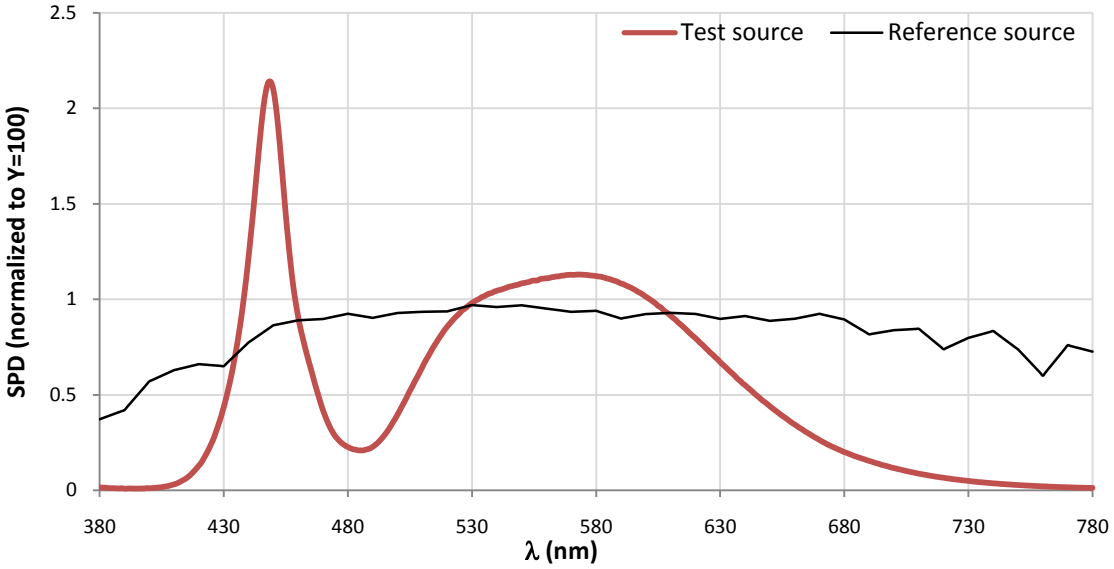
R13	R14	R15
74	89	70



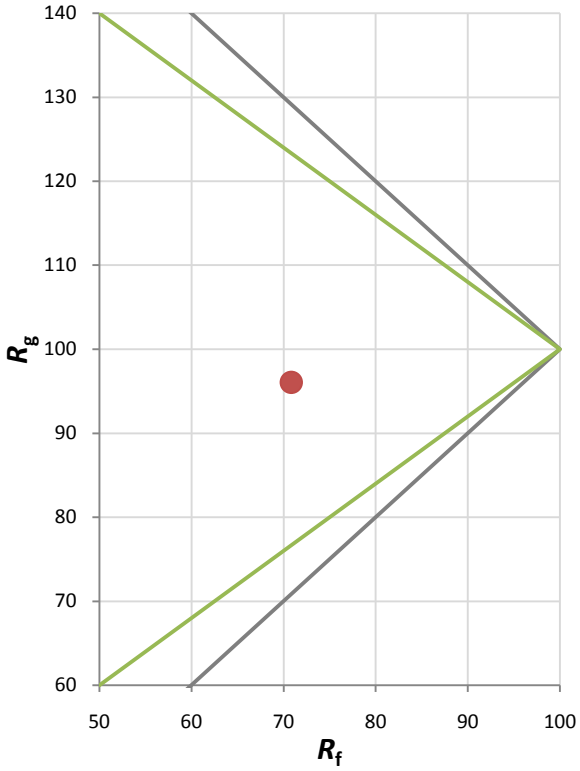
Fidelity Index and Gamut Index

Fidelity Index R_f	71
Gamut Index R_g	96

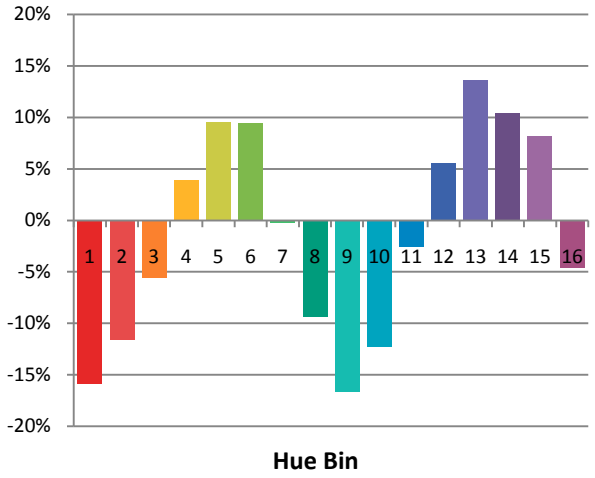
Spectral Power Distribution Comparison



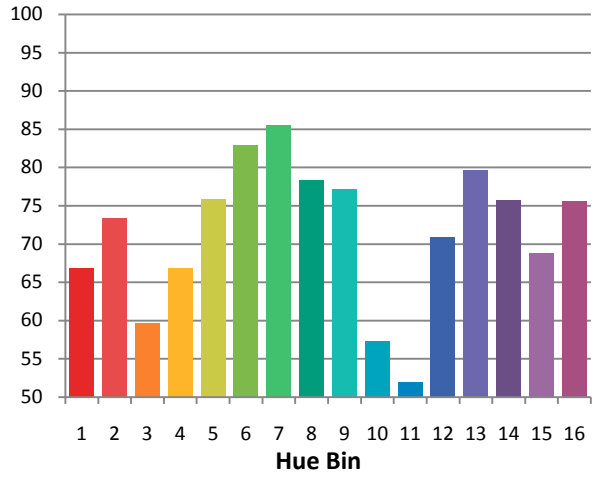
Plot of R_g versus R_f



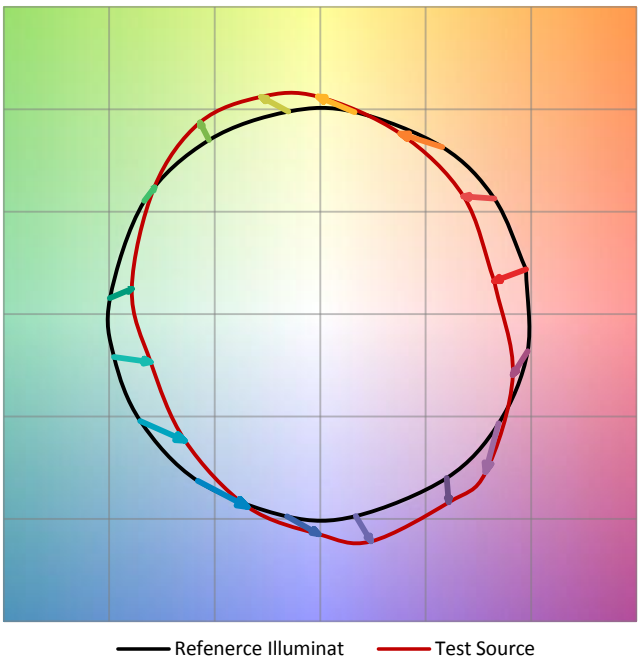
Chroma Shift by Hue



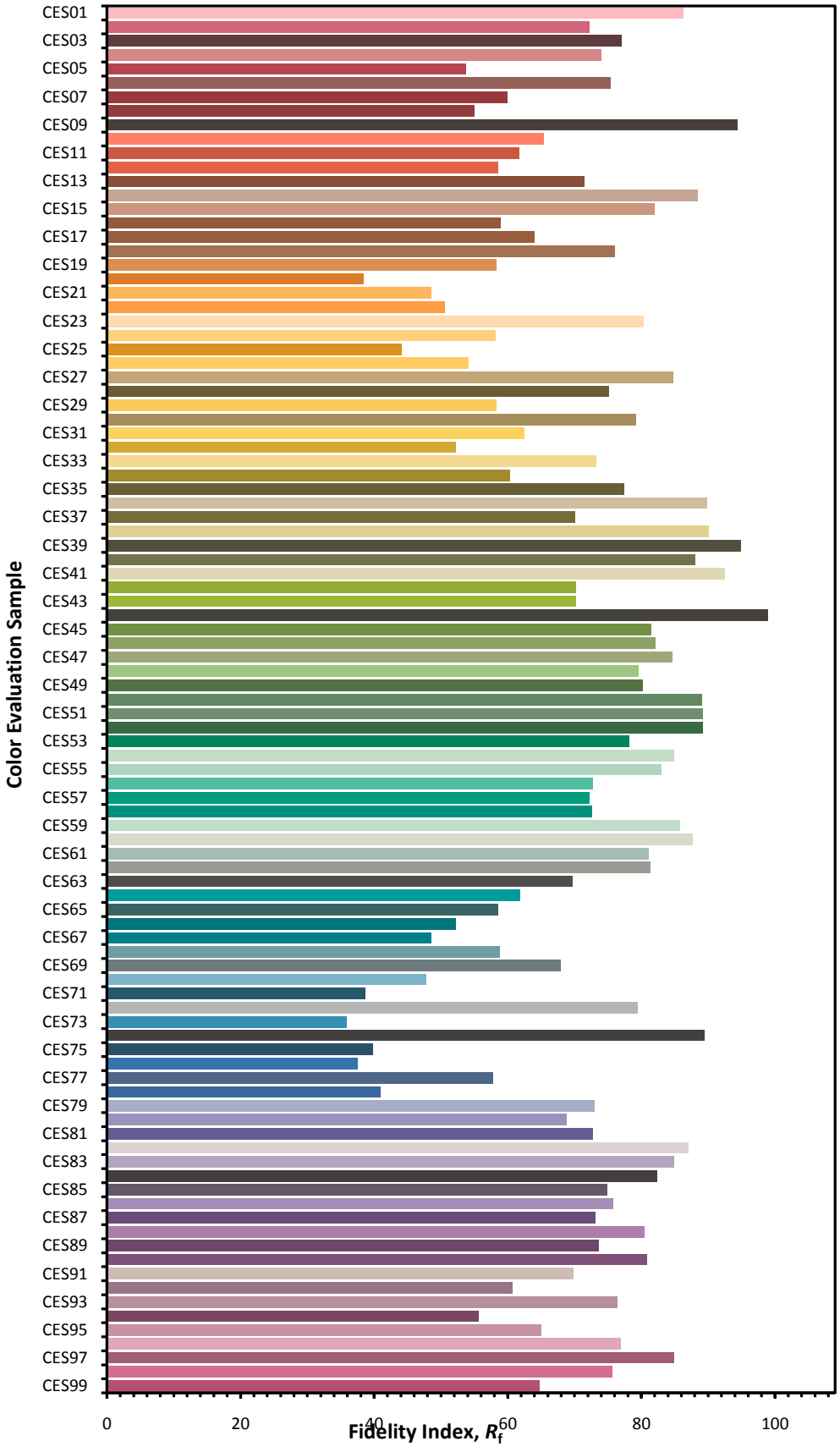
R_f by Hue



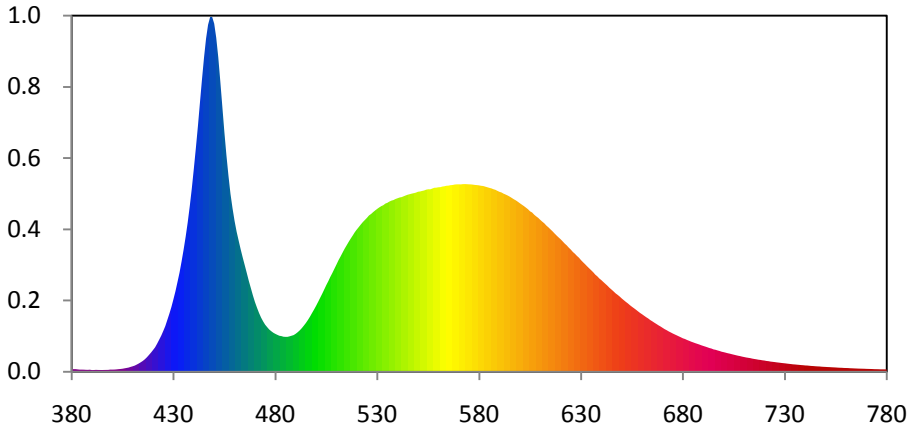
Color Vector Graphic



Color Fidelity by CES Sample



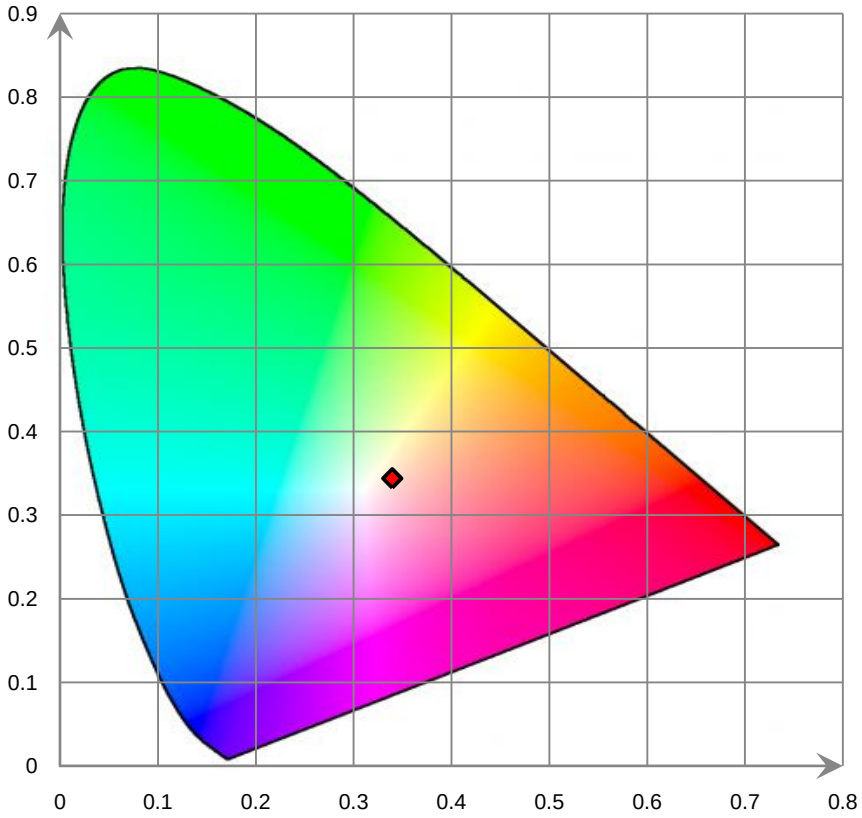
Relative Spectral Power Distribution



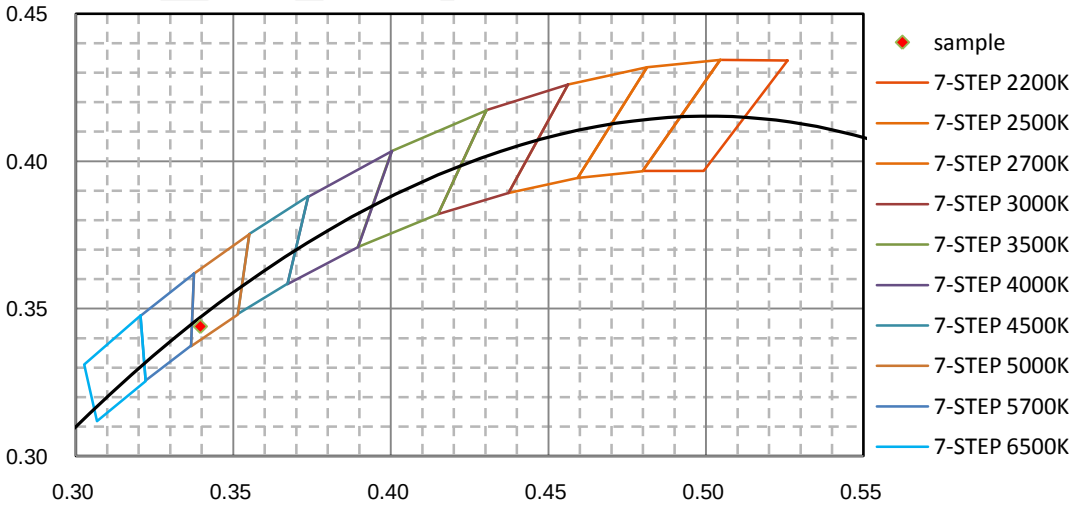
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	2.391E+00	421	2.105E+01	462	1.138E+02	503	6.760E+01	544	1.530E+02
381	2.069E+00	422	2.422E+01	463	1.062E+02	504	7.133E+01	545	1.537E+02
382	2.102E+00	423	2.762E+01	464	9.903E+01	505	7.511E+01	546	1.541E+02
383	1.860E+00	424	3.114E+01	465	9.238E+01	506	7.853E+01	547	1.546E+02
384	1.676E+00	425	3.518E+01	466	8.556E+01	507	8.234E+01	548	1.550E+02
385	1.681E+00	426	3.949E+01	467	7.868E+01	508	8.569E+01	549	1.555E+02
386	1.627E+00	427	4.484E+01	468	7.248E+01	509	8.937E+01	550	1.562E+02
387	1.503E+00	428	5.021E+01	469	6.612E+01	510	9.298E+01	551	1.565E+02
388	1.476E+00	429	5.610E+01	470	6.042E+01	511	9.676E+01	552	1.569E+02
389	1.597E+00	430	6.276E+01	471	5.547E+01	512	9.997E+01	553	1.573E+02
390	1.306E+00	431	6.987E+01	472	5.093E+01	513	1.033E+02	554	1.580E+02
391	1.318E+00	432	7.784E+01	473	4.693E+01	514	1.067E+02	555	1.584E+02
392	1.475E+00	433	8.610E+01	474	4.359E+01	515	1.097E+02	556	1.583E+02
393	1.394E+00	434	9.568E+01	475	4.073E+01	516	1.127E+02	557	1.590E+02
394	1.357E+00	435	1.059E+02	476	3.857E+01	517	1.156E+02	558	1.597E+02
395	1.345E+00	436	1.172E+02	477	3.655E+01	518	1.183E+02	559	1.598E+02
396	1.385E+00	437	1.295E+02	478	3.505E+01	519	1.211E+02	560	1.601E+02
397	1.417E+00	438	1.436E+02	479	3.372E+01	520	1.235E+02	561	1.602E+02
398	1.463E+00	439	1.588E+02	480	3.275E+01	521	1.257E+02	562	1.608E+02
399	1.692E+00	440	1.759E+02	481	3.186E+01	522	1.279E+02	563	1.610E+02
400	1.663E+00	441	1.940E+02	482	3.108E+01	523	1.300E+02	564	1.614E+02
401	1.737E+00	442	2.129E+02	483	3.078E+01	524	1.318E+02	565	1.615E+02
402	1.855E+00	443	2.335E+02	484	3.027E+01	525	1.336E+02	566	1.620E+02
403	2.059E+00	444	2.536E+02	485	3.015E+01	526	1.357E+02	567	1.621E+02
404	2.223E+00	445	2.728E+02	486	3.016E+01	527	1.369E+02	568	1.625E+02
405	2.452E+00	446	2.892E+02	487	3.060E+01	528	1.385E+02	569	1.626E+02
406	2.781E+00	447	3.013E+02	488	3.111E+01	529	1.400E+02	570	1.627E+02
407	3.112E+00	448	3.080E+02	489	3.169E+01	530	1.414E+02	571	1.626E+02
408	3.471E+00	449	3.082E+02	490	3.283E+01	531	1.426E+02	572	1.628E+02
409	4.066E+00	450	3.023E+02	491	3.422E+01	532	1.437E+02	573	1.629E+02
410	4.580E+00	451	2.901E+02	492	3.582E+01	533	1.446E+02	574	1.628E+02
411	5.173E+00	452	2.731E+02	493	3.776E+01	534	1.459E+02	575	1.627E+02
412	6.051E+00	453	2.522E+02	494	3.992E+01	535	1.466E+02	576	1.626E+02
413	7.026E+00	454	2.302E+02	495	4.223E+01	536	1.477E+02	577	1.624E+02
414	8.089E+00	455	2.080E+02	496	4.483E+01	537	1.485E+02	578	1.621E+02
415	9.236E+00	456	1.881E+02	497	4.770E+01	538	1.490E+02	579	1.620E+02
416	1.070E+01	457	1.701E+02	498	5.084E+01	539	1.500E+02	580	1.617E+02
417	1.244E+01	458	1.543E+02	499	5.386E+01	540	1.506E+02	581	1.614E+02
418	1.441E+01	459	1.418E+02	500	5.711E+01	541	1.512E+02	582	1.612E+02
419	1.650E+01	460	1.309E+02	501	6.055E+01	542	1.516E+02	583	1.607E+02
420	1.872E+01	461	1.216E+02	502	6.412E+01	543	1.523E+02	584	1.601E+02

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.596E+02	626	1.039E+02	667	4.133E+01	708	1.343E+01	749	4.130E+00
586	1.591E+02	627	1.024E+02	668	4.016E+01	709	1.301E+01	750	4.035E+00
587	1.584E+02	628	1.005E+02	669	3.917E+01	710	1.262E+01	751	3.893E+00
588	1.579E+02	629	9.887E+01	670	3.803E+01	711	1.227E+01	752	3.830E+00
589	1.570E+02	630	9.680E+01	671	3.689E+01	712	1.194E+01	753	3.699E+00
590	1.561E+02	631	9.498E+01	672	3.596E+01	713	1.165E+01	754	3.616E+00
591	1.556E+02	632	9.326E+01	673	3.488E+01	714	1.128E+01	755	3.522E+00
592	1.546E+02	633	9.144E+01	674	3.399E+01	715	1.093E+01	756	3.391E+00
593	1.538E+02	634	8.968E+01	675	3.308E+01	716	1.064E+01	757	3.306E+00
594	1.530E+02	635	8.800E+01	676	3.224E+01	717	1.029E+01	758	3.255E+00
595	1.520E+02	636	8.623E+01	677	3.140E+01	718	1.008E+01	759	3.133E+00
596	1.509E+02	637	8.419E+01	678	3.057E+01	719	9.761E+00	760	3.070E+00
597	1.497E+02	638	8.273E+01	679	2.973E+01	720	9.575E+00	761	3.026E+00
598	1.488E+02	639	8.084E+01	680	2.887E+01	721	9.197E+00	762	2.889E+00
599	1.475E+02	640	7.943E+01	681	2.829E+01	722	8.998E+00	763	2.805E+00
600	1.462E+02	641	7.772E+01	682	2.744E+01	723	8.671E+00	764	2.710E+00
601	1.450E+02	642	7.613E+01	683	2.677E+01	724	8.461E+00	765	2.657E+00
602	1.437E+02	643	7.449E+01	684	2.598E+01	725	8.233E+00	766	2.560E+00
603	1.424E+02	644	7.270E+01	685	2.537E+01	726	7.991E+00	767	2.502E+00
604	1.410E+02	645	7.118E+01	686	2.470E+01	727	7.750E+00	768	2.471E+00
605	1.392E+02	646	6.957E+01	687	2.410E+01	728	7.556E+00	769	2.410E+00
606	1.382E+02	647	6.791E+01	688	2.351E+01	729	7.348E+00	770	2.305E+00
607	1.363E+02	648	6.657E+01	689	2.283E+01	730	7.134E+00	771	2.303E+00
608	1.348E+02	649	6.511E+01	690	2.224E+01	731	6.938E+00	772	2.212E+00
609	1.335E+02	650	6.349E+01	691	2.169E+01	732	6.701E+00	773	2.173E+00
610	1.318E+02	651	6.201E+01	692	2.106E+01	733	6.495E+00	774	2.077E+00
611	1.302E+02	652	6.055E+01	693	2.043E+01	734	6.285E+00	775	2.047E+00
612	1.288E+02	653	5.917E+01	694	1.999E+01	735	6.167E+00	776	2.016E+00
613	1.268E+02	654	5.766E+01	695	1.924E+01	736	5.981E+00	777	1.923E+00
614	1.253E+02	655	5.629E+01	696	1.890E+01	737	5.813E+00	778	1.906E+00
615	1.236E+02	656	5.501E+01	697	1.835E+01	738	5.623E+00	779	1.899E+00
616	1.219E+02	657	5.369E+01	698	1.785E+01	739	5.504E+00	780	1.902E+00
617	1.200E+02	658	5.225E+01	699	1.722E+01	740	5.277E+00		
618	1.182E+02	659	5.088E+01	700	1.684E+01	741	5.226E+00		
619	1.165E+02	660	4.972E+01	701	1.639E+01	742	5.047E+00		
620	1.149E+02	661	4.844E+01	702	1.590E+01	743	4.866E+00		
621	1.131E+02	662	4.717E+01	703	1.552E+01	744	4.776E+00		
622	1.112E+02	663	4.606E+01	704	1.505E+01	745	4.621E+00		
623	1.096E+02	664	4.470E+01	705	1.462E+01	746	4.490E+00		
624	1.076E+02	665	4.362E+01	706	1.421E+01	747	4.438E+00		
625	1.059E+02	666	4.244E+01	707	1.378E+01	748	4.235E+00		

CIE 1931 x y Chromaticity Diagram



7-Step Chromaticity Quadrangles



[Integrating Sphere System]

Sample No.: R2DG170601050-S02

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)
240.0	50	0.3322	77.57	0.9729	9919	127.87

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
30.472	5218	-0.0017	0.3391	0.3434	0.2105	0.4797

Color Rendering Index

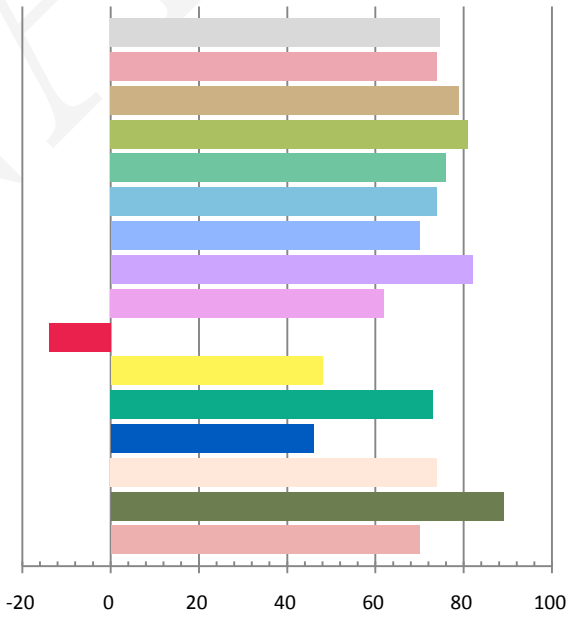
Ra
74.7

R1	R2	R3	R4
74	79	81	76

R5	R6	R7	R8
74	70	82	62

R9	R10	R11	R12
-14	48	73	46

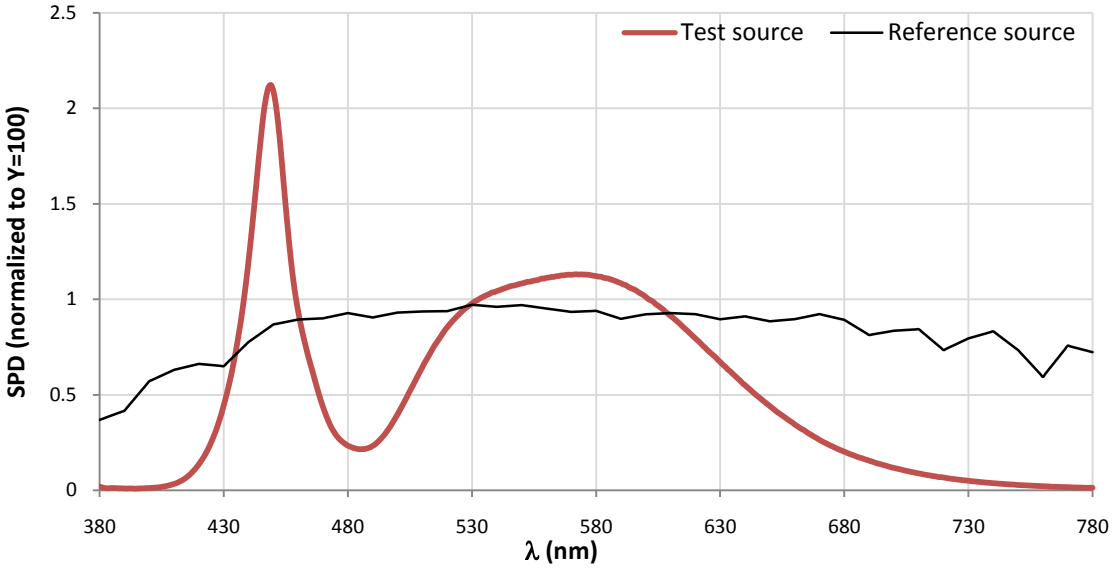
R13	R14	R15
74	89	70



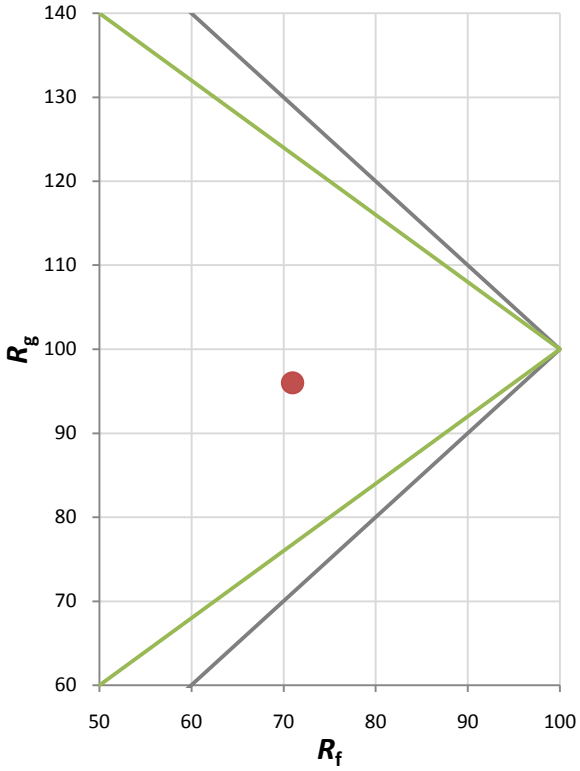
Fidelity Index and Gamut Index

Fidelity Index R_f	71
Gamut Index R_g	96

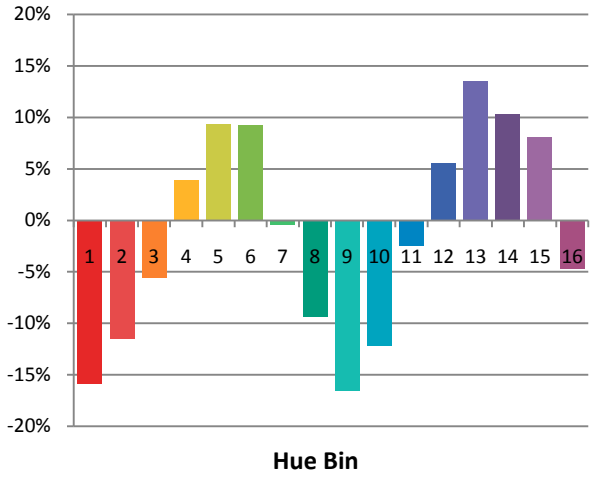
Spectral Power Distribution Comparison



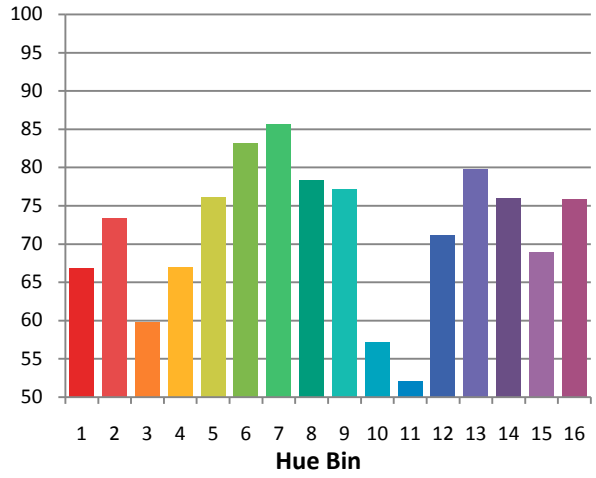
Plot of R_g versus R_f



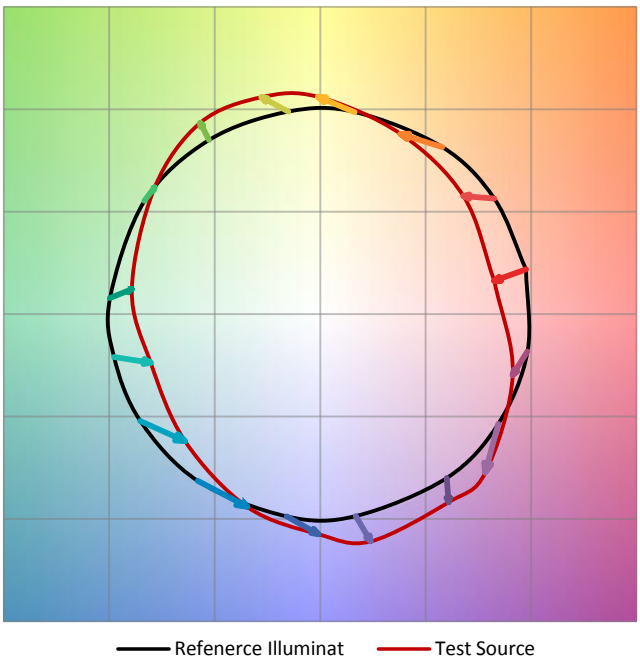
Chroma Shift by Hue



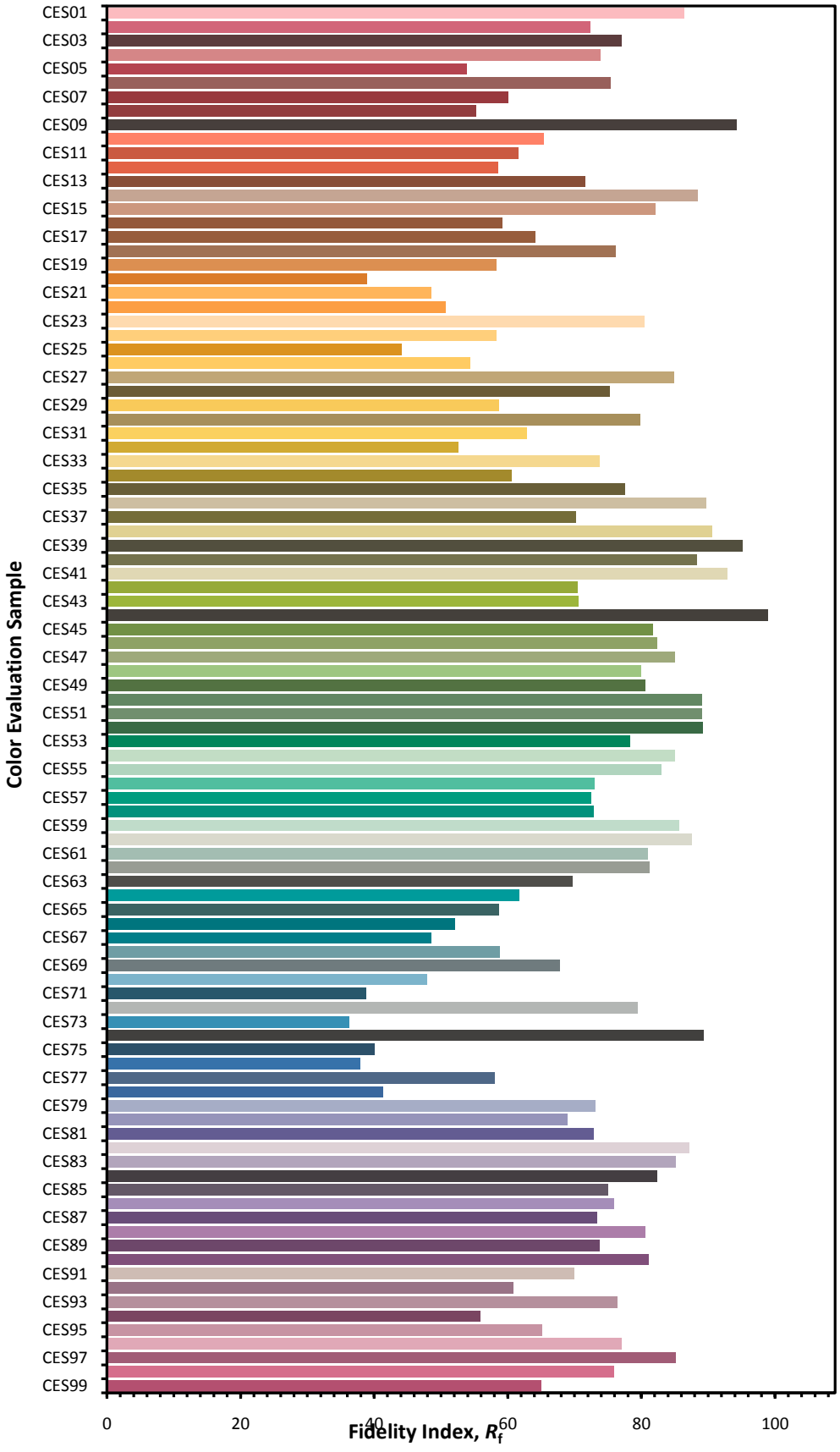
R_f by Hue



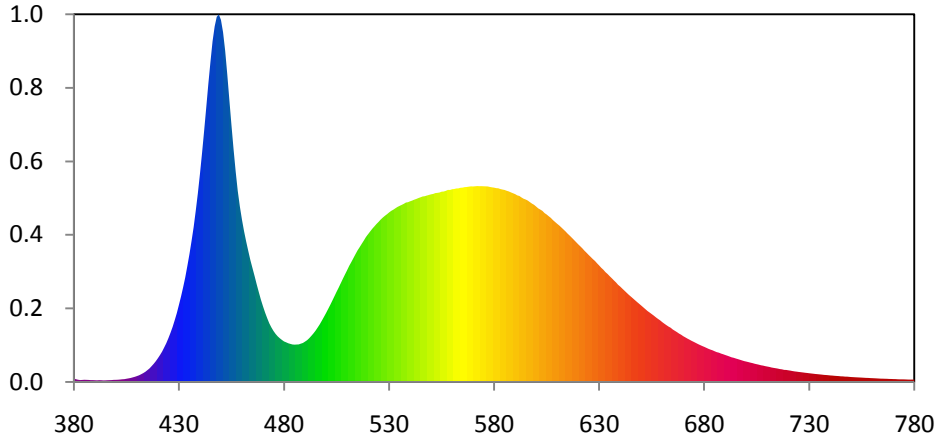
Color Vector Graphic



Color Fidelity by CES Sample



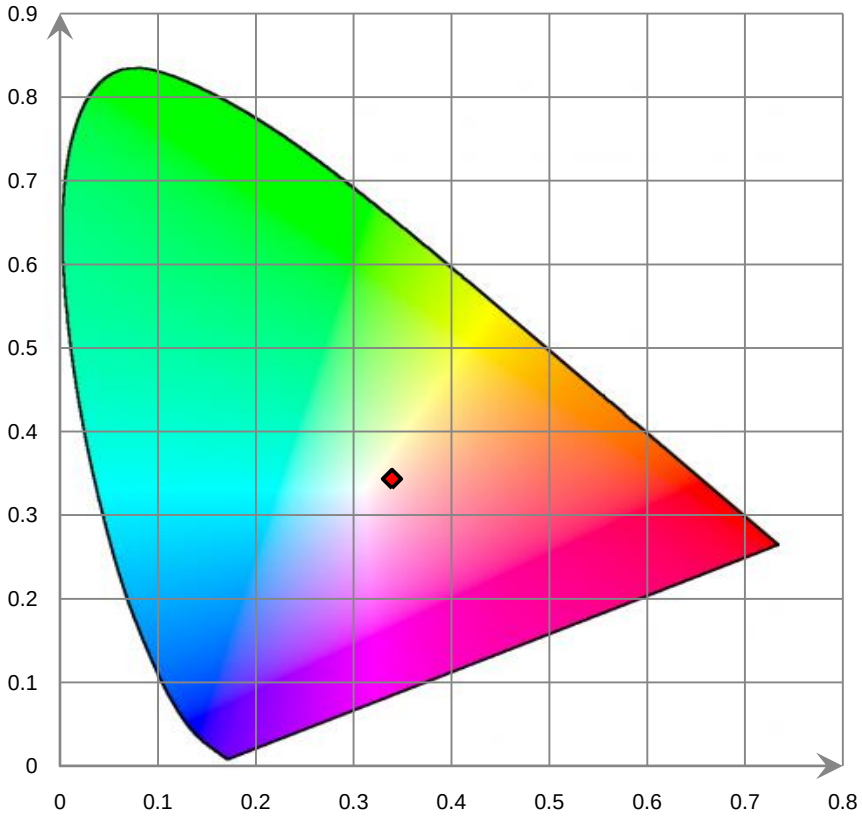
Relative Spectral Power Distribution



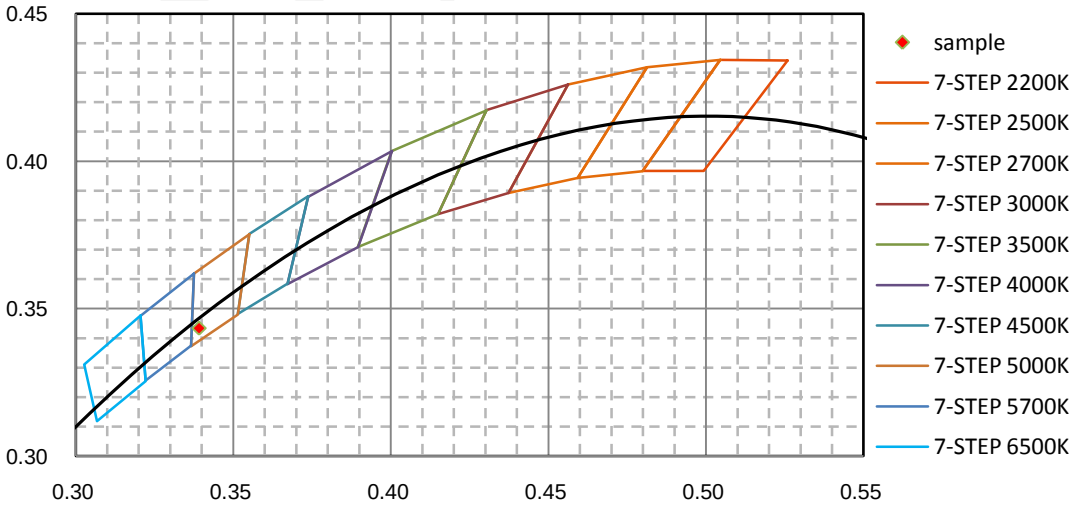
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	2.874E+00	421	2.258E+01	462	1.177E+02	503	6.814E+01	544	1.542E+02
381	2.242E+00	422	2.548E+01	463	1.099E+02	504	7.180E+01	545	1.549E+02
382	1.811E+00	423	2.894E+01	464	1.022E+02	505	7.553E+01	546	1.555E+02
383	1.533E+00	424	3.251E+01	465	9.547E+01	506	7.902E+01	547	1.557E+02
384	1.656E+00	425	3.674E+01	466	8.880E+01	507	8.268E+01	548	1.563E+02
385	1.799E+00	426	4.126E+01	467	8.187E+01	508	8.641E+01	549	1.568E+02
386	1.726E+00	427	4.618E+01	468	7.540E+01	509	9.003E+01	550	1.573E+02
387	1.653E+00	428	5.180E+01	469	6.906E+01	510	9.356E+01	551	1.577E+02
388	1.522E+00	429	5.772E+01	470	6.343E+01	511	9.724E+01	552	1.584E+02
389	1.516E+00	430	6.462E+01	471	5.817E+01	512	1.004E+02	553	1.586E+02
390	1.422E+00	431	7.168E+01	472	5.344E+01	513	1.037E+02	554	1.589E+02
391	1.315E+00	432	7.942E+01	473	4.916E+01	514	1.071E+02	555	1.595E+02
392	1.464E+00	433	8.758E+01	474	4.571E+01	515	1.103E+02	556	1.597E+02
393	1.406E+00	434	9.715E+01	475	4.271E+01	516	1.130E+02	557	1.602E+02
394	1.251E+00	435	1.071E+02	476	4.026E+01	517	1.158E+02	558	1.610E+02
395	1.300E+00	436	1.182E+02	477	3.821E+01	518	1.186E+02	559	1.610E+02
396	1.431E+00	437	1.299E+02	478	3.662E+01	519	1.215E+02	560	1.616E+02
397	1.471E+00	438	1.434E+02	479	3.521E+01	520	1.239E+02	561	1.618E+02
398	1.553E+00	439	1.580E+02	480	3.397E+01	521	1.262E+02	562	1.622E+02
399	1.718E+00	440	1.744E+02	481	3.323E+01	522	1.284E+02	563	1.623E+02
400	1.743E+00	441	1.919E+02	482	3.242E+01	523	1.304E+02	564	1.628E+02
401	1.848E+00	442	2.108E+02	483	3.189E+01	524	1.324E+02	565	1.630E+02
402	1.999E+00	443	2.301E+02	484	3.140E+01	525	1.342E+02	566	1.634E+02
403	2.184E+00	444	2.500E+02	485	3.125E+01	526	1.361E+02	567	1.635E+02
404	2.300E+00	445	2.684E+02	486	3.136E+01	527	1.378E+02	568	1.638E+02
405	2.647E+00	446	2.857E+02	487	3.146E+01	528	1.393E+02	569	1.640E+02
406	2.962E+00	447	2.981E+02	488	3.208E+01	529	1.406E+02	570	1.639E+02
407	3.315E+00	448	3.062E+02	489	3.266E+01	530	1.421E+02	571	1.641E+02
408	3.781E+00	449	3.082E+02	490	3.380E+01	531	1.435E+02	572	1.643E+02
409	4.293E+00	450	3.036E+02	491	3.499E+01	532	1.444E+02	573	1.641E+02
410	4.884E+00	451	2.932E+02	492	3.668E+01	533	1.456E+02	574	1.642E+02
411	5.519E+00	452	2.777E+02	493	3.859E+01	534	1.467E+02	575	1.641E+02
412	6.418E+00	453	2.582E+02	494	4.064E+01	535	1.476E+02	576	1.640E+02
413	7.360E+00	454	2.366E+02	495	4.293E+01	536	1.485E+02	577	1.639E+02
414	8.463E+00	455	2.153E+02	496	4.556E+01	537	1.493E+02	578	1.635E+02
415	9.874E+00	456	1.951E+02	497	4.826E+01	538	1.504E+02	579	1.632E+02
416	1.132E+01	457	1.764E+02	498	5.132E+01	539	1.507E+02	580	1.629E+02
417	1.322E+01	458	1.602E+02	499	5.449E+01	540	1.515E+02	581	1.625E+02
418	1.516E+01	459	1.471E+02	500	5.769E+01	541	1.521E+02	582	1.624E+02
419	1.740E+01	460	1.360E+02	501	6.113E+01	542	1.529E+02	583	1.617E+02
420	1.990E+01	461	1.263E+02	502	6.459E+01	543	1.535E+02	584	1.613E+02

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.610E+02	626	1.047E+02	667	4.178E+01	708	1.367E+01	749	4.215E+00
586	1.603E+02	627	1.030E+02	668	4.057E+01	709	1.323E+01	750	4.072E+00
587	1.597E+02	628	1.014E+02	669	3.958E+01	710	1.288E+01	751	3.992E+00
588	1.590E+02	629	9.944E+01	670	3.832E+01	711	1.255E+01	752	3.876E+00
589	1.582E+02	630	9.761E+01	671	3.734E+01	712	1.209E+01	753	3.796E+00
590	1.575E+02	631	9.566E+01	672	3.632E+01	713	1.179E+01	754	3.688E+00
591	1.565E+02	632	9.406E+01	673	3.541E+01	714	1.146E+01	755	3.620E+00
592	1.560E+02	633	9.202E+01	674	3.441E+01	715	1.115E+01	756	3.477E+00
593	1.547E+02	634	9.051E+01	675	3.357E+01	716	1.077E+01	757	3.384E+00
594	1.537E+02	635	8.866E+01	676	3.268E+01	717	1.054E+01	758	3.327E+00
595	1.530E+02	636	8.694E+01	677	3.175E+01	718	1.007E+01	759	3.222E+00
596	1.521E+02	637	8.516E+01	678	3.094E+01	719	1.002E+01	760	3.151E+00
597	1.508E+02	638	8.347E+01	679	3.012E+01	720	9.753E+00	761	3.063E+00
598	1.496E+02	639	8.143E+01	680	2.940E+01	721	9.458E+00	762	2.961E+00
599	1.485E+02	640	7.998E+01	681	2.858E+01	722	9.111E+00	763	2.843E+00
600	1.471E+02	641	7.825E+01	682	2.777E+01	723	8.821E+00	764	2.738E+00
601	1.455E+02	642	7.659E+01	683	2.709E+01	724	8.616E+00	765	2.715E+00
602	1.445E+02	643	7.489E+01	684	2.645E+01	725	8.352E+00	766	2.654E+00
603	1.434E+02	644	7.322E+01	685	2.565E+01	726	8.129E+00	767	2.577E+00
604	1.416E+02	645	7.169E+01	686	2.494E+01	727	7.932E+00	768	2.508E+00
605	1.404E+02	646	7.018E+01	687	2.448E+01	728	7.668E+00	769	2.468E+00
606	1.389E+02	647	6.858E+01	688	2.375E+01	729	7.501E+00	770	2.390E+00
607	1.376E+02	648	6.705E+01	689	2.320E+01	730	7.250E+00	771	2.329E+00
608	1.357E+02	649	6.558E+01	690	2.254E+01	731	7.057E+00	772	2.221E+00
609	1.342E+02	650	6.405E+01	691	2.195E+01	732	6.833E+00	773	2.172E+00
610	1.326E+02	651	6.255E+01	692	2.132E+01	733	6.642E+00	774	2.149E+00
611	1.312E+02	652	6.101E+01	693	2.062E+01	734	6.481E+00	775	2.117E+00
612	1.295E+02	653	5.945E+01	694	2.024E+01	735	6.291E+00	776	2.053E+00
613	1.279E+02	654	5.820E+01	695	1.964E+01	736	6.113E+00	777	1.963E+00
614	1.262E+02	655	5.686E+01	696	1.912E+01	737	5.880E+00	778	1.954E+00
615	1.243E+02	656	5.557E+01	697	1.858E+01	738	5.775E+00	779	1.959E+00
616	1.226E+02	657	5.417E+01	698	1.803E+01	739	5.614E+00	780	1.963E+00
617	1.209E+02	658	5.283E+01	699	1.745E+01	740	5.418E+00		
618	1.191E+02	659	5.164E+01	700	1.705E+01	741	5.309E+00		
619	1.173E+02	660	5.014E+01	701	1.663E+01	742	5.129E+00		
620	1.155E+02	661	4.885E+01	702	1.617E+01	743	4.991E+00		
621	1.138E+02	662	4.759E+01	703	1.575E+01	744	4.878E+00		
622	1.120E+02	663	4.643E+01	704	1.524E+01	745	4.702E+00		
623	1.100E+02	664	4.545E+01	705	1.484E+01	746	4.621E+00		
624	1.083E+02	665	4.399E+01	706	1.442E+01	747	4.447E+00		
625	1.064E+02	666	4.287E+01	707	1.397E+01	748	4.412E+00		

CIE 1931 x y Chromaticity Diagram



7-Step Chromaticity Quadrangles



[Integrating Sphere System]

Sample No.: R2DG170601050-S03

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)
240.0	50	0.3319	77.45	0.972	10019	129.37

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
30.798	5223	-0.00174	0.3390	0.3432	0.2105	0.4796

Color Rendering Index

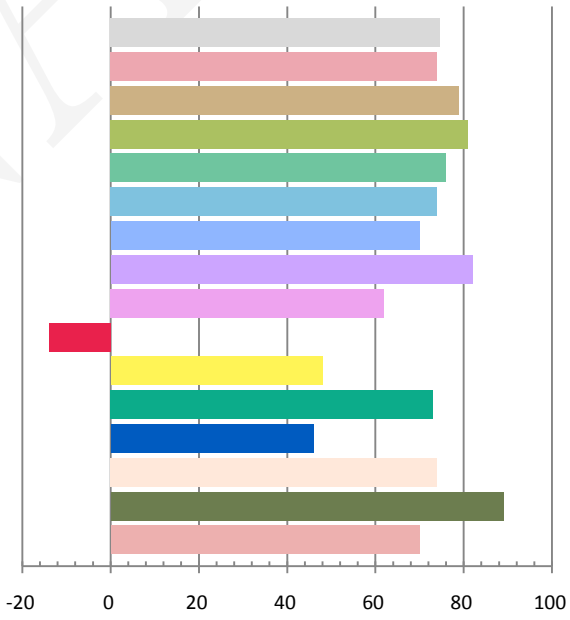
Ra
74.7

R1	R2	R3	R4
74	79	81	76

R5	R6	R7	R8
74	70	82	62

R9	R10	R11	R12
-14	48	73	46

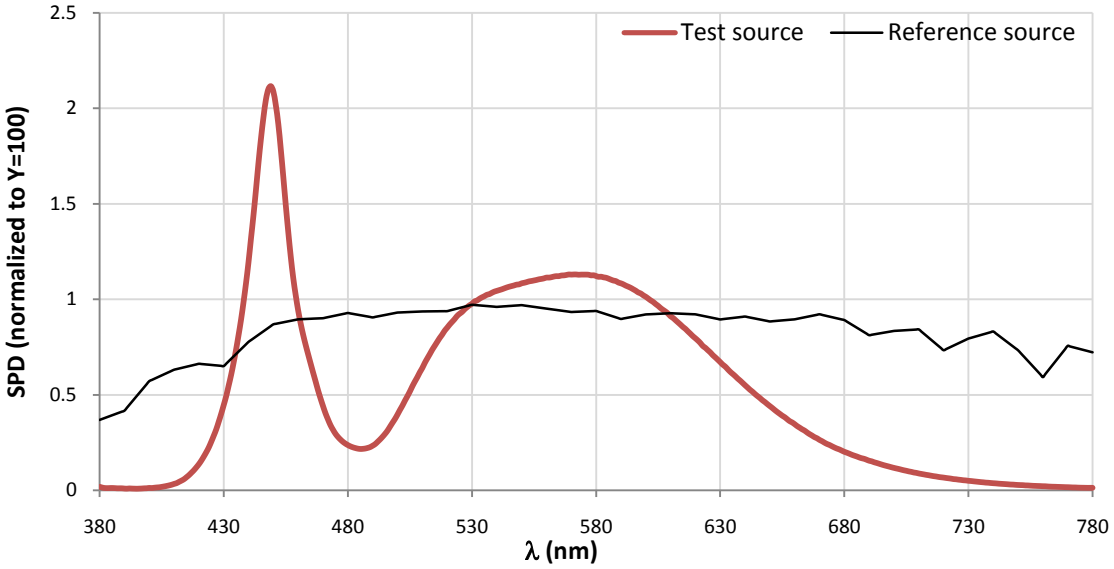
R13	R14	R15
74	89	70



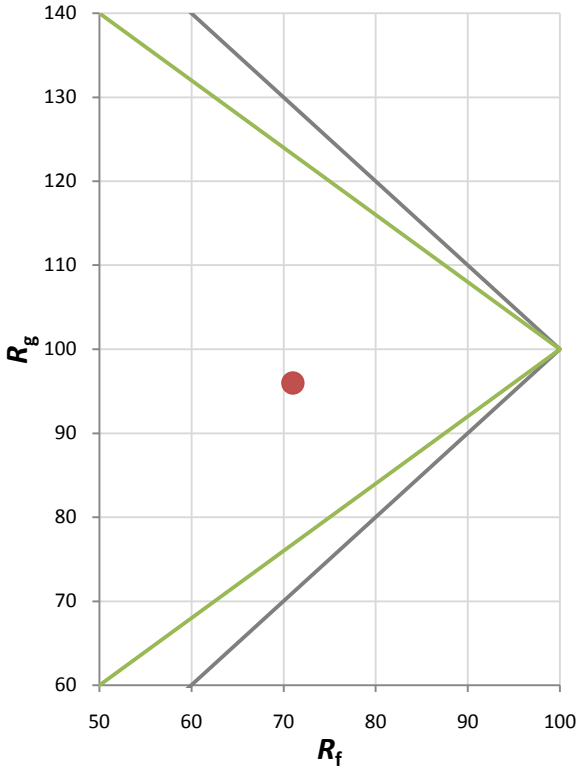
Fidelity Index and Gamut Index

Fidelity Index R_f	71
Gamut Index R_g	96

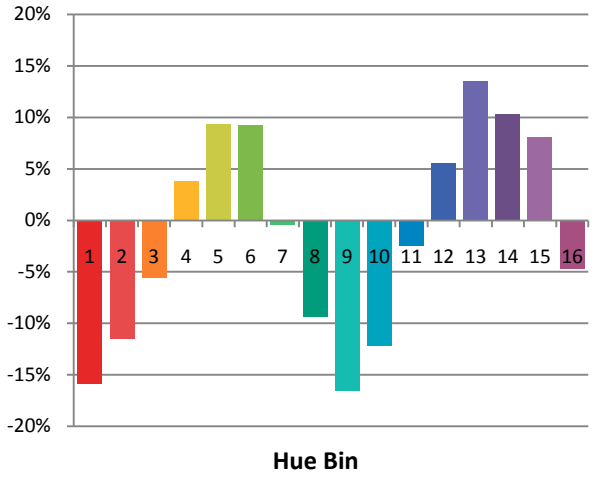
Spectral Power Distribution Comparison



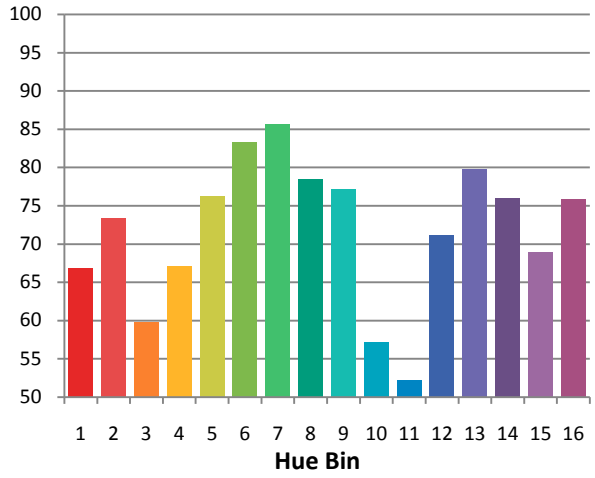
Plot of R_g versus R_f



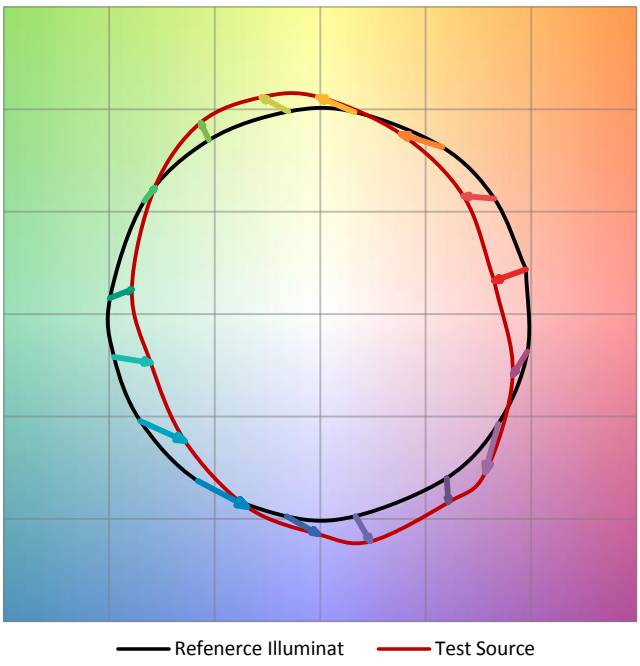
Chroma Shift by Hue



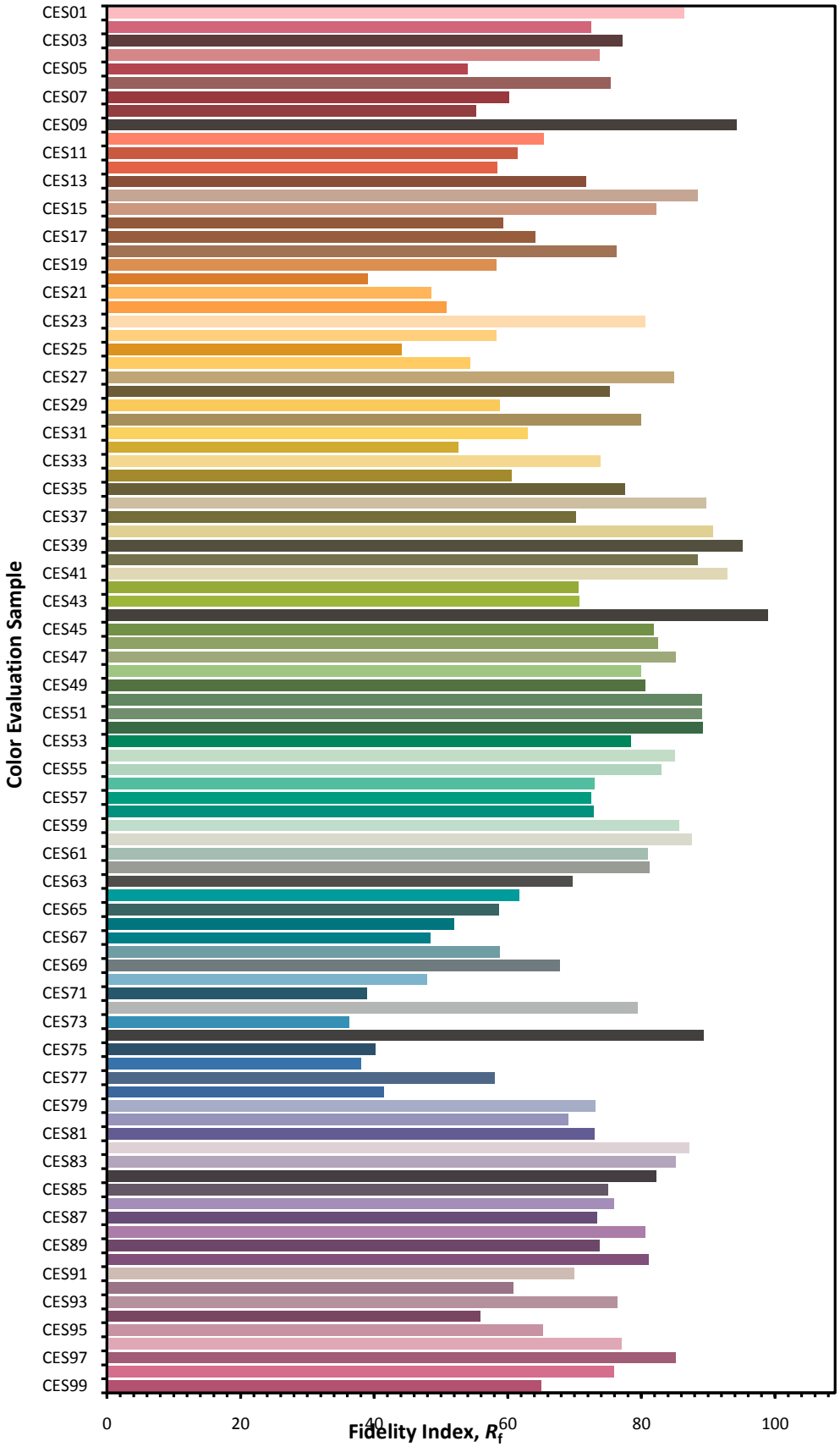
R_f by Hue



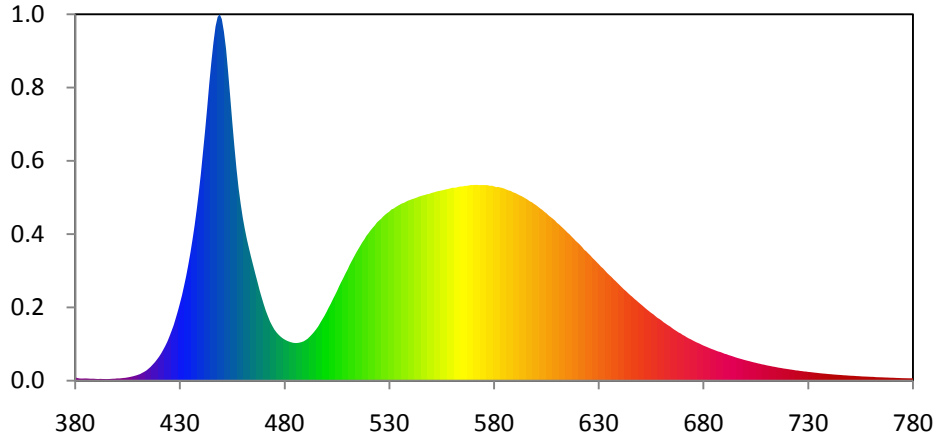
Color Vector Graphic



Color Fidelity by CES Sample



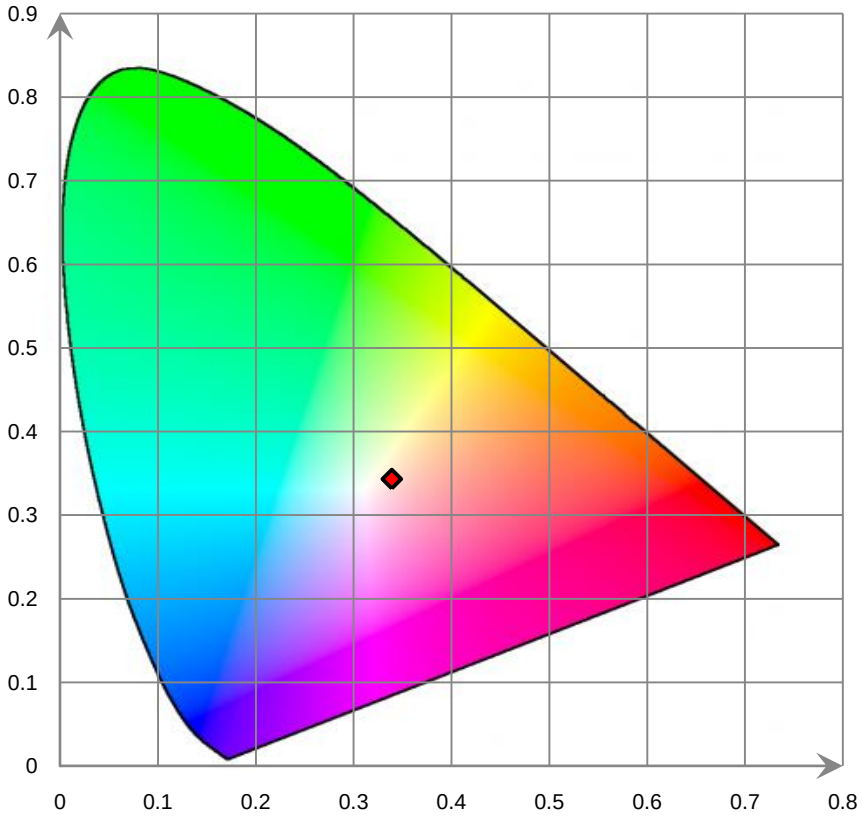
Relative Spectral Power Distribution



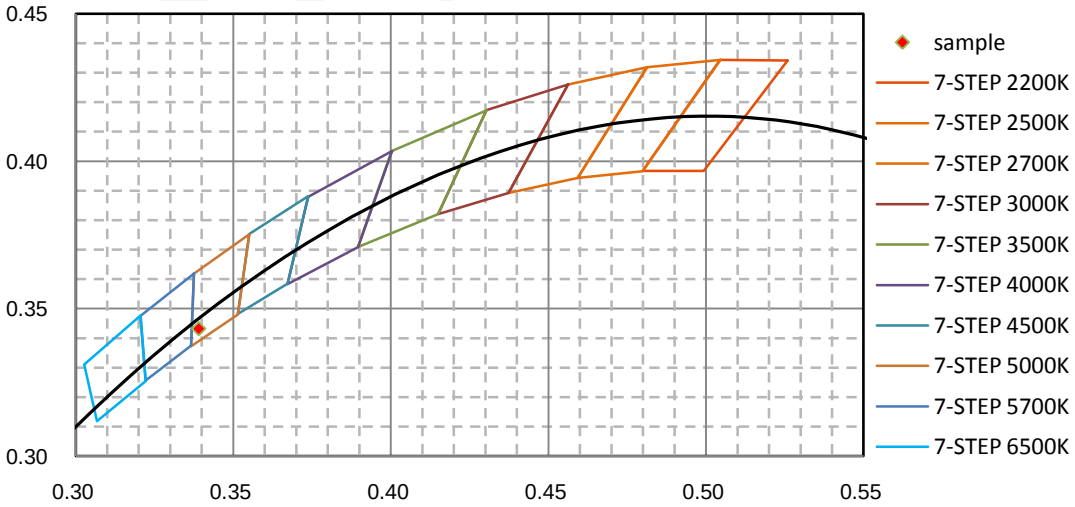
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	2.777E+00	421	2.292E+01	462	1.195E+02	503	6.887E+01	544	1.558E+02
381	2.206E+00	422	2.606E+01	463	1.118E+02	504	7.234E+01	545	1.564E+02
382	1.830E+00	423	2.939E+01	464	1.045E+02	505	7.596E+01	546	1.569E+02
383	1.740E+00	424	3.305E+01	465	9.744E+01	506	7.996E+01	547	1.574E+02
384	1.789E+00	425	3.742E+01	466	9.049E+01	507	8.355E+01	548	1.580E+02
385	1.843E+00	426	4.205E+01	467	8.373E+01	508	8.697E+01	549	1.582E+02
386	1.761E+00	427	4.690E+01	468	7.682E+01	509	9.070E+01	550	1.590E+02
387	1.617E+00	428	5.276E+01	469	7.062E+01	510	9.398E+01	551	1.594E+02
388	1.616E+00	429	5.887E+01	470	6.475E+01	511	9.790E+01	552	1.599E+02
389	1.593E+00	430	6.553E+01	471	5.920E+01	512	1.013E+02	553	1.605E+02
390	1.414E+00	431	7.241E+01	472	5.453E+01	513	1.046E+02	554	1.608E+02
391	1.331E+00	432	8.054E+01	473	5.012E+01	514	1.080E+02	555	1.612E+02
392	1.502E+00	433	8.884E+01	474	4.667E+01	515	1.110E+02	556	1.616E+02
393	1.401E+00	434	9.827E+01	475	4.351E+01	516	1.140E+02	557	1.621E+02
394	1.346E+00	435	1.083E+02	476	4.110E+01	517	1.170E+02	558	1.624E+02
395	1.286E+00	436	1.195E+02	477	3.908E+01	518	1.196E+02	559	1.628E+02
396	1.365E+00	437	1.313E+02	478	3.735E+01	519	1.226E+02	560	1.634E+02
397	1.452E+00	438	1.448E+02	479	3.595E+01	520	1.249E+02	561	1.634E+02
398	1.591E+00	439	1.593E+02	480	3.481E+01	521	1.273E+02	562	1.637E+02
399	1.652E+00	440	1.754E+02	481	3.385E+01	522	1.294E+02	563	1.642E+02
400	1.898E+00	441	1.936E+02	482	3.310E+01	523	1.315E+02	564	1.645E+02
401	1.817E+00	442	2.116E+02	483	3.253E+01	524	1.339E+02	565	1.645E+02
402	2.032E+00	443	2.311E+02	484	3.207E+01	525	1.356E+02	566	1.650E+02
403	2.245E+00	444	2.515E+02	485	3.182E+01	526	1.370E+02	567	1.651E+02
404	2.380E+00	445	2.700E+02	486	3.190E+01	527	1.390E+02	568	1.654E+02
405	2.694E+00	446	2.864E+02	487	3.215E+01	528	1.406E+02	569	1.658E+02
406	3.034E+00	447	3.001E+02	488	3.262E+01	529	1.421E+02	570	1.657E+02
407	3.404E+00	448	3.082E+02	489	3.325E+01	530	1.433E+02	571	1.658E+02
408	3.840E+00	449	3.104E+02	490	3.432E+01	531	1.451E+02	572	1.658E+02
409	4.336E+00	450	3.063E+02	491	3.552E+01	532	1.458E+02	573	1.656E+02
410	4.969E+00	451	2.957E+02	492	3.731E+01	533	1.471E+02	574	1.657E+02
411	5.550E+00	452	2.813E+02	493	3.915E+01	534	1.482E+02	575	1.657E+02
412	6.547E+00	453	2.617E+02	494	4.119E+01	535	1.491E+02	576	1.657E+02
413	7.505E+00	454	2.407E+02	495	4.342E+01	536	1.502E+02	577	1.656E+02
414	8.588E+00	455	2.189E+02	496	4.590E+01	537	1.507E+02	578	1.651E+02
415	1.010E+01	456	1.985E+02	497	4.895E+01	538	1.517E+02	579	1.652E+02
416	1.168E+01	457	1.796E+02	498	5.197E+01	539	1.526E+02	580	1.646E+02
417	1.357E+01	458	1.632E+02	499	5.490E+01	540	1.532E+02	581	1.640E+02
418	1.549E+01	459	1.499E+02	500	5.823E+01	541	1.538E+02	582	1.641E+02
419	1.777E+01	460	1.381E+02	501	6.179E+01	542	1.544E+02	583	1.636E+02
420	2.017E+01	461	1.282E+02	502	6.514E+01	543	1.551E+02	584	1.633E+02

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.626E+02	626	1.060E+02	667	4.209E+01	708	1.374E+01	749	4.272E+00
586	1.618E+02	627	1.039E+02	668	4.088E+01	709	1.344E+01	750	4.152E+00
587	1.611E+02	628	1.022E+02	669	4.003E+01	710	1.299E+01	751	4.076E+00
588	1.607E+02	629	1.004E+02	670	3.877E+01	711	1.264E+01	752	4.011E+00
589	1.596E+02	630	9.854E+01	671	3.782E+01	712	1.229E+01	753	3.832E+00
590	1.590E+02	631	9.661E+01	672	3.667E+01	713	1.194E+01	754	3.780E+00
591	1.582E+02	632	9.511E+01	673	3.567E+01	714	1.164E+01	755	3.639E+00
592	1.572E+02	633	9.311E+01	674	3.490E+01	715	1.127E+01	756	3.514E+00
593	1.564E+02	634	9.115E+01	675	3.391E+01	716	1.093E+01	757	3.444E+00
594	1.555E+02	635	8.949E+01	676	3.297E+01	717	1.068E+01	758	3.377E+00
595	1.544E+02	636	8.785E+01	677	3.213E+01	718	1.031E+01	759	3.307E+00
596	1.533E+02	637	8.597E+01	678	3.145E+01	719	1.005E+01	760	3.203E+00
597	1.520E+02	638	8.435E+01	679	3.052E+01	720	9.827E+00	761	3.157E+00
598	1.512E+02	639	8.258E+01	680	2.965E+01	721	9.528E+00	762	2.994E+00
599	1.498E+02	640	8.078E+01	681	2.895E+01	722	9.287E+00	763	2.894E+00
600	1.487E+02	641	7.905E+01	682	2.819E+01	723	9.020E+00	764	2.813E+00
601	1.473E+02	642	7.728E+01	683	2.738E+01	724	8.680E+00	765	2.783E+00
602	1.459E+02	643	7.577E+01	684	2.670E+01	725	8.527E+00	766	2.696E+00
603	1.447E+02	644	7.401E+01	685	2.605E+01	726	8.242E+00	767	2.630E+00
604	1.431E+02	645	7.244E+01	686	2.531E+01	727	8.035E+00	768	2.581E+00
605	1.417E+02	646	7.095E+01	687	2.468E+01	728	7.774E+00	769	2.498E+00
606	1.400E+02	647	6.925E+01	688	2.424E+01	729	7.638E+00	770	2.444E+00
607	1.386E+02	648	6.785E+01	689	2.352E+01	730	7.354E+00	771	2.378E+00
608	1.373E+02	649	6.625E+01	690	2.278E+01	731	7.193E+00	772	2.270E+00
609	1.357E+02	650	6.475E+01	691	2.233E+01	732	6.984E+00	773	2.241E+00
610	1.337E+02	651	6.326E+01	692	2.162E+01	733	6.764E+00	774	2.152E+00
611	1.324E+02	652	6.167E+01	693	2.109E+01	734	6.576E+00	775	2.083E+00
612	1.307E+02	653	6.017E+01	694	2.049E+01	735	6.354E+00	776	2.047E+00
613	1.290E+02	654	5.878E+01	695	1.987E+01	736	6.192E+00	777	2.006E+00
614	1.273E+02	655	5.736E+01	696	1.930E+01	737	5.982E+00	778	1.966E+00
615	1.255E+02	656	5.618E+01	697	1.880E+01	738	5.865E+00	779	1.977E+00
616	1.240E+02	657	5.464E+01	698	1.829E+01	739	5.674E+00	780	1.981E+00
617	1.221E+02	658	5.317E+01	699	1.776E+01	740	5.510E+00		
618	1.203E+02	659	5.216E+01	700	1.727E+01	741	5.386E+00		
619	1.184E+02	660	5.084E+01	701	1.682E+01	742	5.192E+00		
620	1.168E+02	661	4.936E+01	702	1.640E+01	743	5.054E+00		
621	1.151E+02	662	4.817E+01	703	1.590E+01	744	4.920E+00		
622	1.132E+02	663	4.693E+01	704	1.544E+01	745	4.808E+00		
623	1.109E+02	664	4.588E+01	705	1.504E+01	746	4.653E+00		
624	1.095E+02	665	4.447E+01	706	1.457E+01	747	4.503E+00		
625	1.077E+02	666	4.320E+01	707	1.422E+01	748	4.432E+00		

CIE 1931 x y Chromaticity Diagram



7-Step Chromaticity Quadrangles



[Goniophotometer System]

Sample No.: R2DG170601050-S01

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

Test orientation: **Downward**

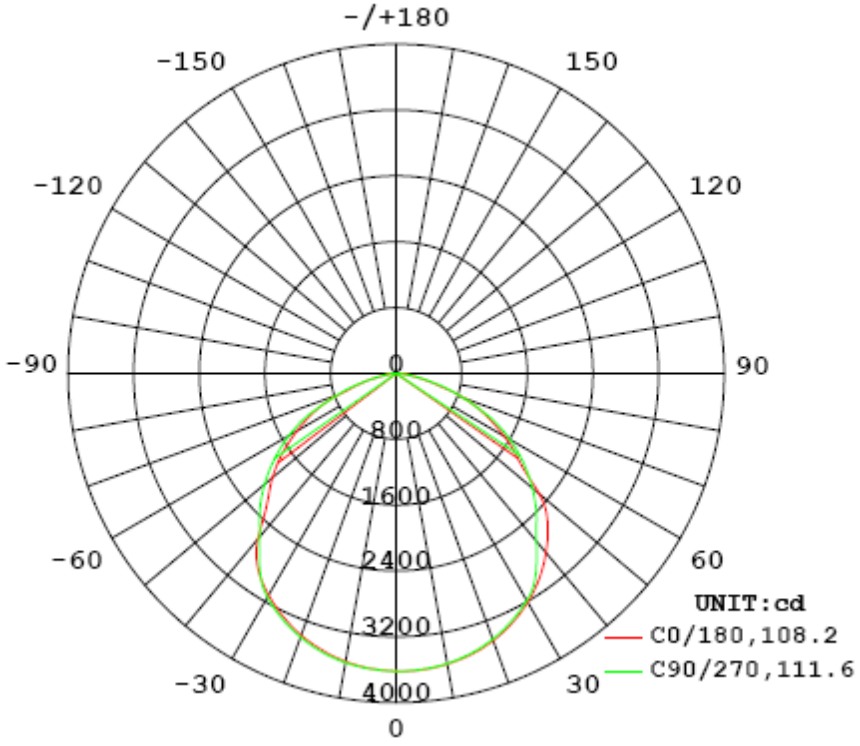
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
240.1	50	0.3327	77.45	0.9696

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I_{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
9876.65	127.52	3619.0	1.32	1.30

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I_{max}):	108.2	109.3	111.6	108.2	109.3
Field Angle (10% I_{max}):	153.1	153.3	153.9	152.7	153.3

Luminous Intensity (cd) Distribution Data

C / γ	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	3617	3617	3617	3617	3617	3617	3617	3617
5.0°	3598	3598	3598	3601	3603	3605	3608	3610
10.0°	3554	3554	3556	3561	3567	3572	3575	3579
15.0°	3483	3482	3485	3493	3503	3511	3517	3524
20.0°	3387	3384	3388	3398	3410	3422	3431	3441
25.0°	3262	3259	3262	3273	3290	3304	3316	3328
30.0°	3111	3105	3108	3121	3141	3156	3169	3185
35.0°	2929	2922	2925	2917	2901	2970	2990	3009
40.0°	2626	2681	2706	2607	2592	2669	2779	2800
45.0°	2225	2265	2391	2338	2354	2375	2514	2554
50.0°	1971	1930	2016	2087	2099	2127	2165	2259
55.0°	1698	1639	1603	1805	1814	1847	1845	1742
60.0°	1401	1314	1310	1496	1511	1538	1428	1425
65.0°	1103	969	1021	1148	1159	1201	1074	1090
70.0°	713	676	719	707	762	792	765	738
75.0°	408	359	405	397	435	431	444	402
80.0°	158	143	154	158	180	181	184	182
85.0°	42	42	45	48	54	58	61	66
90.0°	0	1	1	4	5	1	3	6
95.0°	1	1	1	1	1	1	1	1
100.0°	1	1	1	1	1	1	1	1
105.0°	1	1	1	1	1	1	1	1
110.0°	1	1	1	1	1	1	1	1
115.0°	1	1	1	1	1	1	1	1
120.0°	1	1	1	1	1	1	1	1
125.0°	1	1	1	1	1	1	1	1
130.0°	2	2	2	2	2	2	2	2
135.0°	2	2	2	2	2	2	2	2
140.0°	2	2	2	2	2	3	2	2
145.0°	3	3	3	3	3	3	3	3
150.0°	4	4	4	4	4	4	4	4
155.0°	4	4	4	4	4	4	4	4
160.0°	4	4	4	5	5	5	5	4
165.0°	4	4	4	4	5	5	4	4
170.0°	4	4	4	4	4	4	4	4
175.0°	4	4	4	4	4	4	4	4
180.0°	4	3	4	3	3	3	4	4

Luminous Intensity (cd) Distribution Data (cont.)

C / γ	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	3617	3617	3617	3617	3617	3617	3617	3617
5.0°	3614	3615	3614	3612	3608	3605	3602	3599
10.0°	3585	3586	3585	3583	3578	3571	3564	3559
15.0°	3534	3536	3534	3531	3521	3512	3501	3492
20.0°	3455	3458	3455	3449	3437	3423	3410	3398
25.0°	3345	3348	3346	3338	3324	3306	3290	3277
30.0°	3208	3211	3206	3200	3184	3161	3142	3128
35.0°	3041	3043	3036	3021	2970	2983	2962	2951
40.0°	2842	2840	2836	2725	2660	2693	2754	2711
45.0°	2612	2597	2557	2440	2417	2394	2482	2291
50.0°	2282	2317	2208	2198	2170	2149	2063	1963
55.0°	1821	1828	1918	1927	1895	1877	1640	1684
60.0°	1522	1467	1598	1624	1598	1577	1361	1382
65.0°	1208	1119	1160	1291	1261	1221	1085	1068
70.0°	880	795	848	893	870	771	790	725
75.0°	483	454	509	555	547	473	467	390
80.0°	219	225	228	239	238	212	194	169
85.0°	75	73	74	73	68	60	55	49
90.0°	11	12	13	12	11	1	0	0
95.0°	0	0	0	0	0	0	0	0
100.0°	0	0	0	0	0	0	0	0
105.0°	0	0	0	0	1	1	1	1
110.0°	1	1	1	1	1	1	1	1
115.0°	1	1	1	1	1	1	1	1
120.0°	1	1	1	1	1	1	1	1
125.0°	1	1	1	1	1	1	1	1
130.0°	1	1	1	1	1	1	1	1
135.0°	2	2	2	2	2	2	2	2
140.0°	2	2	2	2	2	2	2	2
145.0°	2	2	2	2	2	2	2	2
150.0°	2	2	2	2	2	2	2	2
155.0°	2	2	2	3	2	3	2	3
160.0°	3	3	3	3	3	3	3	3
165.0°	3	3	3	3	3	3	3	3
170.0°	3	3	3	3	3	3	3	3
175.0°	3	3	3	3	3	3	3	3
180.0°	4	4	4	4	3	3	4	4

Zonal Lumen Density Measurement

Deg	Flux (lm)	%
0-5	86.3	0.87
5-10	256.7	2.60
10-15	420.0	4.26
15-20	571.3	5.78
20-25	705.5	7.14
25-30	818.0	8.29
30-35	903.8	9.15
35-40	950.7	9.62
40-45	952.3	9.64
45-50	919.7	9.32
50-55	849.4	8.60
55-60	753.4	7.62
60-65	633.9	6.42
65-70	484.1	4.90
70-75	318.5	3.23
75-80	165.5	1.67
80-85	61.9	0.63
85-90	16.2	0.16
90-95	0.5	0.01
95-100	0.3	0.00
100-105	0.4	0.01
105-110	0.4	0.00
110-115	0.4	0.01
115-120	0.5	0.00
120-125	0.5	0.01
125-130	0.6	0.00
130-135	0.6	0.01
135-140	0.7	0.00
140-145	0.8	0.01
145-150	0.8	0.01
150-155	0.8	0.01
155-160	0.7	0.01
160-165	0.6	0.00
165-170	0.4	0.01
170-175	0.3	0.00
175-180	0.1	0.00

Deg	Flux (lm)	%
0-5	86.3	0.87
0-10	343.1	3.47
0-15	763.1	7.73
0-20	1334.4	13.51
0-25	2039.9	20.65
0-30	2857.9	28.94
0-35	3761.7	38.09
0-40	4712.3	47.71
0-45	5664.6	57.35
0-50	6584.3	66.67
0-55	7433.7	75.27
0-60	8187.0	82.89
0-65	8820.9	89.31
0-70	9305.0	94.21
0-75	9623.5	97.44
0-80	9789.1	99.11
0-85	9851.0	99.74
0-90	9867.2	99.90
0-95	9867.7	99.91
0-100	9868.0	99.91
0-105	9868.4	99.92
0-110	9868.8	99.92
0-115	9869.2	99.93
0-120	9869.7	99.93
0-125	9870.2	99.94
0-130	9870.8	99.94
0-135	9871.5	99.95
0-140	9872.2	99.95
0-145	9873.0	99.96
0-150	9873.8	99.97
0-155	9874.6	99.98
0-160	9875.3	99.99
0-165	9875.9	99.99
0-170	9876.3	100.00
0-175	9876.6	100.00
0-180	9876.7	100.00

[Goniophotometer System]

Sample No.: R2DG170601050-S02

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

Test orientation: **Downward**

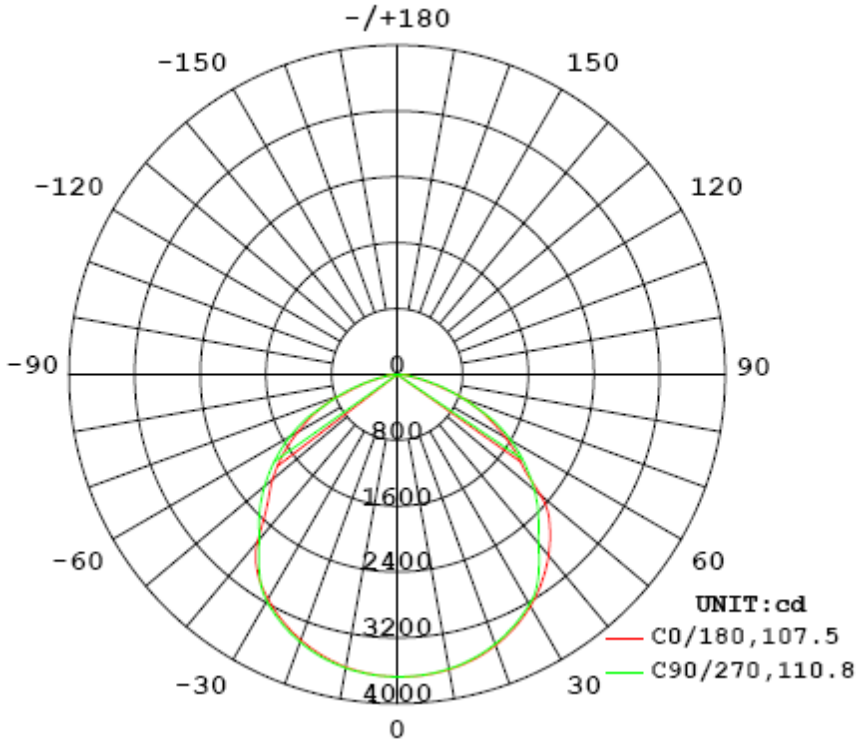
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
240.1	50	0.3331	77.55	0.9698

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I_{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
9934.25	128.10	3676.0	1.31	1.30

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I_{max}):	107.5	108.6	110.8	107.6	108.6
Field Angle (10% I_{max}):	152.5	152.7	153.3	152.1	152.7

Luminous Intensity (cd) Distribution Data

C / γ	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	3674	3674	3674	3674	3674	3674	3674	3674
5.0°	3653	3652	3654	3655	3658	3661	3664	3666
10.0°	3609	3608	3610	3615	3622	3626	3630	3634
15.0°	3536	3534	3538	3545	3555	3564	3571	3578
20.0°	3435	3432	3436	3447	3460	3471	3482	3491
25.0°	3307	3303	3307	3318	3334	3348	3363	3375
30.0°	3151	3145	3148	3161	3182	3196	3211	3227
35.0°	2963	2956	2960	2950	2933	3002	3026	3046
40.0°	2649	2707	2734	2632	2618	2694	2809	2832
45.0°	2243	2279	2410	2359	2374	2396	2536	2578
50.0°	1984	1942	2026	2102	2114	2142	2178	2272
55.0°	1705	1644	1607	1814	1823	1856	1854	1747
60.0°	1403	1312	1311	1498	1513	1540	1421	1427
65.0°	1099	964	1016	1142	1148	1196	1071	1085
70.0°	691	669	712	694	753	782	759	728
75.0°	400	351	393	382	423	422	436	394
80.0°	150	136	146	152	173	172	176	175
85.0°	40	39	42	47	50	54	58	64
90.0°	1	0	0	1	4	5	1	3
95.0°	1	1	1	1	1	1	1	1
100.0°	1	1	1	1	1	1	1	1
105.0°	1	1	1	1	1	1	1	1
110.0°	1	1	1	1	1	1	1	1
115.0°	1	1	1	1	1	1	1	1
120.0°	1	1	1	1	1	1	1	1
125.0°	1	1	1	1	1	1	1	1
130.0°	2	2	2	2	2	2	2	2
135.0°	2	2	2	2	2	2	2	2
140.0°	2	2	3	2	3	3	2	2
145.0°	3	3	3	3	3	3	3	3
150.0°	4	4	4	4	4	4	4	4
155.0°	4	4	4	4	4	4	4	4
160.0°	4	5	5	5	5	5	5	4
165.0°	4	4	4	4	5	5	5	4
170.0°	4	4	4	4	4	4	4	4
175.0°	4	4	4	4	4	4	4	4
180.0°	4	4	4	3	3	4	4	4

Luminous Intensity (cd) Distribution Data (cont.)

C / γ	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	3674	3674	3674	3674	3674	3674	3674	3674
5.0°	3669	3670	3669	3667	3663	3660	3658	3655
10.0°	3639	3641	3639	3637	3632	3625	3619	3613
15.0°	3587	3588	3586	3582	3573	3563	3553	3544
20.0°	3504	3507	3505	3498	3486	3471	3458	3446
25.0°	3390	3394	3392	3383	3369	3351	3335	3321
30.0°	3249	3252	3248	3241	3224	3201	3181	3167
35.0°	3076	3078	3072	3054	2999	3015	2996	2984
40.0°	2871	2869	2866	2748	2683	2716	2782	2735
45.0°	2634	2618	2575	2460	2436	2413	2498	2299
50.0°	2285	2330	2221	2212	2183	2163	2065	1973
55.0°	1827	1823	1925	1934	1902	1884	1642	1687
60.0°	1522	1465	1592	1625	1599	1576	1361	1381
65.0°	1203	1110	1155	1284	1253	1210	1079	1059
70.0°	869	785	838	882	856	759	780	716
75.0°	471	440	497	537	531	461	454	381
80.0°	208	209	214	228	224	202	181	162
85.0°	70	70	69	68	64	56	49	48
90.0°	12	11	11	11	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	1	1	1	1
110.0°	1	1	1	1	1	1	1	1
115.0°	1	1	1	1	1	1	1	1
120.0°	1	1	1	1	1	1	1	1
125.0°	1	1	1	1	1	1	1	1
130.0°	1	1	1	1	1	1	1	1
135.0°	2	2	2	2	2	2	2	2
140.0°	2	2	2	2	2	2	2	2
145.0°	2	2	2	2	2	2	2	2
150.0°	2	2	2	2	2	2	2	2
155.0°	2	2	2	3	3	3	2	3
160.0°	3	3	3	3	3	3	3	3
165.0°	3	3	3	3	3	3	3	3
170.0°	3	3	3	3	3	3	3	3
175.0°	3	3	3	3	3	3	3	3
180.0°	4	4	4	4	3	4	4	4

Zonal Lumen Density Measurement

Deg	Flux (lm)	%
0-5	87.7	0.88
5-10	260.6	2.63
10-15	426.4	4.29
15-20	579.7	5.83
20-25	715.4	7.20
25-30	828.8	8.35
30-35	914.8	9.21
35-40	960.7	9.67
40-45	960.6	9.67
45-50	926.0	9.32
50-55	852.8	8.58
55-60	754.8	7.60
60-65	632.3	6.36
65-70	479.5	4.83
70-75	312.1	3.14
75-80	159.5	1.61
80-85	58.6	0.59
85-90	14.7	0.15
90-95	0.4	0.00
95-100	0.3	0.00
100-105	0.4	0.01
105-110	0.4	0.00
110-115	0.4	0.01
115-120	0.5	0.00
120-125	0.5	0.01
125-130	0.6	0.00
130-135	0.7	0.01
135-140	0.7	0.00
140-145	0.8	0.01
145-150	0.8	0.01
150-155	0.8	0.01
155-160	0.7	0.01
160-165	0.6	0.00
165-170	0.4	0.01
170-175	0.3	0.00
175-180	0.1	0.00

Deg	Flux (lm)	%
0-5	87.7	0.88
0-10	348.3	3.51
0-15	774.7	7.80
0-20	1354.3	13.63
0-25	2069.7	20.83
0-30	2898.5	29.18
0-35	3813.3	38.39
0-40	4774.0	48.06
0-45	5734.6	57.73
0-50	6660.6	67.05
0-55	7513.4	75.63
0-60	8268.2	83.23
0-65	8900.5	89.59
0-70	9380.0	94.42
0-75	9692.1	97.56
0-80	9851.6	99.17
0-85	9910.2	99.76
0-90	9924.9	99.91
0-95	9925.3	99.91
0-100	9925.6	99.91
0-105	9926.0	99.92
0-110	9926.4	99.92
0-115	9926.8	99.93
0-120	9927.3	99.93
0-125	9927.8	99.94
0-130	9928.4	99.94
0-135	9929.0	99.95
0-140	9929.7	99.95
0-145	9930.5	99.96
0-150	9931.4	99.97
0-155	9932.2	99.98
0-160	9932.9	99.99
0-165	9933.5	99.99
0-170	9933.9	100.00
0-175	9934.2	100.00
0-180	9934.3	100.00

[Goniophotometer System]

Sample No.: R2DG170601050-S03

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

Test orientation: **Downward**

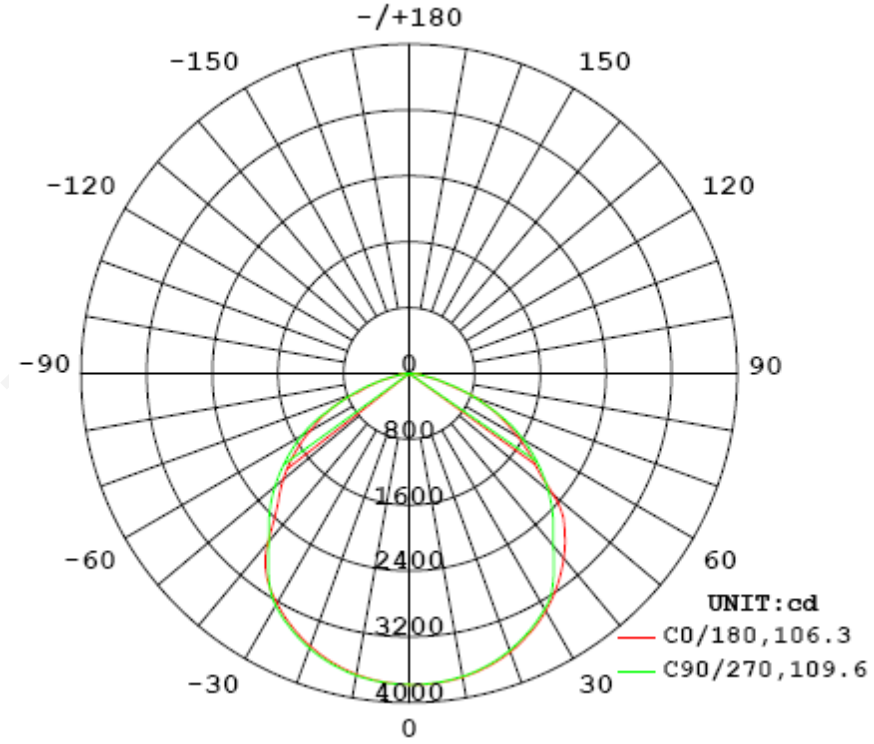
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
240.1	50	0.3327	77.42	0.9693

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I_{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
10053.3	129.85	3783.0	1.31	1.29

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I_{max}):	106.3	107.5	109.6	106.5	107.5
Field Angle (10% I_{max}):	151.4	151.5	152.1	151.0	151.5

Luminous Intensity (cd) Distribution Data

C / γ	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	3781	3781	3781	3781	3781	3781	3781	3781
5.0°	3760	3759	3760	3762	3765	3768	3771	3773
10.0°	3712	3711	3713	3719	3725	3731	3735	3739
15.0°	3635	3632	3637	3645	3655	3664	3670	3677
20.0°	3528	3524	3528	3540	3553	3565	3576	3586
25.0°	3392	3387	3391	3403	3421	3435	3449	3462
30.0°	3227	3220	3223	3237	3257	3273	3288	3305
35.0°	3027	3020	3023	3010	2990	3065	3092	3113
40.0°	2684	2753	2784	2676	2664	2738	2864	2886
45.0°	2275	2299	2440	2398	2414	2435	2572	2619
50.0°	2010	1964	2037	2128	2139	2168	2198	2289
55.0°	1718	1654	1612	1827	1835	1870	1868	1753
60.0°	1404	1306	1312	1498	1514	1541	1405	1426
65.0°	1089	953	1007	1123	1121	1184	1061	1069
70.0°	658	648	691	668	735	756	742	710
75.0°	380	336	358	354	398	400	416	376
80.0°	127	124	131	139	156	157	162	162
85.0°	34	34	37	40	47	50	52	59
90.0°	1	0	0	1	1	0	3	5
95.0°	1	1	1	1	1	1	1	1
100.0°	1	1	1	1	1	1	1	1
105.0°	1	1	1	1	1	1	1	1
110.0°	1	1	1	1	1	1	1	1
115.0°	1	1	1	1	1	1	1	1
120.0°	1	1	1	1	1	1	1	1
125.0°	1	1	1	1	1	1	1	1
130.0°	2	2	2	2	2	2	2	2
135.0°	2	2	2	2	2	2	2	2
140.0°	2	2	3	3	3	3	2	2
145.0°	3	3	3	3	3	3	3	3
150.0°	4	4	4	4	4	4	4	4
155.0°	4	4	4	4	4	4	4	4
160.0°	5	5	5	5	5	5	5	4
165.0°	4	5	4	5	5	5	5	4
170.0°	4	4	4	4	4	4	4	4
175.0°	4	4	4	4	4	4	4	4
180.0°	4	4	4	3	4	4	4	4

Luminous Intensity (cd) Distribution Data (cont.)

C / γ	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	3781	3781	3781	3781	3781	3781	3781	3781
5.0°	3778	3777	3777	3775	3771	3767	3765	3762
10.0°	3745	3746	3745	3743	3737	3730	3723	3718
15.0°	3689	3690	3688	3684	3674	3665	3654	3645
20.0°	3601	3603	3601	3594	3581	3567	3553	3541
25.0°	3480	3483	3480	3473	3457	3439	3422	3408
30.0°	3330	3332	3327	3321	3304	3280	3259	3245
35.0°	3146	3147	3142	3120	3062	3082	3063	3052
40.0°	2931	2926	2924	2798	2733	2765	2838	2784
45.0°	2682	2663	2614	2503	2480	2456	2535	2327
50.0°	2296	2358	2247	2244	2214	2194	2076	2001
55.0°	1845	1823	1944	1954	1920	1903	1655	1702
60.0°	1527	1466	1588	1631	1604	1583	1366	1383
65.0°	1200	1099	1150	1276	1241	1197	1074	1049
70.0°	853	771	823	866	841	743	768	700
75.0°	453	424	478	507	499	441	423	367
80.0°	194	192	198	209	209	182	173	151
85.0°	66	68	65	63	57	51	45	42
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	1	1	1	1
110.0°	1	1	1	1	1	1	1	1
115.0°	1	1	1	1	1	1	1	1
120.0°	1	1	1	1	1	1	1	1
125.0°	1	1	1	1	1	1	1	1
130.0°	1	1	1	1	1	1	1	1
135.0°	2	2	2	2	2	2	2	2
140.0°	2	2	2	2	2	2	2	2
145.0°	2	2	2	2	2	2	2	2
150.0°	2	2	2	2	2	2	2	2
155.0°	2	2	3	3	3	3	3	3
160.0°	3	3	3	3	3	3	3	3
165.0°	3	3	3	3	3	3	3	3
170.0°	3	3	3	3	3	3	3	3
175.0°	3	3	3	3	3	3	3	3
180.0°	4	4	4	4	4	4	4	4

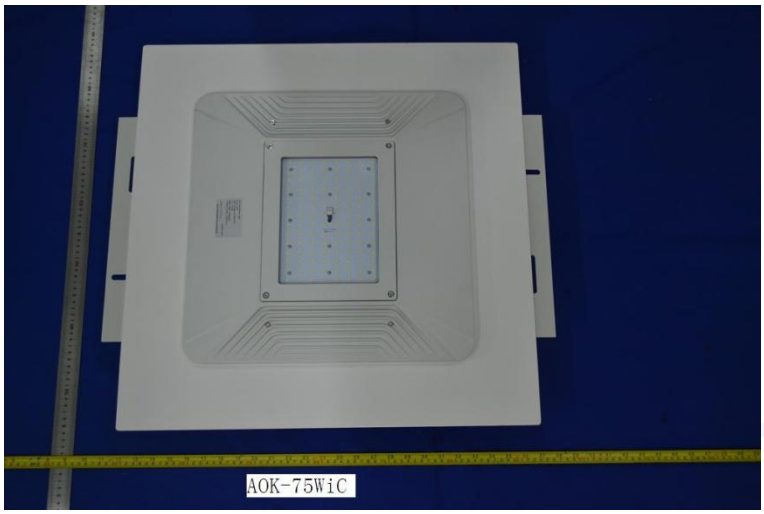
Zonal Lumen Density Measurement

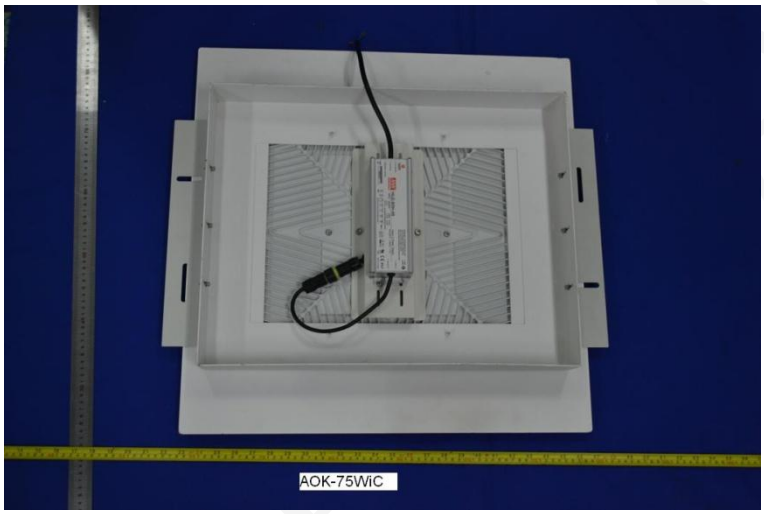
Deg	Flux (lm)	%
0-5	90.2	0.90
5-10	268.2	2.67
10-15	438.5	4.36
15-20	595.8	5.92
20-25	734.4	7.31
25-30	849.7	8.45
30-35	936.0	9.31
35-40	979.9	9.75
40-45	976.7	9.71
45-50	938.6	9.34
50-55	860.1	8.55
55-60	758.3	7.55
60-65	630.0	6.26
65-70	471.4	4.69
70-75	301.2	3.00
75-80	149.5	1.48
80-85	53.4	0.53
85-90	12.4	0.13
90-95	0.2	0.00
95-100	0.3	0.00
100-105	0.4	0.01
105-110	0.4	0.00
110-115	0.4	0.01
115-120	0.5	0.00
120-125	0.5	0.01
125-130	0.6	0.00
130-135	0.7	0.01
135-140	0.7	0.00
140-145	0.8	0.01
145-150	0.8	0.01
150-155	0.8	0.01
155-160	0.7	0.01
160-165	0.6	0.00
165-170	0.4	0.01
170-175	0.3	0.00
175-180	0.1	0.00

Deg	Flux (lm)	%
0-5	90.2	0.90
0-10	358.5	3.57
0-15	797.0	7.93
0-20	1392.7	13.85
0-25	2127.1	21.16
0-30	2976.8	29.61
0-35	3912.8	38.92
0-40	4892.7	48.67
0-45	5869.3	58.38
0-50	6808.0	67.72
0-55	7668.1	76.27
0-60	8426.3	83.82
0-65	9056.3	90.08
0-70	9527.7	94.77
0-75	9828.8	97.77
0-80	9978.3	99.25
0-85	10031.7	99.78
0-90	10044.1	99.91
0-95	10044.3	99.91
0-100	10044.6	99.91
0-105	10045.0	99.92
0-110	10045.4	99.92
0-115	10045.8	99.93
0-120	10046.3	99.93
0-125	10046.8	99.94
0-130	10047.4	99.94
0-135	10048.1	99.95
0-140	10048.8	99.95
0-145	10049.6	99.96
0-150	10050.4	99.97
0-155	10051.2	99.98
0-160	10052.0	99.99
0-165	10052.6	99.99
0-170	10053.0	100.00
0-175	10053.3	100.00
0-180	10053.3	100.00

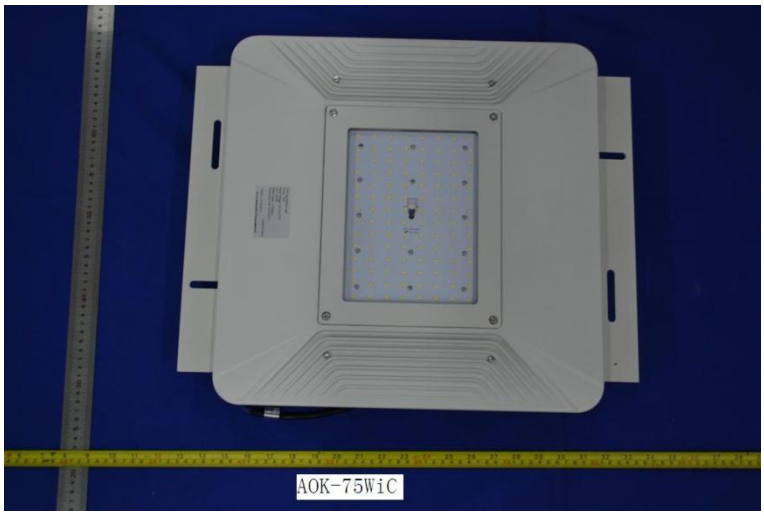
6. Product Photo

Sample No.: R2DG170601050-S01

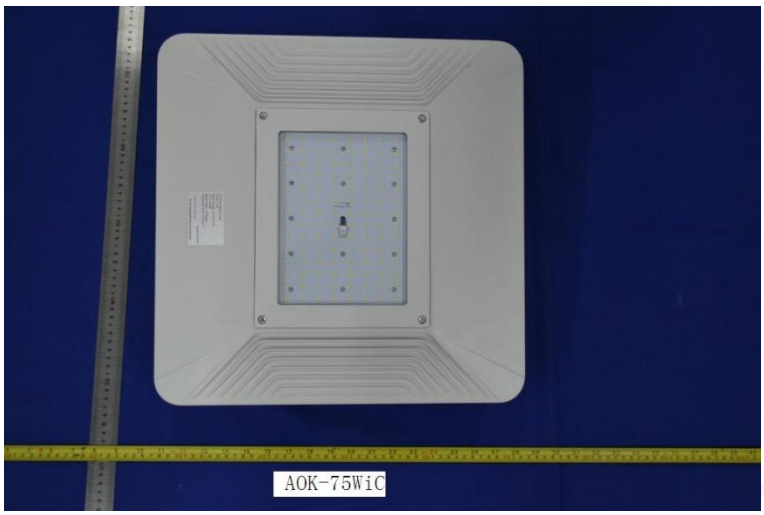


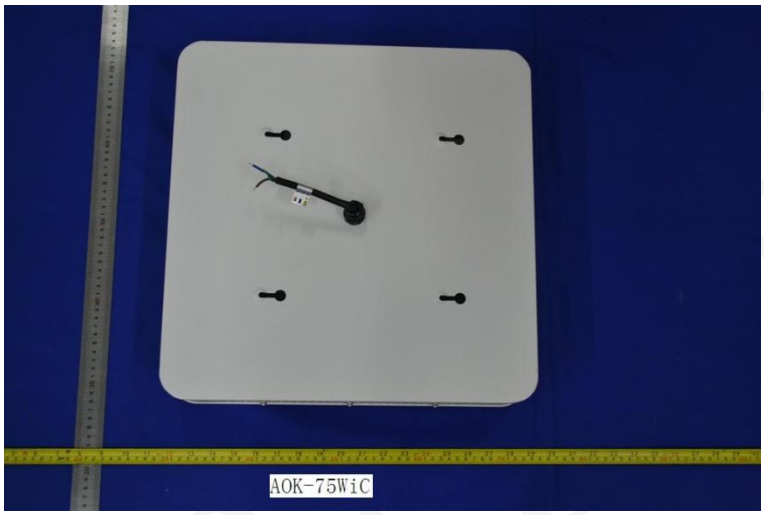


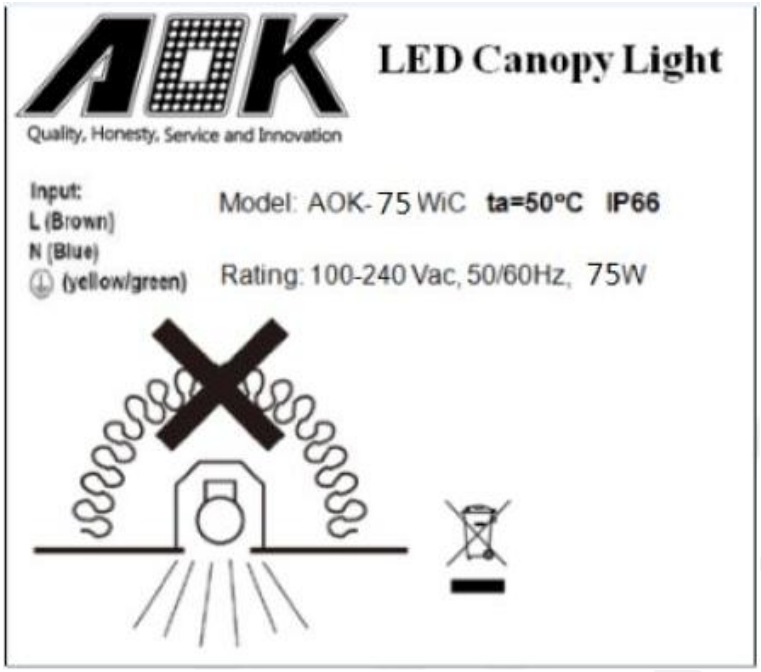
Sample No.: R2DG170601050-S02



Sample No.: R2DG170601050-S03







**********END OF REPORT**********