

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: P895873

Luminaire Tested: **GRZ-10L-940-50x60-X-UNV-STD-1F**

Issue Date: 11/20/2024



Test Information

Test Method: LM-79-08
Report Number: P895873
Test Lab: INNOVATION CENTER(G3)
Issue Date: 11/20/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: io LED
Catalog Number: GRZ-10L-940-50x60-X-UNV-STD-1F
Description: io LED 90CRI 4000K GRAZER 1000 lumens per ft WITH 50 deg x 60 deg OPTIC
Light Source: 4000K CCT, 90 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

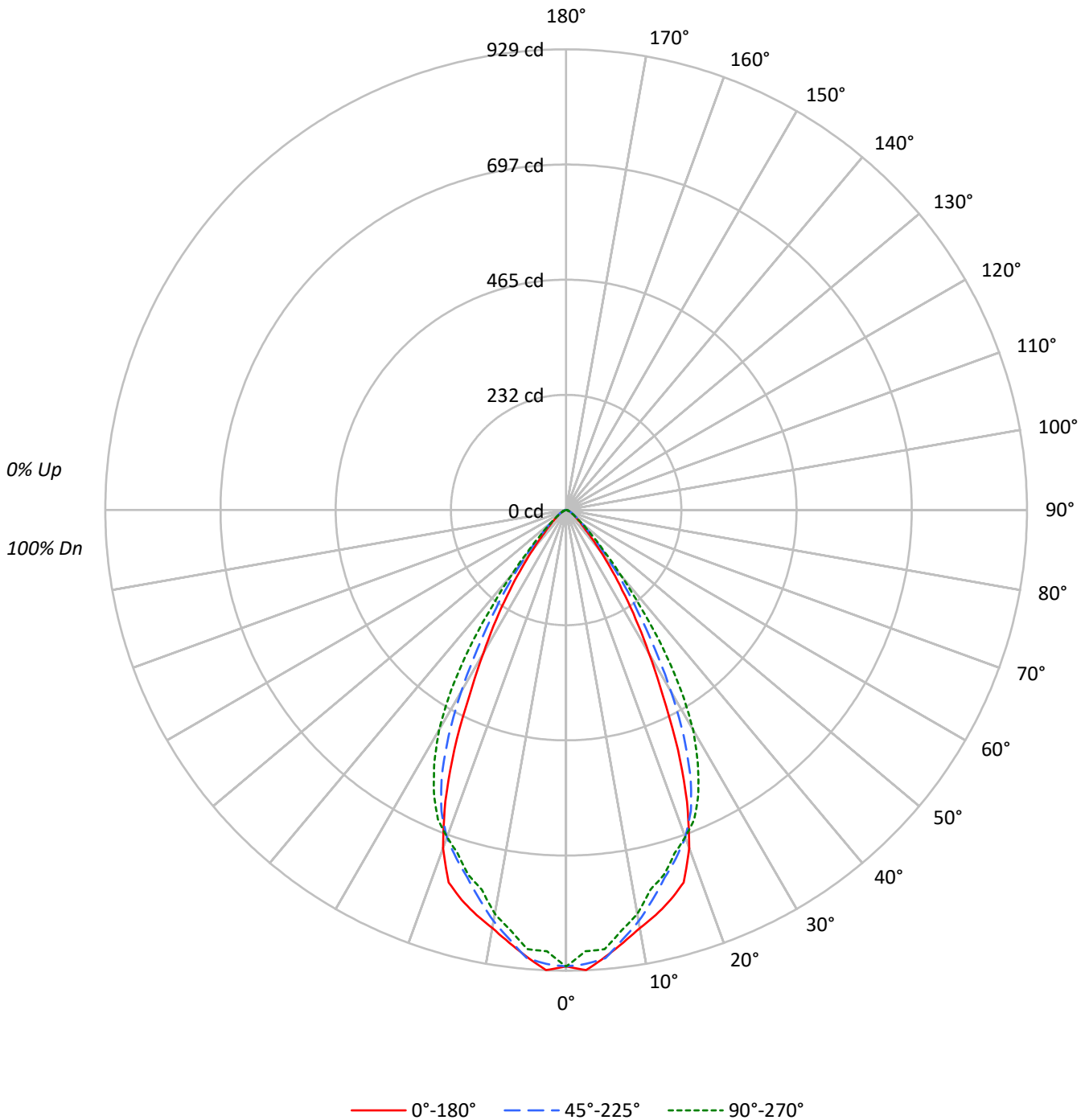
Summary

Lumens per Lamp: N/A
Luminaire Lumens: 849.0 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): 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: P895873
CATALOG NUMBER: GRZ-10L-940-50x60-X-UNV-STD-1F

Luminous Intensity Polar Plot





TEST NUMBER: P895873

CATALOG NUMBER: GRZ-10L-940-50x60-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	0
RCR																		
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	113	110	108	105	111	108	106	104	104	102	100	100	99	97	97	96	95	93
2	107	102	98	94	105	100	96	93	97	94	91	94	91	89	91	89	87	86
3	101	95	89	85	99	93	88	85	91	87	83	88	85	82	86	83	81	79
4	96	88	82	78	94	87	81	77	85	80	76	83	79	75	81	77	75	73
5	91	82	76	71	89	81	75	71	79	74	70	78	73	70	76	72	69	68
6	86	77	70	66	84	76	70	66	74	69	65	73	68	65	72	68	64	63
7	82	72	66	61	80	71	65	61	70	65	61	69	64	60	67	63	60	59
8	77	67	61	57	76	67	61	57	66	60	57	65	60	56	64	59	56	55
9	74	64	57	53	72	63	57	53	62	57	53	61	56	53	60	56	53	51
10	70	60	54	50	69	60	54	50	59	53	50	58	53	50	57	53	49	48

AVERAGE LUMINANCE (cd/sqm):

	0°	45°	90°
0°	59431	59431	59431
5°	58640	58802	57623
10°	56125	55207	54230
15°	54408	51320	50925
20°	49852	48265	48210
25°	37995	42284	44928
30°	24866	31509	38160
35°	15552	20172	26872
40°	8834	11961	14473
45°	4895	6858	7159
50°	3154	3978	3898
55°	2319	2691	2420
60°	1705	1924	1705
65°	1390	1513	1268
70°	944	1095	1095
75°	624	823	823
80°	632	632	632
85°	593	593	593



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	83.8	9.9
10°-20°	217.0	25.6
20°-30°	261.7	30.8
30°-40°	178.6	21.0
40°-50°	71.2	8.4
50°-60°	23.1	2.7
60°-70°	9.3	1.1
70°-80°	3.6	0.4
80°-90°	0.7	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°	562.5	66.2
0°-40°	741.1	87.3
0°-60°	835.4	98.4
0°-90°	849.0	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	849.0	100.0

CANDELA DISTRIBUTION:

	0°	22.5°	45°	67.5°	90°	Flux
0°	920	920	920	920	920	
5°	905	904	907	892	889	85
15°	814	786	768	756	762	227
25°	533	530	594	612	631	240
35°	197	248	256	365	341	126
45°	54	103	75	102	78	45
55°	21	28	24	23	22	19
65°	9	9	10	9	8	9
75°	2	3	3	3	3	3
85°	1	1	1	1	1	1
90°	0	0	0	0	0	



TEST NUMBER: P895873

CATALOG NUMBER: GRZ-10L-940-50x60-X-UNV-STD-1F

CANDELA DISTRIBUTION (FULL):

	0°	22.5°	45°	67.5°	90°
0°	920.4	920.4	920.4	920.4	920.4
2.5°	928.6	919.5	916.2	912.1	890.7
5°	904.7	903.9	907.2	891.5	889.0
7.5°	879.9	875.8	873.3	862.6	855.2
10°	856.0	846.9	842.0	827.1	827.1
12.5°	836.2	821.3	804.8	790.0	784.2
15°	813.9	785.9	767.7	756.1	761.8
17.5°	787.5	743.7	736.3	720.6	726.3
20°	725.5	695.8	702.4	687.6	701.6
22.5°	636.4	619.9	657.0	653.7	675.2
25°	533.3	530.0	593.5	612.5	630.6
27.5°	421.8	439.1	512.6	564.6	575.3
30°	333.5	360.7	422.6	506.8	511.8
32.5°	261.7	300.5	333.5	439.1	431.7
35°	197.3	248.5	255.9	364.8	340.9
37.5°	145.2	208.9	194.8	287.3	245.2
40°	104.8	170.9	141.9	212.2	171.7
42.5°	74.3	136.2	103.1	153.6	116.4
45°	53.6	103.1	75.1	101.5	78.4
47.5°	40.4	75.9	54.5	66.8	55.3
50°	31.4	53.6	39.6	45.4	38.8
52.5°	25.6	38.8	30.5	32.2	28.9
55°	20.6	28.1	23.9	23.1	21.5
57.5°	16.5	21.5	19.0	18.2	17.3
60°	13.2	15.7	14.9	14.0	13.2
62.5°	10.7	12.4	12.4	10.7	10.7
65°	9.1	9.1	9.9	9.1	8.3
67.5°	6.6	7.4	7.4	6.6	6.6
70°	5.0	5.8	5.8	5.8	5.8
72.5°	4.1	4.1	5.0	4.1	4.1
75°	2.5	3.3	3.3	3.3	3.3
77.5°	1.7	2.5	2.5	2.5	2.5
80°	1.7	1.7	1.7	1.7	1.7
82.5°	0.8	0.8	1.7	0.8	0.8
85°	0.8	0.8	0.8	0.8	0.8
87.5°	0.0	0.0	0.0	0.0	0.0
90°	0.0	0.0	0.0	0.0	0.0

Cooper Lighting Solutions Photometric Lab
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Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

iO LED

Report Number: SP1-2101-124-4

Luminaire Tested: GRZ-05L-940-10X10-X-UNV-STD-2F

Test Date: 02/11/2021

Test Information

Test Method: LM-79-08
 Report Number: SP1-2101-124-4
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1
 Measurement Geometry: 4π
 Issue Date: 02/11/2021
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
 Product Line: iO LED
 Catalog Number: **GRZ-05L-940-10X10-X-UNV-STD-2F**
 Description: IO LED Wall Grazer GRZ

Spectral Parameters

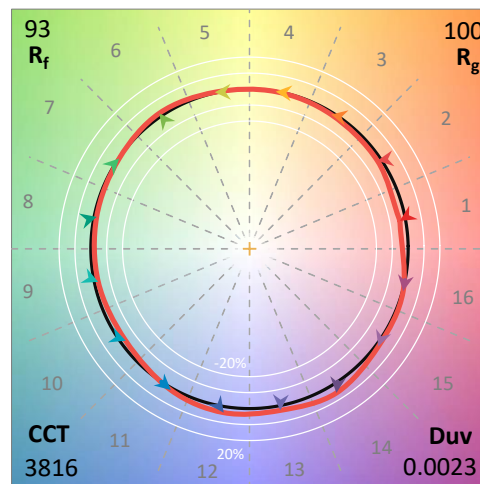
CCT (K): 3816
 CIE u': 0.2273
 CIE v': 0.5079
 Duv: 0.0023
 CIE x: 0.3907
 CIE y: 0.3879
 CIE z: 0.2214
 Peak Wavelength (nm): 614
 Dominant Wavelength (nm): 578
 Purity: 33.8

 Rf: 93.1
 Rg: 100.2

CRI (Ra):	93.3		
R1:	93.7	R9:	69.2
R2:	94.3	R10:	85.8
R3:	93.9	R11:	94.6
R4:	94.7	R12:	78.9
R5:	92.9	R13:	93.7
R6:	92.1	R14:	96.1
R7:	95.7		
R8:	88.8		

Test Conditions

Stabilization Time: 162M
 Operation Time: 12H
 Room Temperature (°C) / RH%: 25.1/41%
 Sphere Temperature (°C): 24.1

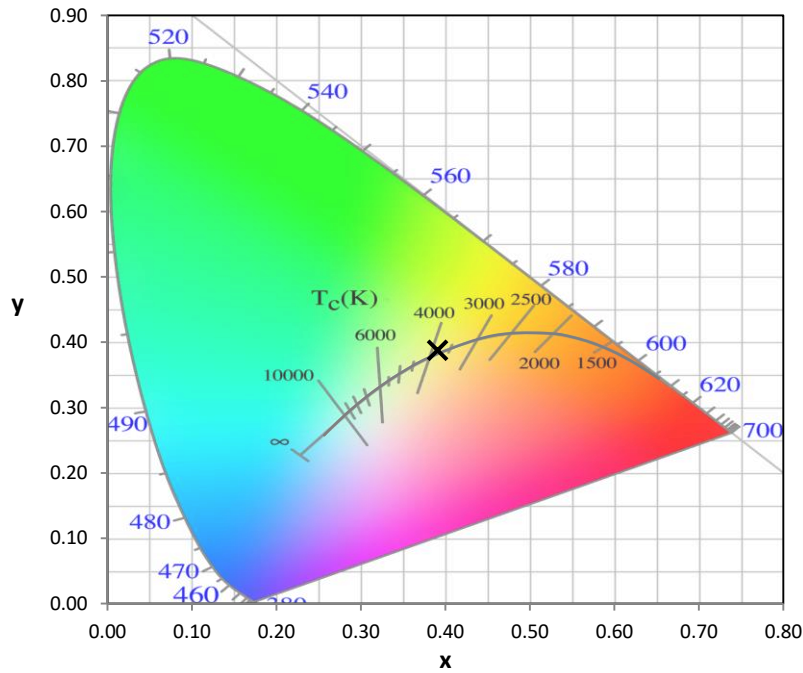


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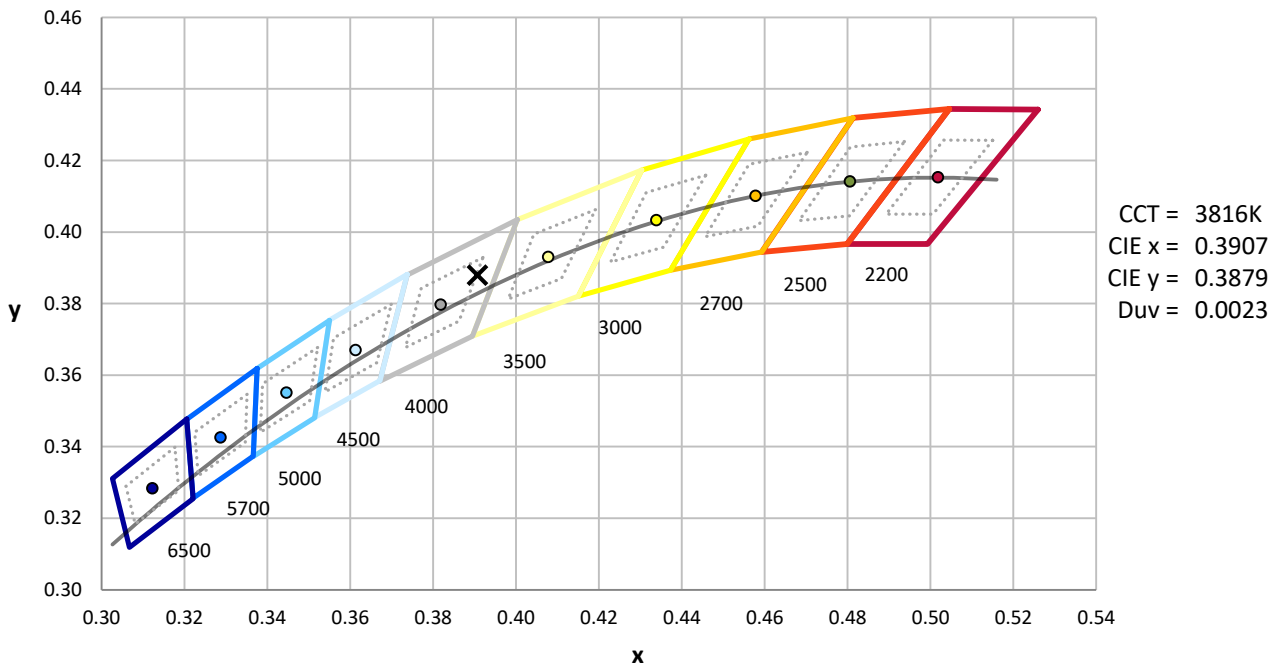
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	1/31/2021	7/31/2021
Power Meter	IN0071	12/1/2020	12/1/2021
AC Power Source	IN0063	12/1/2020	12/1/2021
DC Power Source	IN0208	12/1/2020	12/1/2021
Sphere Thermometer	IN0085	12/1/2020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

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CIE 1931 Chromaticity Diagram



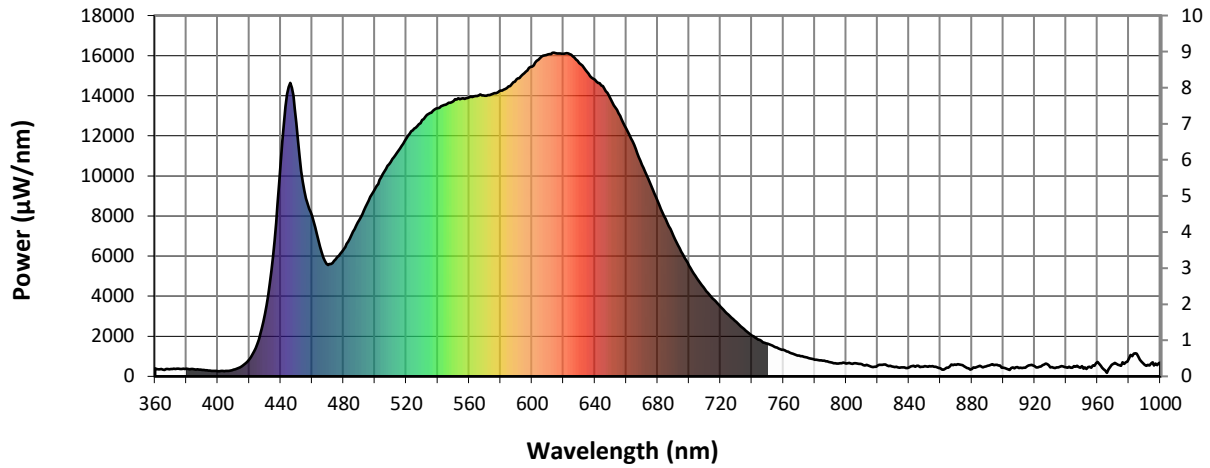
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 4000K 7-step quadrangle

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Photopic Flux vs. Wavelength

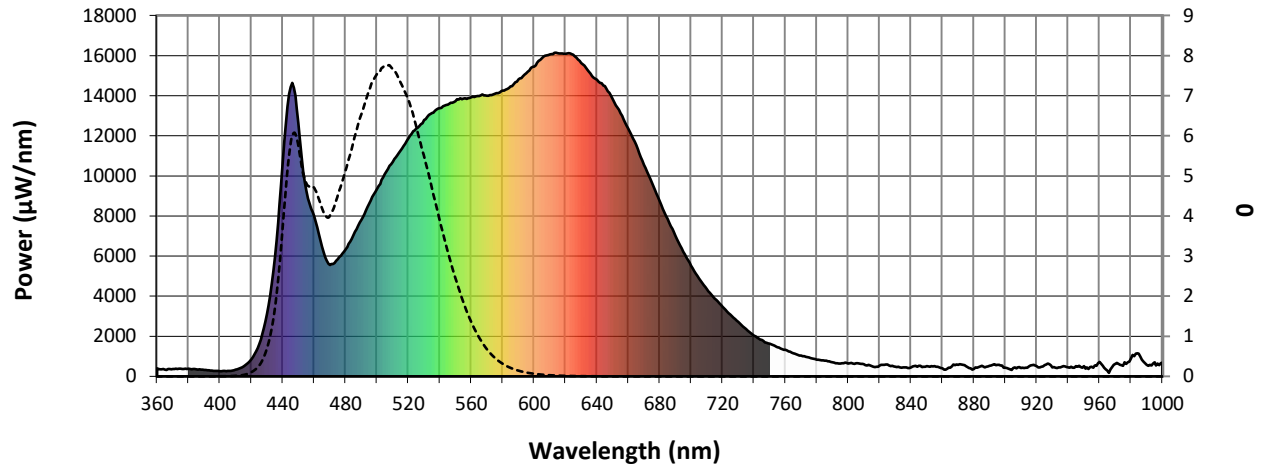


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λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)
360	405	0.0	490	7814	1.1	620	16090	4.2	750	1625	0.0	880	367	0.0
365	335	0.0	495	8606	1.6	625	16048	3.5	755	1453	0.0	885	533	0.0
370	363	0.0	500	9360	2.1	630	15632	2.8	760	1318	0.0	890	535	0.0
375	388	0.0	505	10093	2.8	635	15196	2.3	765	1153	0.0	895	583	0.0
380	378	0.0	510	10690	3.7	640	14791	1.8	770	1033	0.0	900	438	0.0
385	344	0.0	515	11247	4.7	645	14481	1.4	775	948	0.0	905	410	0.0
390	323	0.0	520	11881	5.8	650	13840	1.0	780	831	0.0	910	413	0.0
395	292	0.0	525	12359	6.6	655	13125	0.8	785	778	0.0	915	489	0.0
400	261	0.0	530	12780	7.5	660	12353	0.5	790	708	0.0	920	518	0.0
405	272	0.0	535	13137	8.1	665	11536	0.4	795	643	0.0	925	563	0.0
410	331	0.0	540	13369	8.7	670	10559	0.2	800	645	0.0	930	452	0.0
415	497	0.0	545	13551	9.0	675	9658	0.2	805	648	0.0	935	454	0.0
420	847	0.0	550	13731	9.3	680	8746	0.1	810	610	0.0	940	446	0.0
425	1620	0.0	555	13860	9.5	685	7852	0.1	815	505	0.0	945	516	0.0
430	3114	0.0	560	13921	9.5	690	7031	0.0	820	544	0.0	950	514	0.0
435	5958	0.1	565	13987	9.3	695	6210	0.0	825	591	0.0	955	487	0.0
440	10649	0.2	570	14001	9.1	700	5517	0.0	830	484	0.0	960	723	0.0
445	14435	0.3	575	14097	8.8	705	4890	0.0	835	440	0.0	965	281	0.0
450	12623	0.3	580	14256	8.5	710	4342	0.0	840	452	0.0	970	627	0.0
455	9257	0.3	585	14467	8.0	715	3886	0.0	845	527	0.0	975	532	0.0
460	8011	0.3	590	14814	7.7	720	3470	0.0	850	515	0.0	980	902	0.0
465	6473	0.3	595	15120	7.2	725	3080	0.0	855	517	0.0	985	1126	0.0
470	5561	0.3	600	15449	6.7	730	2713	0.0	860	406	0.0	990	578	0.0
475	5845	0.5	605	15859	6.1	735	2357	0.0	865	434	0.0	995	699	0.0
480	6344	0.6	610	16059	5.5	740	2032	0.0	870	578	0.0	1000	687	0.0
485	7040	0.8	615	16120	4.9	745	1812	0.0	875	517	0.0			

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Scotopic Flux vs. Wavelength



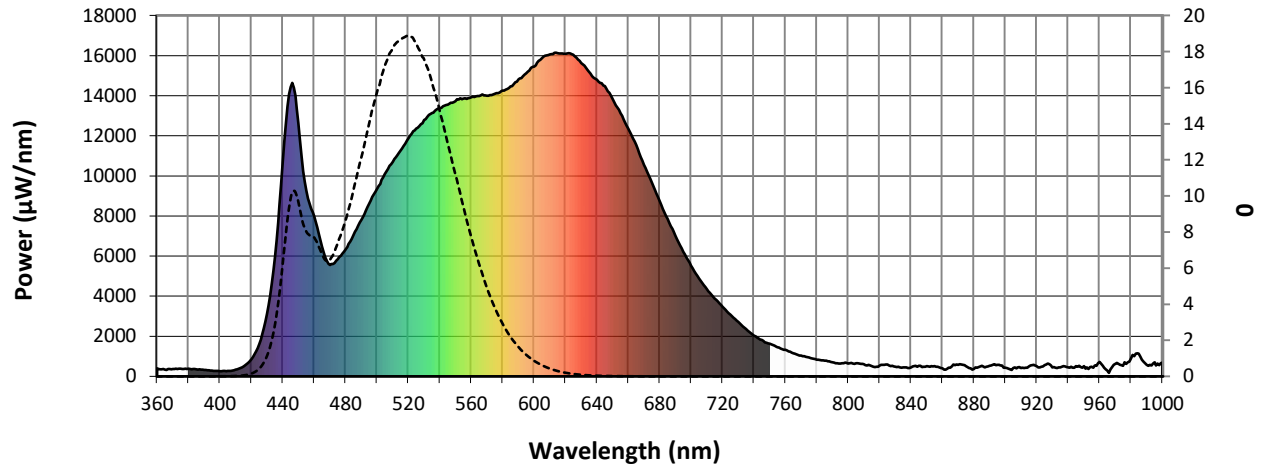
Scotopic Lumens: 1669.3

S/P: 1.71

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	405	0.0	490	7814	12.0	620	16090	0.2	750	1625	0.0	880	367	0.0
365	335	0.0	495	8606	13.9	625	16048	0.1	755	1453	0.0	885	533	0.0
370	363	0.0	500	9360	15.7	630	15632	0.1	760	1318	0.0	890	535	0.0
375	388	0.0	505	10093	17.2	635	15196	0.1	765	1153	0.0	895	583	0.0
380	378	0.0	510	10690	18.1	640	14791	0.0	770	1033	0.0	900	438	0.0
385	344	0.0	515	11247	18.6	645	14481	0.0	775	948	0.0	905	410	0.0
390	323	0.0	520	11881	18.9	650	13840	0.0	780	831	0.0	910	413	0.0
395	292	0.0	525	12359	18.5	655	13125	0.0	785	778	0.0	915	489	0.0
400	261	0.0	530	12780	17.6	660	12353	0.0	790	708	0.0	920	518	0.0
405	272	0.0	535	13137	16.4	665	11536	0.0	795	643	0.0	925	563	0.0
410	331	0.0	540	13369	14.8	670	10559	0.0	800	645	0.0	930	452	0.0
415	497	0.1	545	13551	13.0	675	9658	0.0	805	648	0.0	935	454	0.0
420	847	0.1	550	13731	11.2	680	8746	0.0	810	610	0.0	940	446	0.0
425	1620	0.4	555	13860	9.5	685	7852	0.0	815	505	0.0	945	516	0.0
430	3114	1.1	560	13921	7.8	690	7031	0.0	820	544	0.0	950	514	0.0
435	5958	2.7	565	13987	6.3	695	6210	0.0	825	591	0.0	955	487	0.0
440	10649	6.0	570	14001	4.9	700	5517	0.0	830	484	0.0	960	723	0.0
445	14435	9.7	575	14097	3.8	705	4890	0.0	835	440	0.0	965	281	0.0
450	12623	9.8	580	14256	2.9	710	4342	0.0	840	452	0.0	970	627	0.0
455	9257	8.1	585	14467	2.2	715	3886	0.0	845	527	0.0	975	532	0.0
460	8011	7.7	590	14814	1.6	720	3470	0.0	850	515	0.0	980	902	0.0
465	6473	6.8	595	15120	1.2	725	3080	0.0	855	517	0.0	985	1126	0.0
470	5561	6.4	600	15449	0.9	730	2713	0.0	860	406	0.0	990	578	0.0
475	5845	7.3	605	15859	0.6	735	2357	0.0	865	434	0.0	995	699	0.0
480	6344	8.6	610	16059	0.4	740	2032	0.0	870	578	0.0	1000	687	0.0
485	7040	10.2	615	16120	0.3	745	1812	0.0	875	517	0.0			

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Melanopic Flux vs. Wavelength



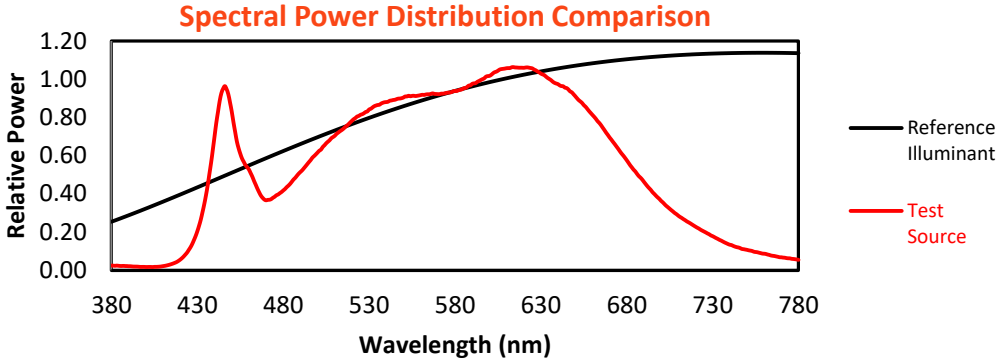
Melanopic Lumens: 670.2

M/P: 0.69

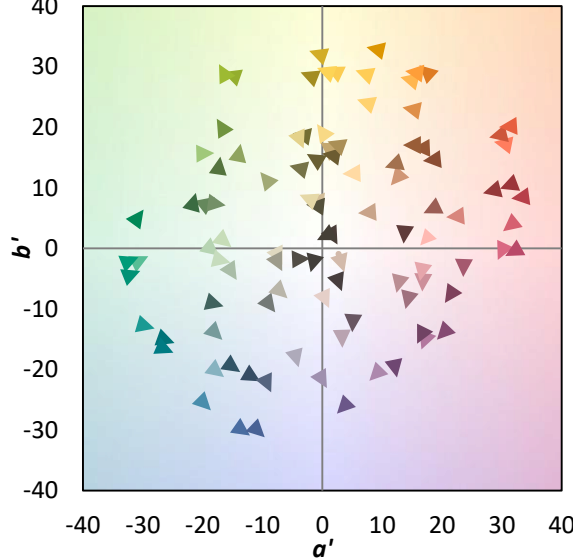
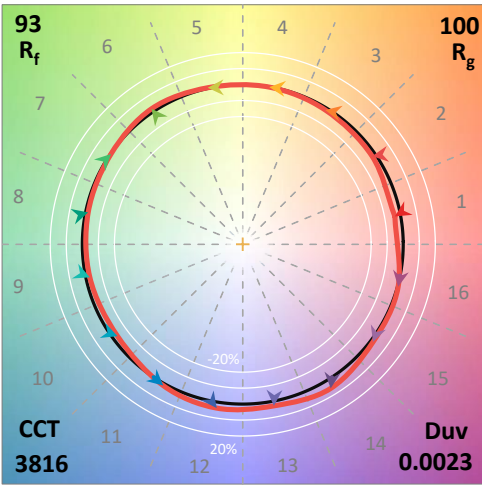
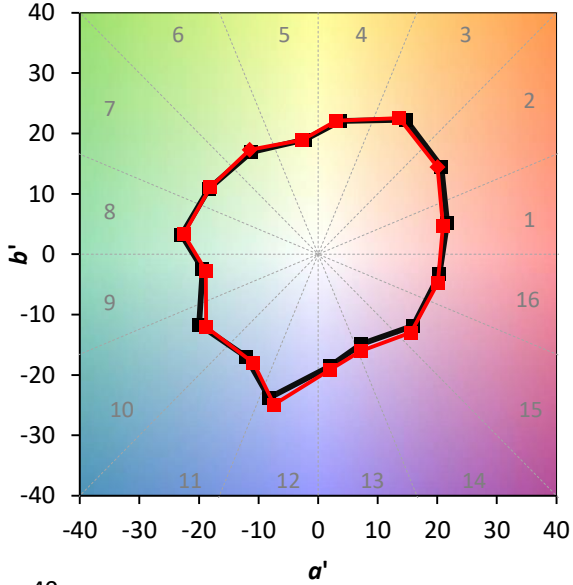
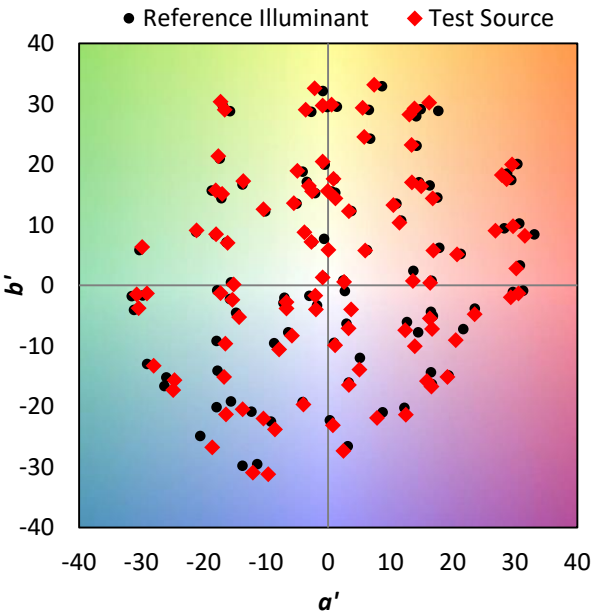
λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)
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365	335	0.0	495	8606	7.1	625	16048	0.0	755	1453	0.0	885	533	0.0
370	363	0.0	500	9360	7.5	630	15632	0.0	760	1318	0.0	890	535	0.0
375	388	0.0	505	10093	7.7	635	15196	0.0	765	1153	0.0	895	583	0.0
380	378	0.0	510	10690	7.7	640	14791	0.0	770	1033	0.0	900	438	0.0
385	344	0.0	515	11247	7.3	645	14481	0.0	775	948	0.0	905	410	0.0
390	323	0.0	520	11881	6.9	650	13840	0.0	780	831	0.0	910	413	0.0
395	292	0.0	525	12359	6.3	655	13125	0.0	785	778	0.0	915	489	0.0
400	261	0.0	530	12780	5.5	660	12353	0.0	790	708	0.0	920	518	0.0
405	272	0.0	535	13137	4.7	665	11536	0.0	795	643	0.0	925	563	0.0
410	331	0.0	540	13369	3.9	670	10559	0.0	800	645	0.0	930	452	0.0
415	497	0.0	545	13551	3.1	675	9658	0.0	805	648	0.0	935	454	0.0
420	847	0.1	550	13731	2.5	680	8746	0.0	810	610	0.0	940	446	0.0
425	1620	0.3	555	13860	1.9	685	7852	0.0	815	505	0.0	945	516	0.0
430	3114	0.7	560	13921	1.4	690	7031	0.0	820	544	0.0	950	514	0.0
435	5958	1.6	565	13987	1.0	695	6210	0.0	825	591	0.0	955	487	0.0
440	10649	3.6	570	14001	0.7	700	5517	0.0	830	484	0.0	960	723	0.0
445	14435	5.7	575	14097	0.5	705	4890	0.0	835	440	0.0	965	281	0.0
450	12623	5.8	580	14256	0.3	710	4342	0.0	840	452	0.0	970	627	0.0
455	9257	4.9	585	14467	0.2	715	3886	0.0	845	527	0.0	975	532	0.0
460	8011	4.7	590	14814	0.1	720	3470	0.0	850	515	0.0	980	902	0.0
465	6473	4.2	595	15120	0.1	725	3080	0.0	855	517	0.0	985	1126	0.0
470	5561	4.0	600	15449	0.1	730	2713	0.0	860	406	0.0	990	578	0.0
475	5845	4.5	605	15859	0.0	735	2357	0.0	865	434	0.0	995	699	0.0
480	6344	5.1	610	16059	0.0	740	2032	0.0	870	578	0.0	1000	687	0.0
485	7040	5.8	615	16120	0.0	745	1812	0.0	875	517	0.0			

Summary

$R_f = 93.1$
 $R_g = 100.2$
 CIE $R_a = 93.3$
 $R_9 = 69.2$

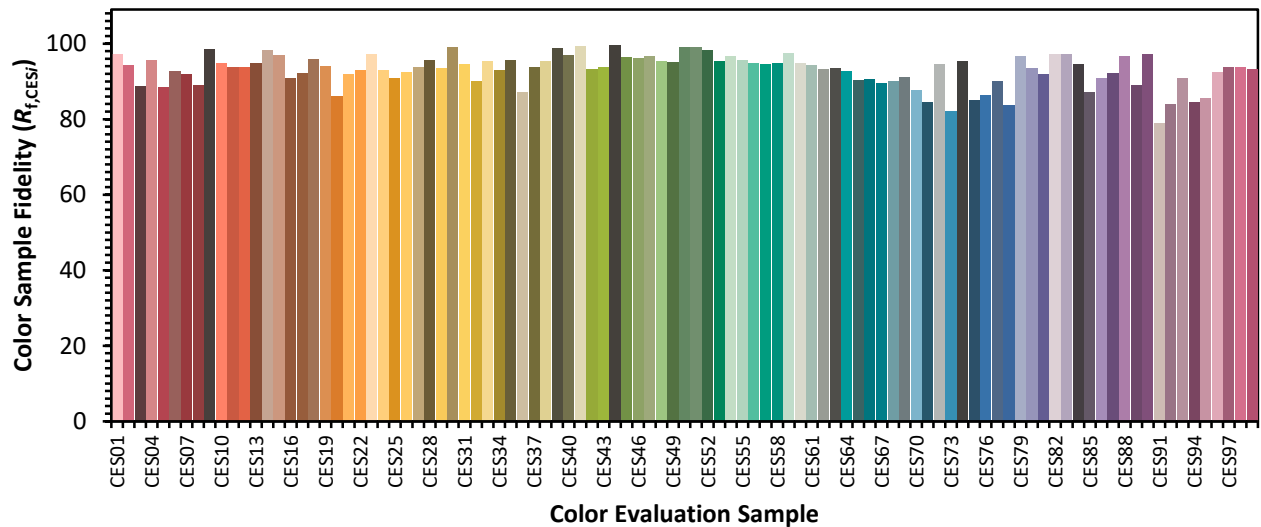


Color Vector Graphics

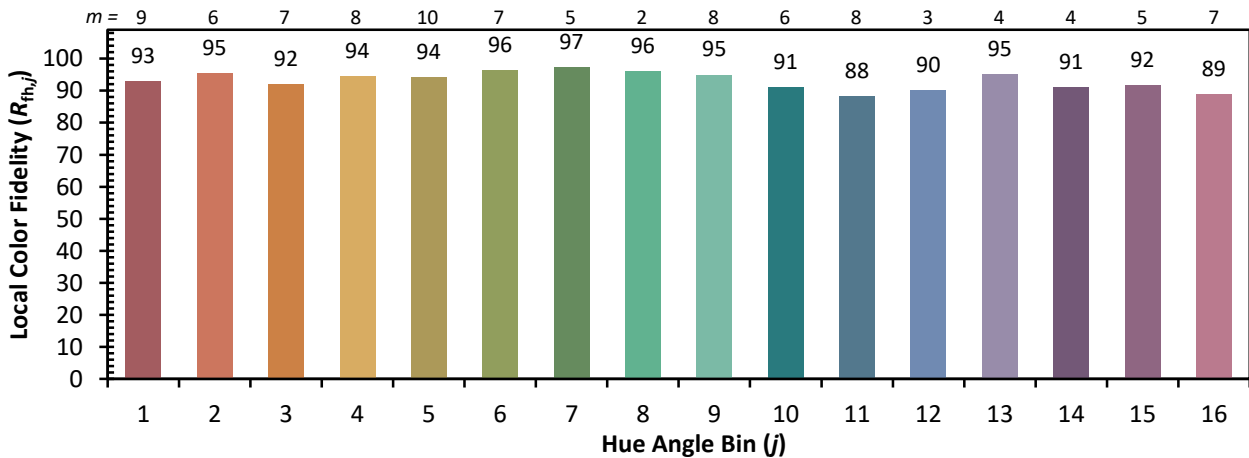
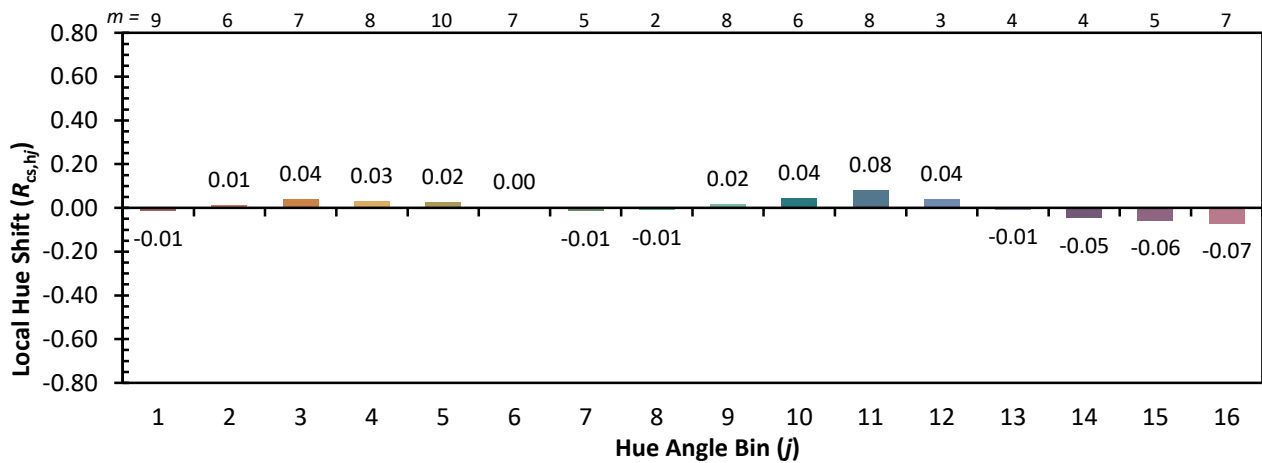
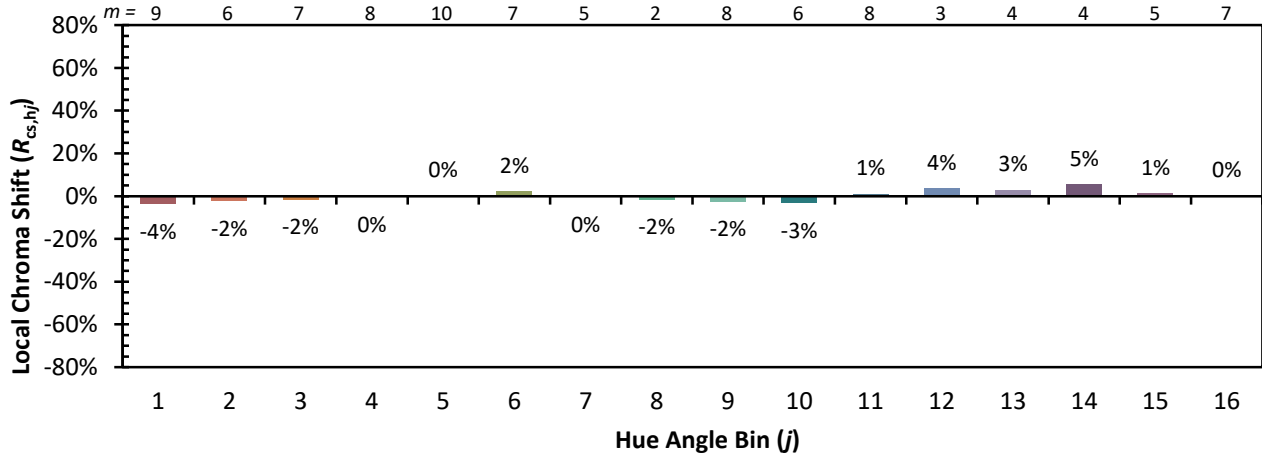


Individual Sample Fidelity Index ($R_{f,i}$)

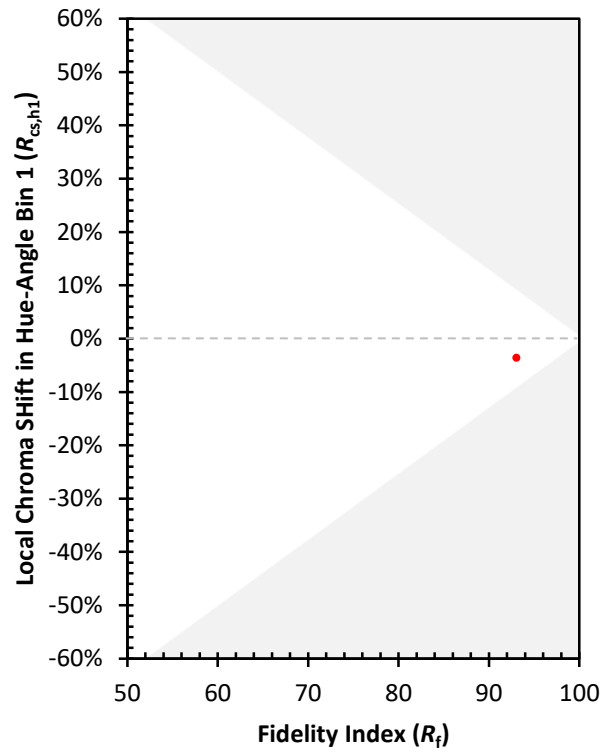
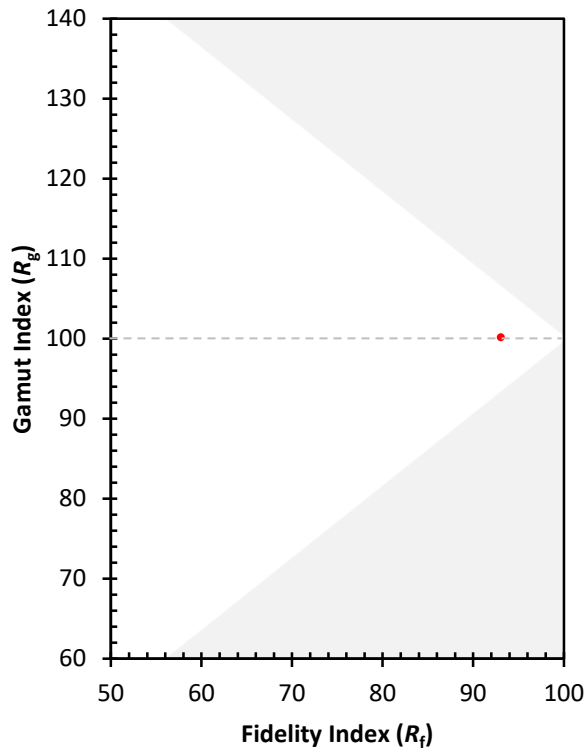
CES01 = 86	CES26 = 93	CES51 = 99	CES76 = 86
CES02 = 62	CES27 = 94	CES52 = 98	CES77 = 90
CES03 = 31	CES28 = 96	CES53 = 95	CES78 = 84
CES04 = 69	CES29 = 94	CES54 = 97	CES79 = 97
CES05 = 49	CES30 = 99	CES55 = 96	CES80 = 94
CES06 = 51	CES31 = 95	CES56 = 95	CES81 = 92
CES07 = 42	CES32 = 90	CES57 = 94	CES82 = 97
CES08 = 41	CES33 = 96	CES58 = 95	CES83 = 97
CES09 = 29	CES34 = 93	CES59 = 97	CES84 = 95
CES10 = 74	CES35 = 96	CES60 = 95	CES85 = 87
CES11 = 57	CES36 = 87	CES61 = 94	CES86 = 91
CES12 = 63	CES37 = 94	CES62 = 93	CES87 = 92
CES13 = 43	CES38 = 95	CES63 = 94	CES88 = 97
CES14 = 74	CES39 = 99	CES64 = 93	CES89 = 89
CES15 = 71	CES40 = 97	CES65 = 90	CES90 = 97
CES16 = 47	CES41 = 99	CES66 = 91	CES91 = 79
CES17 = 49	CES42 = 93	CES67 = 90	CES92 = 84
CES18 = 56	CES43 = 94	CES68 = 90	CES93 = 91
CES19 = 71	CES44 = 100	CES69 = 91	CES94 = 85
CES20 = 66	CES45 = 96	CES70 = 88	CES95 = 86
CES21 = 85	CES46 = 96	CES71 = 85	CES96 = 93
CES22 = 78	CES47 = 97	CES72 = 95	CES97 = 94
CES23 = 91	CES48 = 96	CES73 = 82	CES98 = 94
CES24 = 90	CES49 = 95	CES74 = 95	CES99 = 93
CES25 = 71	CES50 = 99	CES75 = 85	



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)