

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: P895869

Luminaire Tested: **GRZ-05L-935-50x60-X-UNV-STD-1F**

Issue Date: 11/20/2024

**Test Information**

Test Method: LM-79-08  
Report Number: P895869  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 11/20/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: io LED  
Catalog Number: GRZ-05L-935-50x60-X-UNV-STD-1F  
Description: io LED 90CRI 3500K GRAZER 500 lumens per ft WITH 50 deg x 60 deg OPTIC  
Light Source: 3500K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

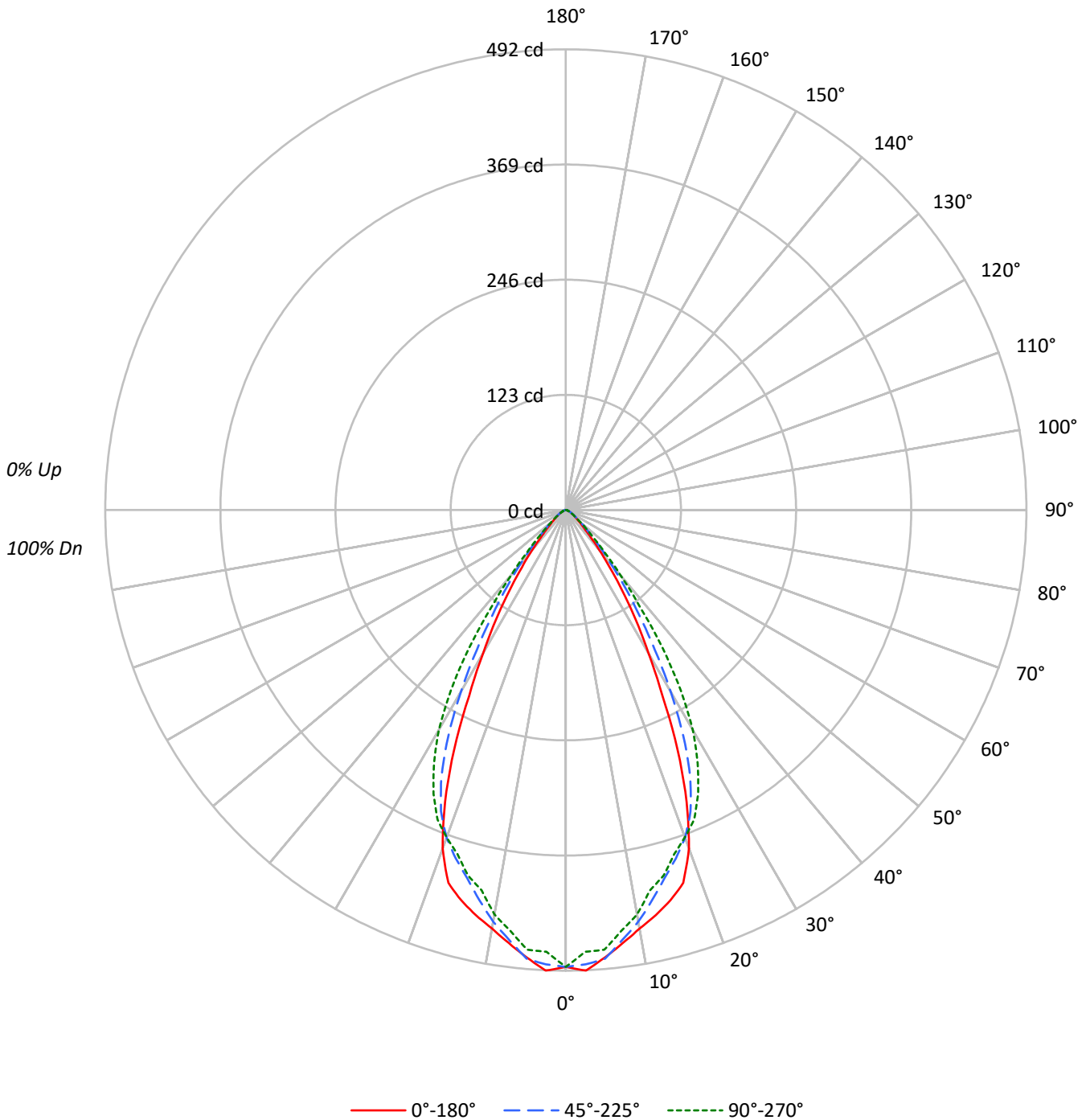
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 450.1 lumens  
Efficiency: N/A  
Efficacy: 84.9 lumens/watt  
Spacing Criteria (0/90/45): 0.87 / 0.95 / 0.87  
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: P895869  
CATALOG NUMBER: GRZ-05L-935-50x60-X-UNV-STD-1F

### Luminous Intensity Polar Plot





TEST NUMBER: P895869

CATALOG NUMBER: GRZ-05L-935-50x60-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	102	102	102	100
1	113	110	108	105	111	108	106	104	104	102	100	100	99	97	97	96	95	95	95	95	93
2	107	102	98	94	105	100	96	93	97	94	91	94	91	89	91	89	87	87	87	87	86
3	101	95	89	85	99	93	88	85	91	87	83	88	85	82	86	83	81	81	81	81	79
4	96	88	82	78	94	87	81	77	85	80	76	83	79	75	81	77	75	75	75	75	73
5	91	82	76	71	89	81	75	71	79	74	70	78	73	70	76	72	69	69	69	69	68
6	86	77	70	66	84	76	70	66	74	69	65	73	68	65	72	68	64	64	64	64	63
7	82	72	66	61	80	71	65	61	70	65	61	69	64	60	68	63	60	60	60	60	59
8	77	68	61	57	76	67	61	57	66	60	57	65	60	56	64	59	56	56	56	56	55
9	74	64	57	53	72	63	57	53	62	57	53	61	56	53	60	56	53	53	53	53	51
10	70	60	54	50	69	60	54	50	59	53	50	58	53	50	57	53	49	49	49	49	48

**AVERAGE LUMINANCE (cd/sqm):**

	0°	45°	90°
0°	31504	31504	31504
5°	31086	31171	30548
10°	29754	29269	28751
15°	28845	27207	27000
20°	26428	25589	25562
25°	20141	22414	23817
30°	13182	16701	20228
35°	8245	10697	14244
40°	4687	6339	7670
45°	2593	3634	3799
50°	1668	2110	2069
55°	1227	1430	1283
60°	904	1020	904
65°	733	794	672
70°	491	585	585
75°	324	424	424
80°	335	335	335
85°	296	296	296



TEST NUMBER: P895869  
 CATALOG NUMBER: GRZ-05L-935-50x60-X-UNV-STD-1F

**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	44.4	9.9
10°-20°	115.0	25.6
20°-30°	138.7	30.8
30°-40°	94.7	21.0
40°-50°	37.7	8.4
50°-60°	12.2	2.7
60°-70°	4.9	1.1
70°-80°	1.9	0.4
80°-90°	0.4	0.1
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°	298.2	66.3
0°-40°	392.9	87.3
0°-60°	442.9	98.4
0°-90°	450.1	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	450.1	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	488	488	488	488	488	
5°	480	479	481	473	471	45
15°	432	417	407	401	404	120
25°	283	281	315	325	334	127
35°	105	132	136	193	181	67
45°	28	55	40	54	42	24
55°	11	15	13	12	11	10
65°	5	5	5	5	4	5
75°	1	2	2	2	2	2
85°	0	0	0	0	0	0
90°	0	0	0	0	0	



TEST NUMBER: P895869

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**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°
0°	487.9	487.9	487.9	487.9	487.9
2.5°	492.3	487.5	485.7	483.6	472.2
5°	479.6	479.2	480.9	472.6	471.3
7.5°	466.5	464.3	463.0	457.3	453.4
10°	453.8	449.0	446.4	438.5	438.5
12.5°	443.3	435.4	426.7	418.8	415.8
15°	431.5	416.6	407.0	400.8	403.9
17.5°	417.5	394.3	390.3	382.0	385.1
20°	384.6	368.9	372.4	364.5	372.0
22.5°	337.4	328.6	348.3	346.6	358.0
25°	282.7	281.0	314.6	324.7	334.3
27.5°	223.6	232.8	271.8	299.3	305.0
30°	176.8	191.2	224.0	268.7	271.3
32.5°	138.7	159.3	176.8	232.8	228.9
35°	104.6	131.7	135.7	193.4	180.7
37.5°	77.0	110.7	103.3	152.3	130.0
40°	55.6	90.6	75.2	112.5	91.0
42.5°	39.4	72.2	54.7	81.4	61.7
45°	28.4	54.7	39.8	53.8	41.6
47.5°	21.4	40.2	28.9	35.4	29.3
50°	16.6	28.4	21.0	24.1	20.6
52.5°	13.6	20.6	16.2	17.1	15.3
55°	10.9	14.9	12.7	12.2	11.4
57.5°	8.7	11.4	10.1	9.6	9.2
60°	7.0	8.3	7.9	7.4	7.0
62.5°	5.7	6.6	6.6	5.7	5.7
65°	4.8	4.8	5.2	4.8	4.4
67.5°	3.5	3.9	3.9	3.5	3.5
70°	2.6	3.1	3.1	3.1	3.1
72.5°	2.2	2.2	2.6	2.2	2.2
75°	1.3	1.7	1.7	1.7	1.7
77.5°	0.9	1.3	1.3	1.3	1.3
80°	0.9	0.9	0.9	0.9	0.9
82.5°	0.4	0.4	0.9	0.4	0.4
85°	0.4	0.4	0.4	0.4	0.4
87.5°	0.0	0.0	0.0	0.0	0.0
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: SP1-2101-124-3

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

Test Date: 02/10/2021

**Test Information**

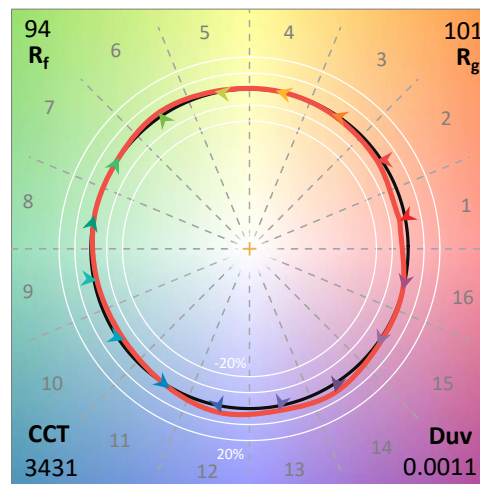
Test Method: LM-79-08  
 Report Number: SP1-2101-124-3  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry: 4π  
 Issue Date: 02/10/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: iO LED  
 Catalog Number: **GRZ-05L-935-10X10-X-UNV-STD-2F**  
 Description: IO LED Wall Grazer GRZ

**Spectral Parameters**

CCT (K):	3431	CRI (Ra):	94.0	R9:	69.9
CIE u':	0.2369	R1:	94.7	R10:	88.4
CIE v':	0.5141	R2:	95.5	R11:	95.7
Duv:	0.0011	R3:	95.0	R12:	83.2
CIE x:	0.4104	R4:	95.4	R13:	94.8
CIE y:	0.3958	R5:	94.1	R14:	96.6
CIE z:	0.1938	R6:	94.0		
Peak Wavelength (nm):	624	R7:	95.4		
Dominant Wavelength (nm):	580	R8:	88.3		
Purity:	42.2				
Rf:	93.6				
Rg:	100.6				

**Test Conditions**

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



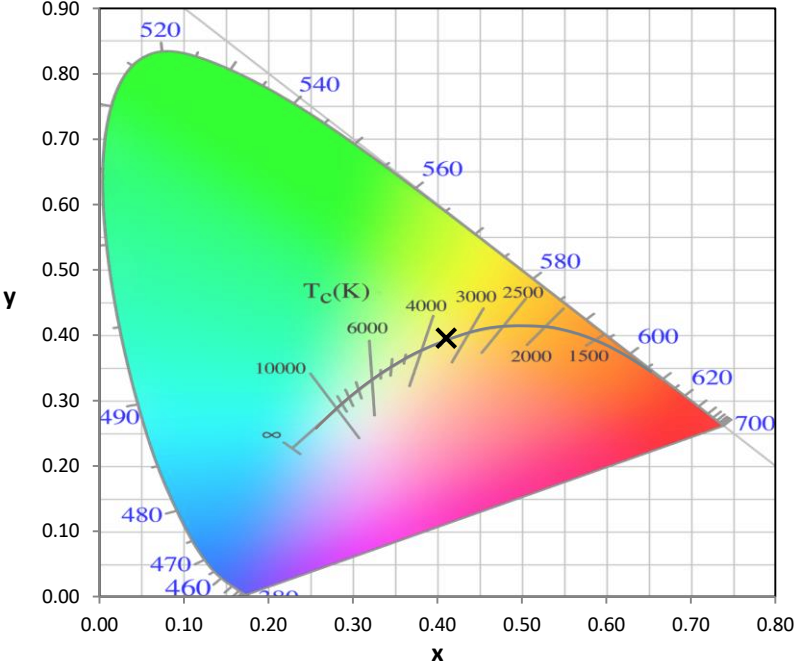


REPORT NUMBER: SP1-2101-124-3

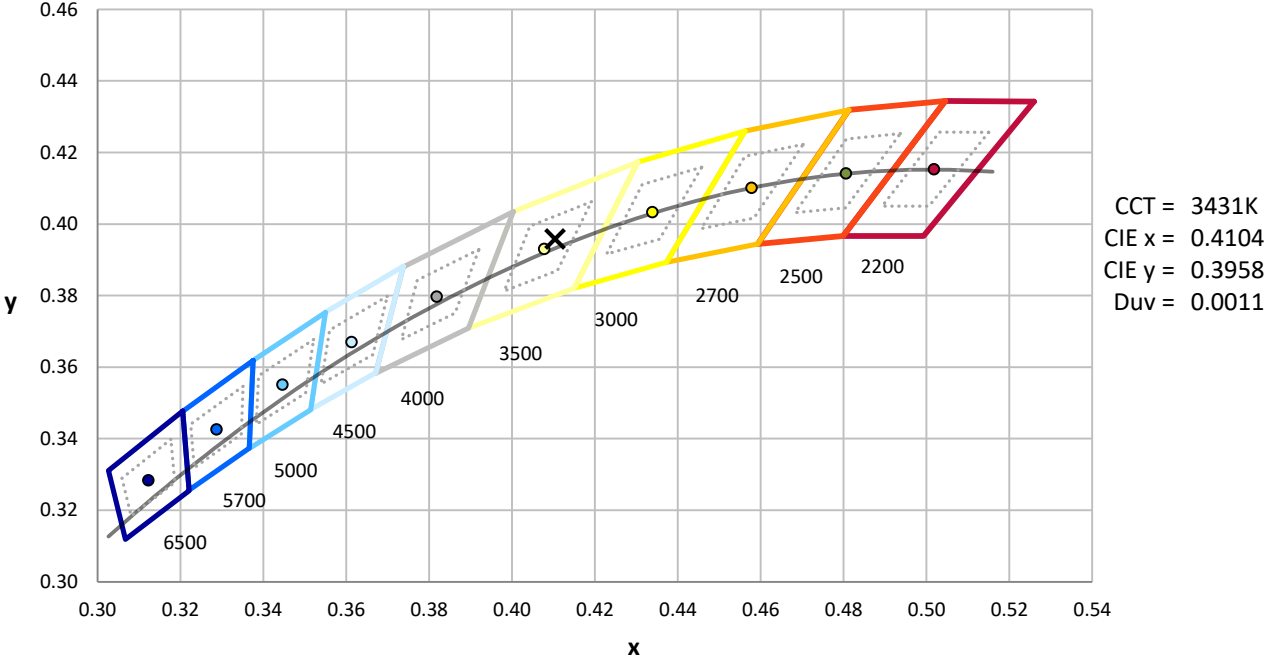
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	1/31/2021	7/31/2021
Power Meter	IN0071	12/1/2020	12/1/2021
AC Power Source	IN0063	12/1/2020	12/1/2021
DC Power Source	IN0208	12/1/2020	12/1/2021
Sphere Thermometer	IN0085	12/1/2020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

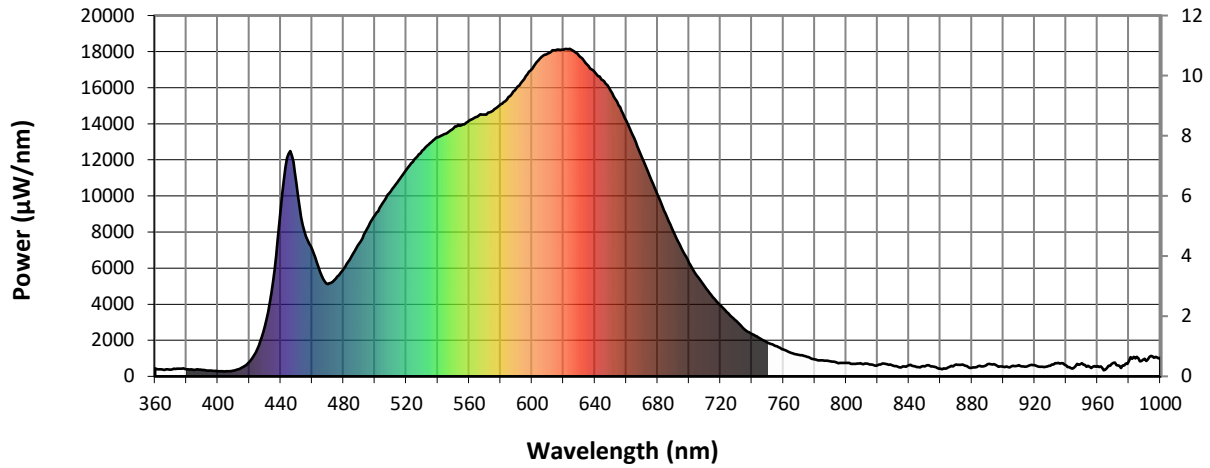


CCT = 3431K  
 CIE x = 0.4104  
 CIE y = 0.3958  
 Duv = 0.0011

Point lies inside the ANSI 3500K 4-step quadrangle

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**Photopic Flux vs. Wavelength**

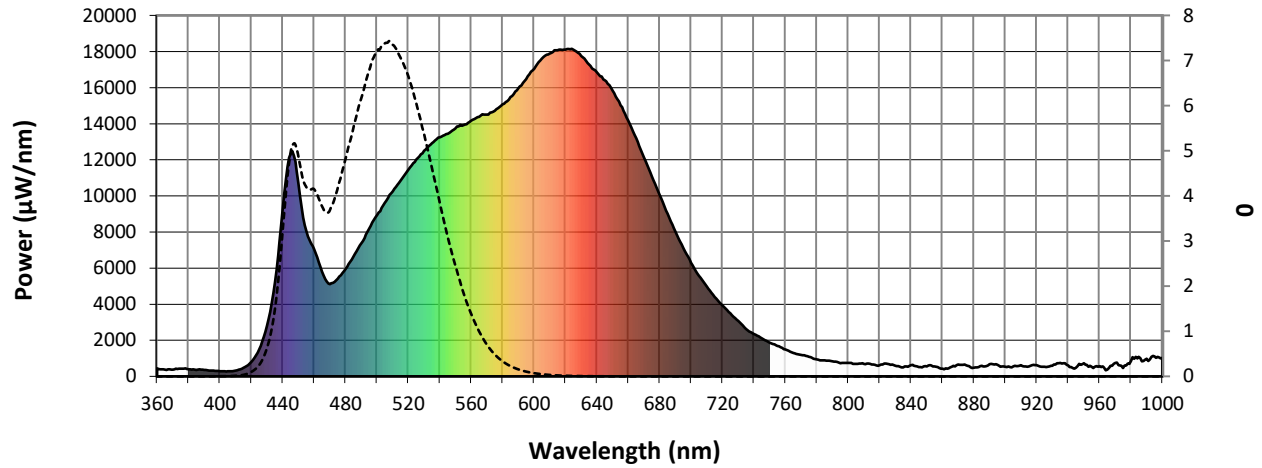


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λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)
360	436	0.0	490	7373	1.0	620	18112	4.7	750	1864	0.0	880	485	0.0
365	370	0.0	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**



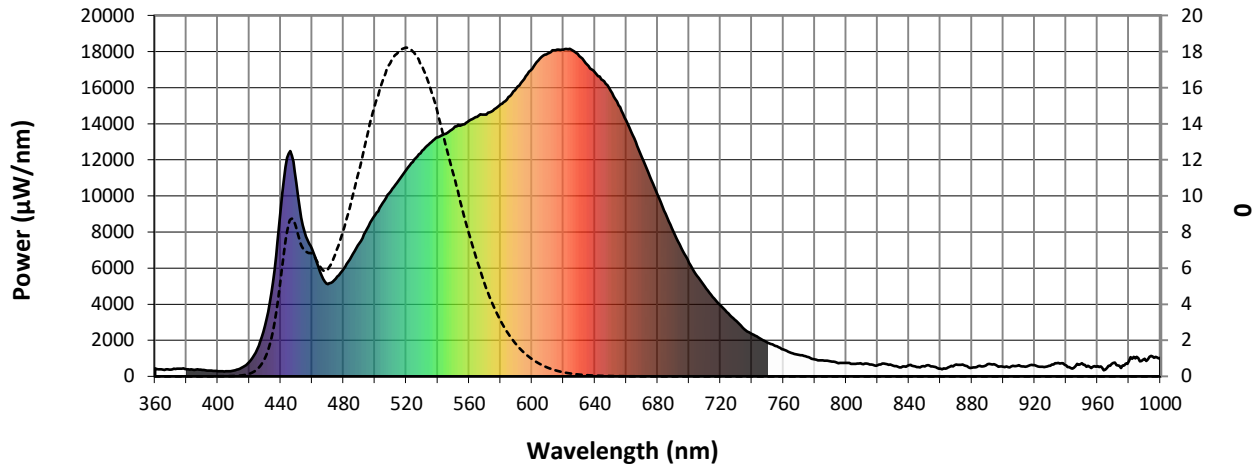
**Scotopic Lumens: 1600.8**

**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			

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**Melanopic Flux vs. Wavelength**



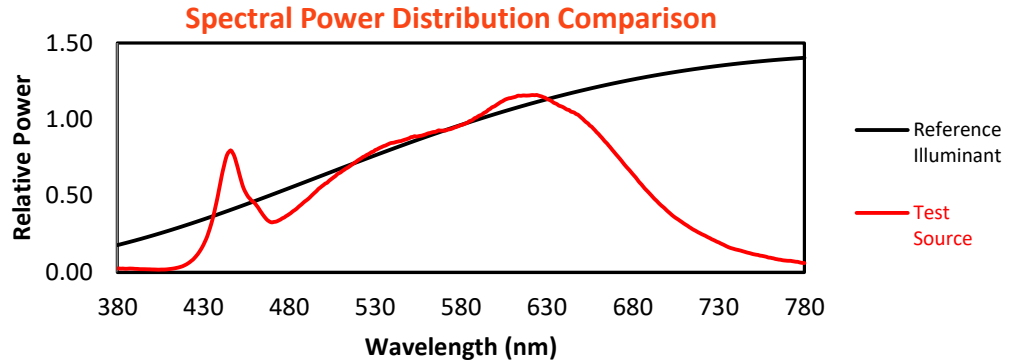
**Melanopic Lumens: 631**

**M/P: 0.63**

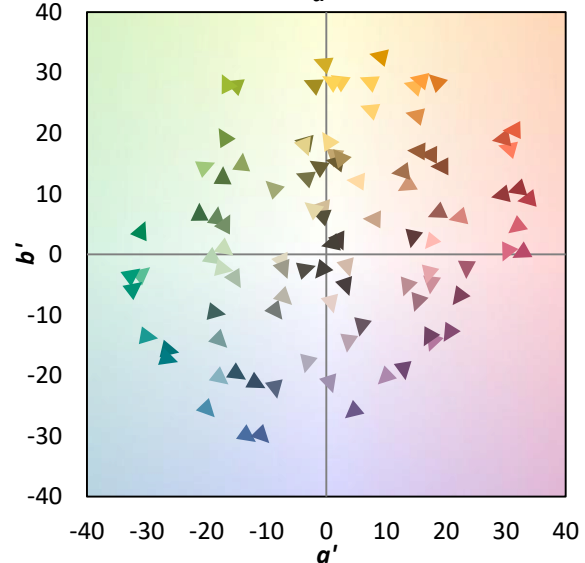
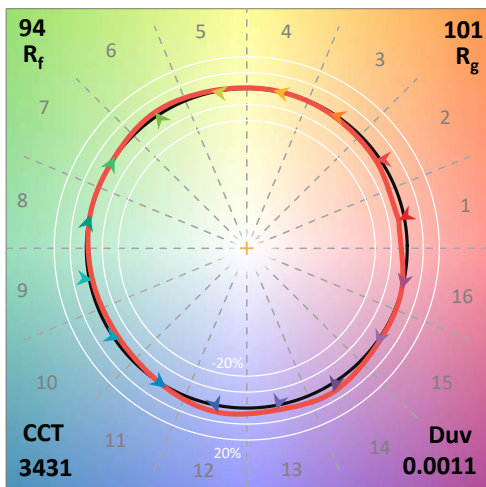
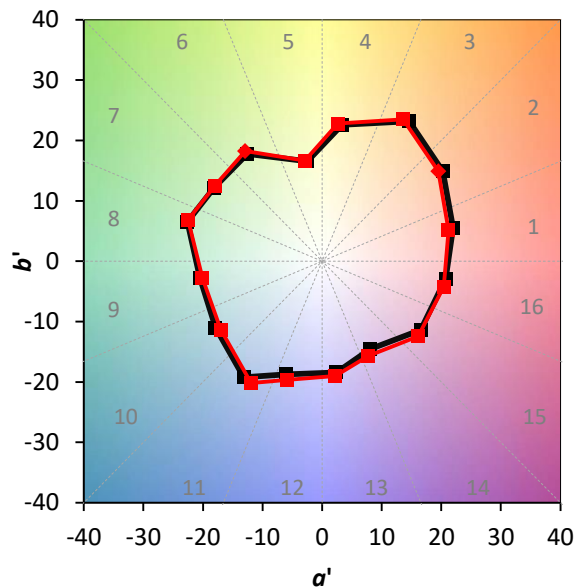
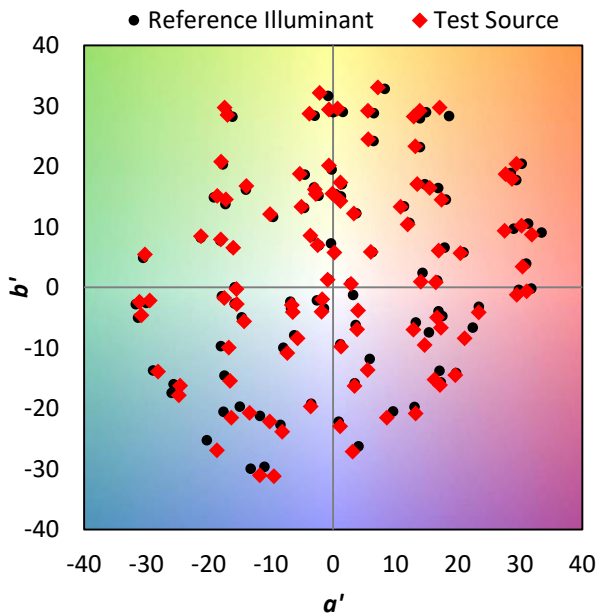
λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)
360	436	0.0	490	7373	6.1	620	18112	0.0	750	1864	0.0	880	485	0.0
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375	432	0.0	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  $R_a = 94.0$   
 $R_9 = 69.9$

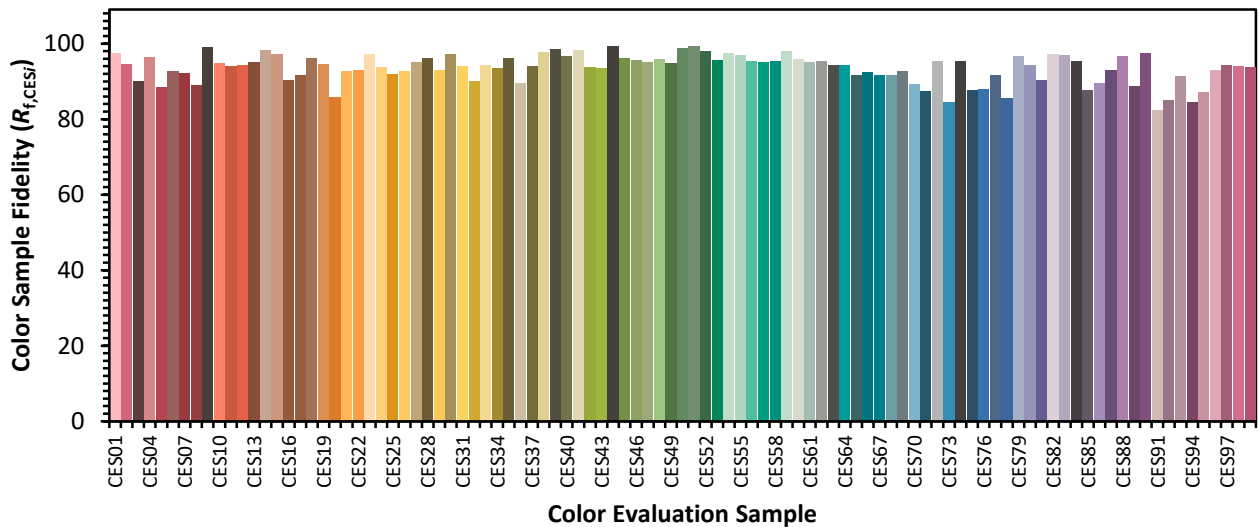


**Color Vector Graphics**

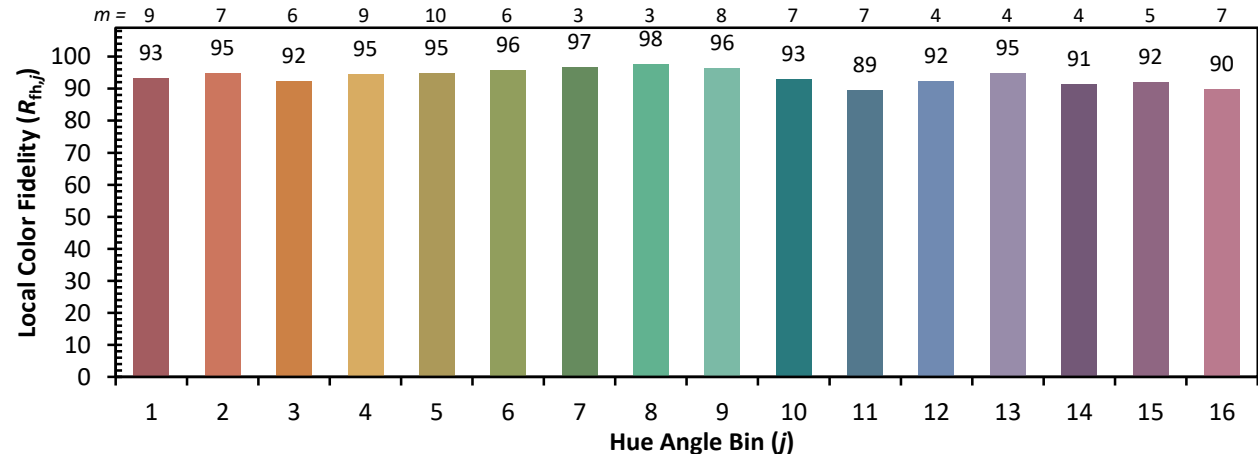
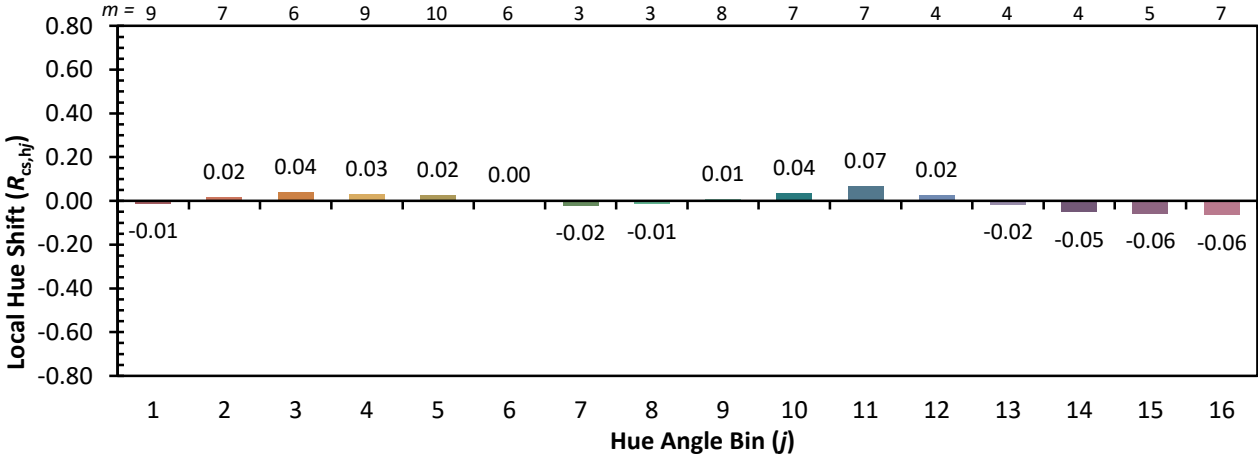
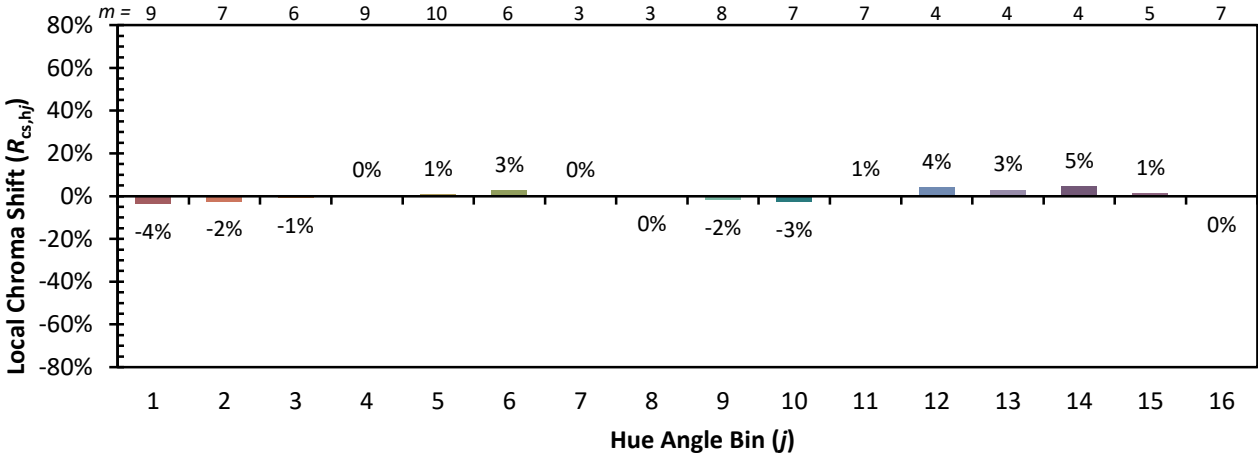


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

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	

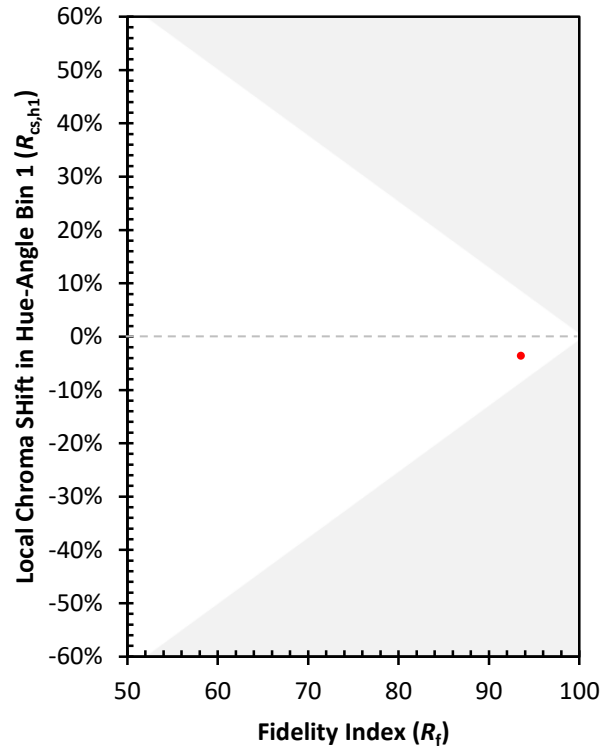
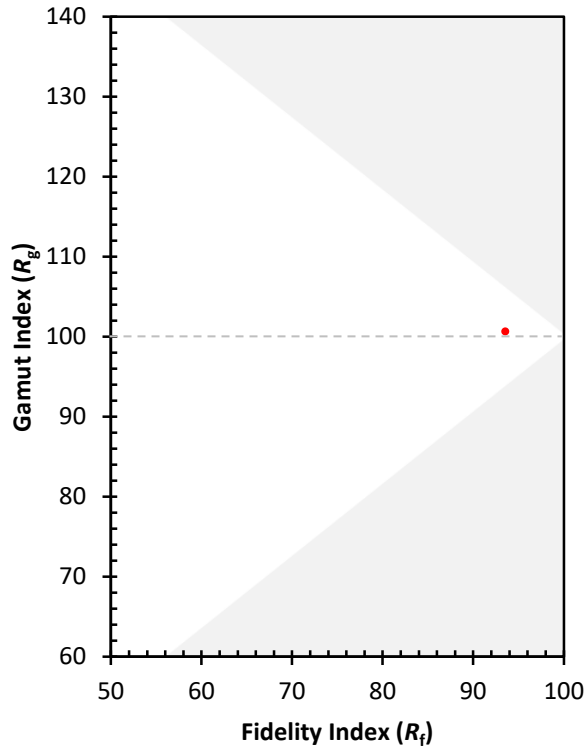


Color Rendition by Hue-Angle Bin





Measure Comparisons



(END OF REPORT)