

Classified
Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269



Scaled data based on original data using
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-State
Lighting Products

Test Report Prepared for
Cooper Lighting Solutions
(formerly Eaton)

Brand: io LED

Report Number: P895796

Luminaire Tested: **GRZ-15L-930-10x10-X-UNV-STD-1F**

Issue Date: 11/20/2024



Test Information

Test Method: LM-79-08
Report Number: P895796
Test Lab: INNOVATION CENTER(G3)
Issue Date: 11/20/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: io LED
Catalog Number: GRZ-15L-930-10x10-X-UNV-STD-1F
Description: iO LED 90CRI 3000K GRAZER 1500 lumens per ft WITH 10 deg x 10 deg OPTIC
Light Source: 3000K CCT, 90 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

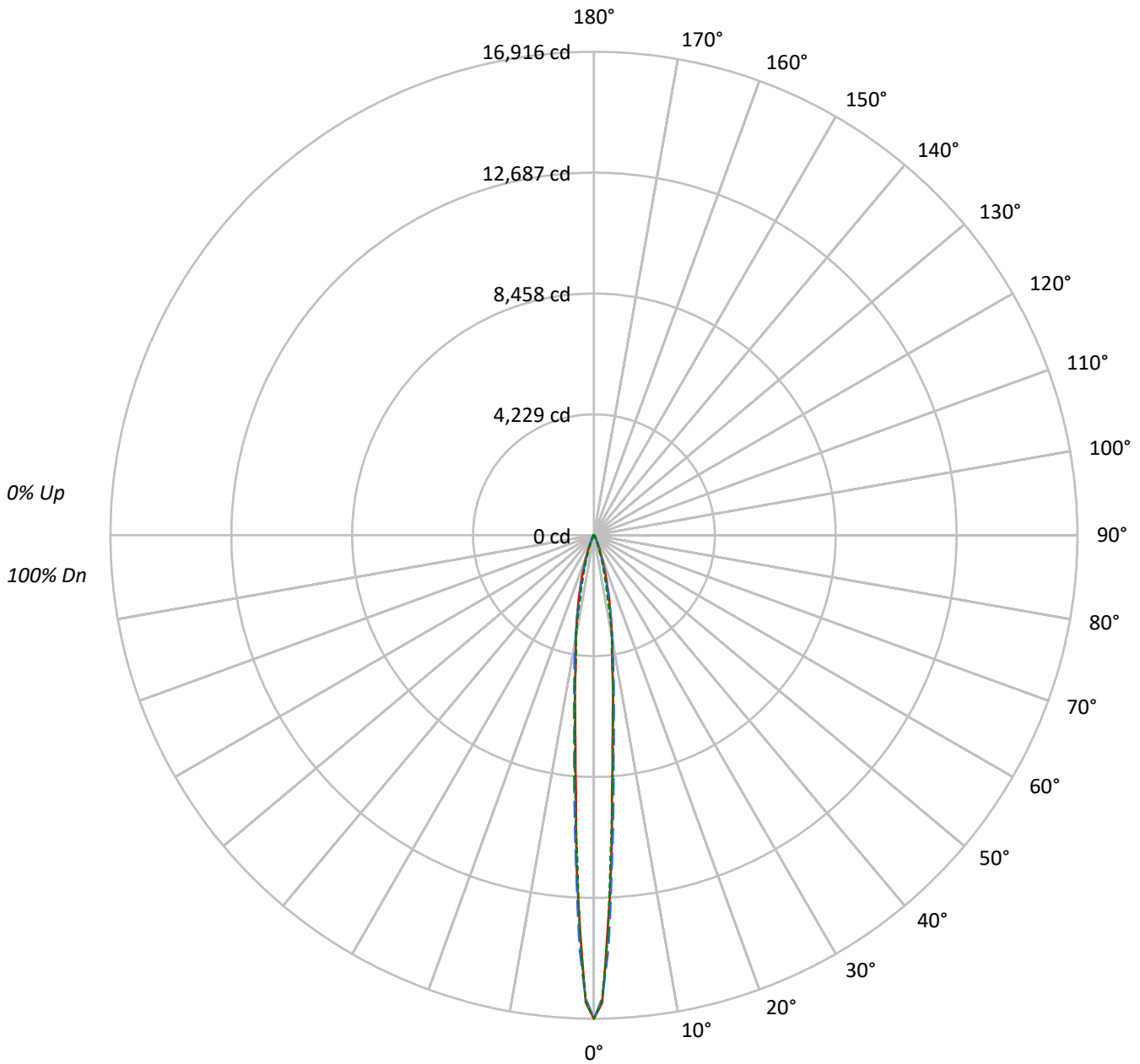
Summary

Lumens per Lamp: N/A
Luminaire Lumens: 1353.7 lumens
Efficiency: N/A
Efficacy: 90.9 lumens/watt
Spacing Criteria (0/90/45): 0.15 / 0.16 / 0.22
Luminous Opening: Rectangular (W 1' x L: 0.17' x H: 0')
CIE Type: Direct

Input Watts (W): 14.9
Input Voltage (V): 120
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT

TEST NUMBER: P895796
CATALOG NUMBER: GRZ-15L-930-10x10-X-UNV-STD-1F

Luminous Intensity Polar Plot



0% Up
100% Dn

— 0°-180° - - 45°-225° - - - 90°-270°



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COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:

RF	20				20				20				20				20	
RC	80				70				50				30				10	0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR																		
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	115	113	111	109	113	111	109	107	107	105	104	103	102	101	100	99	98	96
2	111	107	104	102	109	106	103	101	103	100	99	100	98	96	97	96	95	93
3	108	103	99	96	106	102	98	96	99	96	94	97	95	93	95	93	91	90
4	104	99	95	92	103	98	94	92	96	93	91	94	92	90	93	90	89	87
5	102	96	92	89	100	95	91	88	93	90	88	92	89	87	90	88	86	85
6	99	93	89	86	98	92	88	86	91	88	85	90	87	85	88	86	84	83
7	96	90	86	83	95	90	86	83	89	85	83	88	85	82	87	84	82	81
8	94	88	84	81	93	87	84	81	86	83	81	86	83	80	85	82	80	79
9	92	86	82	79	91	85	82	79	85	81	79	84	81	79	83	80	78	78
10	90	84	80	77	89	83	80	77	83	79	77	82	79	77	82	79	77	76

AVERAGE LUMINANCE (cd/sqm):

	0°	45°	90°
0°	1092295	1092295	1092295
5°	481009	513463	495917
10°	237050	244039	239141
15°	119585	110186	94951
20°	50175	42500	36089
25°	20341	17021	14342
30°	9708	8656	7672
35°	6117	5368	4257
40°	4366	3995	2992
45°	3927	3452	2493
50°	3717	3275	1939
55°	3332	2916	1655
60°	2673	2286	1614
65°	2582	2246	1696
70°	2662	2228	1548
75°	2395	2220	1497
80°	2231	1934	1413
85°	1630	1630	1037



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	635.7	47.0
10°-20°	470.1	34.7
20°-30°	128.3	9.5
30°-40°	45.3	3.3
40°-50°	28.6	2.1
50°-60°	21.2	1.6
60°-70°	13.9	1.0
70°-80°	8.4	0.6
80°-90°	2.2	0.2
90°-100°	0.0	0.0
100°-110°	0.0	0.0
110°-120°	0.0	0.0
120°-130°	0.0	0.0
130°-140°	0.0	0.0
140°-150°	0.0	0.0
150°-160°	0.0	0.0
160°-170°	0.0	0.0
170°-180°	0.0	0.0
0°-30°	1234.1	91.2
0°-40°	1279.4	94.5
0°-60°	1329.2	98.2
0°-90°	1353.7	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1353.7	100.0

CANDELA DISTRIBUTION:

	0°	22.5°	45°	67.5°	90°	Flux
0°	16916	16916	16916	16916	16916	
5°	7421	7749	7922	7628	7651	616
15°	1789	1766	1648	1459	1420	507
25°	286	280	239	212	201	151
35°	78	76	68	62	54	50
45°	43	41	38	32	27	33
55°	30	28	26	19	15	27
65°	17	15	15	12	11	17
75°	10	8	9	7	6	10
85°	2	1	2	1	1	3
90°	0	0	0	0	0	

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CANDELA DISTRIBUTION (FULL):

	0°	22.5°	45°	67.5°	90°
0°	16916.3	16916.3	16916.3	16916.3	16916.3
1°	16350.3	16023.4	16213.5	16206.1	16300.7
2°	13832.7	14856.6	14457.9	14414.2	13960.0
3°	11572.6	12025.5	11772.5	11921.2	11209.5
4°	9010.7	9576.0	9662.5	9468.0	9217.1
5°	7421.0	7748.7	7921.7	7628.1	7651.0
6°	6250.6	6665.5	6639.7	6647.8	6318.6
7°	5476.0	5692.0	5723.1	5535.2	5445.6
8°	4589.7	4961.8	4933.0	4791.6	4591.2
9°	4091.1	4319.6	4283.4	4031.1	3957.9
10°	3615.4	3741.1	3722.0	3444.5	3647.3
12.5°	2603.3	2615.3	2487.9	2337.0	2216.5
15°	1788.9	1765.8	1648.3	1458.9	1420.4
17.5°	1174.8	1177.7	1018.7	875.9	853.7
20°	730.2	734.6	618.5	539.3	525.2
22.5°	459.5	439.4	367.7	334.4	325.5
25°	285.5	280.3	238.9	211.6	201.3
27.5°	193.1	189.3	155.3	142.7	142.0
30°	130.2	135.4	116.1	105.7	102.9
32.5°	98.4	98.4	90.2	82.8	74.7
35°	77.6	76.2	68.1	62.1	54.0
37.5°	59.1	62.1	54.7	50.4	42.2
40°	51.8	51.8	47.4	41.4	35.5
42.5°	45.8	47.4	41.4	35.5	29.6
45°	43.0	41.4	37.8	31.8	27.3
47.5°	39.2	38.4	34.8	28.1	23.7
50°	37.0	35.5	32.6	25.1	19.3
52.5°	34.8	32.6	29.6	22.1	16.3
55°	29.6	28.1	25.9	19.3	14.7
57.5°	25.9	22.9	21.5	16.3	13.3
60°	20.7	18.5	17.7	14.7	12.5
62.5°	18.5	16.9	16.3	14.1	11.8
65°	16.9	14.7	14.7	12.5	11.1
67.5°	15.5	13.3	13.3	11.1	9.6
70°	14.1	11.8	11.8	9.6	8.2
72.5°	11.8	9.6	10.4	8.2	7.4
75°	9.6	8.2	8.9	7.4	6.0
77.5°	8.2	6.6	6.6	6.0	4.4
80°	6.0	5.2	5.2	4.4	3.8
82.5°	3.8	3.0	3.8	3.0	2.2
85°	2.2	1.4	2.2	1.4	1.4
87.5°	0.8	0.8	0.8	0.8	0.8
90°	0.0	0.0	0.0	0.0	0.0

LM-79-08: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

iO LED

Report Number: SP1-2101-124-2

Luminaire Tested: GRZ-05L-930-10X10-X-UNV-STD-2F

Test Date: 02/10/2021

Test Information

Test Method: LM-79-08
 Report Number: SP1-2101-124-2
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1
 Measurement Geometry: 4π
 Issue Date: 02/10/2021
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
 Product Line: iO LED
 Catalog Number: **GRZ-05L-930-10X10-X-UNV-STD-2F**
 Description: IO LED Wall Grazer GRZ

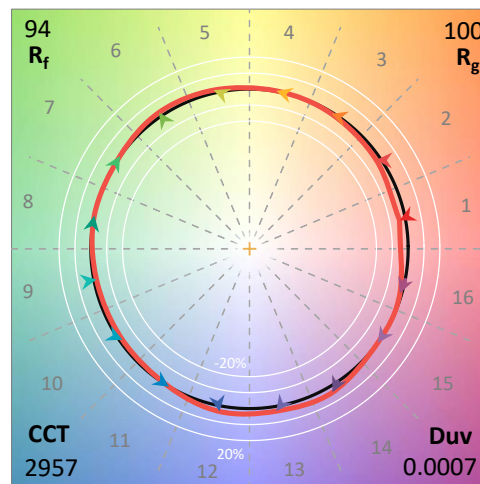
Spectral Parameters

CCT (K): 2957
 CIE u': 0.2518
 CIE v': 0.5232
 Duv: 0.0007
 CIE x: 0.4409
 CIE y: 0.4072
 CIE z: 0.1519
 Peak Wavelength (nm): 624
 Dominant Wavelength (nm): 582
 Purity: 54.9
 Rf: 93.7
 Rg: 100.3

CRI (Ra):	94.1		
R1:	94.6	R9:	66.4
R2:	96.3	R10:	90.2
R3:	96.6	R11:	96.1
R4:	95.3	R12:	86.8
R5:	94.2	R13:	95.0
R6:	95.7	R14:	97.3
R7:	94.2		
R8:	85.7		

Test Conditions

Stabilization Time: 48M
 Operation Time: 12H
 Room Temperature (°C) / RH%: 25.4/38%
 Sphere Temperature (°C): 24.4

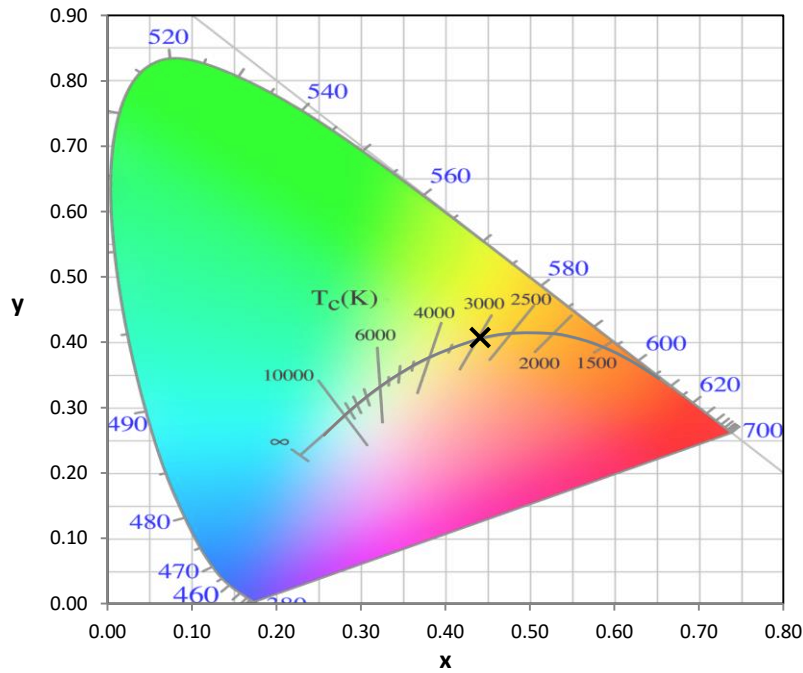


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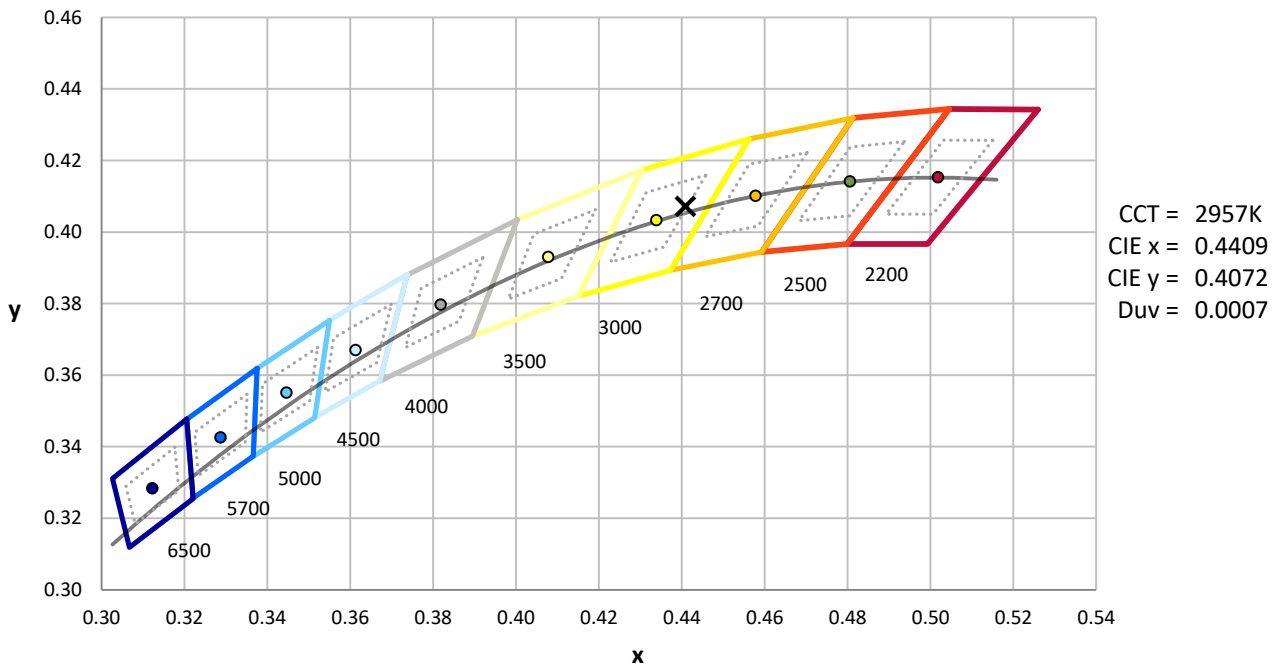
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	1/31/2021	7/31/2021
Power Meter	IN0071	12/1/2020	12/1/2021
AC Power Source	IN0063	12/1/2020	12/1/2021
DC Power Source	IN0208	12/1/2020	12/1/2021
Sphere Thermometer	IN0085	12/1/2020	12/1/2021
Room Thermometer	IN0046	12/1/2020	12/1/2021

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CIE 1931 Chromaticity Diagram



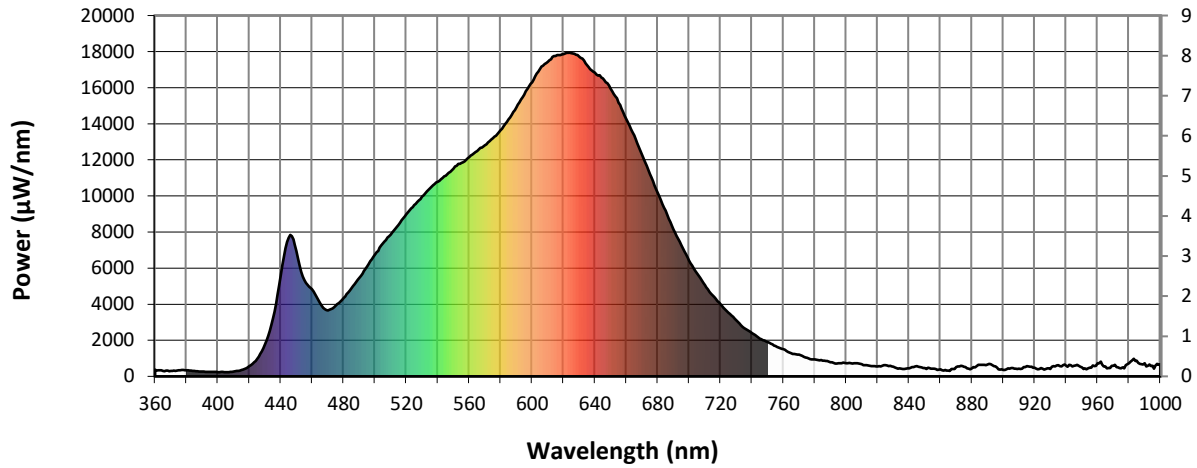
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 3000K 4-step quadrangle

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Photopic Flux vs. Wavelength

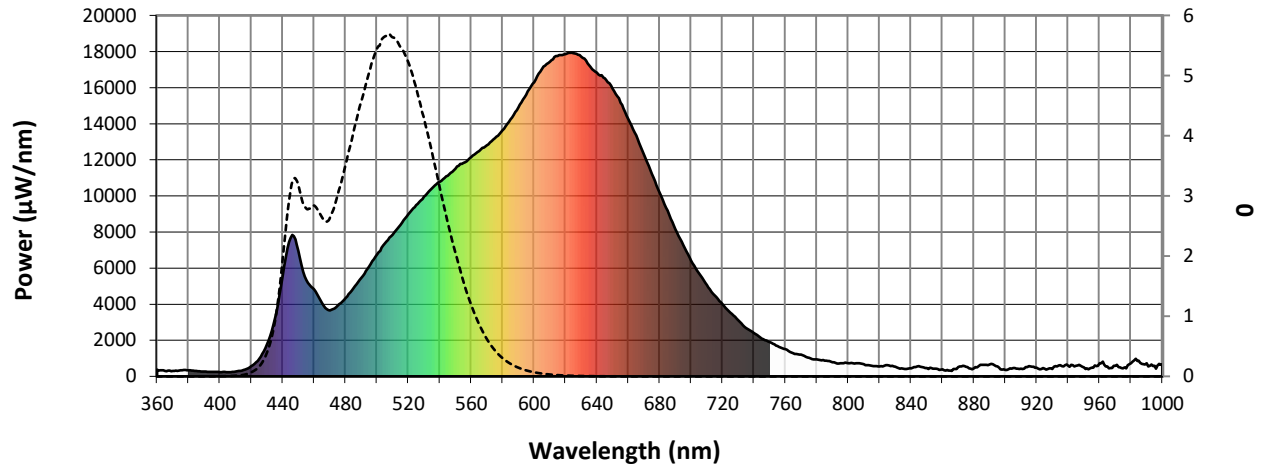


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λ (nm)	Power (µW/nm)	Lumens (Φ/nm)	λ (nm)	Power (µW/nm)	Lumens (Φ/nm)	λ (nm)	Power (µW/nm)	Lumens (Φ/nm)	λ (nm)	Power (µW/nm)	Lumens (Φ/nm)	λ (nm)	Power (µW/nm)	Lumens (Φ/nm)
360	368	0.0	490	5466	0.8	620	17862	4.6	750	1898	0.0	880	436	0.0
365	310	0.0	495	6091	1.1	625	17922	4.0	755	1681	0.0	885	632	0.0
370	293	0.0	500	6757	1.5	630	17723	3.2	760	1509	0.0	890	653	0.0
375	346	0.0	505	7358	2.1	635	17256	2.6	765	1279	0.0	895	546	0.0
380	338	0.0	510	7854	2.7	640	16836	2.0	770	1201	0.0	900	354	0.0
385	299	0.0	515	8389	3.5	645	16513	1.6	775	1028	0.0	905	454	0.0
390	270	0.0	520	8991	4.4	650	15949	1.2	780	937	0.0	910	426	0.0
395	252	0.0	525	9495	5.1	655	15172	0.9	785	877	0.0	915	565	0.0
400	234	0.0	530	9972	5.9	660	14269	0.6	790	784	0.0	920	483	0.0
405	236	0.0	535	10431	6.5	665	13357	0.4	795	723	0.0	925	418	0.0
410	267	0.0	540	10792	7.0	670	12286	0.3	800	735	0.0	930	416	0.0
415	349	0.0	545	11118	7.4	675	11211	0.2	805	729	0.0	935	626	0.0
420	560	0.0	550	11517	7.8	680	10179	0.1	810	667	0.0	940	584	0.0
425	974	0.0	555	11837	8.1	685	9184	0.1	815	584	0.0	945	579	0.0
430	1769	0.0	560	12154	8.3	690	8166	0.0	820	546	0.0	950	504	0.0
435	3208	0.0	565	12489	8.3	695	7279	0.0	825	620	0.0	955	485	0.0
440	5576	0.1	570	12803	8.3	700	6419	0.0	830	532	0.0	960	719	0.0
445	7682	0.2	575	13201	8.2	705	5709	0.0	835	420	0.0	965	552	0.0
450	6958	0.2	580	13645	8.1	710	5055	0.0	840	444	0.0	970	586	0.0
455	5347	0.2	585	14250	7.9	715	4482	0.0	845	562	0.0	975	439	0.0
460	4823	0.2	590	14919	7.7	720	3984	0.0	850	454	0.0	980	736	0.0
465	4070	0.2	595	15606	7.4	725	3526	0.0	855	433	0.0	985	863	0.0
470	3650	0.2	600	16305	7.0	730	3109	0.0	860	383	0.0	990	722	0.0
475	3914	0.3	605	17030	6.6	735	2684	0.0	865	322	0.0	995	579	0.0
480	4339	0.4	610	17428	6.0	740	2396	0.0	870	523	0.0	1000	672	0.0
485	4881	0.6	615	17762	5.4	745	2098	0.0	875	541	0.0			

REPORT NUMBER: SP1-2101-124-2

Scotopic Flux vs. Wavelength



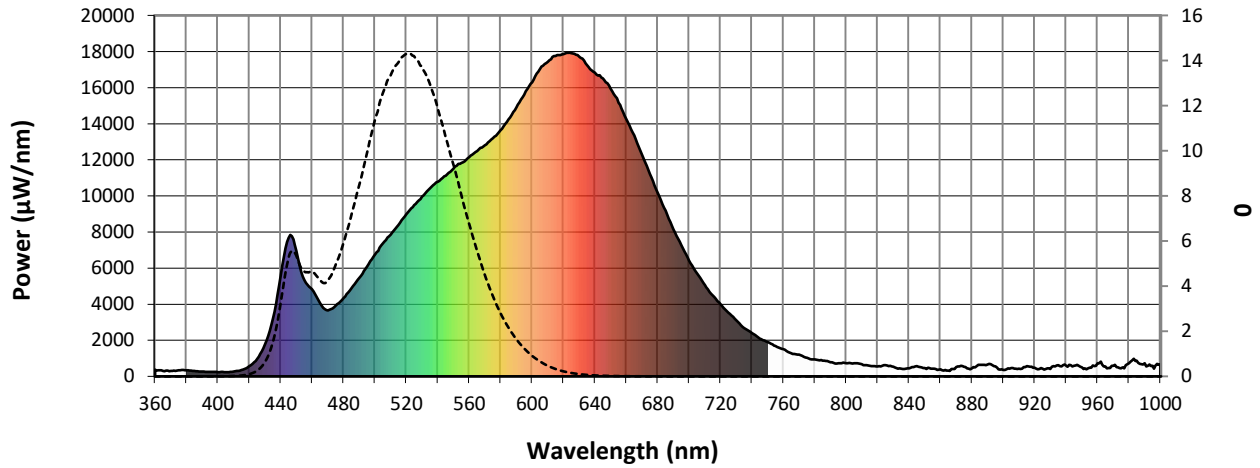
Scotopic Lumens: 1239

S/P: 1.4

λ (nm)	Power (μ W/nm)	Lumens (ϕ /nm)	λ (nm)	Power (μ W/nm)	Lumens (ϕ /nm)	λ (nm)	Power (μ W/nm)	Lumens (ϕ /nm)	λ (nm)	Power (μ W/nm)	Lumens (ϕ /nm)	λ (nm)	Power (μ W/nm)	Lumens (ϕ /nm)
360	368	0.0	490	5466	8.4	620	17862	0.2	750	1898	0.0	880	436	0.0
365	310	0.0	495	6091	9.8	625	17922	0.2	755	1681	0.0	885	632	0.0
370	293	0.0	500	6757	11.3	630	17723	0.1	760	1509	0.0	890	653	0.0
375	346	0.0	505	7358	12.5	635	17256	0.1	765	1279	0.0	895	546	0.0
380	338	0.0	510	7854	13.3	640	16836	0.0	770	1201	0.0	900	354	0.0
385	299	0.0	515	8389	13.9	645	16513	0.0	775	1028	0.0	905	454	0.0
390	270	0.0	520	8991	14.3	650	15949	0.0	780	937	0.0	910	426	0.0
395	252	0.0	525	9495	14.2	655	15172	0.0	785	877	0.0	915	565	0.0
400	234	0.0	530	9972	13.7	660	14269	0.0	790	784	0.0	920	483	0.0
405	236	0.0	535	10431	13.0	665	13357	0.0	795	723	0.0	925	418	0.0
410	267	0.0	540	10792	11.9	670	12286	0.0	800	735	0.0	930	416	0.0
415	349	0.0	545	11118	10.7	675	11211	0.0	805	729	0.0	935	626	0.0
420	560	0.1	550	11517	9.4	680	10179	0.0	810	667	0.0	940	584	0.0
425	974	0.2	555	11837	8.1	685	9184	0.0	815	584	0.0	945	579	0.0
430	1769	0.6	560	12154	6.8	690	8166	0.0	820	546	0.0	950	504	0.0
435	3208	1.4	565	12489	5.6	695	7279	0.0	825	620	0.0	955	485	0.0
440	5576	3.1	570	12803	4.5	700	6419	0.0	830	532	0.0	960	719	0.0
445	7682	5.1	575	13201	3.6	705	5709	0.0	835	420	0.0	965	552	0.0
450	6958	5.4	580	13645	2.8	710	5055	0.0	840	444	0.0	970	586	0.0
455	5347	4.7	585	14250	2.2	715	4482	0.0	845	562	0.0	975	439	0.0
460	4823	4.7	590	14919	1.7	720	3984	0.0	850	454	0.0	980	736	0.0
465	4070	4.3	595	15606	1.2	725	3526	0.0	855	433	0.0	985	863	0.0
470	3650	4.2	600	16305	0.9	730	3109	0.0	860	383	0.0	990	722	0.0
475	3914	4.9	605	17030	0.7	735	2684	0.0	865	322	0.0	995	579	0.0
480	4339	5.9	610	17428	0.5	740	2396	0.0	870	523	0.0	1000	672	0.0
485	4881	7.1	615	17762	0.3	745	2098	0.0	875	541	0.0			

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Melanopic Flux vs. Wavelength



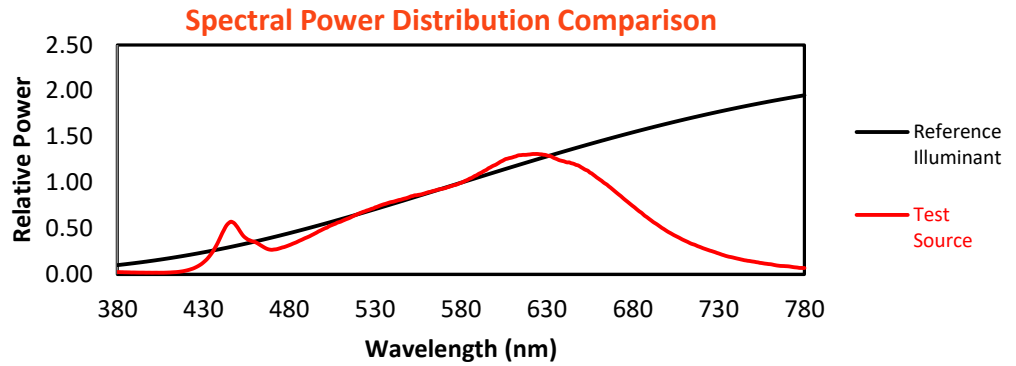
Melanopic Lumens: 471.9

M/P: 0.53

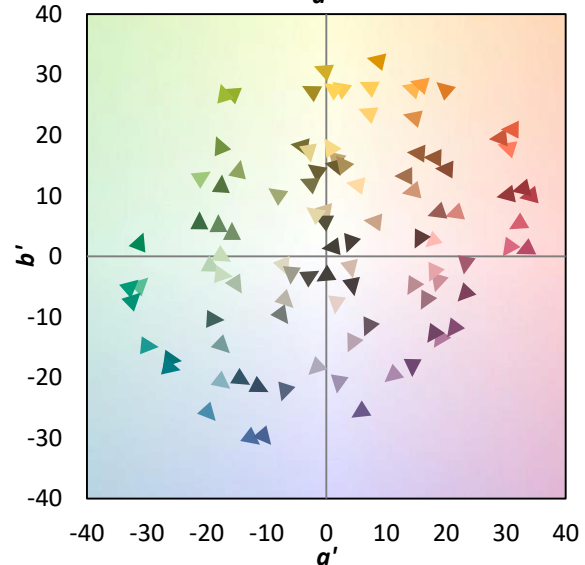
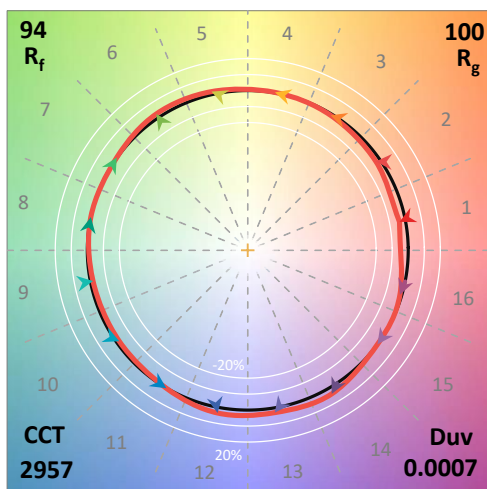
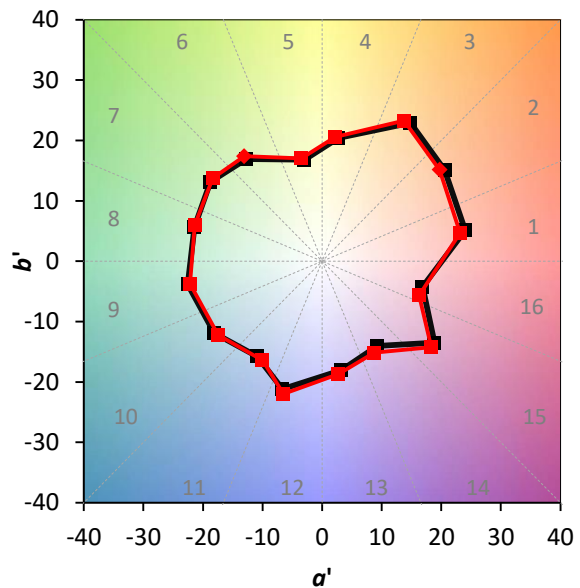
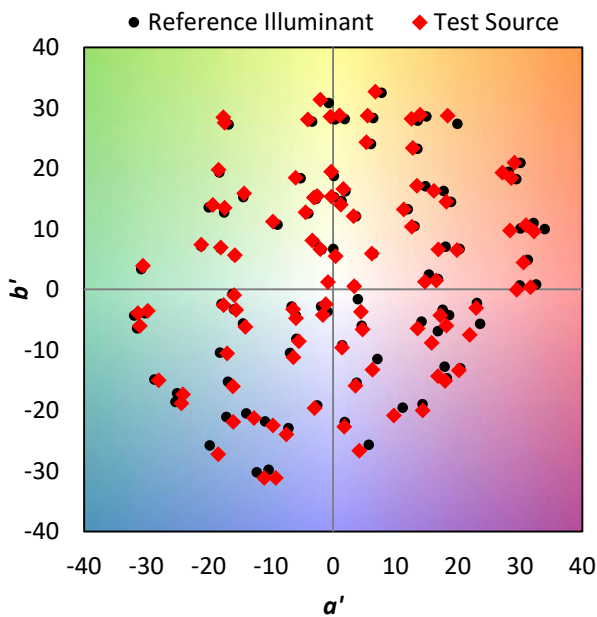
λ (nm)	Power (µW/nm)	Lumens (Φ/nm)	λ (nm)	Power (µW/nm)	Lumens (Φ/nm)	λ (nm)	Power (µW/nm)	Lumens (Φ/nm)	λ (nm)	Power (µW/nm)	Lumens (Φ/nm)	λ (nm)	Power (µW/nm)	Lumens (Φ/nm)
360	368	0.0	490	5466	4.5	620	17862	0.0	750	1898	0.0	880	436	0.0
365	310	0.0	495	6091	5.0	625	17922	0.0	755	1681	0.0	885	632	0.0
370	293	0.0	500	6757	5.4	630	17723	0.0	760	1509	0.0	890	653	0.0
375	346	0.0	505	7358	5.6	635	17256	0.0	765	1279	0.0	895	546	0.0
380	338	0.0	510	7854	5.6	640	16836	0.0	770	1201	0.0	900	354	0.0
385	299	0.0	515	8389	5.5	645	16513	0.0	775	1028	0.0	905	454	0.0
390	270	0.0	520	8991	5.2	650	15949	0.0	780	937	0.0	910	426	0.0
395	252	0.0	525	9495	4.8	655	15172	0.0	785	877	0.0	915	565	0.0
400	234	0.0	530	9972	4.3	660	14269	0.0	790	784	0.0	920	483	0.0
405	236	0.0	535	10431	3.8	665	13357	0.0	795	723	0.0	925	418	0.0
410	267	0.0	540	10792	3.2	670	12286	0.0	800	735	0.0	930	416	0.0
415	349	0.0	545	11118	2.6	675	11211	0.0	805	729	0.0	935	626	0.0
420	560	0.1	550	11517	2.1	680	10179	0.0	810	667	0.0	940	584	0.0
425	974	0.2	555	11837	1.6	685	9184	0.0	815	584	0.0	945	579	0.0
430	1769	0.4	560	12154	1.2	690	8166	0.0	820	546	0.0	950	504	0.0
435	3208	0.9	565	12489	0.9	695	7279	0.0	825	620	0.0	955	485	0.0
440	5576	1.9	570	12803	0.6	700	6419	0.0	830	532	0.0	960	719	0.0
445	7682	3.0	575	13201	0.4	705	5709	0.0	835	420	0.0	965	552	0.0
450	6958	3.2	580	13645	0.3	710	5055	0.0	840	444	0.0	970	586	0.0
455	5347	2.8	585	14250	0.2	715	4482	0.0	845	562	0.0	975	439	0.0
460	4823	2.8	590	14919	0.1	720	3984	0.0	850	454	0.0	980	736	0.0
465	4070	2.7	595	15606	0.1	725	3526	0.0	855	433	0.0	985	863	0.0
470	3650	2.6	600	16305	0.1	730	3109	0.0	860	383	0.0	990	722	0.0
475	3914	3.0	605	17030	0.0	735	2684	0.0	865	322	0.0	995	579	0.0
480	4339	3.5	610	17428	0.0	740	2396	0.0	870	523	0.0	1000	672	0.0
485	4881	4.0	615	17762	0.0	745	2098	0.0	875	541	0.0			

Summary

$R_f = 93.7$
 $R_g = 100.3$
 CIE $R_a = 94.1$
 $R_9 = 66.4$

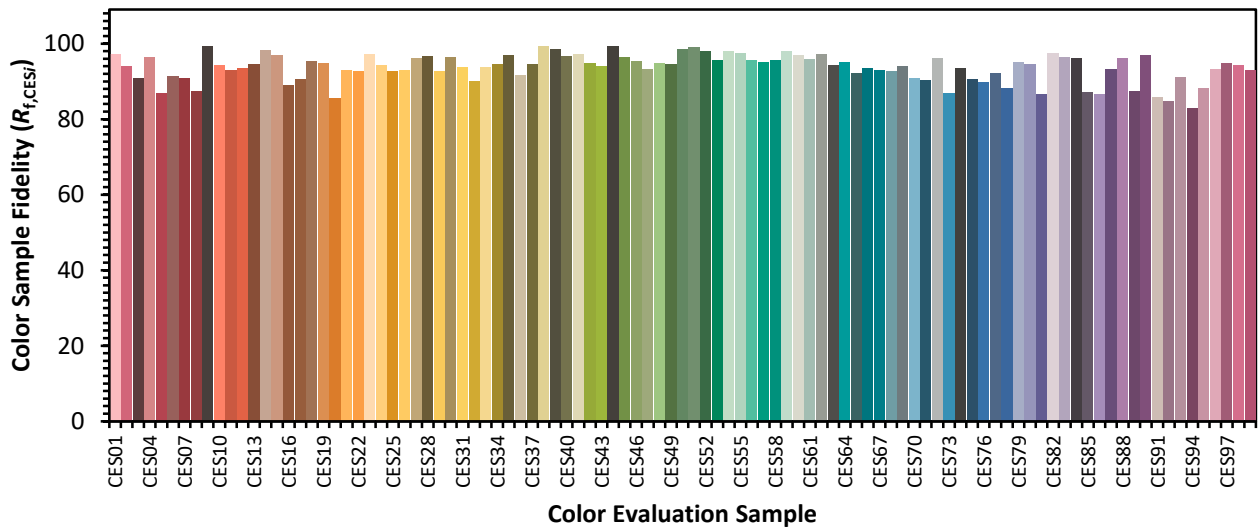


Color Vector Graphics

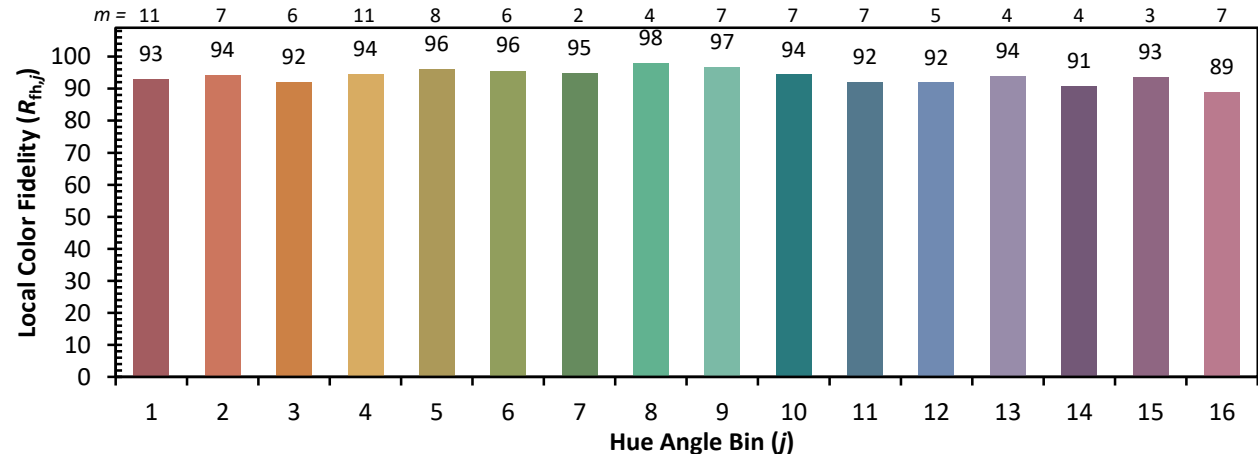
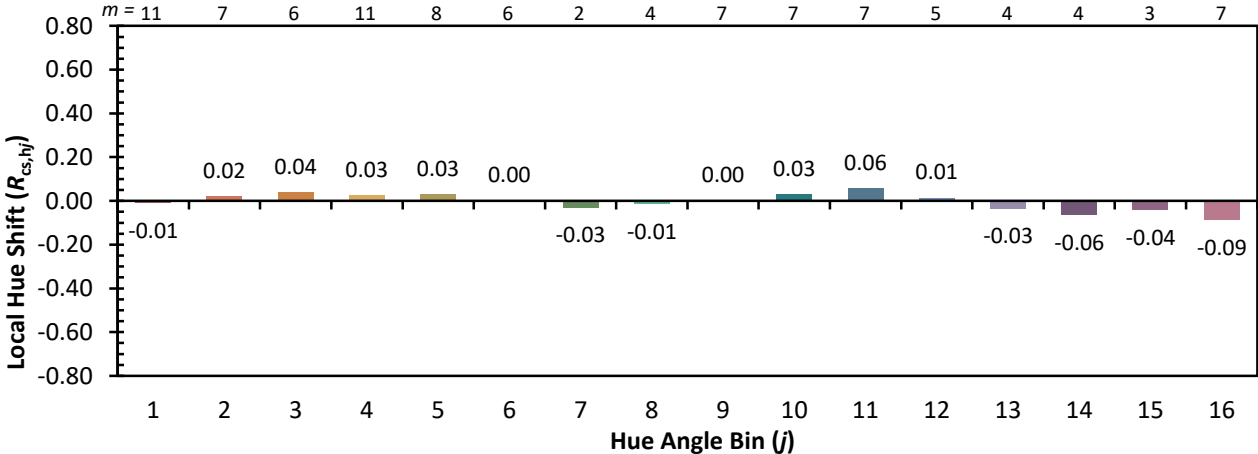
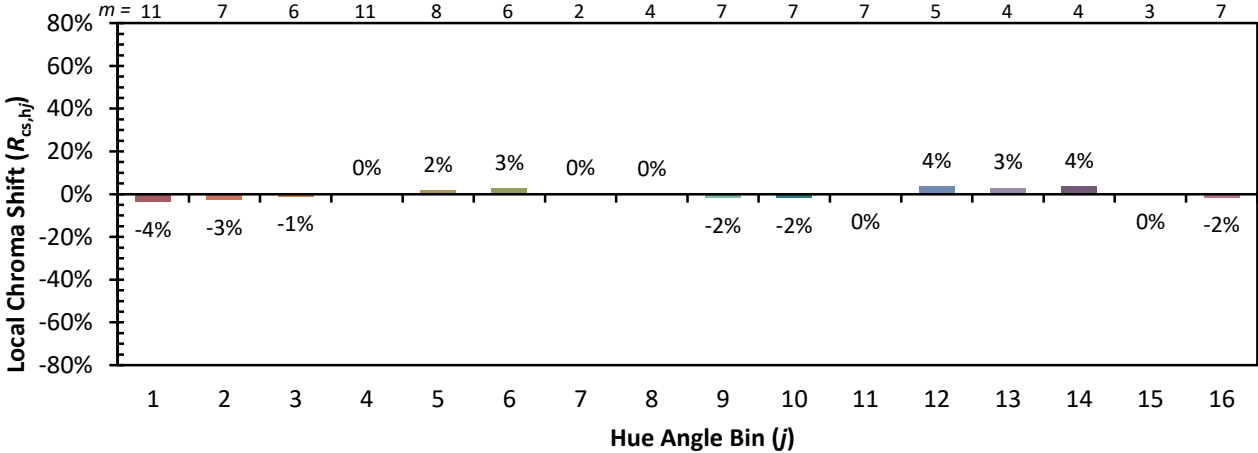


Individual Sample Fidelity Index ($R_{f,i}$)

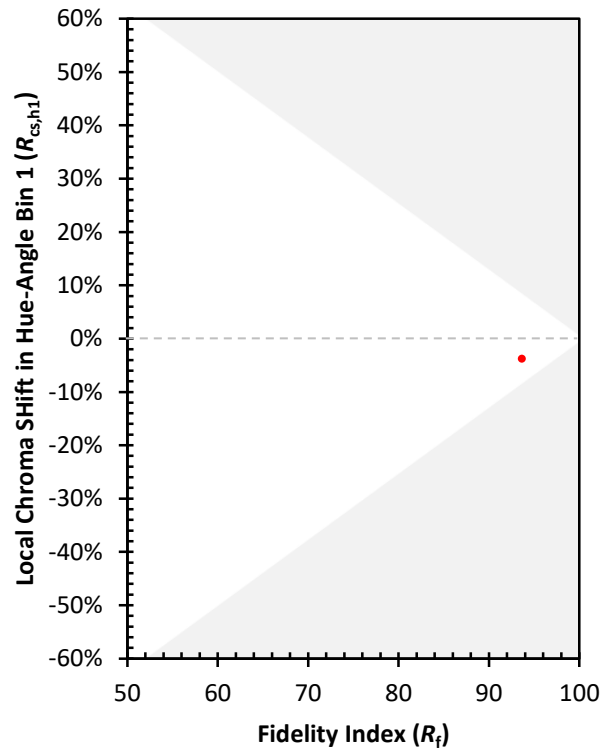
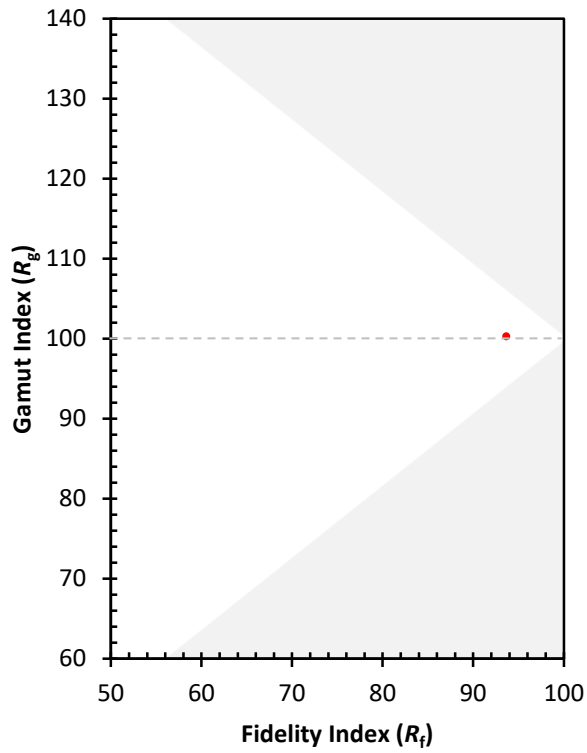
CES01 = 86	CES26 = 93	CES51 = 99	CES76 = 90
CES02 = 63	CES27 = 96	CES52 = 98	CES77 = 92
CES03 = 32	CES28 = 97	CES53 = 96	CES78 = 88
CES04 = 70	CES29 = 93	CES54 = 98	CES79 = 95
CES05 = 51	CES30 = 96	CES55 = 98	CES80 = 95
CES06 = 51	CES31 = 94	CES56 = 96	CES81 = 87
CES07 = 44	CES32 = 90	CES57 = 95	CES82 = 97
CES08 = 42	CES33 = 94	CES58 = 96	CES83 = 96
CES09 = 29	CES34 = 94	CES59 = 98	CES84 = 96
CES10 = 76	CES35 = 97	CES60 = 97	CES85 = 87
CES11 = 59	CES36 = 92	CES61 = 96	CES86 = 87
CES12 = 65	CES37 = 95	CES62 = 97	CES87 = 93
CES13 = 44	CES38 = 99	CES63 = 94	CES88 = 96
CES14 = 74	CES39 = 99	CES64 = 95	CES89 = 87
CES15 = 72	CES40 = 97	CES65 = 92	CES90 = 97
CES16 = 48	CES41 = 97	CES66 = 94	CES91 = 86
CES17 = 50	CES42 = 95	CES67 = 93	CES92 = 85
CES18 = 57	CES43 = 94	CES68 = 93	CES93 = 91
CES19 = 72	CES44 = 99	CES69 = 94	CES94 = 83
CES20 = 67	CES45 = 96	CES70 = 91	CES95 = 88
CES21 = 86	CES46 = 95	CES71 = 90	CES96 = 93
CES22 = 79	CES47 = 93	CES72 = 96	CES97 = 95
CES23 = 92	CES48 = 95	CES73 = 87	CES98 = 94
CES24 = 91	CES49 = 95	CES74 = 94	CES99 = 93
CES25 = 72	CES50 = 99	CES75 = 90	



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)