

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: P895812

Luminaire Tested: **GRZ-05L-940-10x10FR-X-UNV-STD-1F**

Issue Date: 11/20/2024

**Test Information**

Test Method: LM-79-08  
Report Number: P895812  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 11/20/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: io LED  
Catalog Number: GRZ-05L-940-10x10FR-X-UNV-STD-1F  
Description: io LED 90CRI 4000K GRAZER 500 lumens per ft WITH 10 deg x 10 deg,  
1/3 Frosted OPTIC  
Light Source: 4000K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

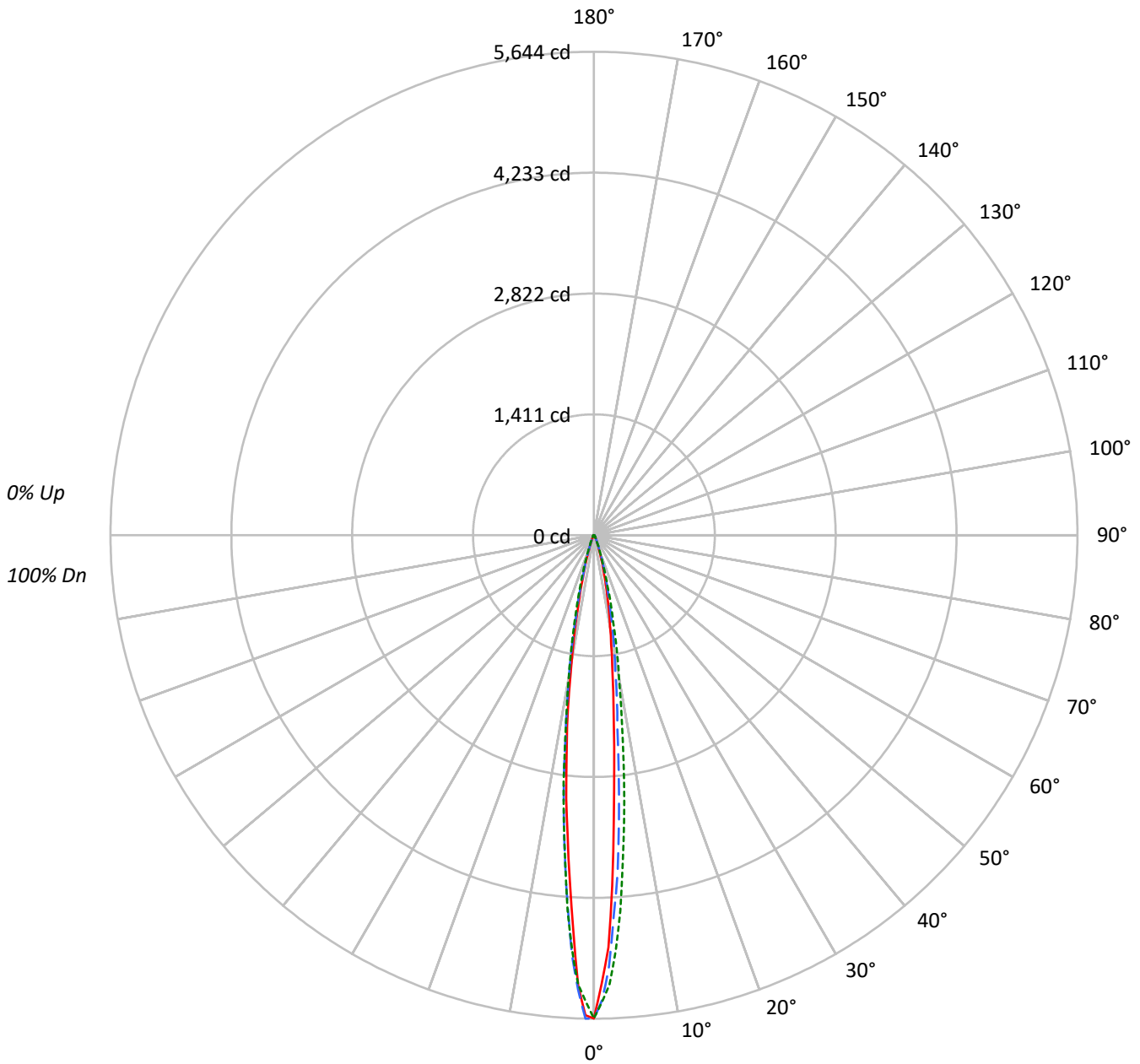
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 520.9 lumens  
Efficiency: N/A  
Efficacy: 98.3 lumens/watt  
Spacing Criteria (0/90/45): 0.19 / 0.25 / 0.25  
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: P895812  
CATALOG NUMBER: GRZ-05L-940-10x10FR-X-UNV-STD-1F

### Luminous Intensity Polar Plot



0% Up  
100% Dn

— 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	97	97	97	97
2	111	108	105	102	109	106	103	101	103	101	99	100	98	97	97	96	95	93	93	93	93
3	108	103	100	97	106	102	99	96	100	97	95	97	95	93	95	93	92	91	91	91	91
4	105	100	96	93	103	99	95	92	97	94	91	95	92	90	93	91	89	88	88	88	88
5	102	96	93	90	101	96	92	89	94	91	89	93	90	88	91	89	87	86	86	86	86
6	100	94	90	87	98	93	89	87	92	89	86	91	88	86	89	87	85	84	84	84	84
7	97	91	87	85	96	91	87	84	90	86	84	89	86	84	88	85	83	82	82	82	82
8	95	89	85	83	94	89	85	83	88	85	82	87	84	82	86	84	82	81	81	81	81
9	93	87	83	81	92	87	83	81	86	83	81	85	82	80	85	82	80	79	79	79	79
10	91	85	82	79	91	85	82	79	84	81	79	84	81	79	83	81	79	78	78	78	78

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

	0°	90°	180°
0°	364301	364301	364301
5°	175869	248956	227962
10°	71048	110716	97478
15°	28163	40724	30175
20°	11001	13461	8864
25°	5073	5336	4082
30°	2990	2915	2393
35°	2026	2026	1600
40°	1534	1627	1264
45°	1324	1415	1078
50°	1125	1286	914
55°	1024	1205	844
60°	904	1175	827
65°	825	1146	825
70°	699	1114	699
75°	524	923	674
80°	409	781	595
85°	370	370	370



TEST NUMBER: P895812  
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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	271.9	52.2
10°-20°	164.3	31.6
20°-30°	36.7	7.0
30°-40°	15.9	3.0
40°-50°	11.4	2.2
50°-60°	9.1	1.7
60°-70°	6.8	1.3
70°-80°	3.9	0.7
80°-90°	1.0	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°	472.9	90.8
0°-40°	488.8	93.8
0°-60°	509.3	97.8
0°-90°	520.9	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	520.9	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	5642	5642	5642	5642	5642	
5°	2713	3348	3841	3858	3517	211
15°	421	543	609	502	451	129
25°	71	81	75	59	57	36
35°	26	26	26	22	20	17
45°	14	16	16	14	12	11
55°	9	11	11	10	8	8
65°	5	8	8	6	5	5
75°	2	4	4	4	3	2
85°	0	1	0	1	0	1
90°	0	0	0	0	0	



TEST NUMBER: P895812

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**CANDELA DISTRIBUTION (FULL):**

	0°	5°	15°	25°	35°	45°	55°	65°	75°	85°	90°
0°	5641.9	5641.9	5641.9	5641.9	5641.9	5641.9	5641.9	5641.9	5641.9	5641.9	5641.9
1°	5235.0	5399.4	5358.7	5397.2	5404.2	5430.4	5447.6	5459.4	5487.7	5477.6	5442.7
2°	4815.8	4906.8	4901.4	4925.0	5059.4	5040.6	5088.9	5190.6	5174.5	5198.1	5247.3
3°	4098.9	4298.6	4252.6	4248.3	4377.3	4433.0	4624.1	4669.1	4781.0	4856.5	4858.1
4°	3311.4	3440.9	3471.4	3718.3	3704.3	3948.5	4062.5	4156.2	4243.5	4516.5	4397.7
5°	2713.3	2809.2	2904.5	3026.0	3056.0	3348.3	3413.1	3548.0	3784.1	3886.4	3840.9
6°	2221.3	2315.5	2315.0	2437.1	2549.0	2757.7	2830.1	3023.9	3216.1	3351.0	3356.9
7°	1847.6	1901.7	1936.0	2014.6	2139.4	2250.3	2419.4	2546.8	2670.5	2811.3	2897.0
8°	1536.6	1588.5	1607.8	1679.5	1753.4	1910.8	2080.0	2179.0	2308.6	2431.2	2406.5
9°	1291.3	1372.2	1361.0	1403.3	1487.3	1593.8	1695.0	1841.7	1925.3	2046.2	2018.4
10°	1083.6	1135.0	1168.2	1221.2	1252.3	1369.0	1430.6	1525.9	1630.8	1647.4	1688.6
12.5°	711.0	722.8	729.7	756.0	812.7	869.5	931.0	981.3	1012.4	1018.9	1049.4
15°	421.3	441.7	445.9	481.9	512.9	542.9	581.9	589.4	606.0	599.6	609.2
17.5°	259.1	261.2	277.4	277.9	311.6	327.1	354.4	360.8	351.8	346.9	346.9
20°	160.1	161.2	165.4	176.7	183.1	200.2	214.1	215.7	210.9	200.8	195.9
22.5°	103.9	107.1	103.9	108.2	114.6	124.2	130.7	131.7	125.3	121.6	121.0
25°	71.2	71.7	74.4	71.7	74.9	80.8	83.0	84.6	79.2	77.6	74.9
27.5°	52.5	52.5	52.5	52.5	53.5	53.5	54.6	55.1	53.5	52.5	53.0
30°	40.1	39.6	40.1	40.1	39.1	40.1	40.7	40.7	39.6	39.6	39.1
32.5°	31.0	31.6	32.1	31.6	31.0	31.6	32.1	31.6	31.6	32.1	31.0
35°	25.7	25.7	26.2	25.7	25.7	25.7	26.2	26.2	26.2	26.2	25.7
37.5°	20.9	21.4	21.9	21.9	21.9	21.9	22.5	22.5	23.0	21.9	21.4
40°	18.2	18.2	18.7	18.7	19.3	18.7	19.3	19.8	19.8	19.3	19.3
42.5°	16.1	16.1	16.6	16.6	16.6	17.1	17.7	17.7	17.7	17.7	17.1
45°	14.5	13.9	14.5	15.0	15.5	15.5	16.1	16.6	16.1	16.1	15.5
47.5°	12.8	12.8	12.8	13.4	13.9	14.5	14.5	15.0	15.0	14.5	13.9
50°	11.2	11.2	11.8	12.3	12.8	13.4	13.4	13.9	13.9	13.4	12.8
52.5°	9.6	9.6	10.2	11.2	11.8	12.3	12.3	12.8	12.8	12.3	11.8
55°	9.1	8.6	9.1	9.6	10.7	11.2	11.8	11.8	11.8	11.2	10.7
57.5°	7.5	7.5	8.0	8.6	9.6	10.7	10.7	11.2	10.7	10.2	10.2
60°	7.0	7.0	7.5	8.0	9.1	10.2	10.2	10.2	9.6	9.1	9.1
62.5°	5.9	5.9	6.4	7.0	8.0	9.1	9.6	9.6	9.1	8.6	8.0
65°	5.4	5.4	5.4	6.4	7.5	8.0	8.6	8.6	8.0	7.5	7.5
67.5°	4.3	4.3	4.8	5.4	6.4	7.0	7.5	8.0	7.5	7.0	6.4
70°	3.7	3.7	3.7	4.8	5.9	6.4	7.0	7.0	6.4	5.9	5.9
72.5°	2.7	2.7	3.2	3.7	4.8	5.4	5.9	5.9	5.4	4.8	4.8
75°	2.1	2.1	2.7	3.2	3.7	4.3	4.8	4.8	4.8	4.3	3.7
77.5°	1.6	1.6	2.1	2.7	3.2	3.7	3.7	3.7	3.7	3.2	3.2
80°	1.1	1.1	1.6	1.6	2.1	2.7	2.7	2.7	2.7	2.1	2.1
82.5°	1.1	0.5	1.1	1.1	1.6	1.6	2.1	2.1	1.6	1.6	1.6
85°	0.5	0.5	0.5	0.5	1.1	1.1	1.1	1.1	1.1	1.1	0.5
87.5°	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



TEST NUMBER: P895812

CATALOG NUMBER: GRZ-05L-940-10x10FR-X-UNV-STD-1F

**CANDELA DISTRIBUTION (continued):**

	95°	105°	115°	125°	135°	145°	155°	165°	175°	180°
0°	5641.9	5641.9	5641.9	5641.9	5641.9	5641.9	5641.9	5641.9	5641.9	5641.9
1°	5528.4	5609.2	5555.7	5615.6	5644.1	5644.1	5653.7	5613.0	5586.2	5606.0
2°	5268.8	5339.4	5360.3	5348.5	5312.6	5318.0	5250.0	5243.0	5153.6	5256.9
3°	4895.0	4973.2	4941.1	4899.8	4906.8	4830.2	4721.0	4669.6	4638.0	4623.6
4°	4446.4	4496.7	4488.1	4459.2	4368.7	4279.3	4180.3	4213.5	4011.6	4038.4
5°	3958.6	4014.8	3985.9	3890.7	3858.5	3762.2	3712.4	3609.6	3500.9	3517.0
6°	3405.6	3386.9	3442.0	3375.1	3359.6	3189.8	3163.1	3180.2	3104.1	3097.2
7°	2842.9	2973.6	2937.1	2889.5	2871.3	2770.1	2754.0	2650.2	2656.6	2617.0
8°	2474.0	2486.9	2520.6	2455.8	2396.9	2384.6	2322.5	2261.5	2274.9	2247.0
9°	2057.0	2097.1	2069.8	2076.2	1999.7	1920.4	1891.0	1907.1	1861.5	1867.9
10°	1666.6	1731.5	1714.3	1699.9	1684.8	1602.9	1589.0	1552.6	1528.6	1486.7
12.5°	1049.4	1025.3	1037.1	990.5	972.2	908.5	896.2	880.7	828.8	828.8
15°	638.7	587.8	606.0	547.2	501.7	488.3	454.6	455.1	453.5	451.4
17.5°	336.2	336.2	328.7	282.2	268.3	244.1	240.9	244.1	236.1	237.7
20°	197.6	190.6	179.4	157.4	147.8	137.6	135.5	133.9	133.9	129.0
22.5°	121.6	115.7	109.2	95.9	88.3	85.1	81.9	83.5	83.5	84.0
25°	77.6	72.8	70.1	62.1	58.9	58.3	56.7	54.6	55.1	57.3
27.5°	51.9	49.8	47.6	44.4	42.3	41.2	41.2	41.7	40.7	39.6
30°	39.1	36.4	35.3	34.3	32.6	32.6	32.6	32.1	31.6	32.1
32.5°	31.0	29.4	28.4	27.3	26.8	26.2	26.8	26.2	25.7	25.2
35°	25.7	24.1	23.5	23.0	22.5	21.9	21.9	21.9	20.9	20.3
37.5°	21.4	20.9	20.9	19.8	19.3	18.7	18.7	18.7	17.7	17.7
40°	19.3	18.7	18.2	17.7	17.1	16.6	16.1	16.1	15.0	15.0
42.5°	17.1	16.6	16.6	16.1	15.5	14.5	14.5	13.9	13.4	13.4
45°	15.5	15.0	15.0	14.5	13.9	13.4	12.8	12.3	11.8	11.8
47.5°	14.5	13.9	13.9	13.4	12.3	11.8	11.2	10.7	10.7	10.7
50°	12.8	12.8	12.8	12.3	11.8	11.2	10.2	9.6	9.1	9.1
52.5°	11.8	11.8	11.2	11.2	10.7	10.2	9.1	8.6	8.6	8.6
55°	11.2	10.7	10.7	10.2	9.6	9.6	8.6	8.0	7.5	7.5
57.5°	10.2	9.6	9.6	9.1	9.1	8.6	7.5	7.5	7.0	7.0
60°	9.1	8.6	8.6	8.0	8.0	7.5	7.0	6.4	6.4	6.4
62.5°	8.0	7.5	8.0	7.5	7.5	7.0	6.4	5.9	5.9	5.9
65°	7.5	7.0	7.0	7.0	6.4	6.4	5.9	5.4	5.4	5.4
67.5°	6.4	5.9	6.4	5.9	5.9	5.4	5.4	4.8	4.8	4.3
70°	5.4	5.4	5.4	5.4	5.4	4.8	4.3	4.3	3.7	3.7
72.5°	4.8	4.8	4.8	4.8	4.3	4.3	3.7	3.7	3.2	3.2
75°	3.7	3.7	3.7	3.7	3.7	3.7	3.2	3.2	2.7	2.7
77.5°	3.2	3.2	3.2	3.2	3.2	2.7	2.7	2.1	2.1	2.1
80°	2.1	2.1	2.1	2.1	2.1	2.1	2.1	1.6	1.6	1.6
82.5°	1.6	1.6	1.6	1.6	1.6	1.1	1.1	1.1	1.1	1.1
85°	1.1	1.1	1.1	1.1	1.1	0.5	0.5	0.5	0.5	0.5
87.5°	0.5	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



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

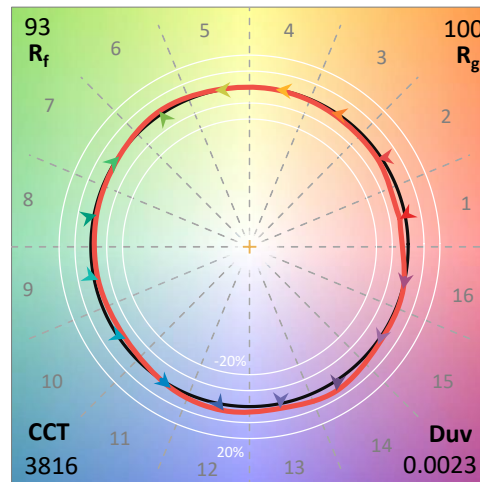
**Spectral Parameters**

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

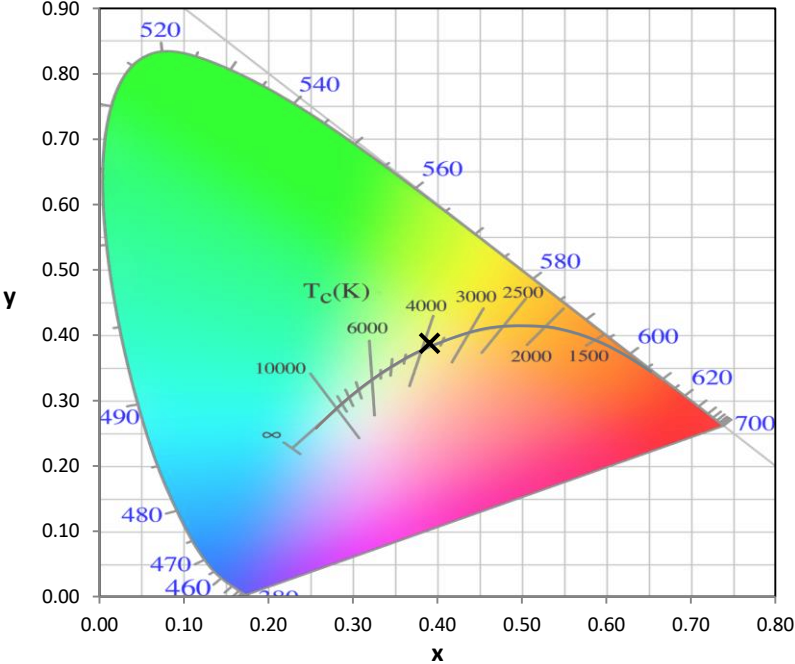


REPORT NUMBER: SP1-2101-124-4

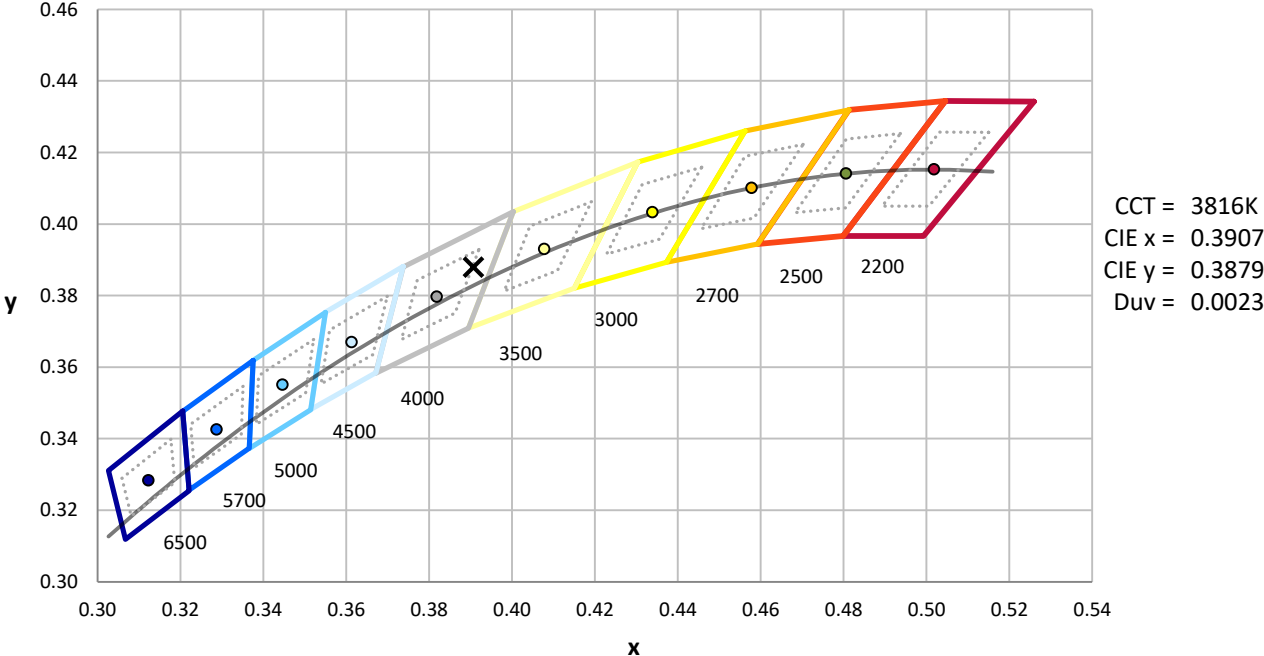
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	1/31/2021	7/31/2021
Power Meter	IN0071	12/1/2020	12/1/2021
AC Power Source	IN0063	12/1/2020	12/1/2021
DC Power Source	IN0208	12/1/2020	12/1/2021
Sphere Thermometer	IN0085	12/1/2020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

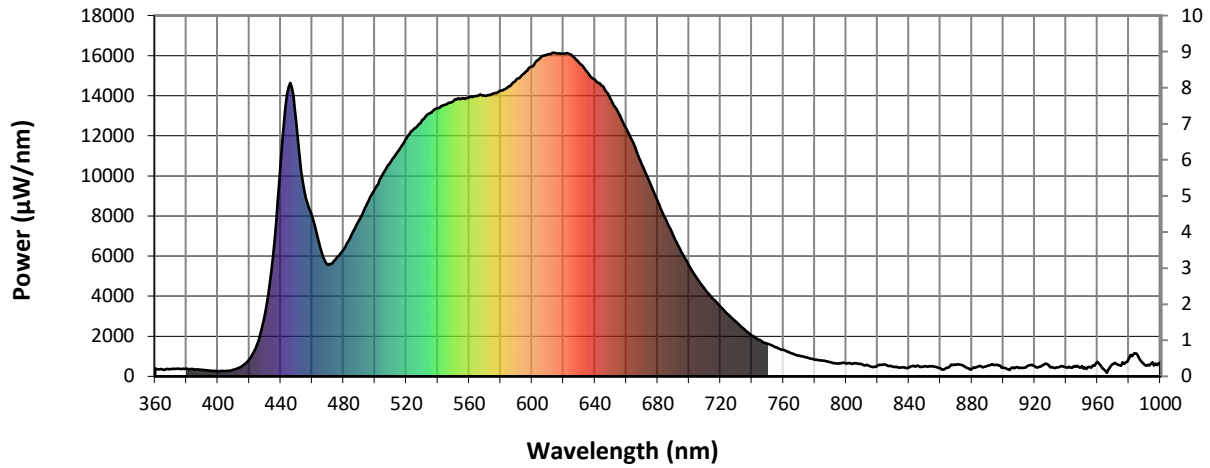


CCT = 3816K  
 CIE x = 0.3907  
 CIE y = 0.3879  
 Duv = 0.0023

Point lies inside the ANSI 4000K 7-step quadrangle

REPORT NUMBER: SP1-2101-124-4

**Photopic Flux vs. Wavelength**

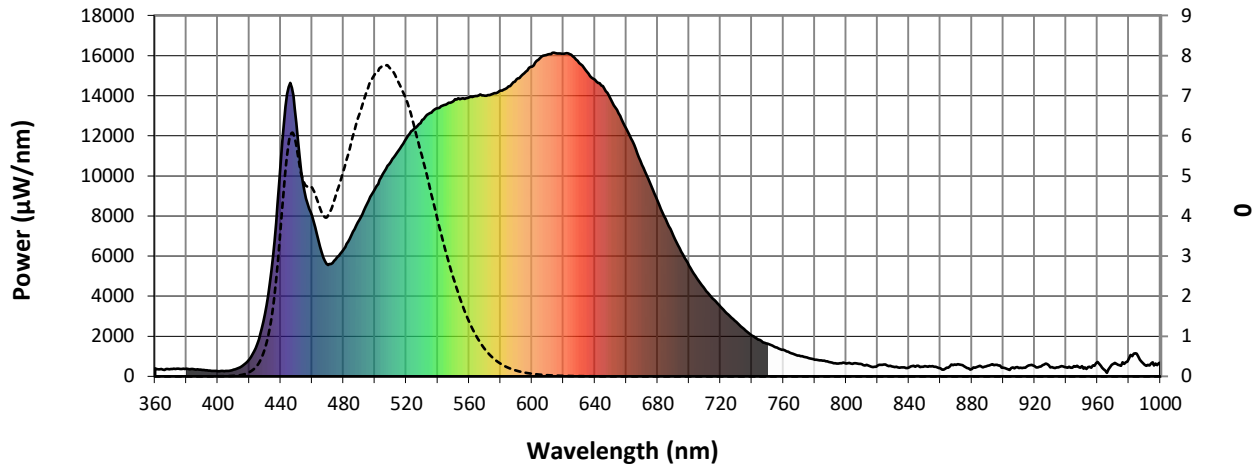


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λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)
360	405	0.0	490	7814	1.1	620	16090	4.2	750	1625	0.0	880	367	0.0
365	335	0.0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



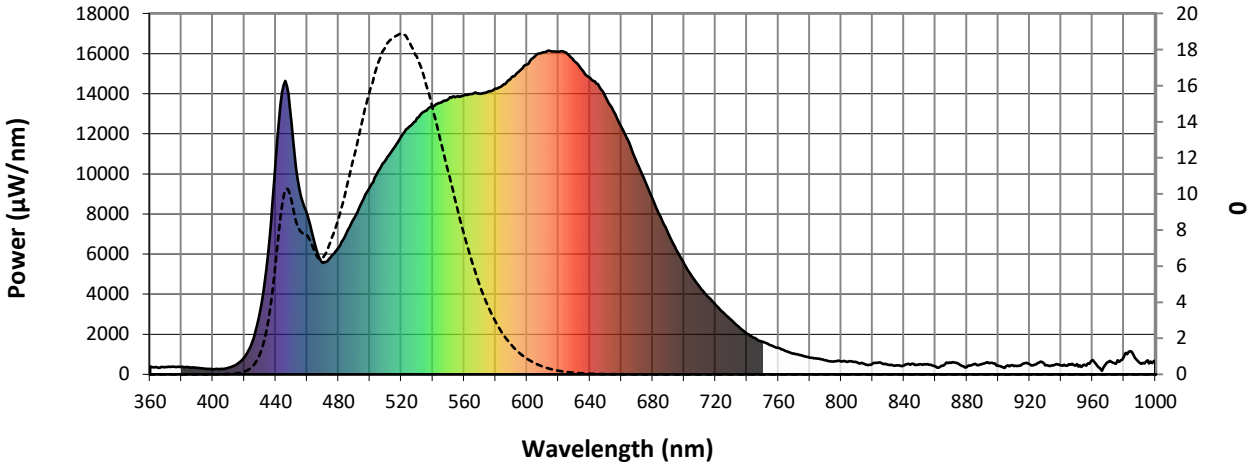
**Scotopic Lumens: 1669.3**

**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

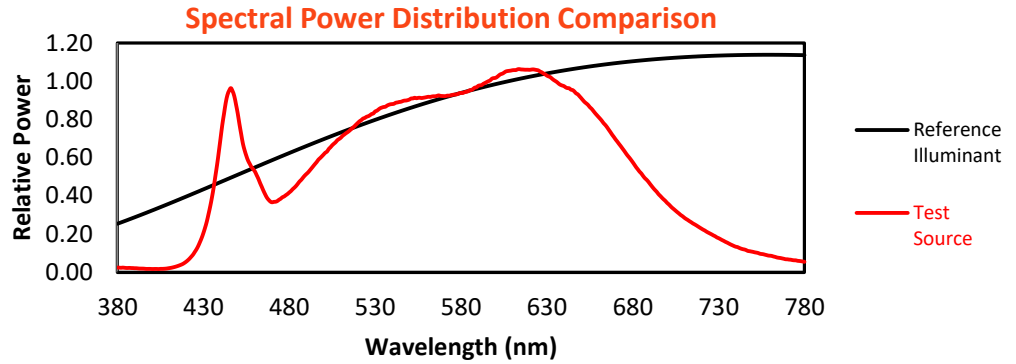


Melanopic Lumens: 670.2 M/P: 0.69

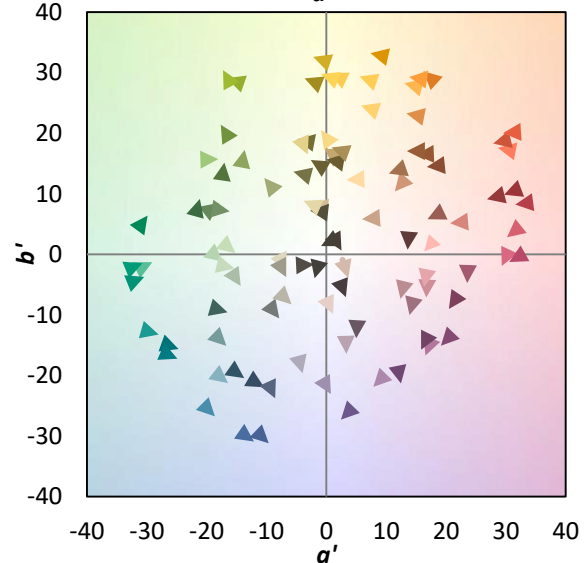
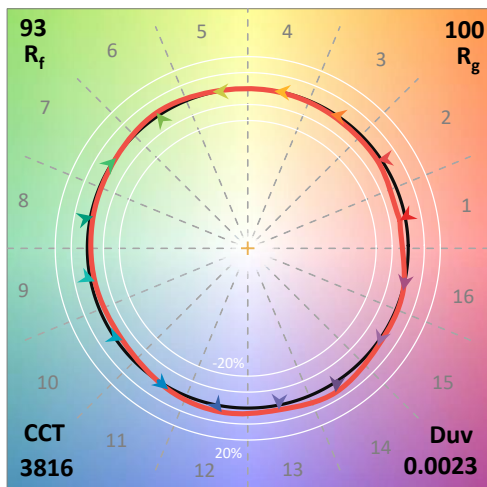
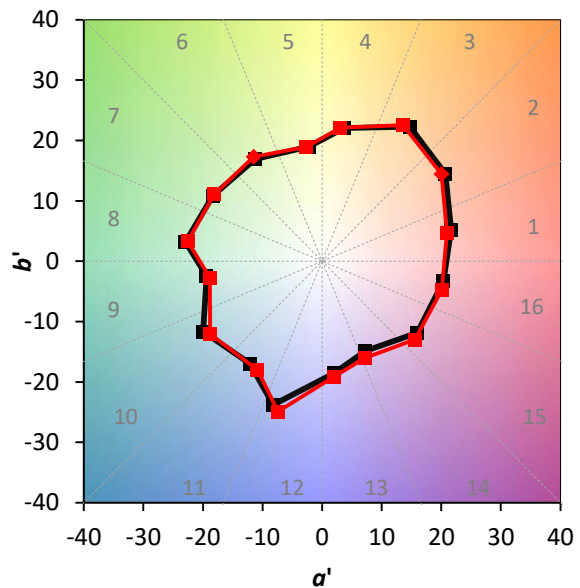
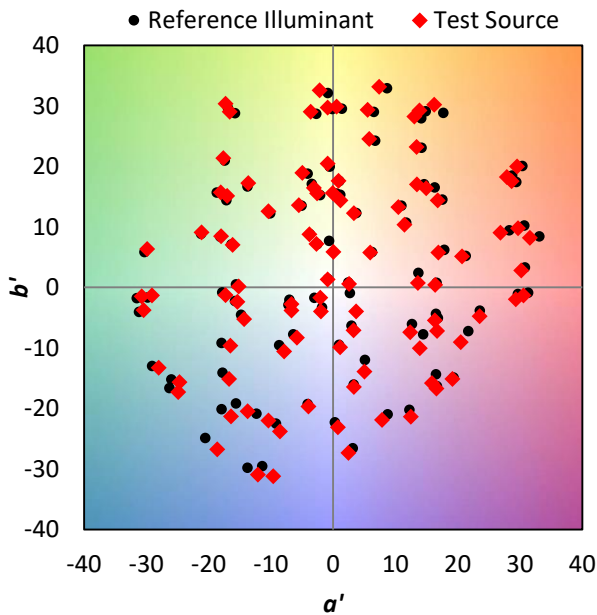
λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)
360	405	0.0	490	7814	6.5	620	16090	0.0	750	1625	0.0	880	367	0.0
365	335	0.0	495	8606	7.1	625	16048	0.0	755	1453	0.0	885	533	0.0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

**Summary**

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

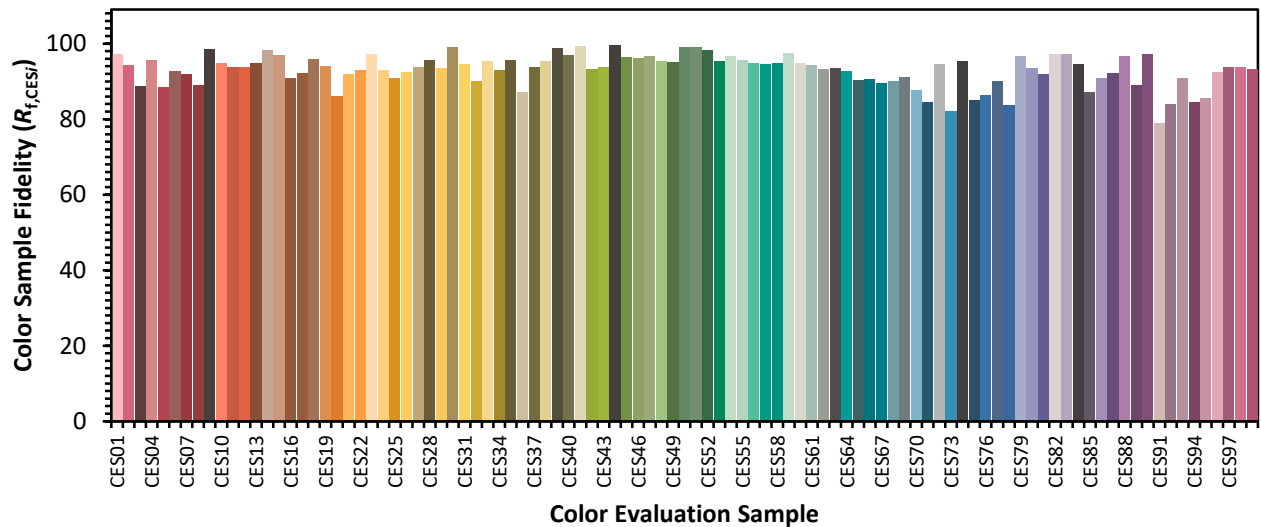


**Color Vector Graphics**



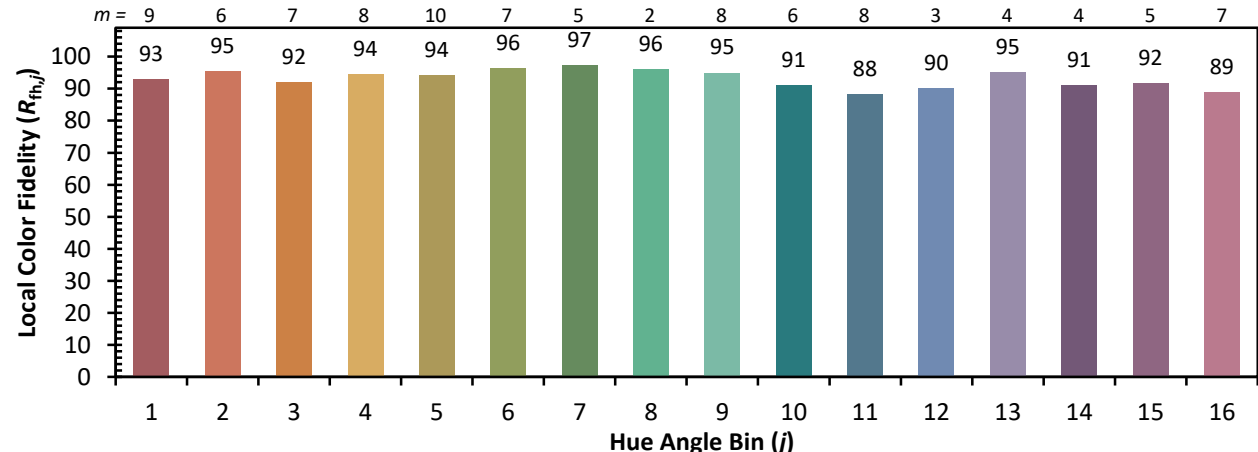
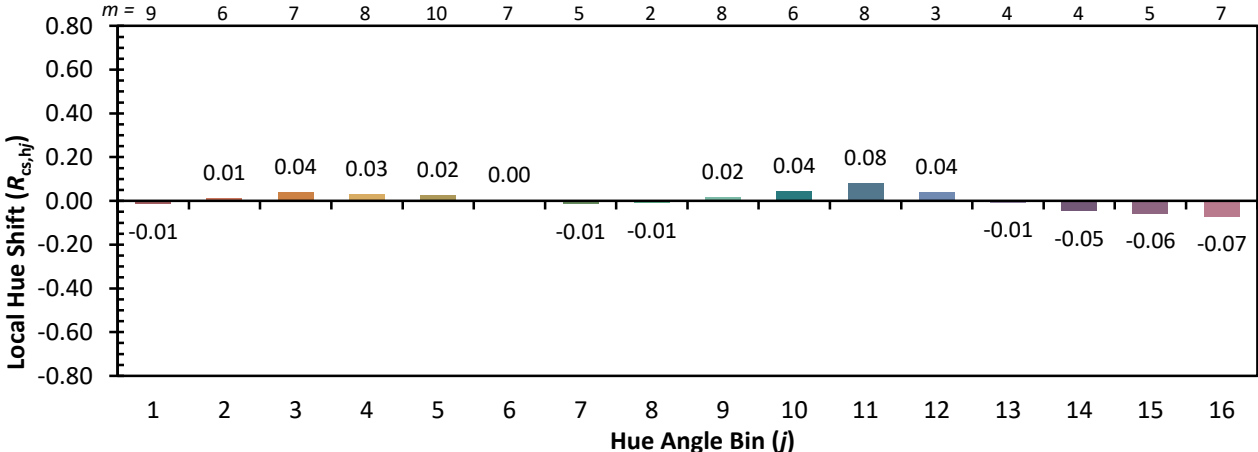
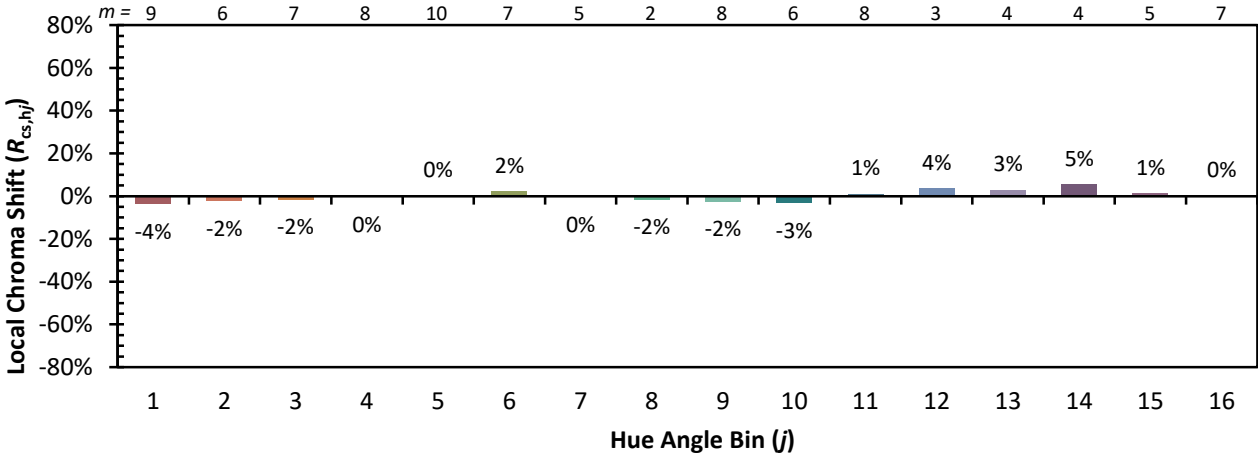
**Individual Sample Fidelity Index ( $R_{f,i}$ )**

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	

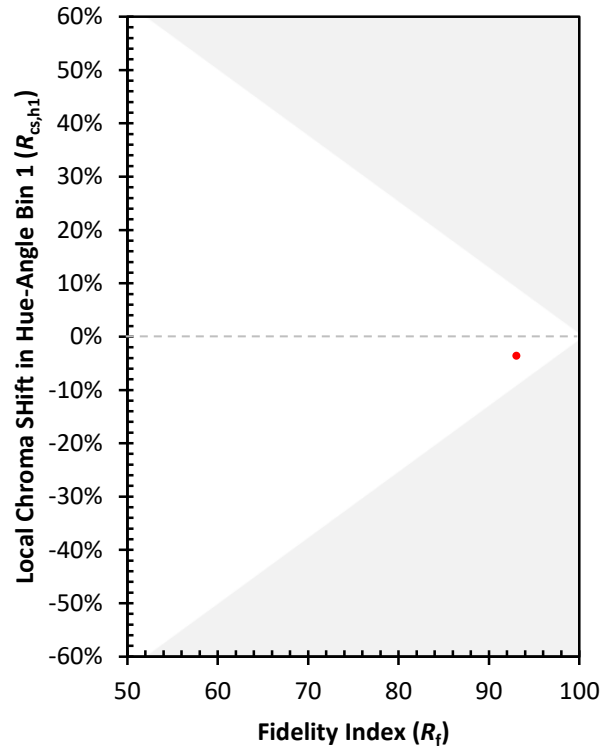
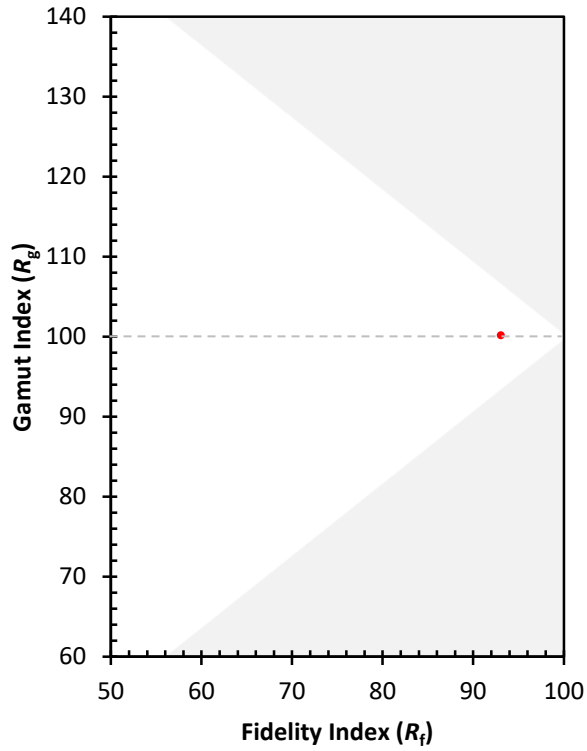




Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)