

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: P895799

Luminaire Tested: **GRZ-15L-935-10x10-X-UNV-STD-1F**

Issue Date: 11/20/2024

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

**Test Information**

Test Method: LM-79-08
Report Number: P895799
Test Lab: INNOVATION CENTER(G3)
Issue Date: 11/20/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: io LED
Catalog Number: GRZ-15L-935-10x10-X-UNV-STD-1F
Description: iO LED 90CRI 3500K GRAZER 1500 lumens per ft WITH 10 deg x 10 deg OPTIC
Light Source: 3500K CCT, 90 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

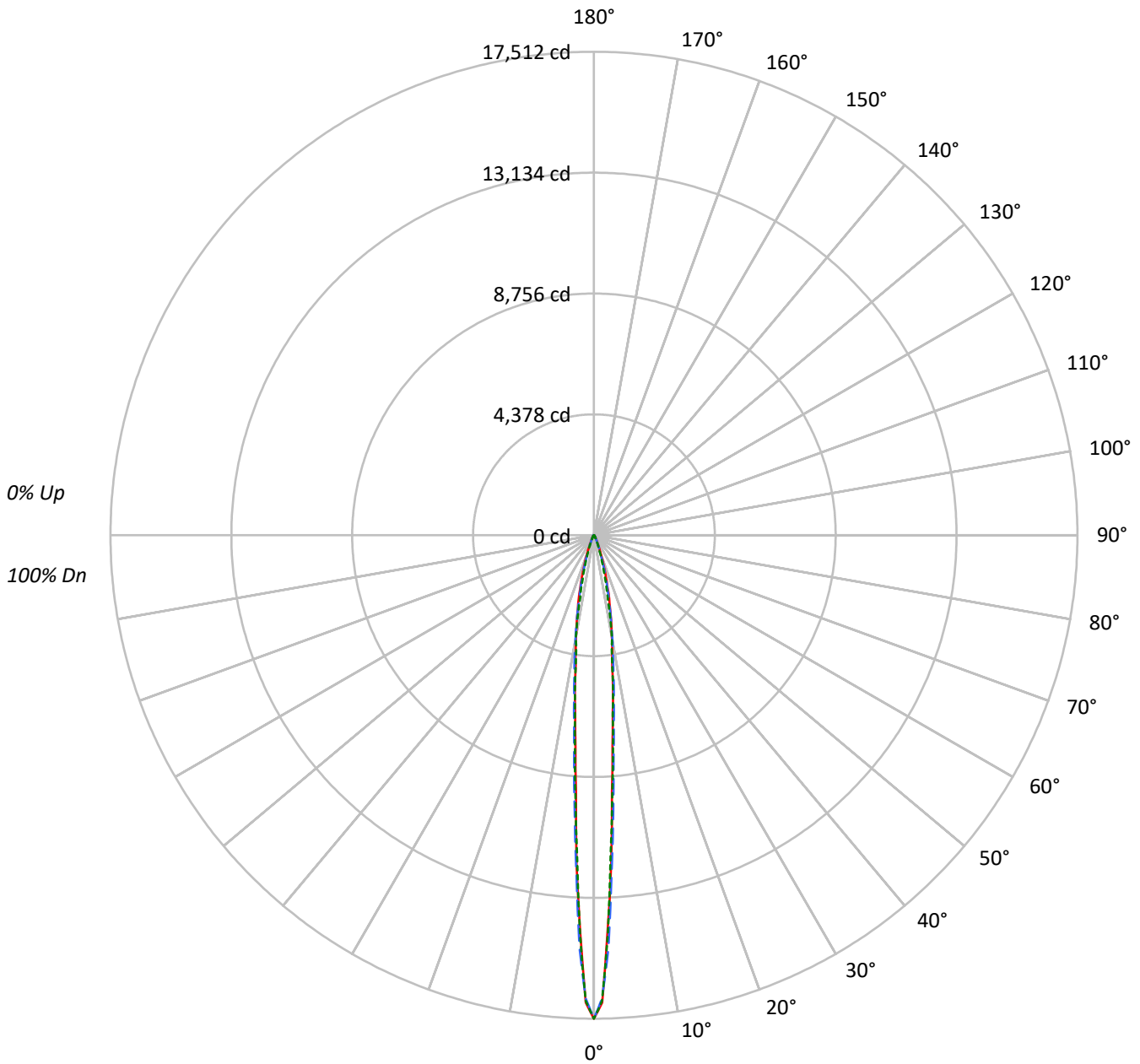
Summary

Lumens per Lamp: N/A
Luminaire Lumens: 1401.4 lumens
Efficiency: N/A
Efficacy: 94.1 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: P895799
CATALOG NUMBER: GRZ-15L-935-10x10-X-UNV-STD-1F

Luminous Intensity Polar Plot



— 0°-180° - - 45°-225° - · - · 90°-270°

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



TEST NUMBER: P895799

CATALOG NUMBER: GRZ-15L-935-10x10-X-UNV-STD-1F

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

AVERAGE LUMINANCE (cd/sqm):

	0°	45°	90°
0°	1130741	1130741	1130741
5°	497939	531534	513372
10°	245396	252628	247560
15°	123797	114070	98294
20°	51941	43998	37360
25°	21053	17619	14840
30°	10051	8962	7941
35°	6338	5557	4406
40°	4518	4130	3093
45°	4064	3570	2584
50°	3847	3395	2009
55°	3456	3017	1722
60°	2764	2363	1679
65°	2674	2338	1757
70°	2756	2303	1586
75°	2470	2320	1547
80°	2305	2008	1450
85°	1704	1704	1111



TEST NUMBER: P895799
 CATALOG NUMBER: GRZ-15L-935-10x10-X-UNV-STD-1F

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	658.1	47.0
10°-20°	486.6	34.7
20°-30°	132.8	9.5
30°-40°	46.9	3.3
40°-50°	29.6	2.1
50°-60°	22.0	1.6
60°-70°	14.4	1.0
70°-80°	8.7	0.6
80°-90°	2.3	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°	1277.5	91.2
0°-40°	1324.5	94.5
0°-60°	1376.0	98.2
0°-90°	1401.4	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1401.4	100.0

CANDELA DISTRIBUTION:

	0°	22.5°	45°	67.5°	90°	Flux
0°	17512	17512	17512	17512	17512	
5°	7682	8021	8200	7897	7920	638
15°	1852	1828	1706	1510	1470	525
25°	296	290	247	219	208	156
35°	80	79	70	64	56	52
45°	44	43	39	33	28	34
55°	31	29	27	20	15	28
65°	18	15	15	13	12	18
75°	10	8	9	8	6	11
85°	2	2	2	2	2	3
90°	0	0	0	0	0	



TEST NUMBER: P895799

CATALOG NUMBER: GRZ-15L-935-10x10-X-UNV-STD-1F

CANDELA DISTRIBUTION (FULL):

	0°	22.5°	45°	67.5°	90°
0°	17511.7	17511.7	17511.7	17511.7	17511.7
1°	16925.8	16587.3	16784.2	16776.5	16874.4
2°	14319.6	15379.5	14966.7	14921.6	14451.3
3°	11979.9	12448.8	12186.8	12340.8	11604.0
4°	9327.8	9913.1	10002.6	9801.2	9541.5
5°	7682.2	8021.4	8200.5	7896.6	7920.3
6°	6470.6	6900.1	6873.4	6881.8	6540.9
7°	5668.8	5892.4	5924.5	5730.0	5637.3
8°	4751.3	5136.5	5106.6	4960.3	4752.7
9°	4235.1	4471.7	4434.1	4173.0	4097.2
10°	3742.7	3872.8	3853.0	3565.7	3775.7
12.5°	2695.0	2707.3	2575.5	2419.2	2294.5
15°	1851.9	1828.0	1706.4	1510.2	1470.4
17.5°	1216.1	1219.2	1054.5	906.8	883.7
20°	755.9	760.5	640.3	558.3	543.7
22.5°	475.6	454.8	380.6	346.2	337.0
25°	295.5	290.2	247.3	219.1	208.3
27.5°	199.9	196.0	160.8	147.8	147.0
30°	134.8	140.1	120.2	109.4	106.5
32.5°	101.8	101.8	93.4	85.7	77.3
35°	80.4	78.9	70.5	64.3	55.9
37.5°	61.2	64.3	56.7	52.1	43.7
40°	53.6	53.6	49.0	42.9	36.7
42.5°	47.4	49.0	42.9	36.7	30.7
45°	44.5	42.9	39.1	33.0	28.3
47.5°	40.6	39.8	36.0	29.1	24.5
50°	38.3	36.7	33.8	26.0	20.0
52.5°	36.0	33.8	30.7	22.9	16.9
55°	30.7	29.1	26.8	20.0	15.3
57.5°	26.8	23.7	22.2	16.9	13.8
60°	21.4	19.2	18.3	15.3	13.0
62.5°	19.2	17.5	16.9	14.6	12.2
65°	17.5	15.3	15.3	13.0	11.5
67.5°	16.1	13.8	13.8	11.5	9.9
70°	14.6	12.2	12.2	9.9	8.4
72.5°	12.2	9.9	10.7	8.4	7.6
75°	9.9	8.4	9.3	7.6	6.2
77.5°	8.4	6.8	6.8	6.2	4.5
80°	6.2	5.4	5.4	4.5	3.9
82.5°	3.9	3.1	3.9	3.1	2.3
85°	2.3	1.5	2.3	1.5	1.5
87.5°	0.8	0.8	0.8	0.8	0.8
90°	0.0	0.0	0.0	0.0	0.0

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



Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

iO LED

Report Number: SP1-2101-124-3

Luminaire Tested: GRZ-05L-935-10X10-X-UNV-STD-2F

Test Date: 02/10/2021

Test Information

Test Method: LM-79-08
 Report Number: SP1-2101-124-3
 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-935-10X10-X-UNV-STD-2F**
 Description: IO LED Wall Grazer GRZ

Spectral Parameters

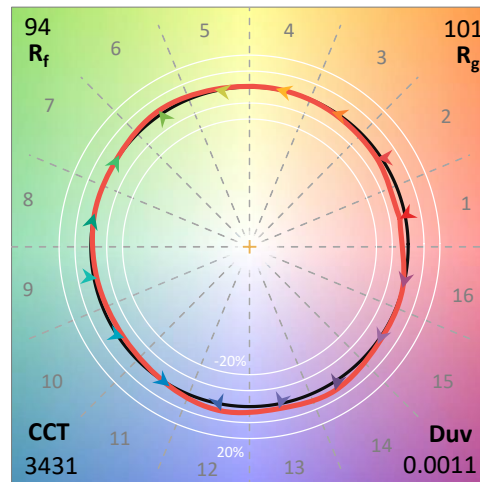
CCT (K): 3431
 CIE u': 0.2369
 CIE v': 0.5141
 Duv: 0.0011
 CIE x: 0.4104
 CIE y: 0.3958
 CIE z: 0.1938
 Peak Wavelength (nm): 624
 Dominant Wavelength (nm): 580
 Purity: 42.2

 Rf: 93.6
 Rg: 100.6

CRI (Ra):	94.0		
R1:	94.7	R9:	69.9
R2:	95.5	R10:	88.4
R3:	95.0	R11:	95.7
R4:	95.4	R12:	83.2
R5:	94.1	R13:	94.8
R6:	94.0	R14:	96.6
R7:	95.4		
R8:	88.3		

Test Conditions

Stabilization Time: 57M
 Operation Time: 12H
 Room Temperature (°C) / RH%: 25.5/38%
 Sphere Temperature (°C): 24.4

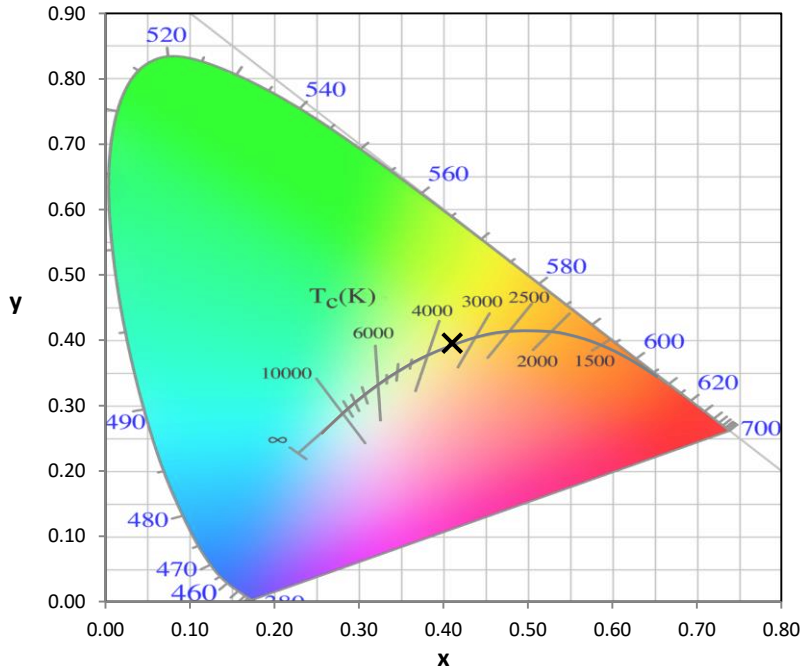


REPORT NUMBER: SP1-2101-124-3

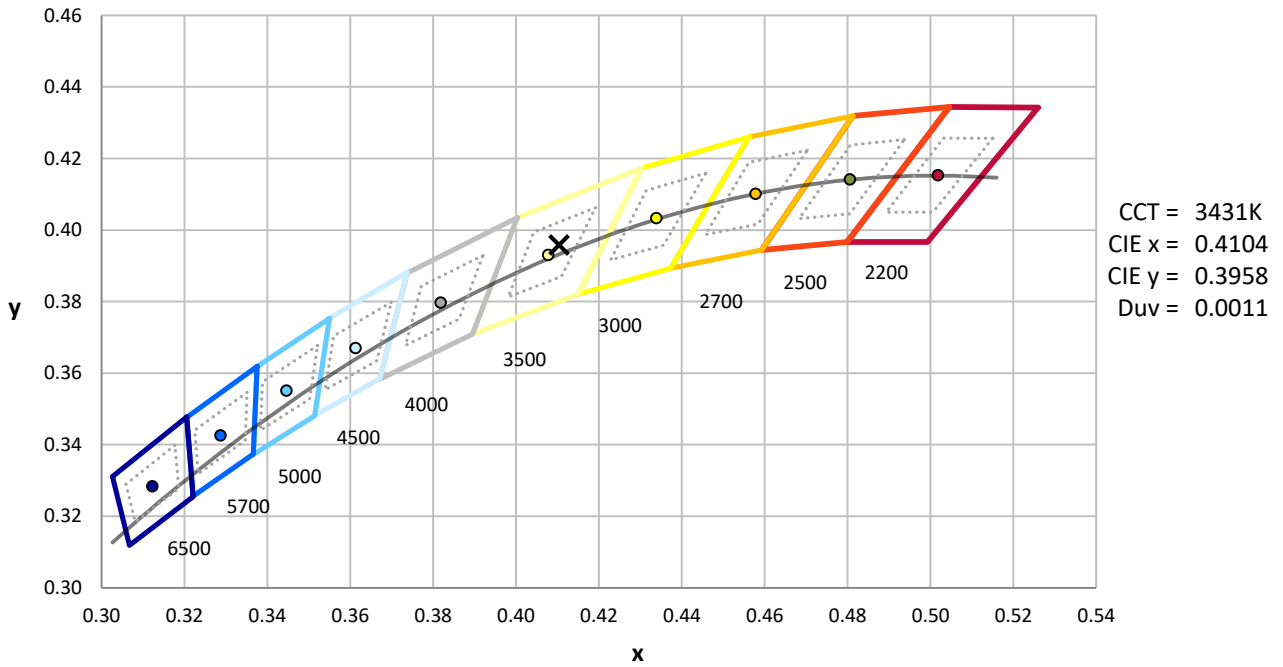
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	1/31/2021	7/31/2021
Power Meter	IN0071	12/1/2020	12/1/2021
AC Power Source	IN0063	12/1/2020	12/1/2021
DC Power Source	IN0208	12/1/2020	12/1/2021
Sphere Thermometer	IN0085	12/1/2020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

REPORT NUMBER: SP1-2101-124-3

CIE 1931 Chromaticity Diagram



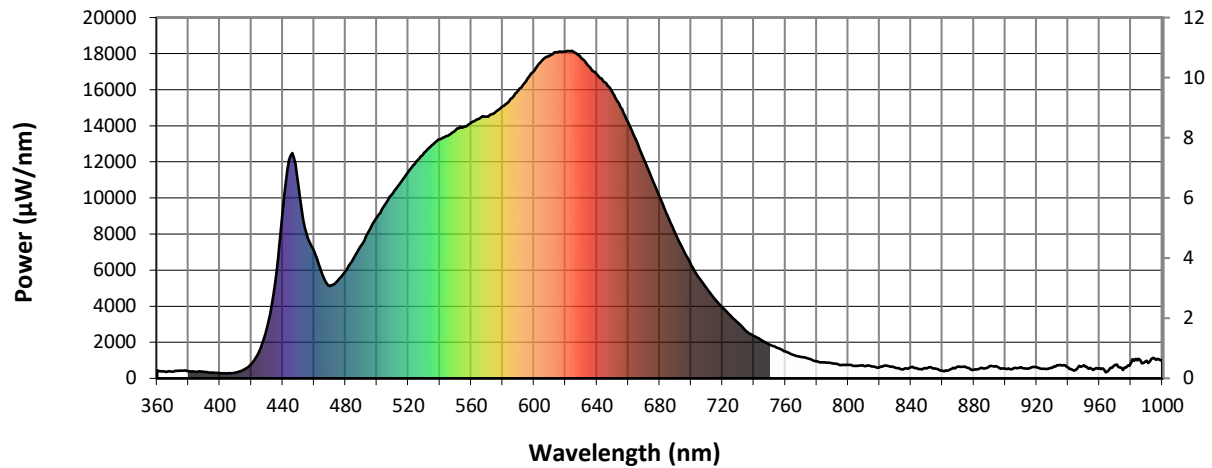
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 3500K 4-step quadrangle

REPORT NUMBER: SP1-2101-124-3

Photopic Flux vs. Wavelength

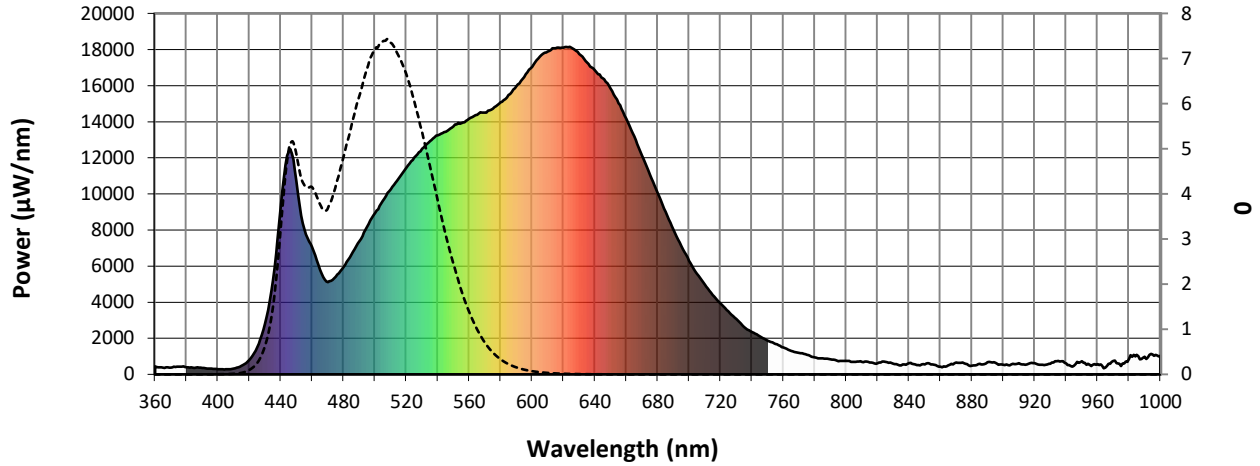


#####

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	436	0.0	490	7373	1.0	620	18112	4.7	750	1864	0.0	880	485	0.0
365	370	0.0	495	8181	1.5	625	18107	4.0	755	1693	0.0	885	593	0.0
370	381	0.0	500	8943	2.0	630	17758	3.2	760	1498	0.0	890	677	0.0
375	432	0.0	505	9613	2.7	635	17291	2.6	765	1302	0.0	895	646	0.0
380	398	0.0	510	10245	3.5	640	16854	2.0	770	1180	0.0	900	526	0.0
385	359	0.0	515	10835	4.5	645	16410	1.6	775	1079	0.0	905	557	0.0
390	355	0.0	520	11465	5.6	650	15843	1.2	780	946	0.0	910	613	0.0
395	320	0.0	525	12004	6.4	655	15029	0.9	785	883	0.0	915	556	0.0
400	290	0.0	530	12512	7.4	660	14175	0.6	790	832	0.0	920	623	0.0
405	278	0.0	535	12925	8.0	665	13195	0.4	795	731	0.0	925	528	0.0
410	327	0.0	540	13254	8.6	670	12132	0.3	800	744	0.0	930	586	0.0
415	471	0.0	545	13437	8.9	675	11067	0.2	805	688	0.0	935	744	0.0
420	803	0.0	550	13744	9.3	680	10056	0.1	810	699	0.0	940	610	0.0
425	1501	0.0	555	13925	9.5	685	9011	0.1	815	651	0.0	945	486	0.0
430	2800	0.0	560	14164	9.6	690	8032	0.0	820	620	0.0	950	719	0.0
435	5221	0.1	565	14379	9.6	695	7112	0.0	825	686	0.0	955	527	0.0
440	9255	0.1	570	14511	9.4	700	6301	0.0	830	578	0.0	960	561	0.0
445	12350	0.3	575	14729	9.2	705	5570	0.0	835	502	0.0	965	364	0.0
450	10708	0.3	580	15069	9.0	710	4970	0.0	840	624	0.0	970	739	0.0
455	8053	0.3	585	15482	8.6	715	4396	0.0	845	523	0.0	975	457	0.0
460	7058	0.3	590	15975	8.3	720	3921	0.0	850	555	0.0	980	848	0.0
465	5809	0.3	595	16476	7.8	725	3489	0.0	855	553	0.0	985	1084	0.0
470	5111	0.3	600	17051	7.3	730	3068	0.0	860	424	0.0	990	980	0.0
475	5409	0.4	605	17607	6.8	735	2631	0.0	865	489	0.0	995	1093	0.0
480	5958	0.6	610	17893	6.1	740	2336	0.0	870	652	0.0	1000	1033	0.0
485	6631	0.8	615	18072	5.5	745	2108	0.0	875	622	0.0			

REPORT NUMBER: SP1-2101-124-3

Scotopic Flux vs. Wavelength



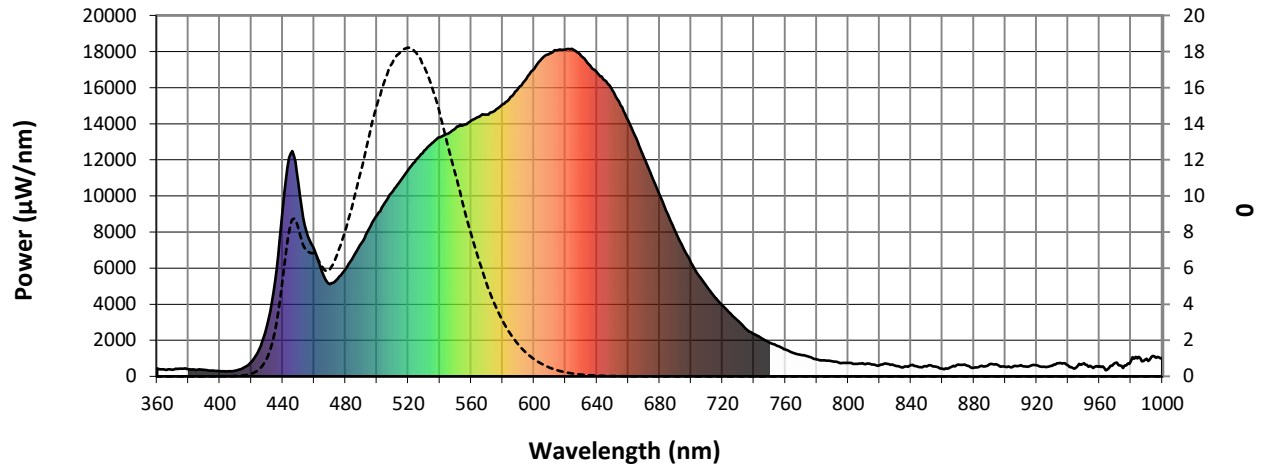
Scotopic Lumens: 1600.8

S/P: 1.59

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	436	0.0	490	7373	11.4	620	18112	0.2	750	1864	0.0	880	485	0.0
365	370	0.0	495	8181	13.2	625	18107	0.2	755	1693	0.0	885	593	0.0
370	381	0.0	500	8943	15.0	630	17758	0.1	760	1498	0.0	890	677	0.0
375	432	0.0	505	9613	16.3	635	17291	0.1	765	1302	0.0	895	646	0.0
380	398	0.0	510	10245	17.4	640	16854	0.0	770	1180	0.0	900	526	0.0
385	359	0.0	515	10835	18.0	645	16410	0.0	775	1079	0.0	905	557	0.0
390	355	0.0	520	11465	18.2	650	15843	0.0	780	946	0.0	910	613	0.0
395	320	0.0	525	12004	18.0	655	15029	0.0	785	883	0.0	915	556	0.0
400	290	0.0	530	12512	17.3	660	14175	0.0	790	832	0.0	920	623	0.0
405	278	0.0	535	12925	16.1	665	13195	0.0	795	731	0.0	925	528	0.0
410	327	0.0	540	13254	14.6	670	12132	0.0	800	744	0.0	930	586	0.0
415	471	0.0	545	13437	12.9	675	11067	0.0	805	688	0.0	935	744	0.0
420	803	0.1	550	13744	11.2	680	10056	0.0	810	699	0.0	940	610	0.0
425	1501	0.4	555	13925	9.5	685	9011	0.0	815	651	0.0	945	486	0.0
430	2800	1.0	560	14164	7.9	690	8032	0.0	820	620	0.0	950	719	0.0
435	5221	2.3	565	14379	6.5	695	7112	0.0	825	686	0.0	955	527	0.0
440	9255	5.2	570	14511	5.1	700	6301	0.0	830	578	0.0	960	561	0.0
445	12350	8.3	575	14729	4.0	705	5570	0.0	835	502	0.0	965	364	0.0
450	10708	8.3	580	15069	3.1	710	4970	0.0	840	624	0.0	970	739	0.0
455	8053	7.0	585	15482	2.4	715	4396	0.0	845	523	0.0	975	457	0.0
460	7058	6.8	590	15975	1.8	720	3921	0.0	850	555	0.0	980	848	0.0
465	5809	6.1	595	16476	1.3	725	3489	0.0	855	553	0.0	985	1084	0.0
470	5111	5.9	600	17051	1.0	730	3068	0.0	860	424	0.0	990	980	0.0
475	5409	6.8	605	17607	0.7	735	2631	0.0	865	489	0.0	995	1093	0.0
480	5958	8.0	610	17893	0.5	740	2336	0.0	870	652	0.0	1000	1033	0.0
485	6631	9.6	615	18072	0.3	745	2108	0.0	875	622	0.0			

REPORT NUMBER: SP1-2101-124-3

Melanopic Flux vs. Wavelength



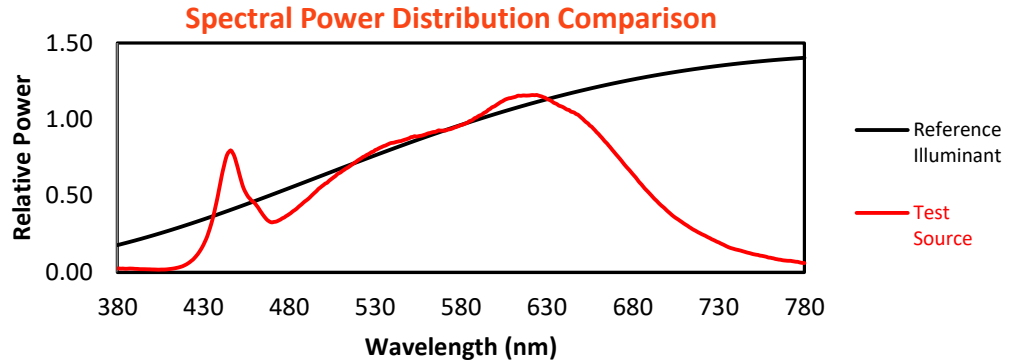
Melanopic Lumens: 631

M/P: 0.63

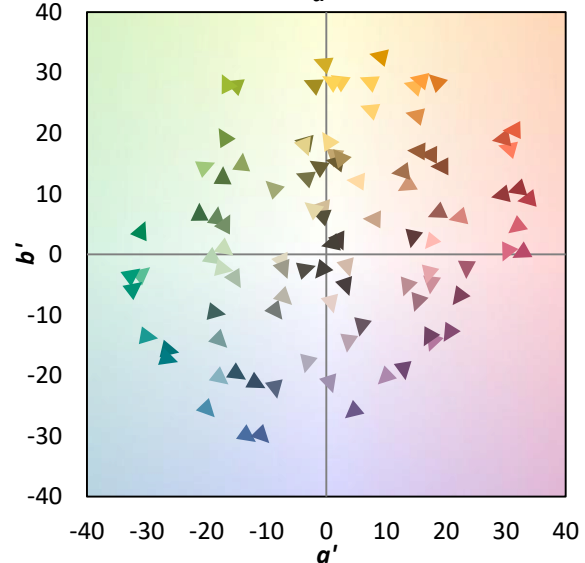
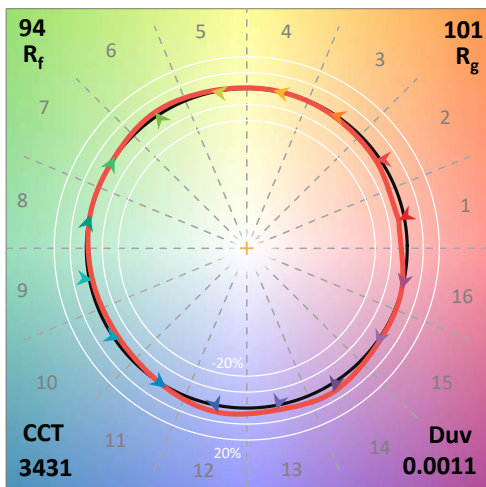
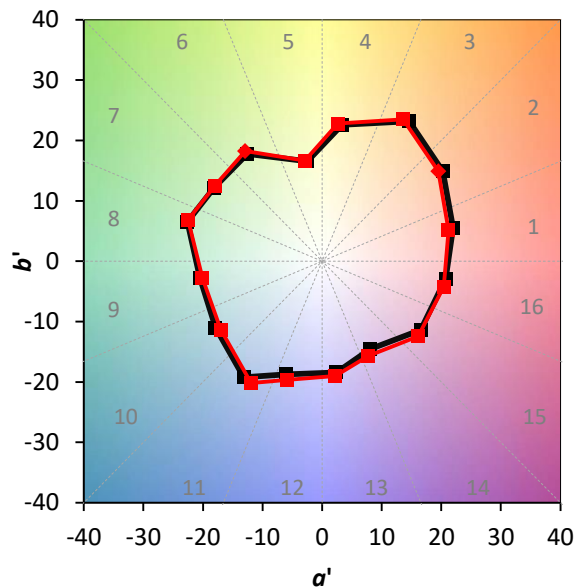
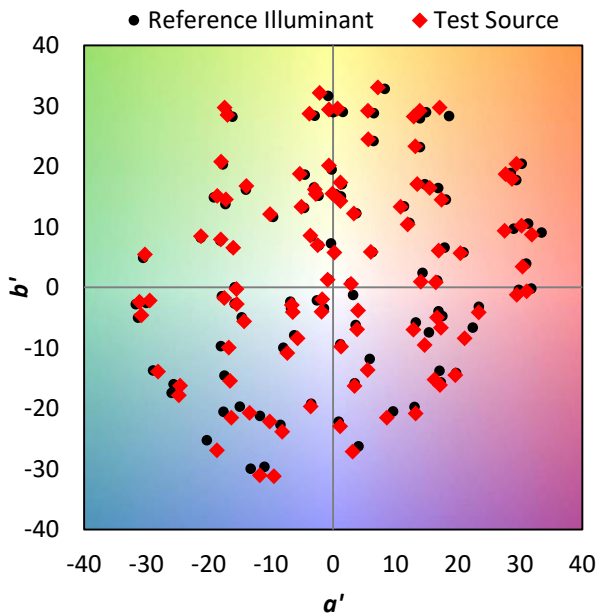
λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)
360	436	0.0	490	7373	6.1	620	18112	0.0	750	1864	0.0	880	485	0.0
365	370	0.0	495	8181	6.8	625	18107	0.0	755	1693	0.0	885	593	0.0
370	381	0.0	500	8943	7.2	630	17758	0.0	760	1498	0.0	890	677	0.0
375	432	0.0	505	9613	7.4	635	17291	0.0	765	1302	0.0	895	646	0.0
380	398	0.0	510	10245	7.4	640	16854	0.0	770	1180	0.0	900	526	0.0
385	359	0.0	515	10835	7.1	645	16410	0.0	775	1079	0.0	905	557	0.0
390	355	0.0	520	11465	6.7	650	15843	0.0	780	946	0.0	910	613	0.0
395	320	0.0	525	12004	6.1	655	15029	0.0	785	883	0.0	915	556	0.0
400	290	0.0	530	12512	5.4	660	14175	0.0	790	832	0.0	920	623	0.0
405	278	0.0	535	12925	4.7	665	13195	0.0	795	731	0.0	925	528	0.0
410	327	0.0	540	13254	3.9	670	12132	0.0	800	744	0.0	930	586	0.0
415	471	0.0	545	13437	3.1	675	11067	0.0	805	688	0.0	935	744	0.0
420	803	0.1	550	13744	2.5	680	10056	0.0	810	699	0.0	940	610	0.0
425	1501	0.2	555	13925	1.9	685	9011	0.0	815	651	0.0	945	486	0.0
430	2800	0.6	560	14164	1.4	690	8032	0.0	820	620	0.0	950	719	0.0
435	5221	1.4	565	14379	1.0	695	7112	0.0	825	686	0.0	955	527	0.0
440	9255	3.1	570	14511	0.7	700	6301	0.0	830	578	0.0	960	561	0.0
445	12350	4.9	575	14729	0.5	705	5570	0.0	835	502	0.0	965	364	0.0
450	10708	4.9	580	15069	0.3	710	4970	0.0	840	624	0.0	970	739	0.0
455	8053	4.2	585	15482	0.2	715	4396	0.0	845	523	0.0	975	457	0.0
460	7058	4.2	590	15975	0.2	720	3921	0.0	850	555	0.0	980	848	0.0
465	5809	3.8	595	16476	0.1	725	3489	0.0	855	553	0.0	985	1084	0.0
470	5111	3.7	600	17051	0.1	730	3068	0.0	860	424	0.0	990	980	0.0
475	5409	4.1	605	17607	0.0	735	2631	0.0	865	489	0.0	995	1093	0.0
480	5958	4.8	610	17893	0.0	740	2336	0.0	870	652	0.0	1000	1033	0.0
485	6631	5.5	615	18072	0.0	745	2108	0.0	875	622	0.0			

Summary

$R_f = 93.6$
 $R_g = 100.6$
 CIE $R_a = 94.0$
 $R_9 = 69.9$

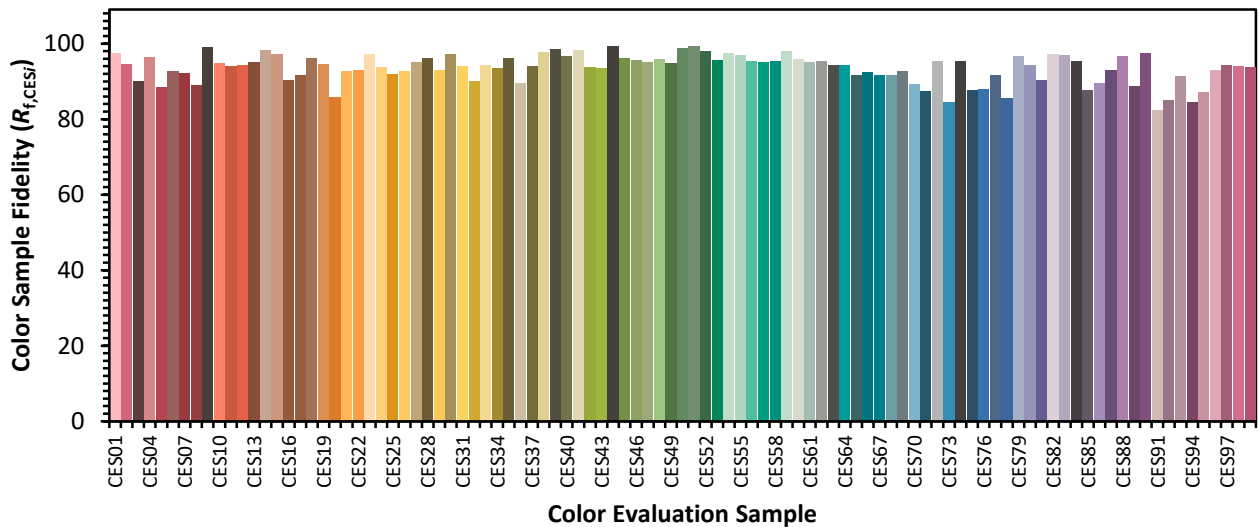


Color Vector Graphics

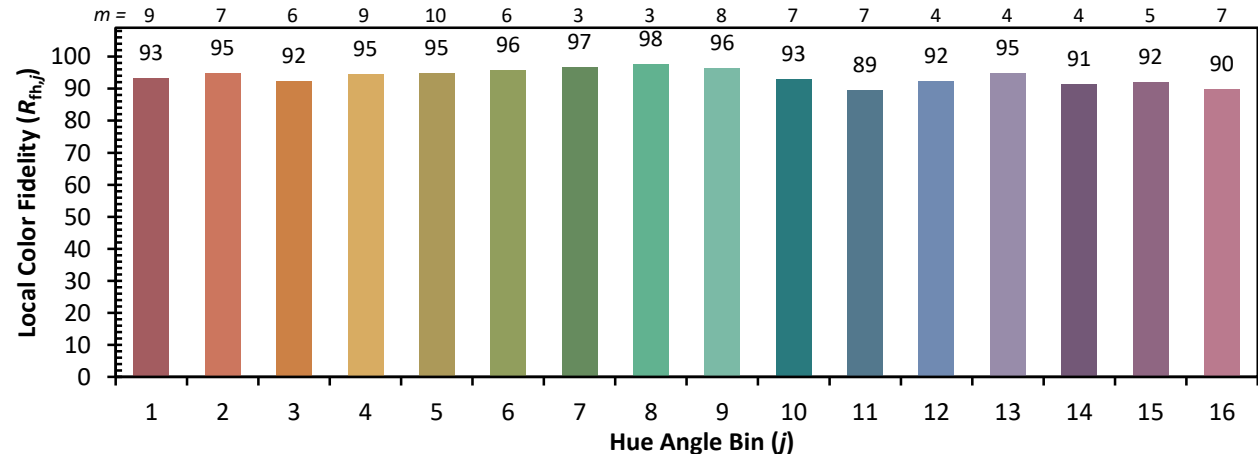
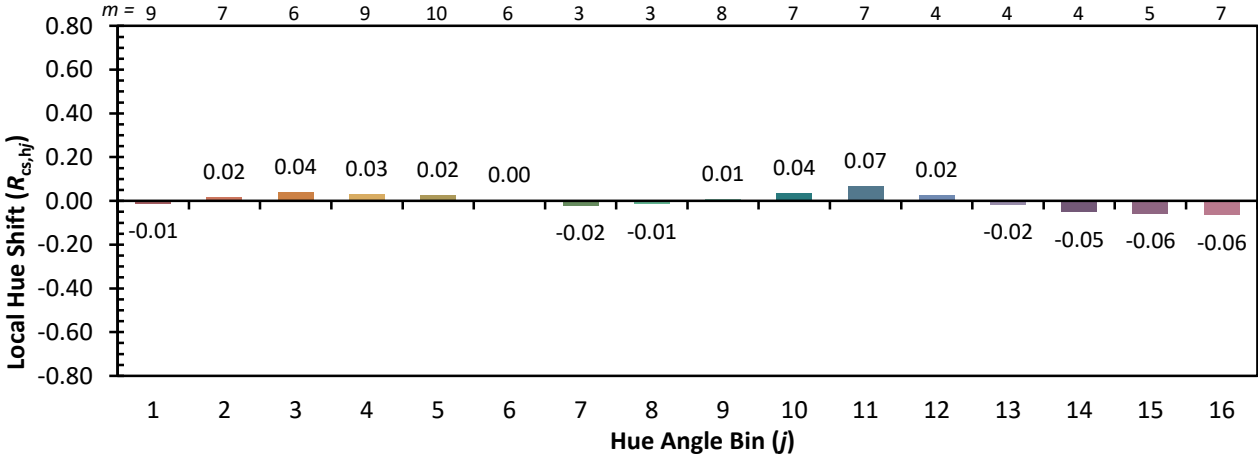
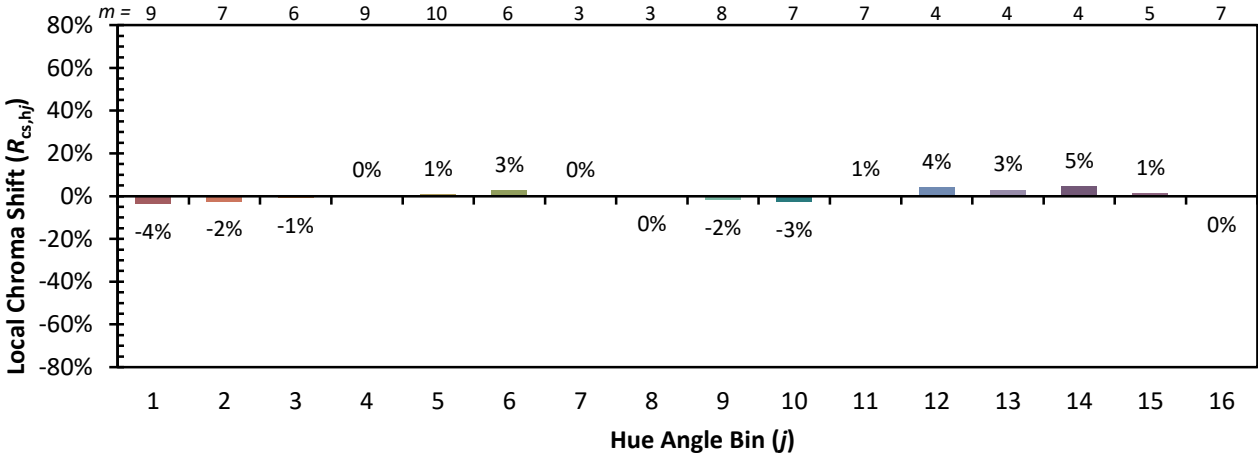


Individual Sample Fidelity Index ($R_{f,i}$)

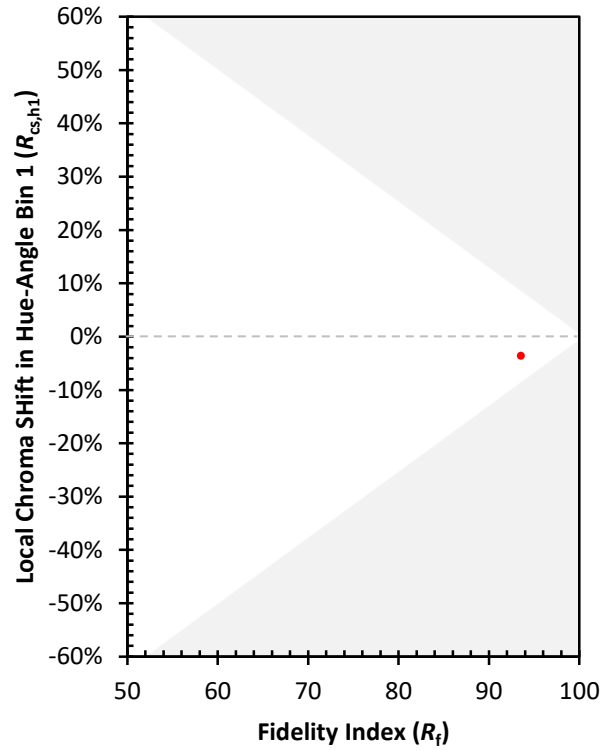
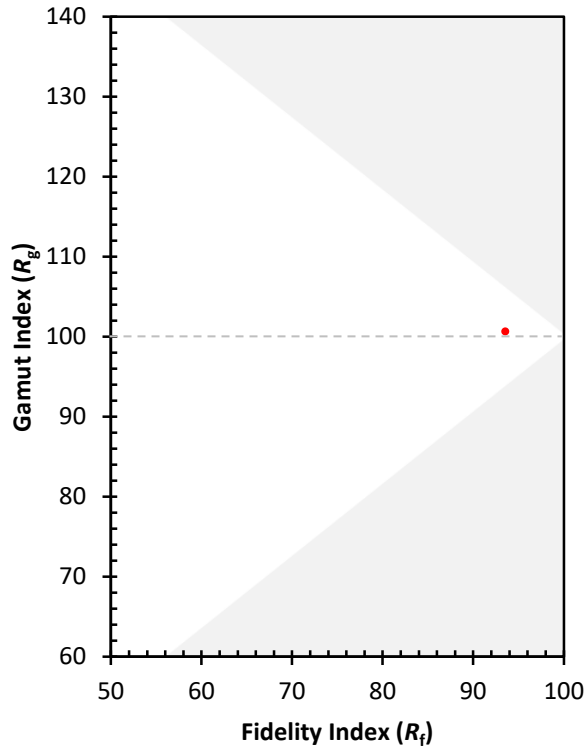
CES01 = 86	CES26 = 93	CES51 = 99	CES76 = 88
CES02 = 62	CES27 = 95	CES52 = 98	CES77 = 92
CES03 = 31	CES28 = 96	CES53 = 96	CES78 = 86
CES04 = 70	CES29 = 93	CES54 = 98	CES79 = 97
CES05 = 50	CES30 = 97	CES55 = 97	CES80 = 94
CES06 = 51	CES31 = 94	CES56 = 95	CES81 = 90
CES07 = 43	CES32 = 90	CES57 = 95	CES82 = 97
CES08 = 42	CES33 = 94	CES58 = 96	CES83 = 97
CES09 = 29	CES34 = 93	CES59 = 98	CES84 = 95
CES10 = 75	CES35 = 96	CES60 = 96	CES85 = 88
CES11 = 58	CES36 = 90	CES61 = 95	CES86 = 90
CES12 = 64	CES37 = 94	CES62 = 95	CES87 = 93
CES13 = 43	CES38 = 98	CES63 = 94	CES88 = 97
CES14 = 74	CES39 = 99	CES64 = 94	CES89 = 89
CES15 = 71	CES40 = 97	CES65 = 92	CES90 = 97
CES16 = 48	CES41 = 98	CES66 = 92	CES91 = 82
CES17 = 49	CES42 = 94	CES67 = 92	CES92 = 85
CES18 = 56	CES43 = 94	CES68 = 92	CES93 = 91
CES19 = 71	CES44 = 99	CES69 = 93	CES94 = 84
CES20 = 66	CES45 = 96	CES70 = 89	CES95 = 87
CES21 = 86	CES46 = 96	CES71 = 88	CES96 = 93
CES22 = 78	CES47 = 95	CES72 = 95	CES97 = 94
CES23 = 91	CES48 = 96	CES73 = 85	CES98 = 94
CES24 = 90	CES49 = 95	CES74 = 95	CES99 = 94
CES25 = 71	CES50 = 99	CES75 = 88	



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)