

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: P895802

Luminaire Tested: **GRZ-15L-940-10x10-X-UNV-STD-1F**

Issue Date: 11/20/2024



Test Information

Test Method: LM-79-08
Report Number: P895802
Test Lab: INNOVATION CENTER(G3)
Issue Date: 11/20/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: io LED
Catalog Number: GRZ-15L-940-10x10-X-UNV-STD-1F
Description: iO LED 90CRI 4000K GRAZER 1500 lumens per ft WITH 10 deg x 10 deg OPTIC
Light Source: 4000K CCT, 90 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

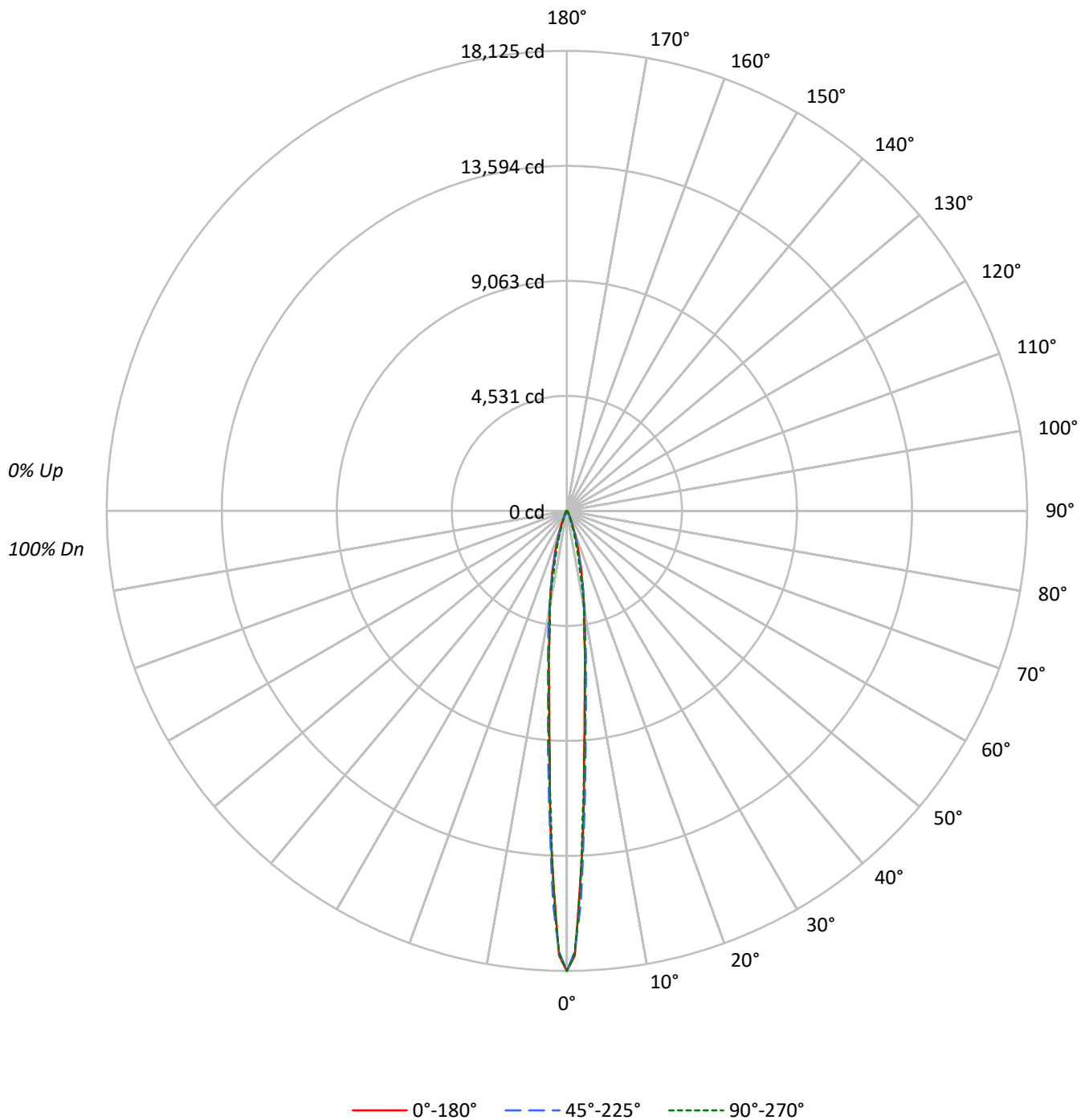
Summary

Lumens per Lamp: N/A
Luminaire Lumens: 1450.4 lumens
Efficiency: N/A
Efficacy: 97.3 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: P895802
CATALOG NUMBER: GRZ-15L-940-10x10-X-UNV-STD-1F

Luminous Intensity Polar Plot



Cooper Lighting Solutions Photometric Lab

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TEST NUMBER: P895802

CATALOG NUMBER: GRZ-15L-940-10x10-X-UNV-STD-1F

COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:

RF	20				20					20					20					20
RC	80				70					50					30					10
RW	70	50	30	10	70	50	30	10		50	30	10			50	30	10			50
RCR																				
0	119	119	119	119	116	116	116	116		111	111	111			106	106	106			102
1	115	113	111	109	113	111	109	107		107	105	104			103	102	101			100
2	111	107	104	102	109	106	103	101		103	100	99			100	98	96			97
3	108	103	99	96	106	102	98	96		99	96	94			97	95	93			95
4	104	99	95	92	103	98	94	92		96	93	91			94	92	90			93
5	102	96	92	89	100	95	91	88		93	90	88			92	89	87			90
6	99	93	89	86	98	92	88	86		91	88	85			90	87	85			88
7	96	90	86	83	95	90	86	83		89	85	83			88	85	82			87
8	94	88	84	81	93	87	84	81		86	83	81			86	83	80			85
9	92	86	82	79	91	85	82	79		85	81	79			84	81	79			83
10	90	84	80	77	89	83	80	77		83	79	77			82	79	77			82

AVERAGE LUMINANCE (cd/sqm):

	0°	45°	90°
0°	1170316	1170316	1170316
5°	515368	550143	531339
10°	253986	261467	256221
15°	128128	118061	101737
20°	53762	45537	38666
25°	21794	18239	15361
30°	10401	9275	8224
35°	6558	5746	4556
40°	4678	4282	3203
45°	4210	3698	2666
50°	3988	3516	2079
55°	3580	3118	1779
60°	2867	2454	1730
65°	2781	2414	1818
70°	2851	2379	1642
75°	2570	2395	1597
80°	2380	2045	1487
85°	1778	1778	1111

TEST NUMBER: P895802

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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	681.2	47.0
10°-20°	503.7	34.7
20°-30°	137.4	9.5
30°-40°	48.6	3.3
40°-50°	30.6	2.1
50°-60°	22.7	1.6
60°-70°	14.9	1.0
70°-80°	9.0	0.6
80°-90°	2.4	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°	1322.3	91.2
0°-40°	1370.8	94.5
0°-60°	1424.2	98.2
0°-90°	1450.4	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1450.4	100.0

CANDELA DISTRIBUTION:

	0°	22.5°	45°	67.5°	90°	Flux
0°	18125	18125	18125	18125	18125	
5°	7951	8302	8488	8173	8198	660
15°	1917	1892	1766	1563	1522	543
25°	306	300	256	227	216	161
35°	83	82	73	67	58	54
45°	46	44	40	34	29	36
55°	32	30	28	21	16	28
65°	18	16	16	13	12	18
75°	10	9	10	8	6	11
85°	2	2	2	2	2	3
90°	0	0	0	0	0	

TEST NUMBER: P895802

CATALOG NUMBER: GRZ-15L-940-10x10-X-UNV-STD-1F

CANDELA DISTRIBUTION (FULL):

	0°	22.5°	45°	67.5°	90°
0°	18124.6	18124.6	18124.6	18124.6	18124.6
1°	17518.2	17167.9	17371.6	17363.7	17465.1
2°	14820.8	15917.8	15490.6	15443.8	14957.1
3°	12399.2	12884.5	12613.4	12772.7	12010.2
4°	9654.3	10260.0	10352.6	10144.2	9875.5
5°	7951.1	8302.2	8487.6	8172.9	8197.5
6°	6697.1	7141.7	7113.9	7122.7	6769.9
7°	5867.2	6098.6	6131.9	5930.5	5834.6
8°	4917.6	5316.2	5285.3	5133.9	4919.1
9°	4383.3	4628.2	4589.3	4319.1	4240.6
10°	3873.7	4008.3	3987.8	3690.5	3907.8
12.5°	2789.3	2802.1	2665.6	2503.9	2374.8
15°	1916.7	1892.0	1766.1	1563.1	1521.9
17.5°	1258.7	1261.9	1091.5	938.5	914.6
20°	782.4	787.1	662.7	577.8	562.7
22.5°	492.3	470.8	394.0	358.3	348.7
25°	305.9	300.3	256.0	226.7	215.6
27.5°	206.9	202.9	166.4	152.9	152.1
30°	139.5	145.0	124.4	113.3	110.3
32.5°	105.4	105.4	96.6	88.7	80.0
35°	83.2	81.7	72.9	66.6	57.8
37.5°	63.4	66.6	58.7	54.0	45.2
40°	55.5	55.5	50.8	44.4	38.0
42.5°	49.1	50.8	44.4	38.0	31.8
45°	46.1	44.4	40.5	34.1	29.2
47.5°	42.0	41.2	37.3	30.1	25.4
50°	39.7	38.0	35.0	26.9	20.7
52.5°	37.3	35.0	31.8	23.7	17.5
55°	31.8	30.1	27.7	20.7	15.8
57.5°	27.7	24.5	23.0	17.5	14.3
60°	22.2	19.8	19.0	15.8	13.4
62.5°	19.8	18.2	17.5	15.1	12.6
65°	18.2	15.8	15.8	13.4	11.9
67.5°	16.6	14.3	14.3	11.9	10.3
70°	15.1	12.6	12.6	10.3	8.7
72.5°	12.6	10.3	11.1	8.7	7.9
75°	10.3	8.7	9.6	7.9	6.4
77.5°	8.7	7.1	7.1	6.4	4.7
80°	6.4	5.5	5.5	4.7	4.0
82.5°	4.0	3.2	4.0	3.2	2.4
85°	2.4	1.5	2.4	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

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

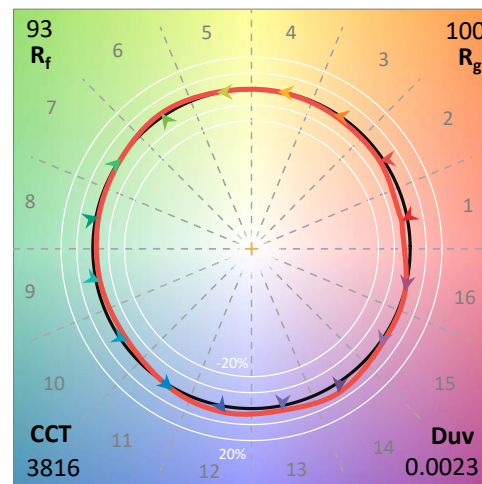
Test Date: 02/11/2021

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	CRI (Ra):	93.3		
CIE u':	0.2273	R1:	93.7	R9:	69.2
CIE v':	0.5079	R2:	94.3	R10:	85.8
Duv:	0.0023	R3:	93.9	R11:	94.6
CIE x:	0.3907	R4:	94.7	R12:	78.9
CIE y:	0.3879	R5:	92.9	R13:	93.7
CIE z:	0.2214	R6:	92.1	R14:	96.1
Peak Wavelength (nm):	614	R7:	95.7		
Dominant Wavelength (nm):	578	R8:	88.8		
Purity:	33.8				
Rf:	93.1				
Rg:	100.2				



Test Conditions

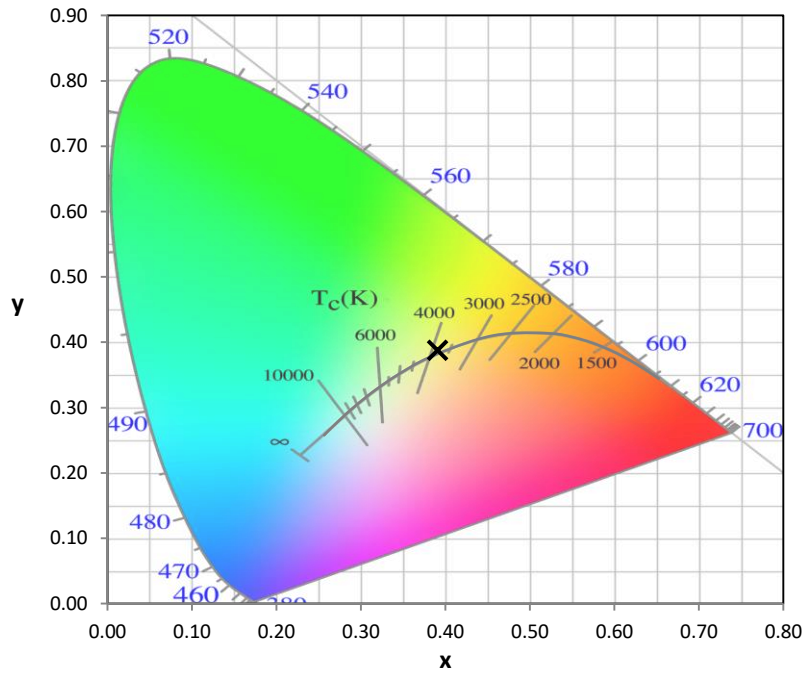
Stabilization Time: 162M
 Operation Time: 12H
 Room Temperature (°C) / RH%: 25.1/41%
 Sphere Temperature (°C): 24.1

REPORT NUMBER: SP1-2101-124-4

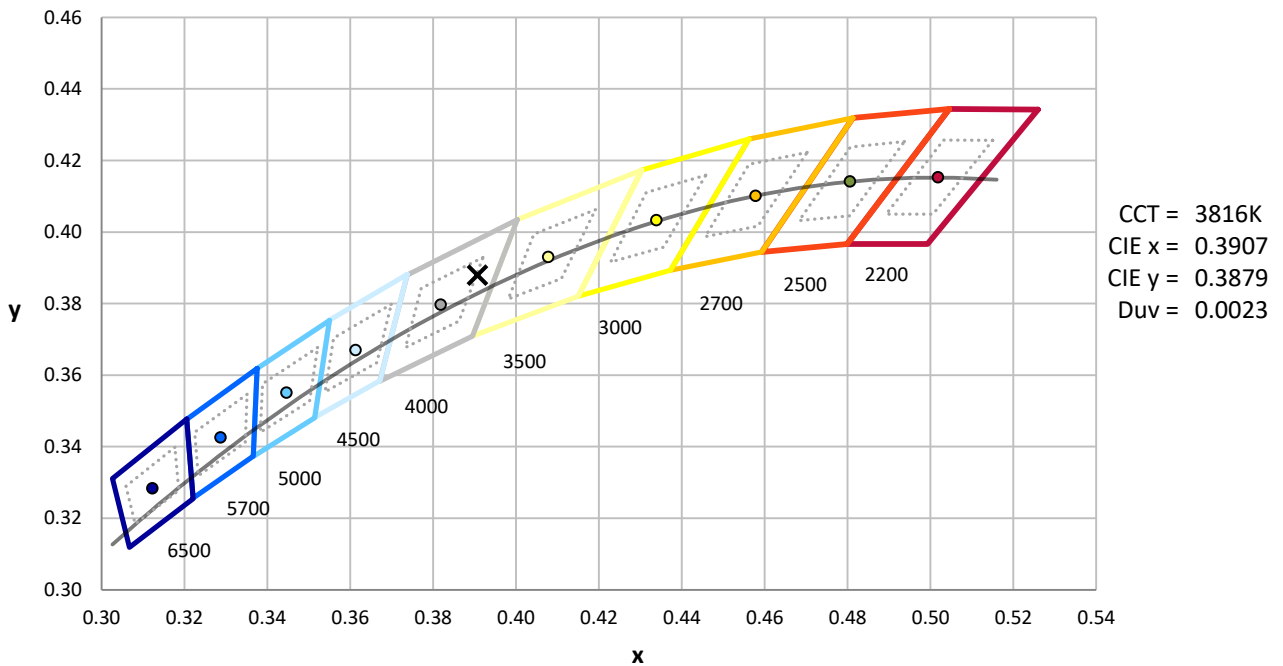
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	1/31/2021	7/31/2021
Power Meter	IN0071	12/1/2020	12/1/2021
AC Power Source	IN0063	12/1/2020	12/1/2021
DC Power Source	IN0208	12/1/2020	12/1/2021
Sphere Thermometer	IN0085	12/1/2020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

REPORT NUMBER: SP1-2101-124-4

CIE 1931 Chromaticity Diagram



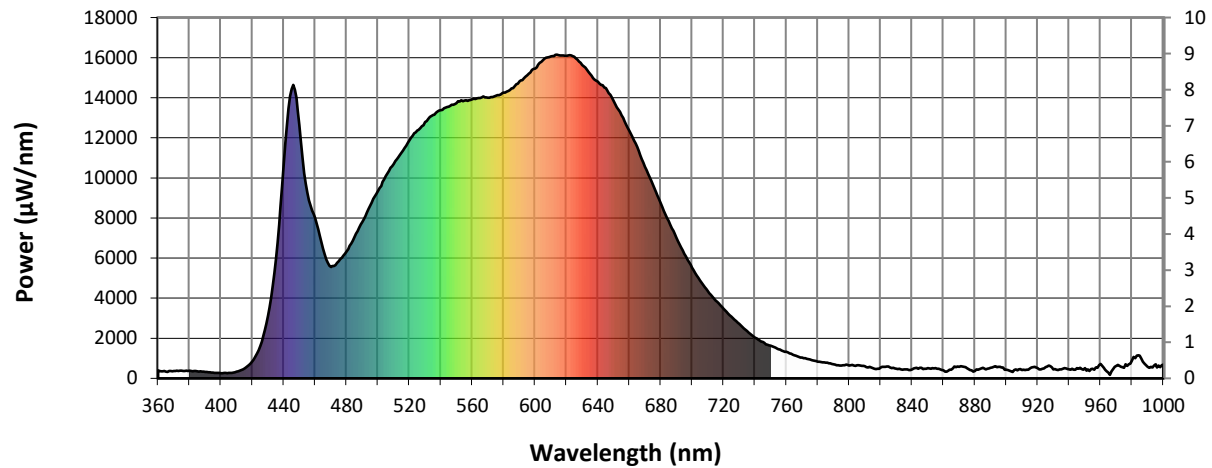
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 4000K 7-step quadrangle

REPORT NUMBER: SP1-2101-124-4

Photopic Flux vs. Wavelength

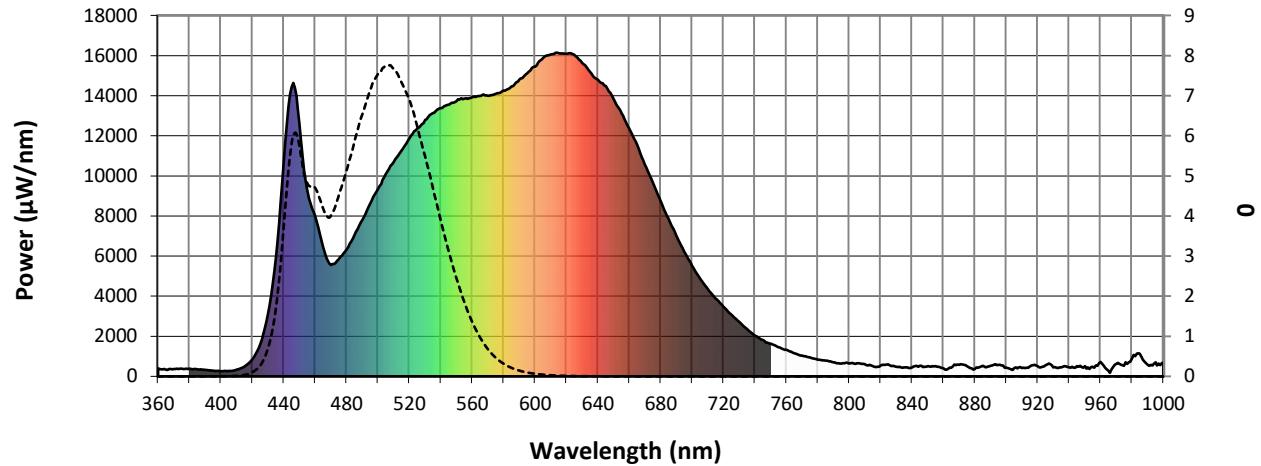


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λ (nm)	Power (μW/nm)	Lumens (Φ/nm)	λ (nm)	Power (μW/nm)	Lumens (Φ/nm)	λ (nm)	Power (μW/nm)	Lumens (Φ/nm)	λ (nm)	Power (μW/nm)	Lumens (Φ/nm)	λ (nm)	Power (μW/nm)	Lumens (Φ/nm)
360	405	0.0	490	7814	1.1	620	16090	4.2	750	1625	0.0	880	367	0.0
365	335	0.0	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			

REPORT NUMBER: SP1-2101-124-4

Scotopic Flux vs. Wavelength



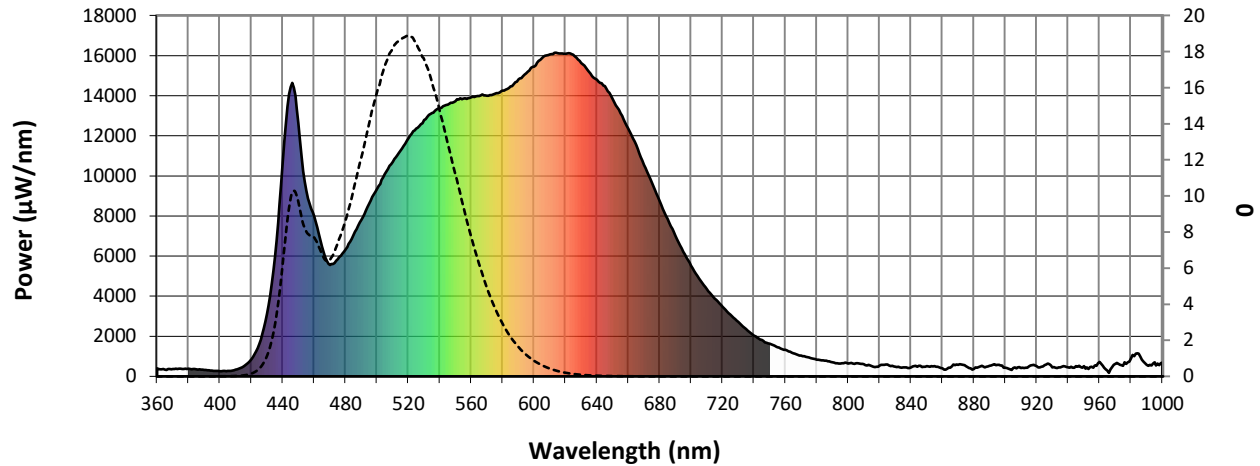
Scotopic Lumens: 1669.3

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			

REPORT NUMBER: SP1-2101-124-4

Melanopic Flux vs. Wavelength



Melanopic Lumens: 670.2

M/P: 0.69

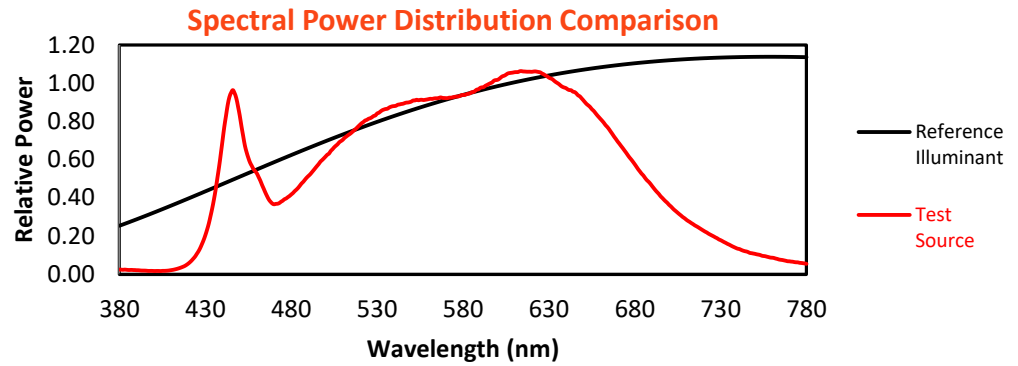
λ (nm)	Power (μW/nm)	Lumens (Φ/nm)	λ (nm)	Power (μW/nm)	Lumens (Φ/nm)	λ (nm)	Power (μW/nm)	Lumens (Φ/nm)	λ (nm)	Power (μW/nm)	Lumens (Φ/nm)	λ (nm)	Power (μW/nm)	Lumens (Φ/nm)
360	405	0.0	490	7814	6.5	620	16090	0.0	750	1625	0.0	880	367	0.0
365	335	0.0	495	8606	7.1	625	16048	0.0	755	1453	0.0	885	533	0.0
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			

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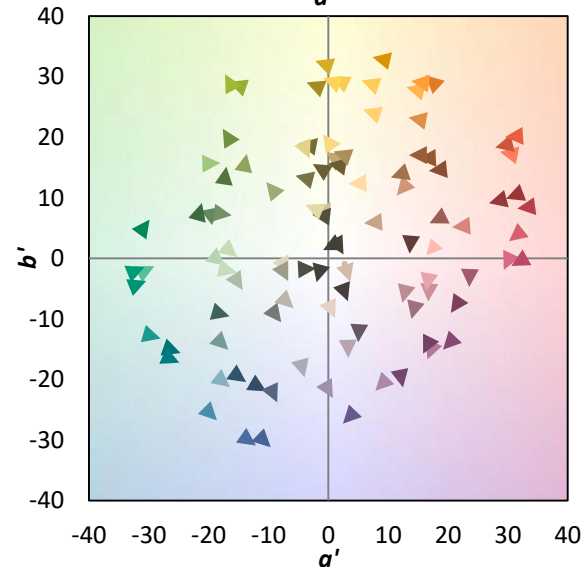
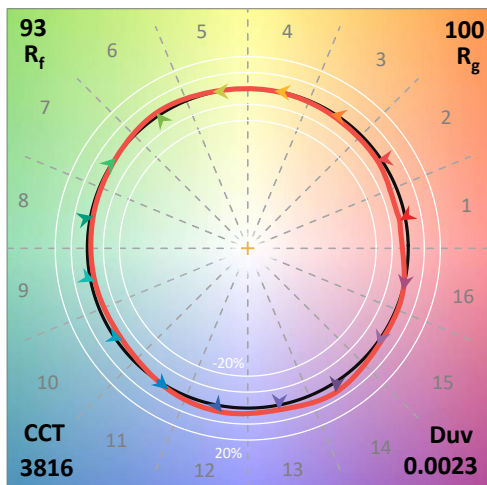
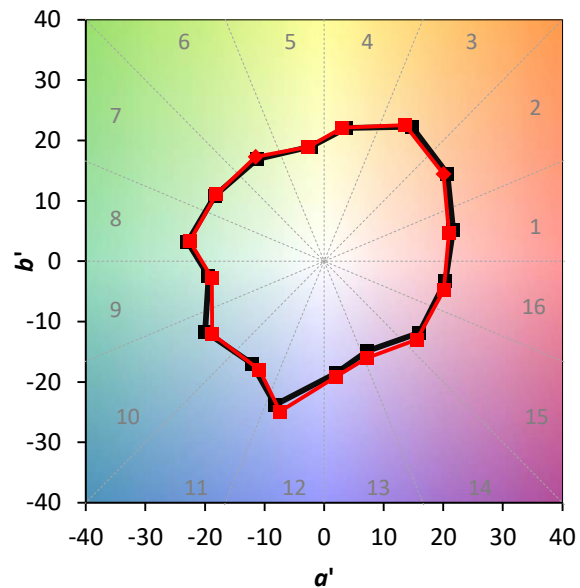
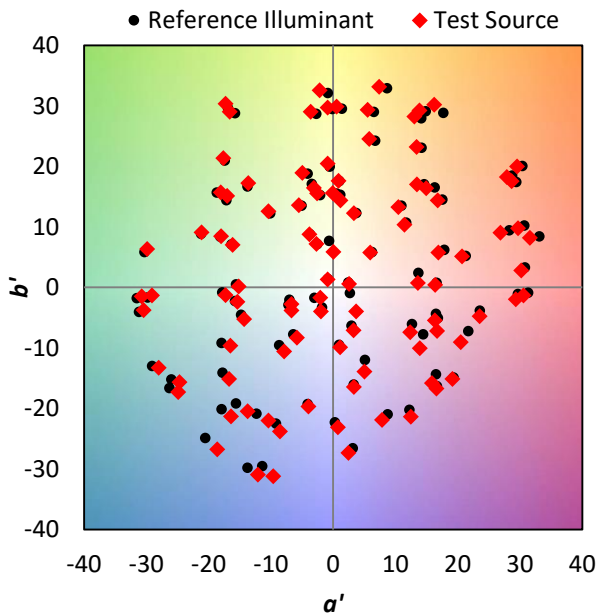
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Summary

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

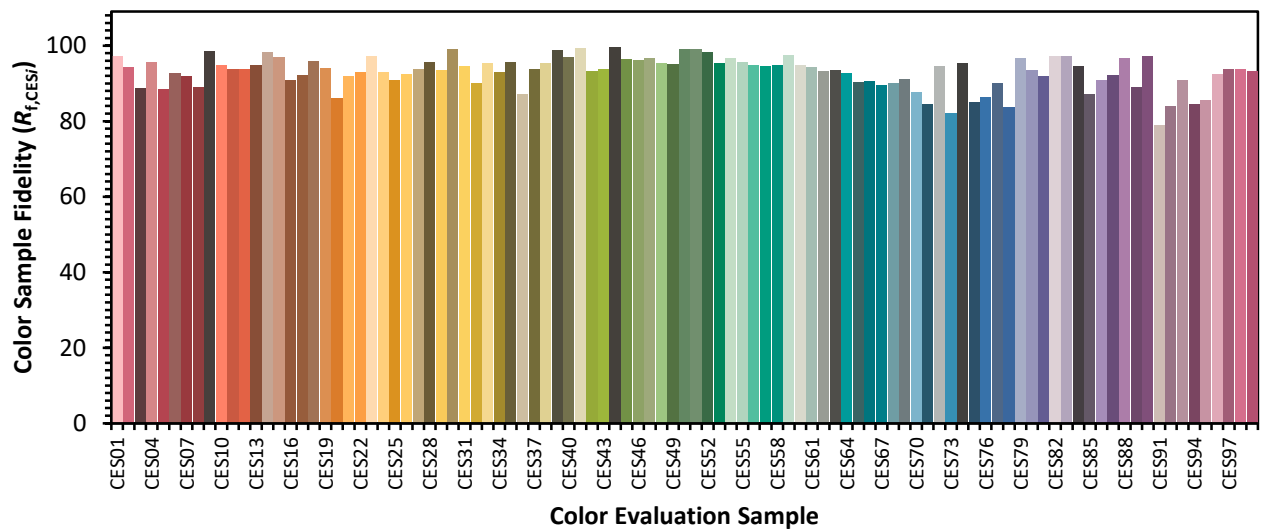


Color Vector Graphics

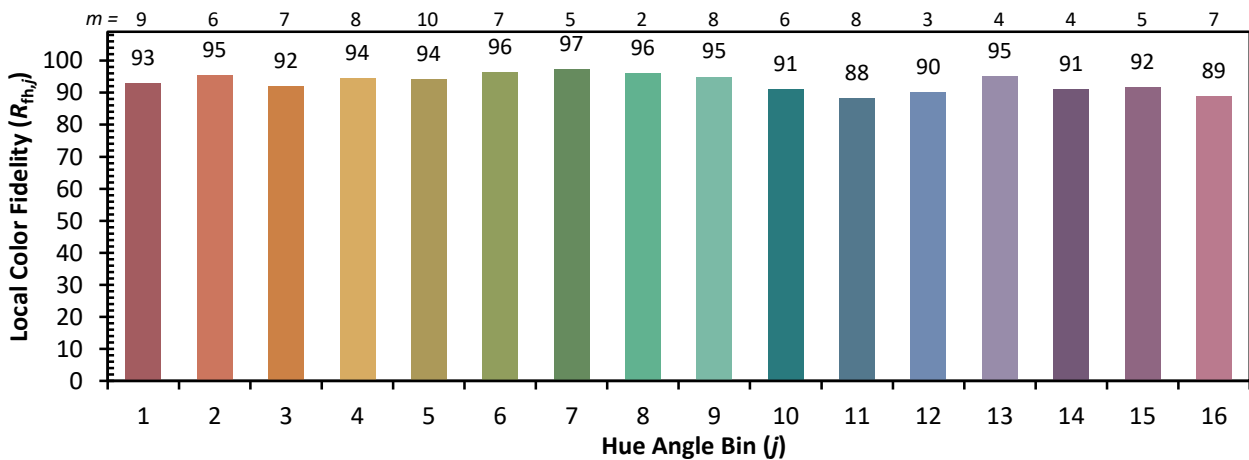
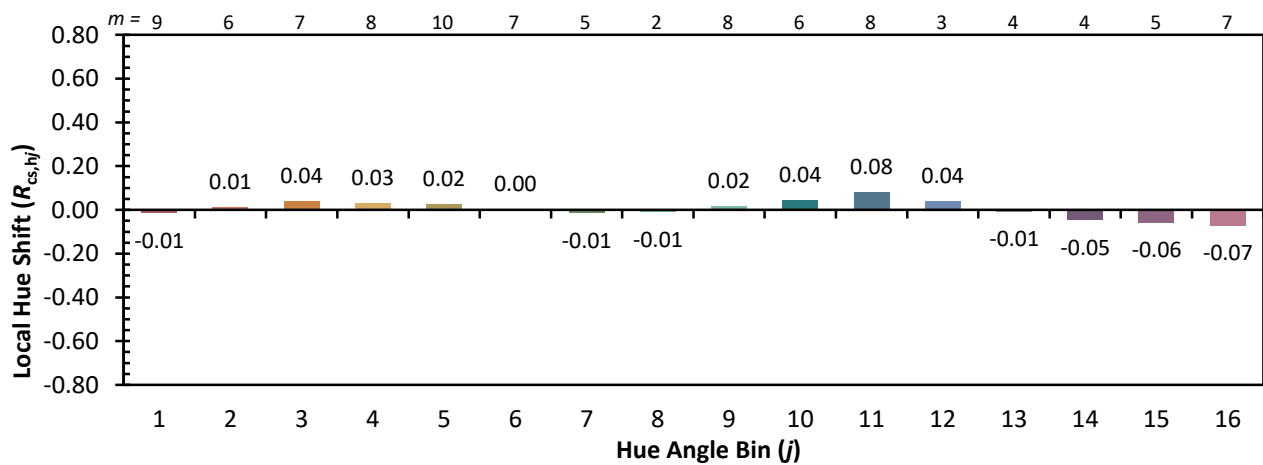
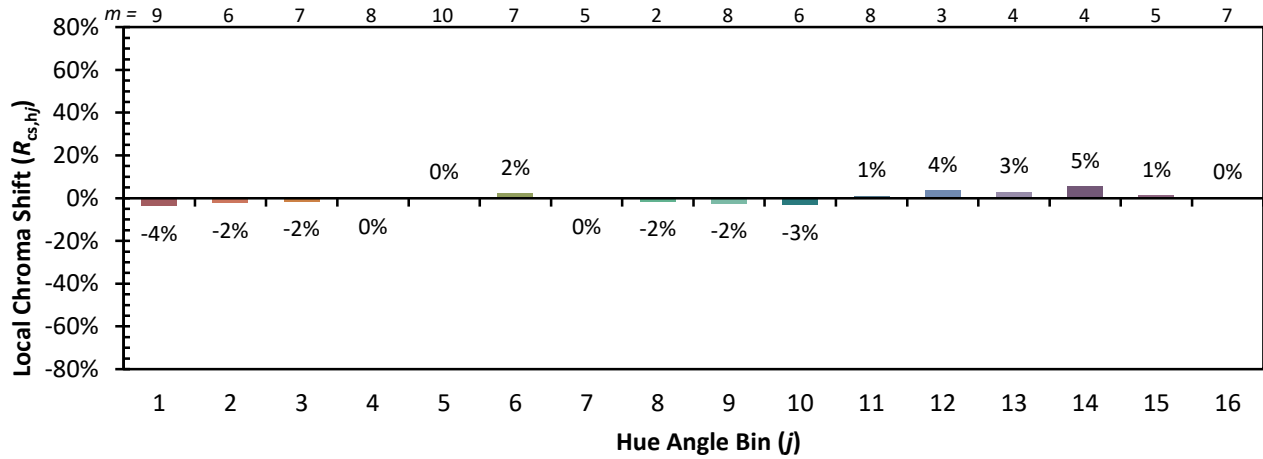


Individual Sample Fidelity Index ($R_{f,i}$)

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	



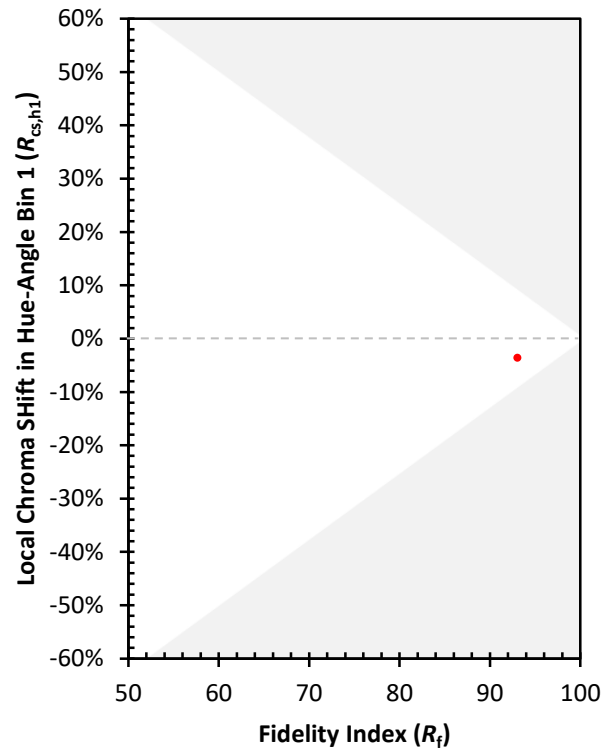
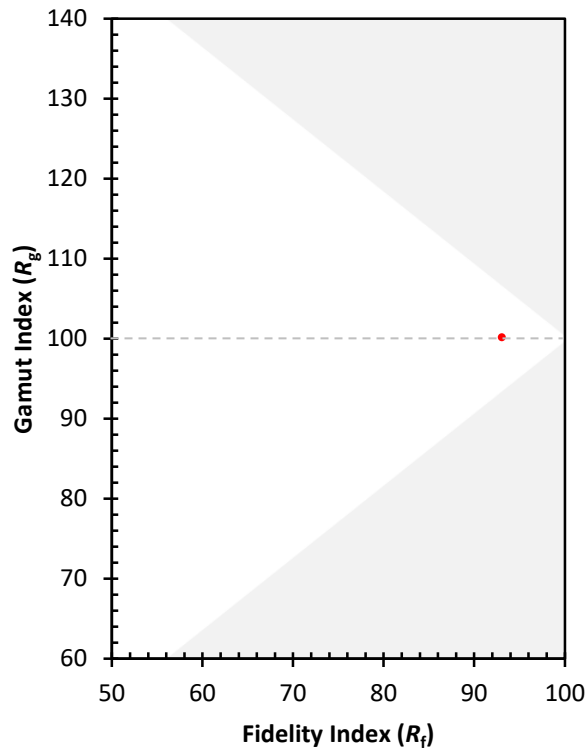
Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)