

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: P895792

Luminaire Tested: **GRZ-10L-927-10x10-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: P895792  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 11/20/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: io LED  
Catalog Number: GRZ-10L-927-10x10-X-UNV-STD-1F  
Description: io LED 90CRI 2700K GRAZER 1000 lumens per ft WITH 10 deg x 10 deg OPTIC  
Light Source: 2700K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

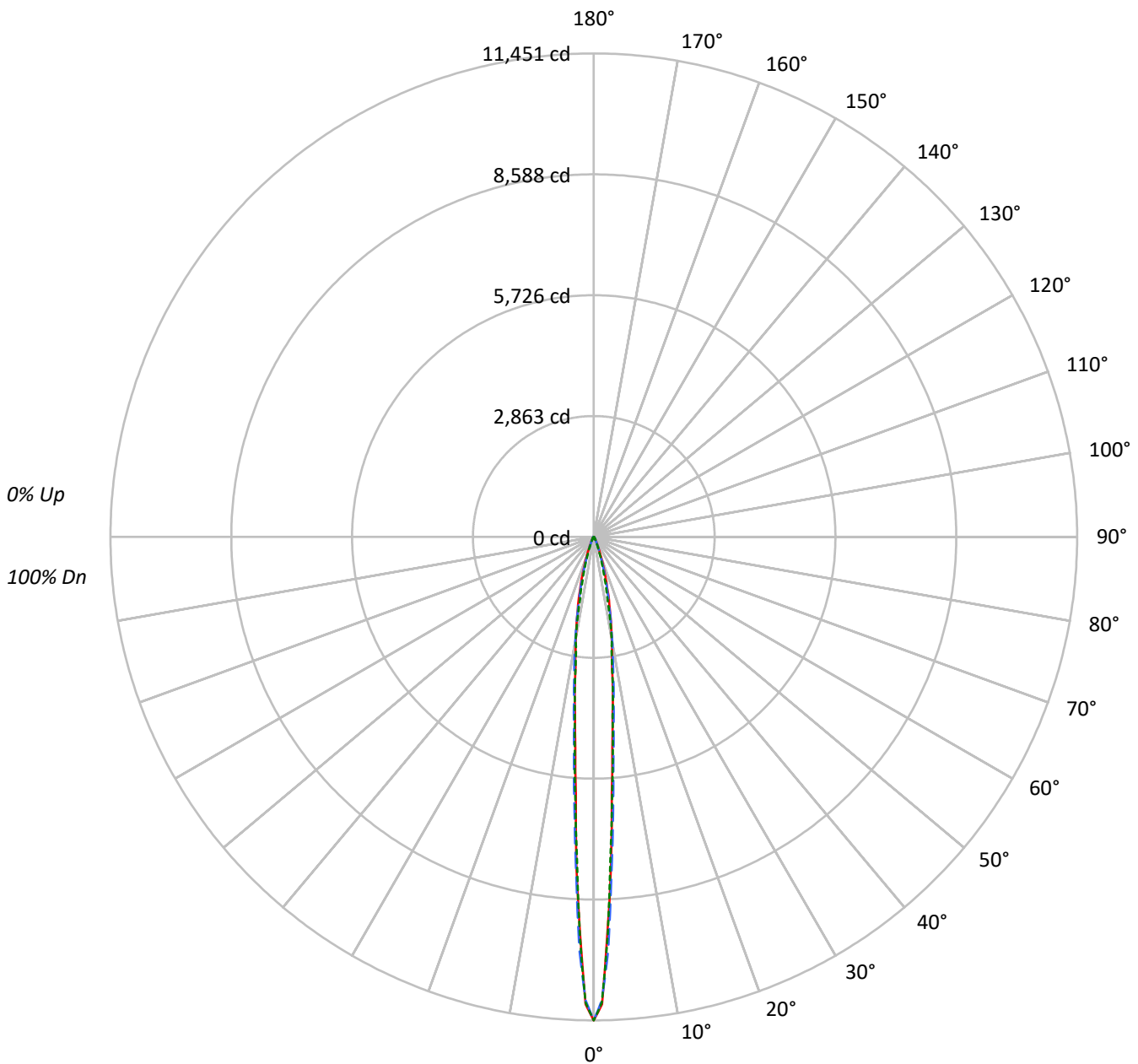
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 916.4 lumens  
Efficiency: N/A  
Efficacy: 91.6 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): 10  
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: P895792  
CATALOG NUMBER: GRZ-10L-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	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°	739398	739398	739398
5°	325603	347576	335695
10°	160468	165195	161878
15°	80947	74589	64275
20°	33966	28771	24428
25°	13772	11520	9704
30°	6569	5860	5197
35°	4146	3634	2877
40°	2950	2706	2023
45°	2657	2338	1689
50°	2521	2220	1316
55°	2263	1970	1126
60°	1808	1550	1098
65°	1757	1528	1146
70°	1812	1510	1038
75°	1622	1522	998
80°	1487	1301	930
85°	1111	1111	741



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	430.3	47.0
10°-20°	318.2	34.7
20°-30°	86.8	9.5
30°-40°	30.7	3.3
40°-50°	19.3	2.1
50°-60°	14.4	1.6
60°-70°	9.4	1.0
70°-80°	5.7	0.6
80°-90°	1.5	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°	835.4	91.2
0°-40°	866.1	94.5
0°-60°	899.8	98.2
0°-90°	916.4	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	916.4	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	11451	11451	11451	11451	11451	
5°	5023	5245	5362	5164	5179	417
15°	1211	1195	1116	988	962	343
25°	193	190	162	143	136	102
35°	53	52	46	42	36	34
45°	29	28	26	22	18	22
55°	20	19	18	13	10	18
65°	12	10	10	8	8	11
75°	6	6	6	5	4	7
85°	2	1	2	1	1	2
90°	0	0	0	0	0	



TEST NUMBER: P895792

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

**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°
0°	11451.0	11451.0	11451.0	11451.0	11451.0
1°	11067.9	10846.6	10975.3	10970.3	11034.3
2°	9363.7	10056.7	9786.8	9757.3	9449.8
3°	7833.7	8140.3	7969.0	8069.7	7587.9
4°	6099.5	6482.2	6540.7	6409.1	6239.3
5°	5023.4	5245.3	5362.4	5163.6	5179.1
6°	4231.2	4512.0	4494.5	4500.0	4277.2
7°	3706.8	3853.1	3874.1	3746.9	3686.2
8°	3106.9	3358.8	3339.2	3243.6	3107.8
9°	2769.3	2924.0	2899.5	2728.8	2679.2
10°	2447.4	2532.4	2519.5	2331.6	2468.9
12.5°	1762.3	1770.3	1684.1	1582.0	1500.4
15°	1210.9	1195.3	1115.8	987.5	961.5
17.5°	795.2	797.2	689.6	592.9	577.9
20°	494.3	497.3	418.7	365.1	355.5
22.5°	311.0	297.4	248.9	226.4	220.3
25°	193.3	189.8	161.7	143.2	136.2
27.5°	130.7	128.2	105.1	96.6	96.1
30°	88.1	91.6	78.6	71.6	69.7
32.5°	66.6	66.6	61.1	56.1	50.5
35°	52.6	51.6	46.1	42.0	36.5
37.5°	40.0	42.0	37.1	34.1	28.6
40°	35.0	35.0	32.1	28.0	24.0
42.5°	31.0	32.1	28.0	24.0	20.1
45°	29.1	28.0	25.6	21.6	18.5
47.5°	26.5	26.0	23.6	19.0	16.0
50°	25.1	24.0	22.1	17.0	13.1
52.5°	23.6	22.1	20.1	15.0	11.0
55°	20.1	19.0	17.5	13.1	10.0
57.5°	17.5	15.5	14.5	11.0	9.0
60°	14.0	12.5	12.0	10.0	8.5
62.5°	12.5	11.5	11.0	9.6	8.0
65°	11.5	10.0	10.0	8.5	7.5
67.5°	10.5	9.0	9.0	7.5	6.5
70°	9.6	8.0	8.0	6.5	5.5
72.5°	8.0	6.5	7.0	5.5	5.0
75°	6.5	5.5	6.1	5.0	4.0
77.5°	5.5	4.5	4.5	4.0	3.0
80°	4.0	3.5	3.5	3.0	2.5
82.5°	2.5	2.0	2.5	2.0	1.5
85°	1.5	1.0	1.5	1.0	1.0
87.5°	0.5	0.5	0.5	0.5	0.5
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

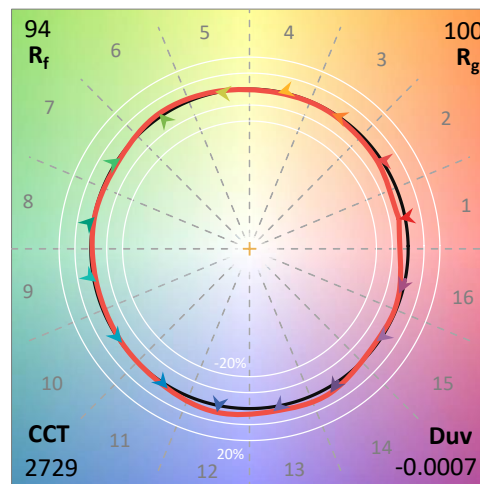
**Spectral Parameters**

CCT (K): 2729  
 CIE u': 0.2613  
 CIE v': 0.5257  
 Duv: -0.0007  
 CIE x: 0.4561  
 CIE y: 0.4078  
 CIE z: 0.1361  
 Peak Wavelength (nm): 624  
 Dominant Wavelength (nm): 584  
 Purity: 59.5  
  
 Rf: 93.5  
 Rg: 99.9

CRI (Ra):	94.7		
R1:	95.4	R9:	67.0
R2:	98.0	R10:	94.1
R3:	98.7	R11:	96.2
R4:	95.1	R12:	88.6
R5:	95.2	R13:	96.3
R6:	97.5	R14:	98.5
R7:	92.8		
R8:	84.7		

**Test Conditions**

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



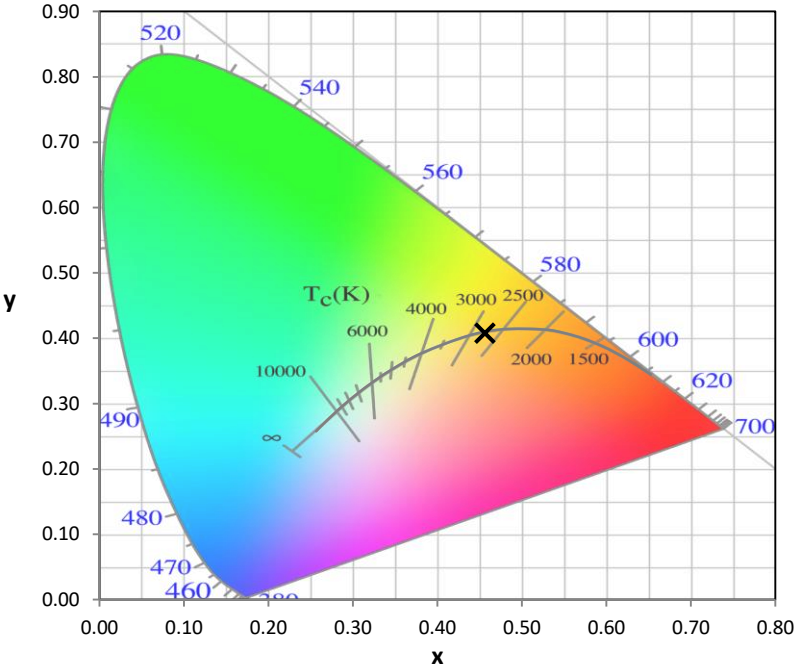


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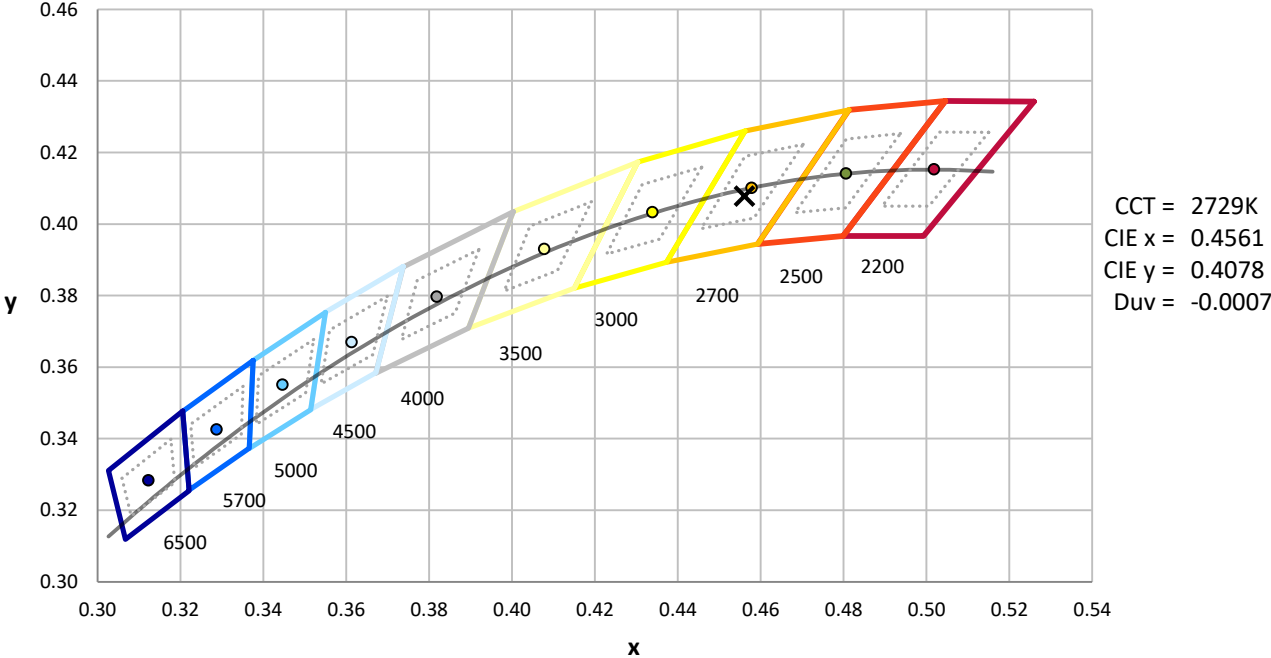
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	1/31/2021	7/31/2021
Power Meter	IN0071	12/1/2020	12/1/2021
AC Power Source	IN0063	12/1/2020	12/1/2021
DC Power Source	IN0208	12/1/2020	12/1/2021
Sphere Thermometer	IN0085	12/1/2020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

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CIE 1931 Chromaticity Diagram



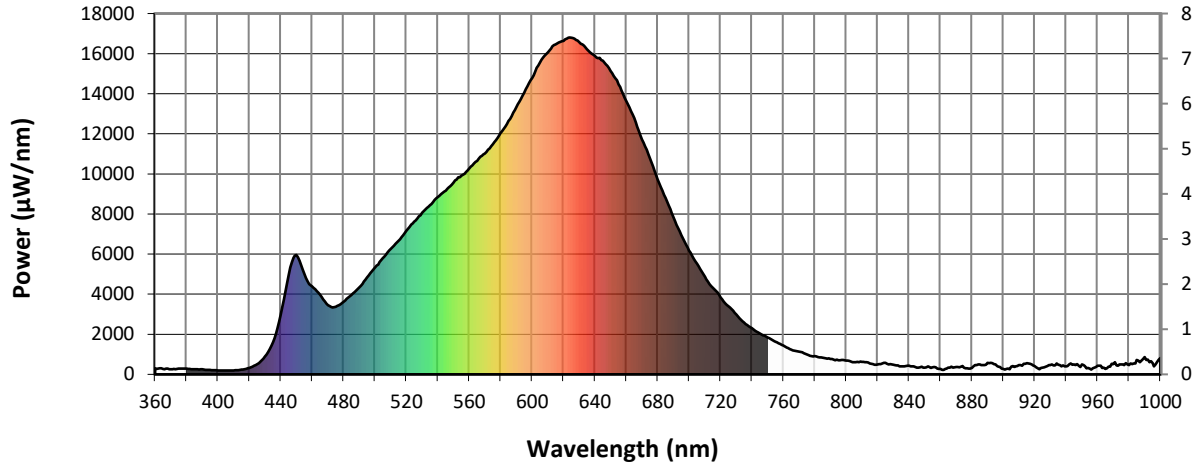
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 2700K 4-step quadrangle

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**Photopic Flux vs. Wavelength**

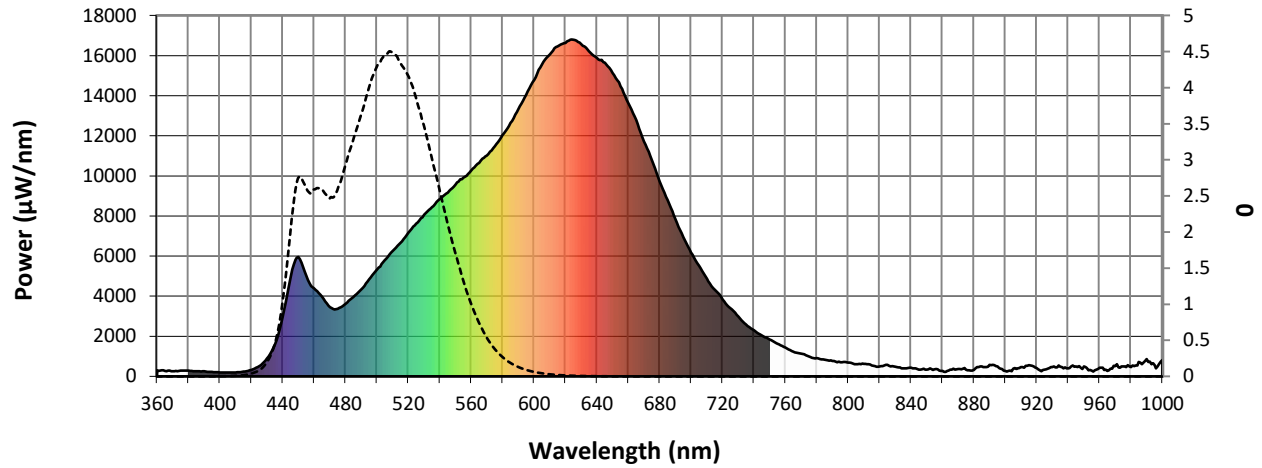


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λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)
360	309	0.0	490	4342	0.6	620	16630	4.3	750	1836	0.0	880	324	0.0
365	277	0.0	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			

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**Scotopic Flux vs. Wavelength**



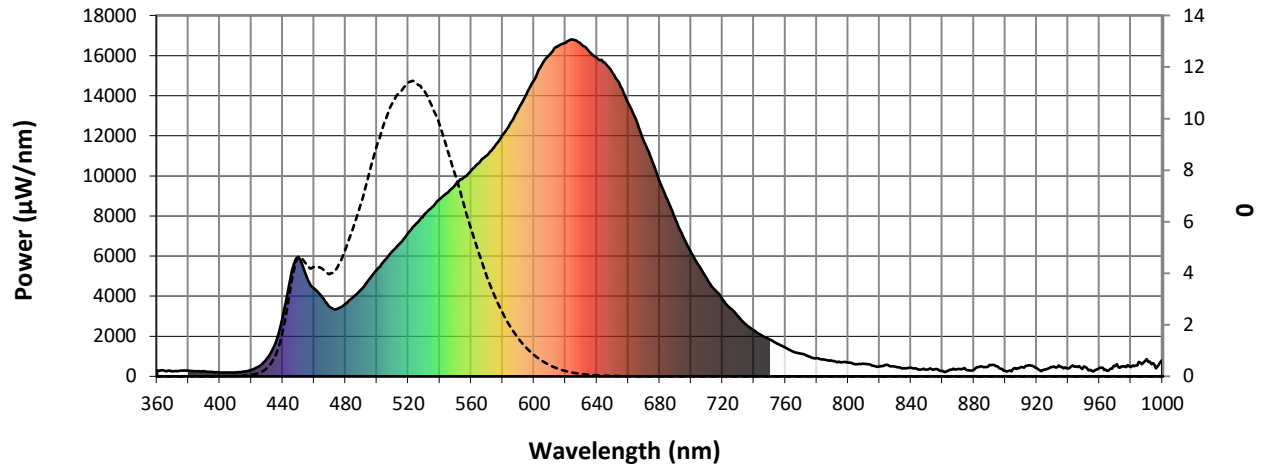
**Scotopic Lumens: 1011.1**

**S/P: 1.32**

$\lambda$ (nm)	Power ( $\mu\text{W}/\text{nm}$ )	Lumens ( $\phi/\text{nm}$ )	$\lambda$ (nm)	Power ( $\mu\text{W}/\text{nm}$ )	Lumens ( $\phi/\text{nm}$ )	$\lambda$ (nm)	Power ( $\mu\text{W}/\text{nm}$ )	Lumens ( $\phi/\text{nm}$ )	$\lambda$ (nm)	Power ( $\mu\text{W}/\text{nm}$ )	Lumens ( $\phi/\text{nm}$ )	$\lambda$ (nm)	Power ( $\mu\text{W}/\text{nm}$ )	Lumens ( $\phi/\text{nm}$ )
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**



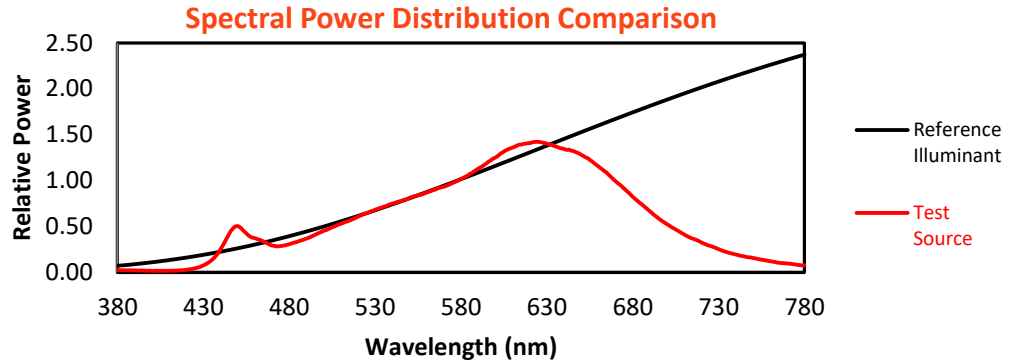
**Melanopic Lumens: 382.4**

**M/P: 0.5**

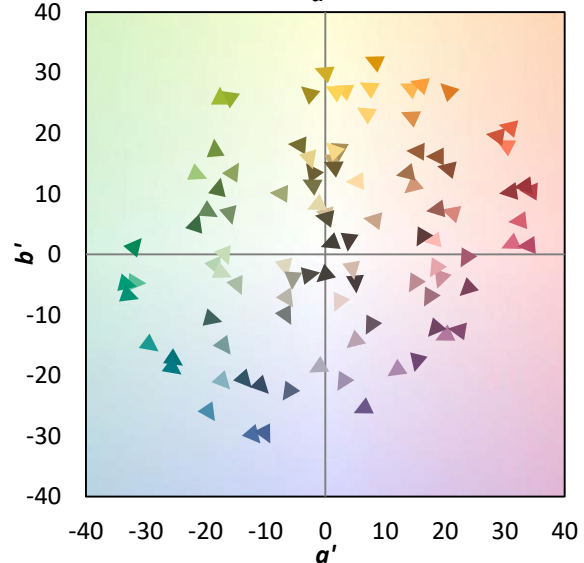
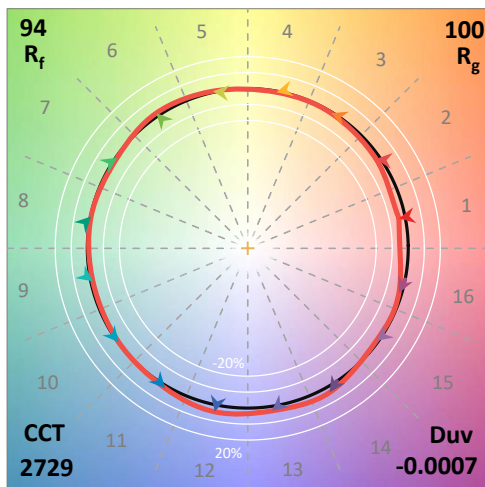
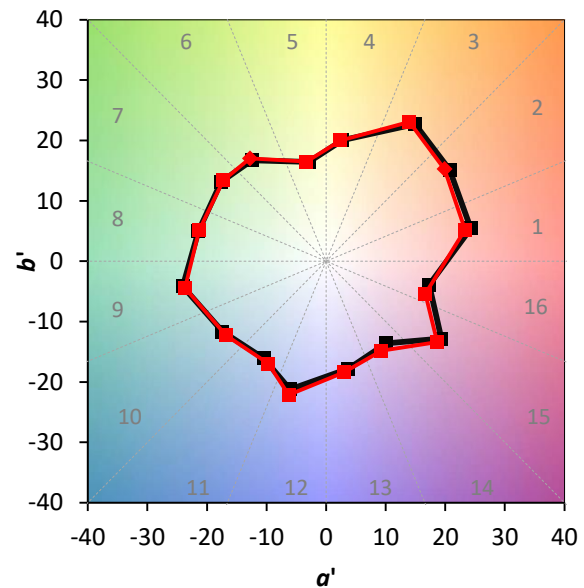
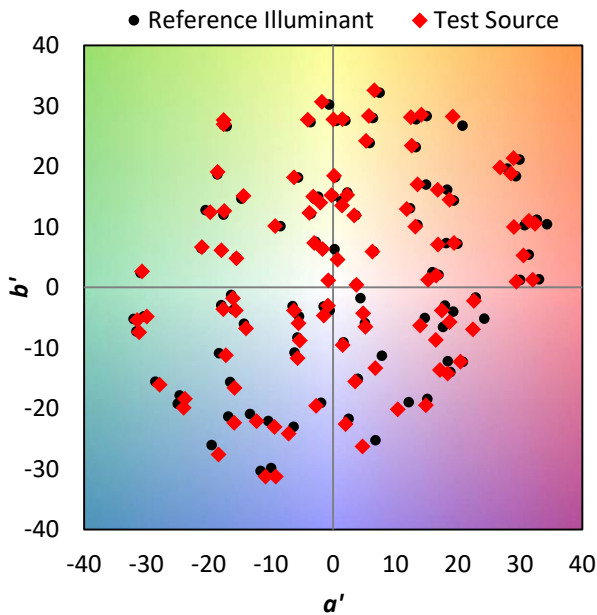
λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)
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365	277	0.0	495	4830	4.0	625	16799	0.0	755	1629	0.0	885	500	0.0
370	260	0.0	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  $R_a = 94.7$   
 $R_9 = 67.0$

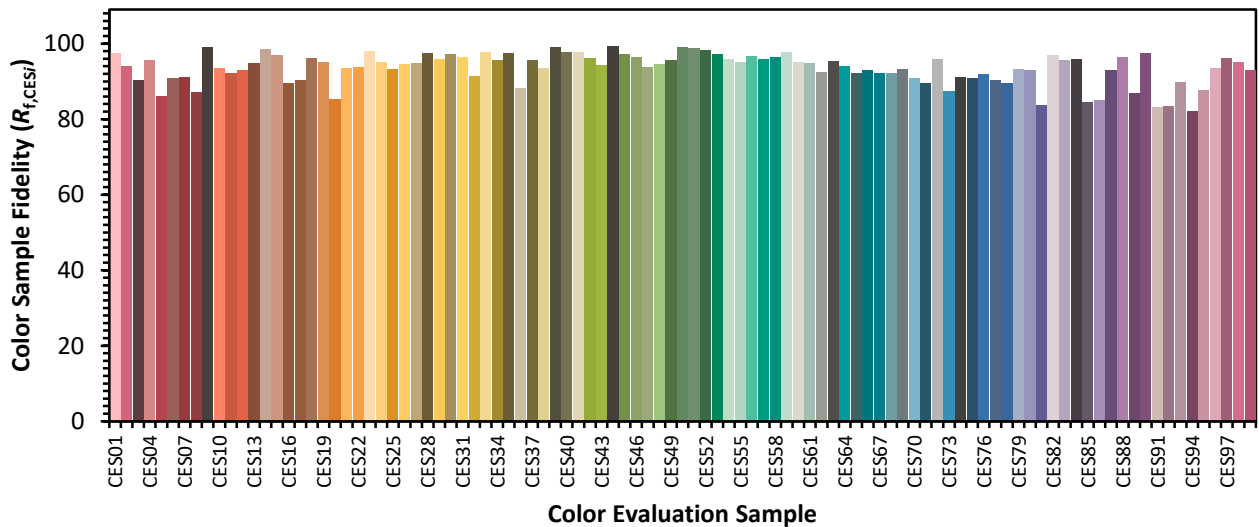


**Color Vector Graphics**

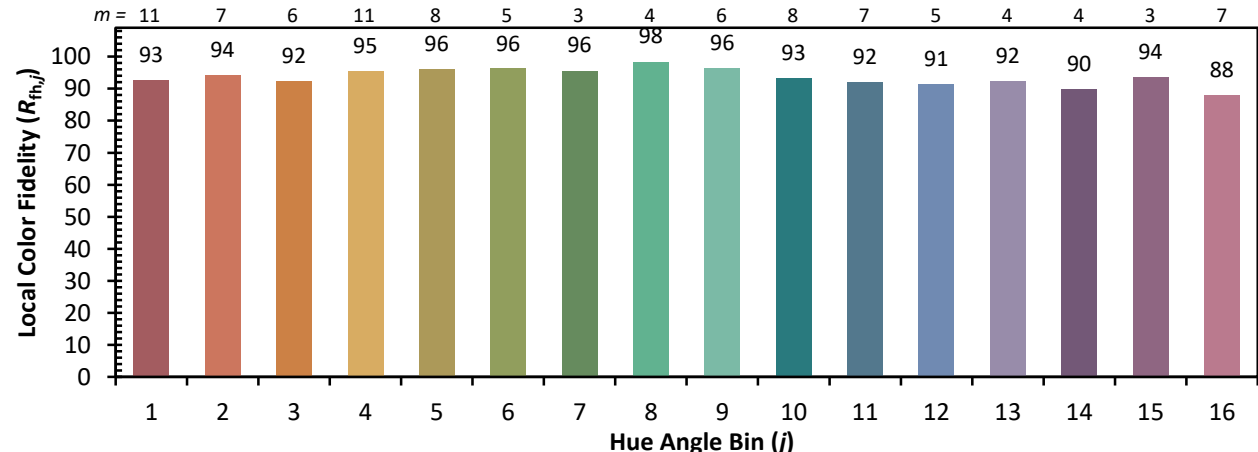
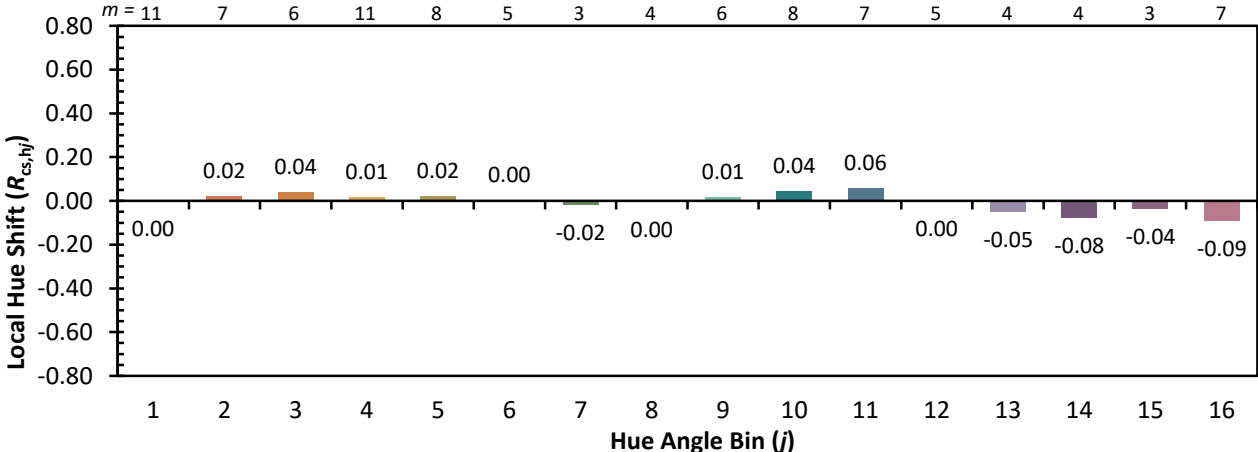
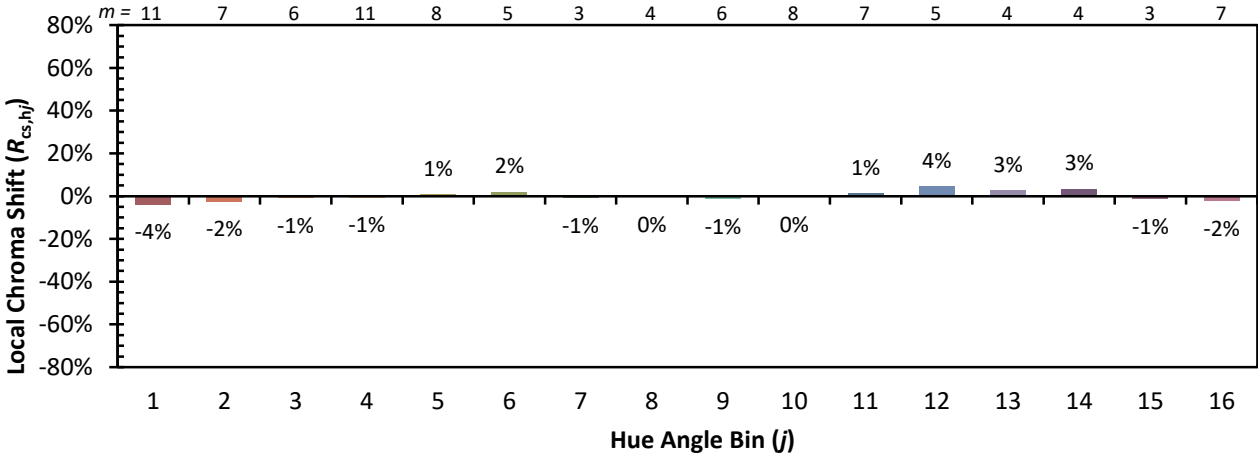


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

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	

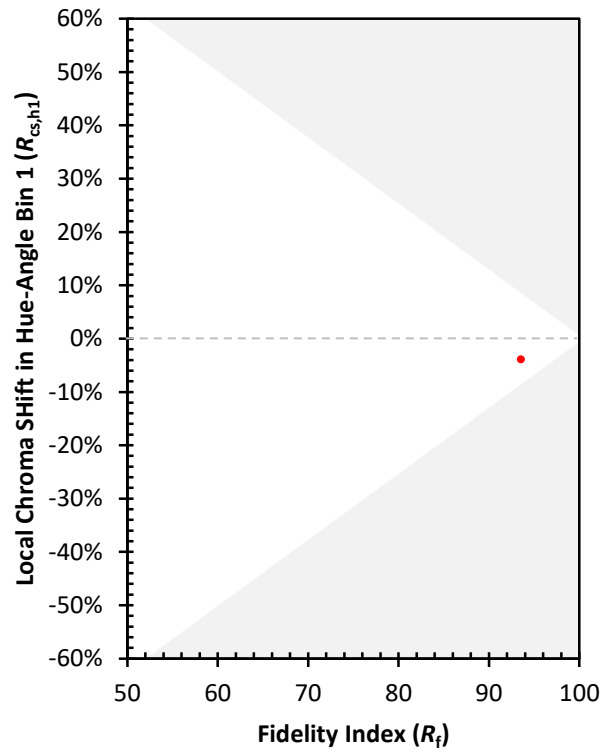
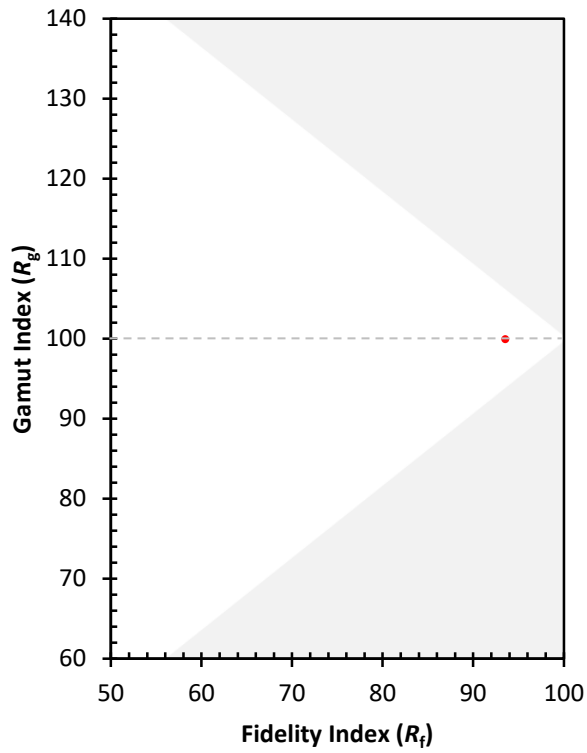


Color Rendition by Hue-Angle Bin





Measure Comparisons



(END OF REPORT)