

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: P895791

Luminaire Tested: **GRZ-05L-927-10x10-X-UNV-STD-1F**

Issue Date: 11/20/2024



Test Information

Test Method: LM-79-08
Report Number: P895791
Test Lab: INNOVATION CENTER(G3)
Issue Date: 11/20/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: io LED
Catalog Number: GRZ-05L-927-10x10-X-UNV-STD-1F
Description: io LED 90CRI 2700K GRAZER 500 lumens per ft WITH 10 deg x 10 deg OPTIC
Light Source: 2700K CCT, 90 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

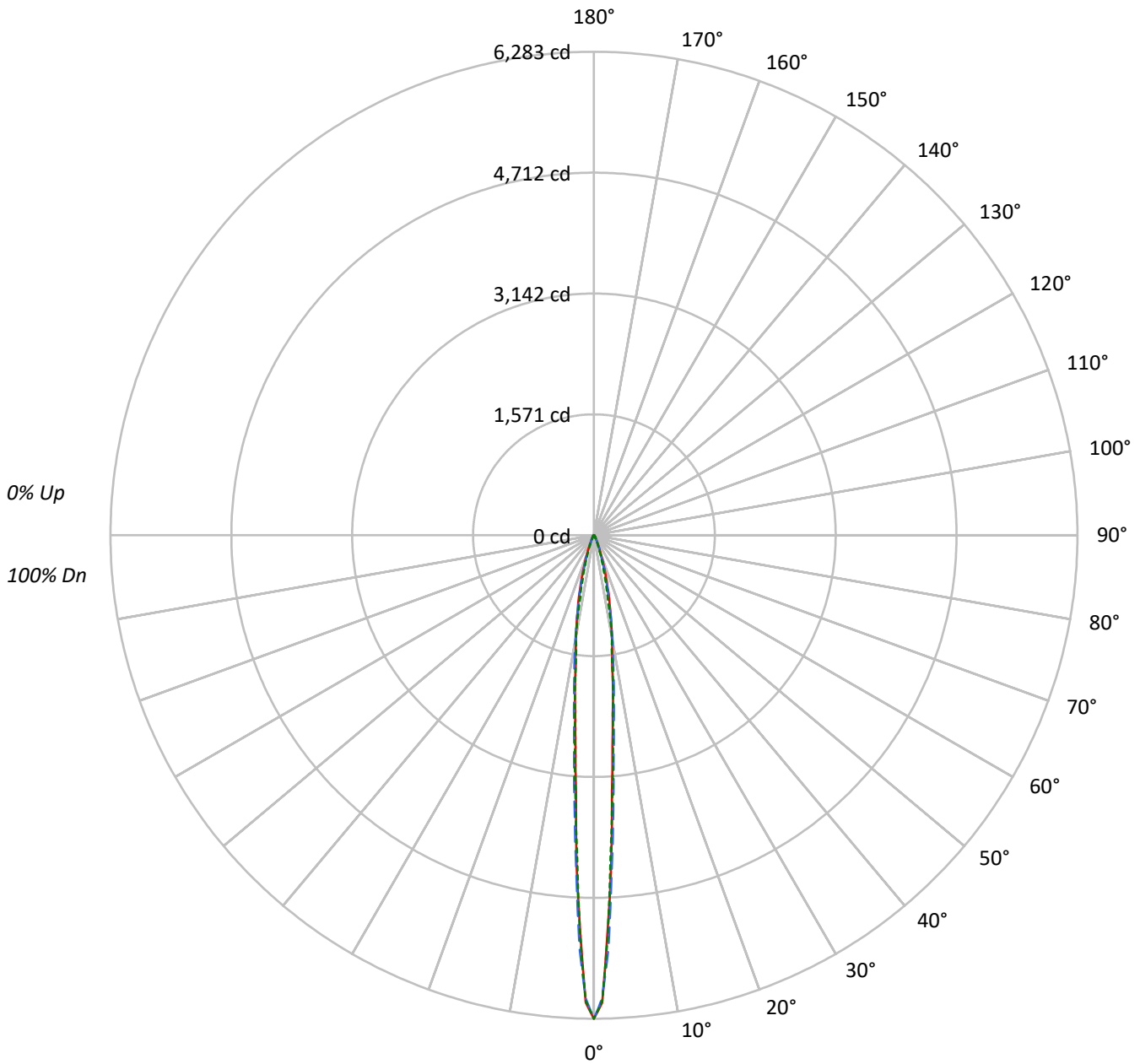
Summary

Lumens per Lamp: N/A
Luminaire Lumens: 502.8 lumens
Efficiency: N/A
Efficacy: 94.9 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): 5.3
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: P895791
CATALOG NUMBER: GRZ-05L-927-10x10-X-UNV-STD-1F

Luminous Intensity Polar Plot



— 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	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°	405716	405716	405716
5°	178662	190718	184204
10°	88049	90646	88823
15°	44421	40931	35269
20°	18635	15784	13406
25°	7552	6319	5329
30°	3609	3214	2848
35°	2270	1994	1577
40°	1618	1484	1113
45°	1461	1278	922
50°	1386	1215	723
55°	1238	1081	619
60°	994	852	607
65°	963	840	626
70°	982	831	566
75°	898	823	549
80°	818	707	521
85°	593	593	370



TEST NUMBER: P895791
 CATALOG NUMBER: GRZ-05L-927-10x10-X-UNV-STD-1F

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	236.1	47.0
10°-20°	174.6	34.7
20°-30°	47.6	9.5
30°-40°	16.8	3.3
40°-50°	10.6	2.1
50°-60°	7.9	1.6
60°-70°	5.2	1.0
70°-80°	3.1	0.6
80°-90°	0.8	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°	458.4	91.2
0°-40°	475.2	94.5
0°-60°	493.7	98.2
0°-90°	502.8	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	502.8	100.0

CANDELA DISTRIBUTION:

	0°	22.5°	45°	67.5°	90°	Flux
0°	6283	6283	6283	6283	6283	
5°	2756	2878	2942	2833	2842	229
15°	664	656	612	542	528	188
25°	106	104	89	79	75	56
35°	29	28	25	23	20	19
45°	16	15	14	12	10	12
55°	11	10	10	7	6	10
65°	6	6	6	5	4	6
75°	4	3	3	3	2	4
85°	1	0	1	0	0	1
90°	0	0	0	0	0	



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CANDELA DISTRIBUTION (FULL):

	0°	22.5°	45°	67.5°	90°
0°	6283.3	6283.3	6283.3	6283.3	6283.3
1°	6073.1	5951.7	6022.3	6019.5	6054.7
2°	5138.0	5518.3	5370.2	5354.0	5185.2
3°	4298.5	4466.7	4372.7	4428.0	4163.6
4°	3346.9	3556.9	3589.0	3516.7	3423.6
5°	2756.4	2878.2	2942.4	2833.3	2841.9
6°	2321.7	2475.8	2466.2	2469.2	2346.9
7°	2034.0	2114.2	2125.8	2056.0	2022.7
8°	1704.8	1843.0	1832.3	1779.8	1705.3
9°	1519.6	1604.5	1591.0	1497.3	1470.1
10°	1342.9	1389.6	1382.5	1279.4	1354.7
12.5°	967.0	971.4	924.1	868.0	823.3
15°	664.5	655.9	612.3	541.9	527.6
17.5°	436.4	437.5	378.4	325.4	317.1
20°	271.2	272.9	229.7	200.3	195.1
22.5°	170.7	163.2	136.6	124.2	120.9
25°	106.0	104.1	88.7	78.6	74.8
27.5°	71.7	70.3	57.7	53.0	52.7
30°	48.4	50.3	43.1	39.3	38.2
32.5°	36.5	36.5	33.5	30.8	27.7
35°	28.8	28.3	25.3	23.1	20.0
37.5°	22.0	23.1	20.3	18.7	15.7
40°	19.2	19.2	17.6	15.4	13.2
42.5°	17.0	17.6	15.4	13.2	11.0
45°	16.0	15.4	14.0	11.8	10.1
47.5°	14.6	14.3	12.9	10.4	8.8
50°	13.8	13.2	12.1	9.3	7.2
52.5°	12.9	12.1	11.0	8.2	6.1
55°	11.0	10.4	9.6	7.2	5.5
57.5°	9.6	8.5	8.0	6.1	5.0
60°	7.7	6.9	6.6	5.5	4.7
62.5°	6.9	6.3	6.1	5.2	4.4
65°	6.3	5.5	5.5	4.7	4.1
67.5°	5.8	5.0	5.0	4.1	3.6
70°	5.2	4.4	4.4	3.6	3.0
72.5°	4.4	3.6	3.8	3.0	2.7
75°	3.6	3.0	3.3	2.7	2.2
77.5°	3.0	2.4	2.4	2.2	1.6
80°	2.2	1.9	1.9	1.6	1.4
82.5°	1.4	1.1	1.4	1.1	0.8
85°	0.8	0.5	0.8	0.5	0.5
87.5°	0.3	0.3	0.3	0.3	0.3
90°	0.0	0.0	0.0	0.0	0.0

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Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

iO LED

Report Number: SP1-2101-124-1

Luminaire Tested: GRZ-05L-927-10X10-X-UNV-STD-2F

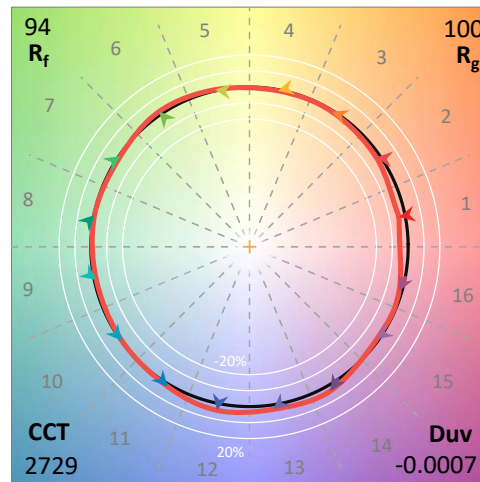
Test Date: 02/10/2021

Test Information

Test Method: LM-79-08
 Report Number: SP1-2101-124-1
 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-927-10X10-X-UNV-STD-2F**
 Description: IO LED Wall Grazer GRZ

Spectral Parameters

CCT (K):	2729	CRI (Ra):	94.7	R9:	67.0
CIE u':	0.2613	R1:	95.4	R10:	94.1
CIE v':	0.5257	R2:	98.0	R11:	96.2
Duv:	-0.0007	R3:	98.7	R12:	88.6
CIE x:	0.4561	R4:	95.1	R13:	96.3
CIE y:	0.4078	R5:	95.2	R14:	98.5
CIE z:	0.1361	R6:	97.5		
Peak Wavelength (nm):	624	R7:	92.8		
Dominant Wavelength (nm):	584	R8:	84.7		
Purity:	59.5				
Rf:	93.5				
Rg:	99.9				



Test Conditions

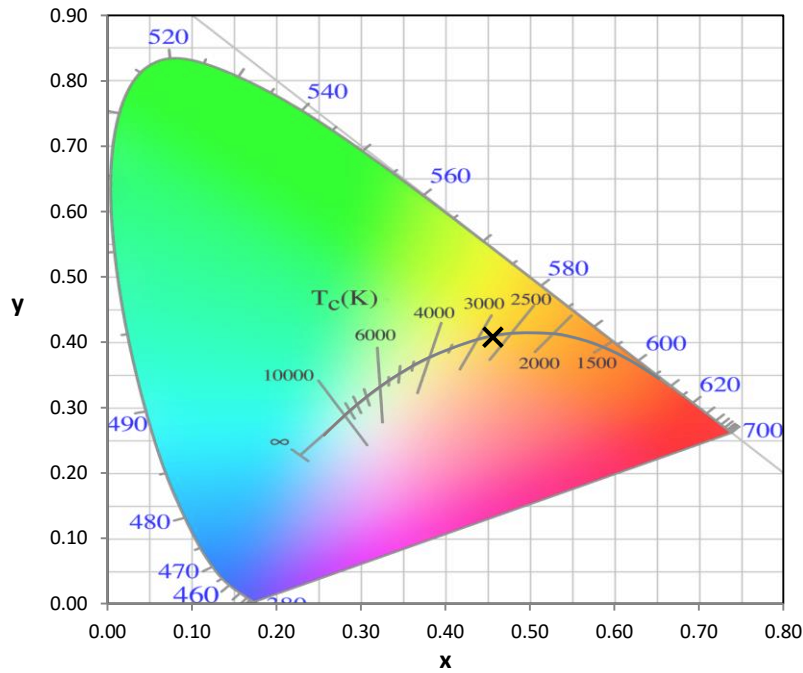
Stabilization Time: 176M
 Operation Time: 12H
 Room Temperature (°C) / RH%: 25.1/39%
 Sphere Temperature (°C): 24.5

REPORT NUMBER: SP1-2101-124-1

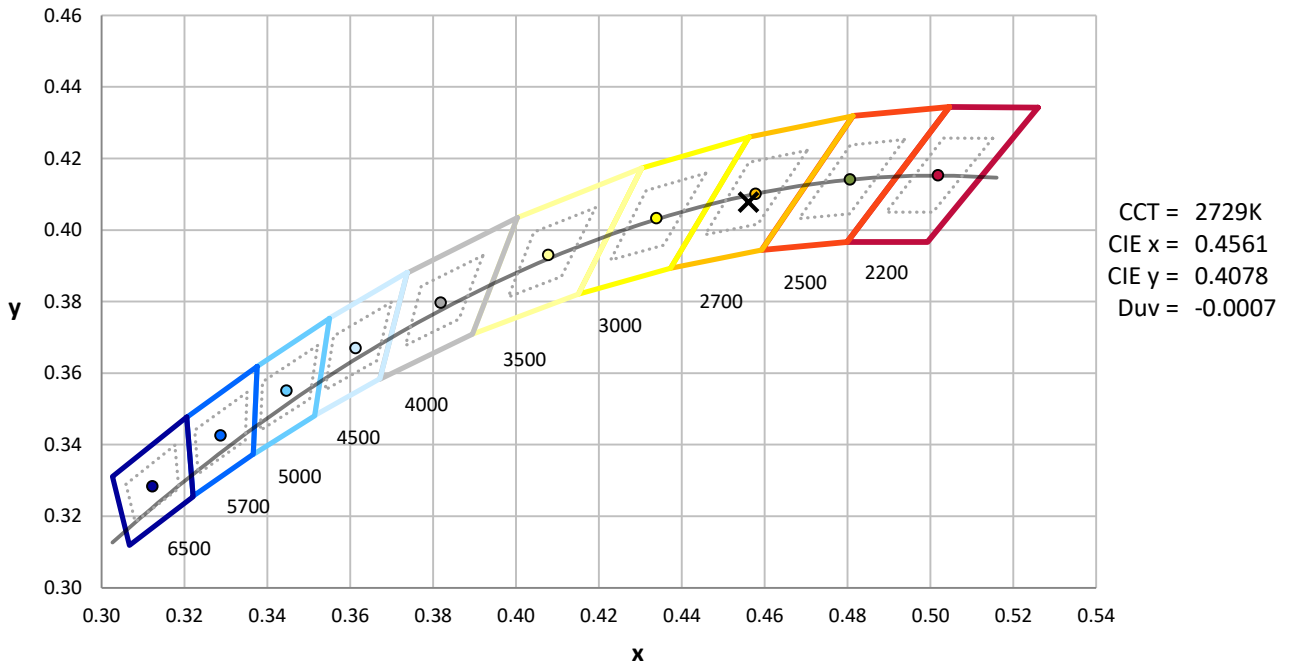
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	1/31/2021	7/31/2021
Power Meter	IN0071	12/1/2020	12/1/2021
AC Power Source	IN0063	12/1/2020	12/1/2021
DC Power Source	IN0208	12/1/2020	12/1/2021
Sphere Thermometer	IN0085	12/1/2020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

REPORT NUMBER: SP1-2101-124-1

CIE 1931 Chromaticity Diagram



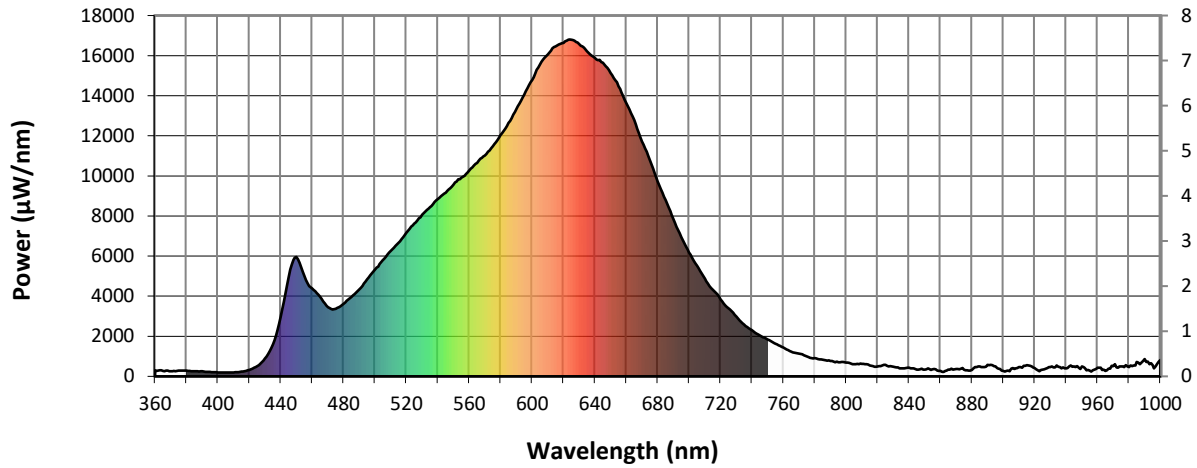
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 2700K 4-step quadrangle

REPORT NUMBER: SP1-2101-124-1

Photopic Flux vs. Wavelength

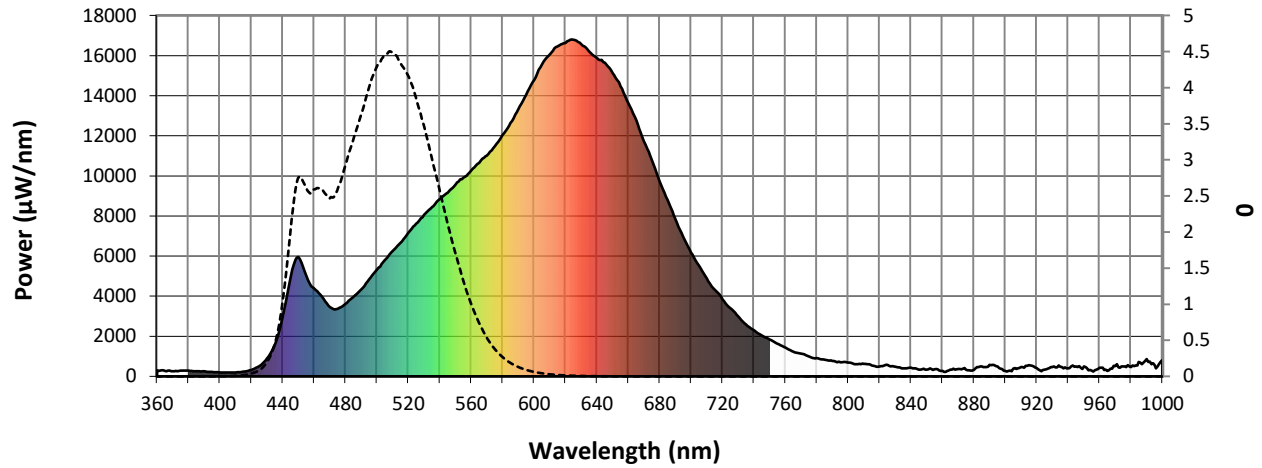


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λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)
360	309	0.0	490	4342	0.6	620	16630	4.3	750	1836	0.0	880	324	0.0
365	277	0.0	495	4830	0.9	625	16799	3.7	755	1629	0.0	885	500	0.0
370	260	0.0	500	5328	1.2	630	16562	3.0	760	1434	0.0	890	571	0.0
375	295	0.0	505	5798	1.6	635	16219	2.4	765	1231	0.0	895	494	0.0
380	288	0.0	510	6250	2.1	640	15881	1.9	770	1141	0.0	900	267	0.0
385	260	0.0	515	6656	2.8	645	15637	1.5	775	986	0.0	905	379	0.0
390	252	0.0	520	7162	3.5	650	15133	1.1	780	904	0.0	910	465	0.0
395	226	0.0	525	7622	4.1	655	14463	0.8	785	827	0.0	915	557	0.0
400	191	0.0	530	8063	4.7	660	13640	0.6	790	768	0.0	920	412	0.0
405	196	0.0	535	8439	5.2	665	12787	0.4	795	711	0.0	925	332	0.0
410	195	0.0	540	8846	5.8	670	11721	0.3	800	693	0.0	930	466	0.0
415	235	0.0	545	9169	6.1	675	10776	0.2	805	609	0.0	935	480	0.0
420	323	0.0	550	9555	6.5	680	9728	0.1	810	615	0.0	940	404	0.0
425	510	0.0	555	9909	6.8	685	8803	0.1	815	547	0.0	945	502	0.0
430	889	0.0	560	10257	7.0	690	7856	0.0	820	491	0.0	950	495	0.0
435	1599	0.0	565	10655	7.1	695	6947	0.0	825	570	0.0	955	285	0.0
440	2967	0.0	570	11020	7.2	700	6181	0.0	830	477	0.0	960	433	0.0
445	4944	0.1	575	11481	7.1	705	5516	0.0	835	401	0.0	965	277	0.0
450	5950	0.2	580	12032	7.1	710	4865	0.0	840	440	0.0	970	517	0.0
455	5013	0.2	585	12647	7.0	715	4321	0.0	845	330	0.0	975	498	0.0
460	4393	0.2	590	13350	6.9	720	3839	0.0	850	336	0.0	980	465	0.0
465	3971	0.2	595	14054	6.7	725	3403	0.0	855	350	0.0	985	724	0.0
470	3442	0.2	600	14775	6.4	730	2978	0.0	860	266	0.0	990	861	0.0
475	3372	0.3	605	15552	6.0	735	2581	0.0	865	338	0.0	995	562	0.0
480	3623	0.3	610	16054	5.5	740	2292	0.0	870	363	0.0	1000	816	0.0
485	3960	0.5	615	16452	5.0	745	2037	0.0	875	335	0.0			

REPORT NUMBER: SP1-2101-124-1

Scotopic Flux vs. Wavelength



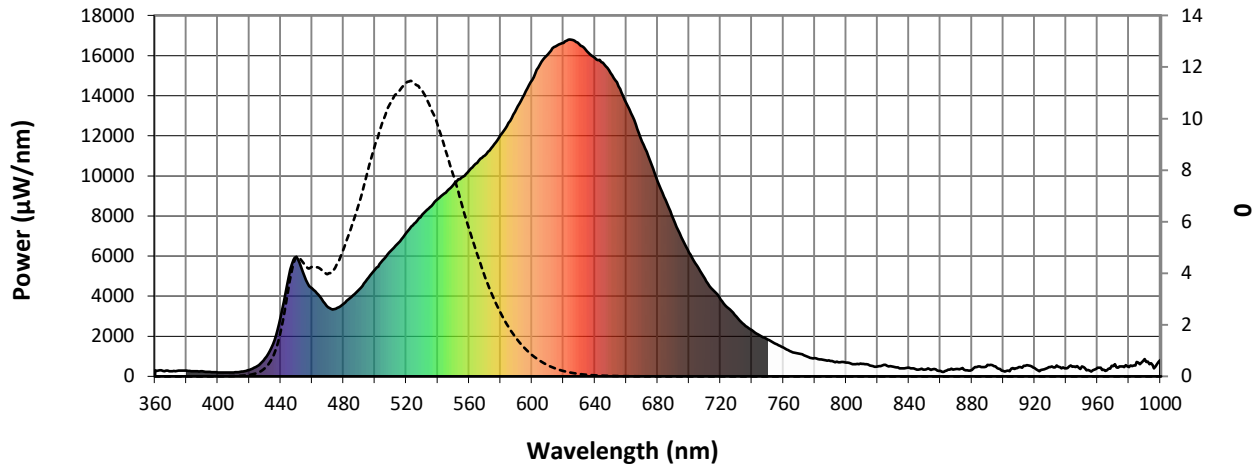
Scotopic Lumens: 1011.1

S/P: 1.32

λ (nm)	Power ($\mu\text{W}/\text{nm}$)	Lumens (ϕ/nm)	λ (nm)	Power ($\mu\text{W}/\text{nm}$)	Lumens (ϕ/nm)	λ (nm)	Power ($\mu\text{W}/\text{nm}$)	Lumens (ϕ/nm)	λ (nm)	Power ($\mu\text{W}/\text{nm}$)	Lumens (ϕ/nm)	λ (nm)	Power ($\mu\text{W}/\text{nm}$)	Lumens (ϕ/nm)
360	309	0.0	490	4342	6.7	620	16630	0.2	750	1836	0.0	880	324	0.0
365	277	0.0	495	4830	7.8	625	16799	0.1	755	1629	0.0	885	500	0.0
370	260	0.0	500	5328	8.9	630	16562	0.1	760	1434	0.0	890	571	0.0
375	295	0.0	505	5798	9.9	635	16219	0.1	765	1231	0.0	895	494	0.0
380	288	0.0	510	6250	10.6	640	15881	0.0	770	1141	0.0	900	267	0.0
385	260	0.0	515	6656	11.0	645	15637	0.0	775	986	0.0	905	379	0.0
390	252	0.0	520	7162	11.4	650	15133	0.0	780	904	0.0	910	465	0.0
395	226	0.0	525	7622	11.4	655	14463	0.0	785	827	0.0	915	557	0.0
400	191	0.0	530	8063	11.1	660	13640	0.0	790	768	0.0	920	412	0.0
405	196	0.0	535	8439	10.5	665	12787	0.0	795	711	0.0	925	332	0.0
410	195	0.0	540	8846	9.8	670	11721	0.0	800	693	0.0	930	466	0.0
415	235	0.0	545	9169	8.8	675	10776	0.0	805	609	0.0	935	480	0.0
420	323	0.1	550	9555	7.8	680	9728	0.0	810	615	0.0	940	404	0.0
425	510	0.1	555	9909	6.8	685	8803	0.0	815	547	0.0	945	502	0.0
430	889	0.3	560	10257	5.7	690	7856	0.0	820	491	0.0	950	495	0.0
435	1599	0.7	565	10655	4.8	695	6947	0.0	825	570	0.0	955	285	0.0
440	2967	1.7	570	11020	3.9	700	6181	0.0	830	477	0.0	960	433	0.0
445	4944	3.3	575	11481	3.1	705	5516	0.0	835	401	0.0	965	277	0.0
450	5950	4.6	580	12032	2.5	710	4865	0.0	840	440	0.0	970	517	0.0
455	5013	4.4	585	12647	1.9	715	4321	0.0	845	330	0.0	975	498	0.0
460	4393	4.2	590	13350	1.5	720	3839	0.0	850	336	0.0	980	465	0.0
465	3971	4.2	595	14054	1.1	725	3403	0.0	855	350	0.0	985	724	0.0
470	3442	4.0	600	14775	0.8	730	2978	0.0	860	266	0.0	990	861	0.0
475	3372	4.2	605	15552	0.6	735	2581	0.0	865	338	0.0	995	562	0.0
480	3623	4.9	610	16054	0.4	740	2292	0.0	870	363	0.0	1000	816	0.0
485	3960	5.7	615	16452	0.3	745	2037	0.0	875	335	0.0			

REPORT NUMBER: SP1-2101-124-1

Melanopic Flux vs. Wavelength



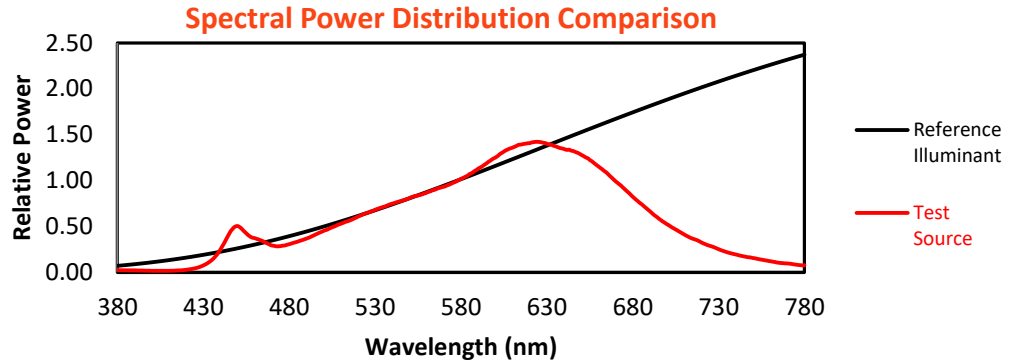
Melanopic Lumens: 382.4

M/P: 0.5

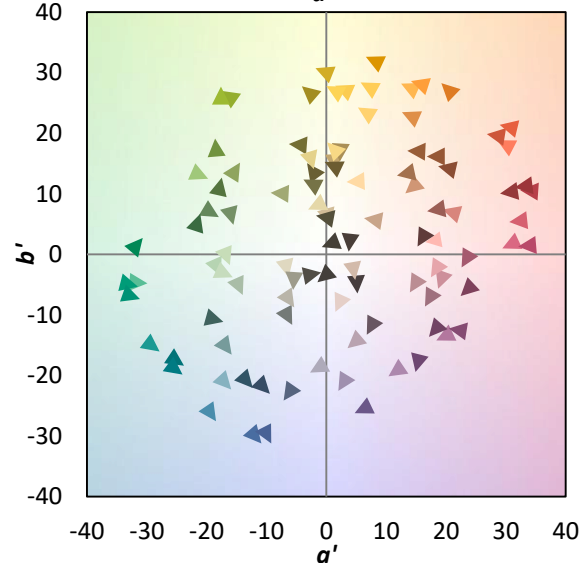
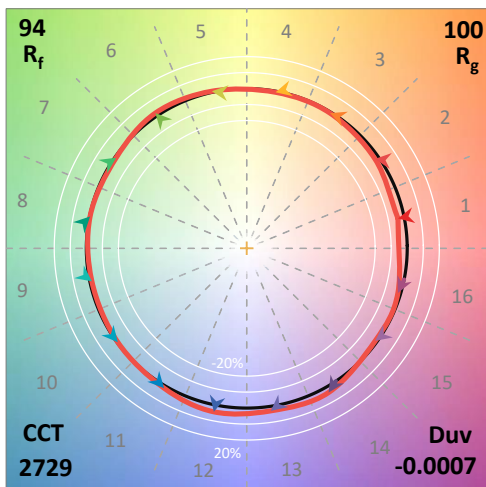
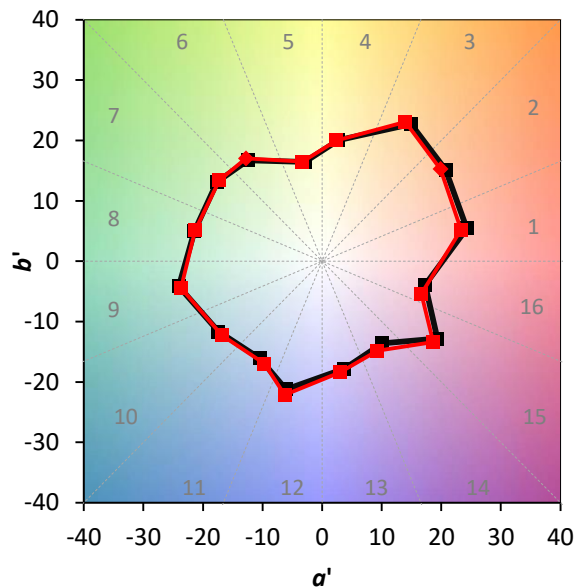
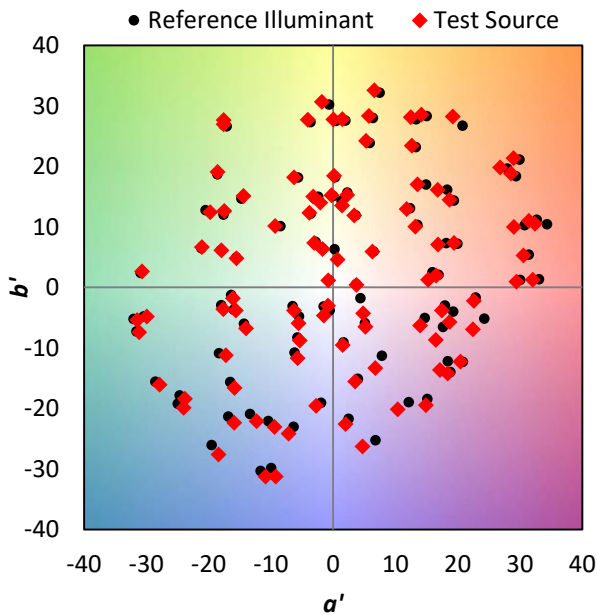
λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)
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365	277	0.0	495	4830	4.0	625	16799	0.0	755	1629	0.0	885	500	0.0
370	260	0.0	500	5328	4.3	630	16562	0.0	760	1434	0.0	890	571	0.0
375	295	0.0	505	5798	4.5	635	16219	0.0	765	1231	0.0	895	494	0.0
380	288	0.0	510	6250	4.5	640	15881	0.0	770	1141	0.0	900	267	0.0
385	260	0.0	515	6656	4.3	645	15637	0.0	775	986	0.0	905	379	0.0
390	252	0.0	520	7162	4.2	650	15133	0.0	780	904	0.0	910	465	0.0
395	226	0.0	525	7622	3.9	655	14463	0.0	785	827	0.0	915	557	0.0
400	191	0.0	530	8063	3.5	660	13640	0.0	790	768	0.0	920	412	0.0
405	196	0.0	535	8439	3.0	665	12787	0.0	795	711	0.0	925	332	0.0
410	195	0.0	540	8846	2.6	670	11721	0.0	800	693	0.0	930	466	0.0
415	235	0.0	545	9169	2.1	675	10776	0.0	805	609	0.0	935	480	0.0
420	323	0.0	550	9555	1.7	680	9728	0.0	810	615	0.0	940	404	0.0
425	510	0.1	555	9909	1.3	685	8803	0.0	815	547	0.0	945	502	0.0
430	889	0.2	560	10257	1.0	690	7856	0.0	820	491	0.0	950	495	0.0
435	1599	0.4	565	10655	0.7	695	6947	0.0	825	570	0.0	955	285	0.0
440	2967	1.0	570	11020	0.5	700	6181	0.0	830	477	0.0	960	433	0.0
445	4944	2.0	575	11481	0.4	705	5516	0.0	835	401	0.0	965	277	0.0
450	5950	2.7	580	12032	0.3	710	4865	0.0	840	440	0.0	970	517	0.0
455	5013	2.6	585	12647	0.2	715	4321	0.0	845	330	0.0	975	498	0.0
460	4393	2.6	590	13350	0.1	720	3839	0.0	850	336	0.0	980	465	0.0
465	3971	2.6	595	14054	0.1	725	3403	0.0	855	350	0.0	985	724	0.0
470	3442	2.5	600	14775	0.1	730	2978	0.0	860	266	0.0	990	861	0.0
475	3372	2.6	605	15552	0.0	735	2581	0.0	865	338	0.0	995	562	0.0
480	3623	2.9	610	16054	0.0	740	2292	0.0	870	363	0.0	1000	816	0.0
485	3960	3.3	615	16452	0.0	745	2037	0.0	875	335	0.0			

Summary

$R_f = 93.5$
 $R_g = 99.9$
 CIE $R_a = 94.7$
 $R_9 = 67.0$

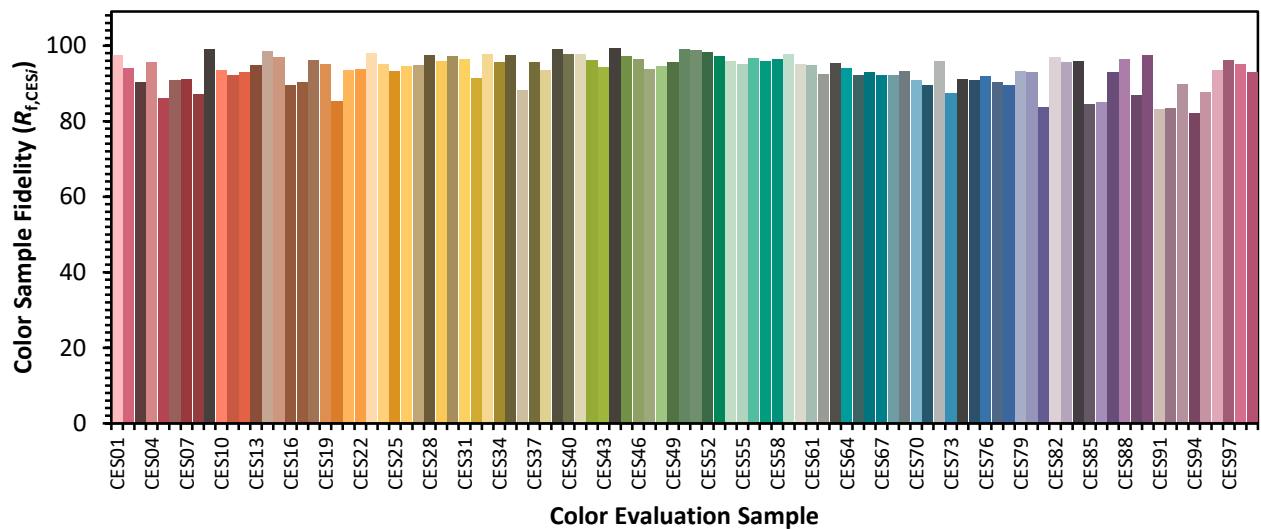


Color Vector Graphics

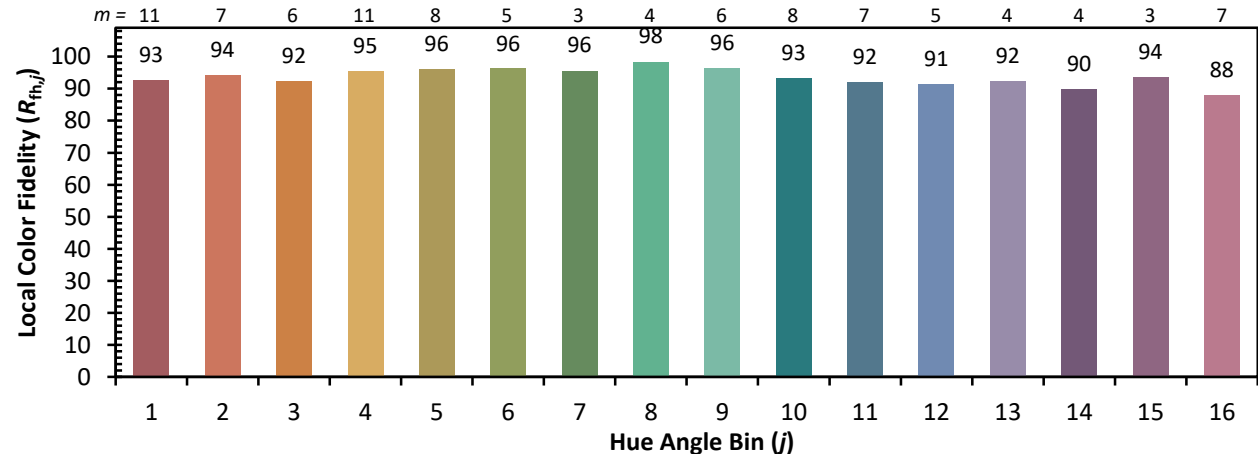
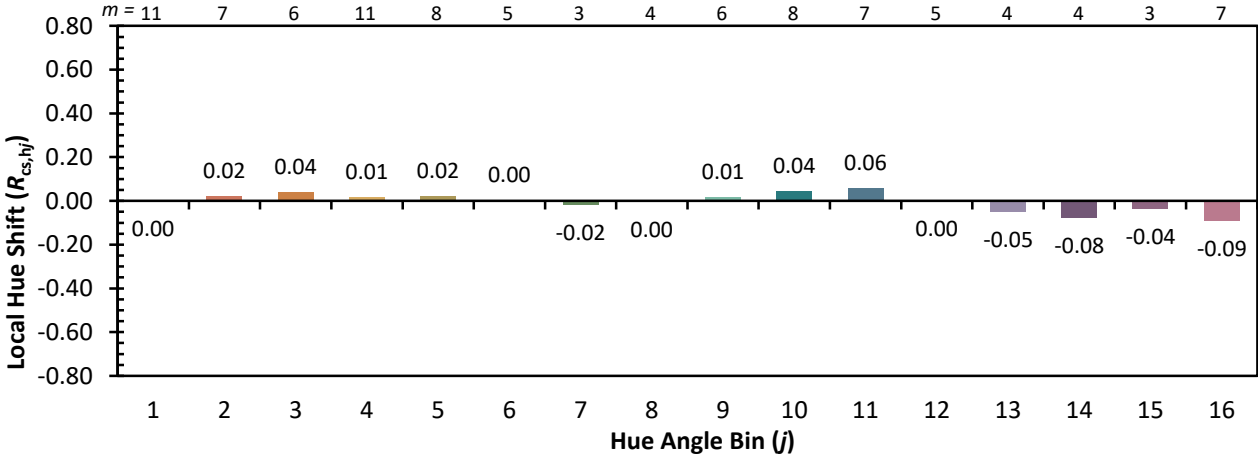
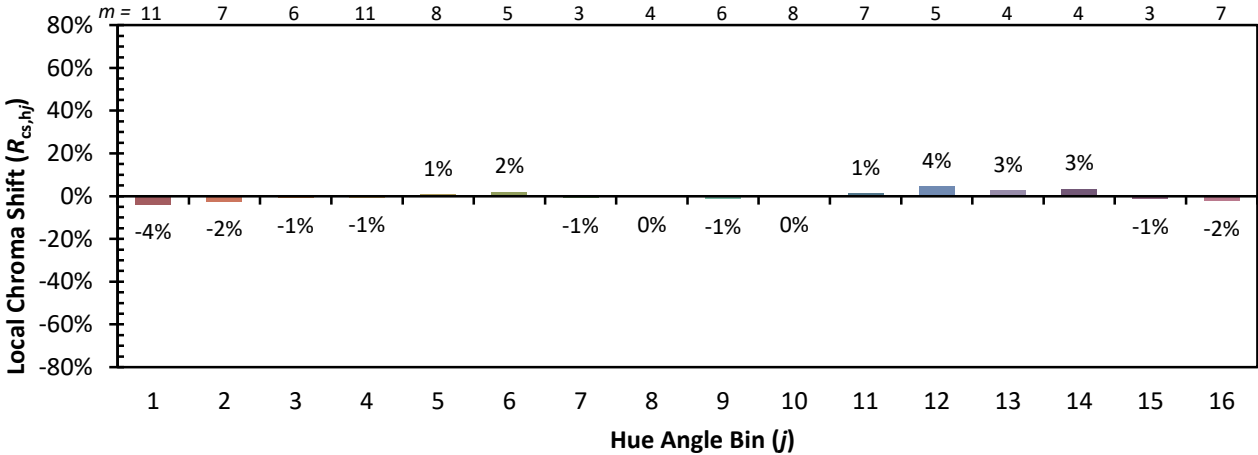


Individual Sample Fidelity Index ($R_{f,i}$)

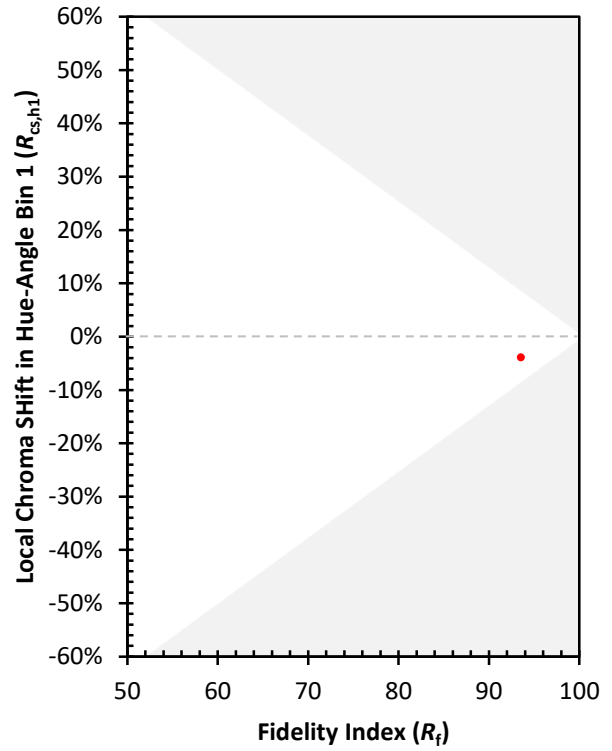
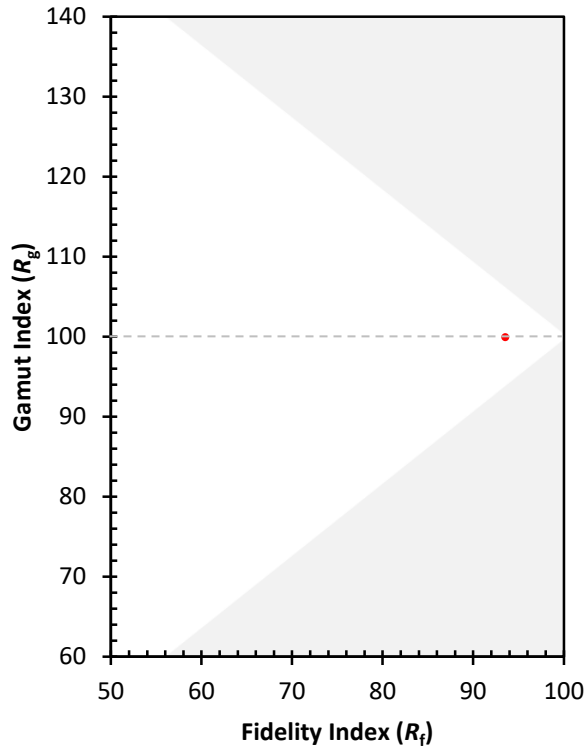
CES01 = 86	CES26 = 95	CES51 = 99	CES76 = 92
CES02 = 64	CES27 = 95	CES52 = 98	CES77 = 90
CES03 = 32	CES28 = 98	CES53 = 97	CES78 = 90
CES04 = 71	CES29 = 96	CES54 = 96	CES79 = 93
CES05 = 51	CES30 = 97	CES55 = 95	CES80 = 93
CES06 = 52	CES31 = 96	CES56 = 97	CES81 = 84
CES07 = 44	CES32 = 91	CES57 = 96	CES82 = 97
CES08 = 43	CES33 = 98	CES58 = 97	CES83 = 96
CES09 = 29	CES34 = 96	CES59 = 98	CES84 = 96
CES10 = 77	CES35 = 97	CES60 = 95	CES85 = 85
CES11 = 59	CES36 = 88	CES61 = 95	CES86 = 85
CES12 = 66	CES37 = 96	CES62 = 93	CES87 = 93
CES13 = 44	CES38 = 94	CES63 = 95	CES88 = 96
CES14 = 74	CES39 = 99	CES64 = 94	CES89 = 87
CES15 = 72	CES40 = 98	CES65 = 92	CES90 = 97
CES16 = 48	CES41 = 98	CES66 = 93	CES91 = 83
CES17 = 50	CES42 = 96	CES67 = 92	CES92 = 83
CES18 = 57	CES43 = 94	CES68 = 92	CES93 = 90
CES19 = 72	CES44 = 99	CES69 = 93	CES94 = 82
CES20 = 68	CES45 = 97	CES70 = 91	CES95 = 88
CES21 = 87	CES46 = 96	CES71 = 90	CES96 = 94
CES22 = 79	CES47 = 94	CES72 = 96	CES97 = 96
CES23 = 92	CES48 = 95	CES73 = 87	CES98 = 95
CES24 = 91	CES49 = 96	CES74 = 91	CES99 = 93
CES25 = 72	CES50 = 99	CES75 = 91	



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)