

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: P895876

Luminaire Tested: **GRZ-10L-927-ASYMx40-X-UNV-STD-1F**

Issue Date: 11/20/2024

**Test Information**

Test Method: LM-79-08  
Report Number: P895876  
Test Lab: EVERFINE  
Issue Date: 11/20/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: io LED  
Catalog Number: GRZ-10L-927-ASYMx40-X-UNV-STD-1F  
Description: iO LED 90CRI 2700K GRAZER 1000 lumens per ft WITH Asymmetric x 40 deg OPTIC  
Light Source: 2700K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

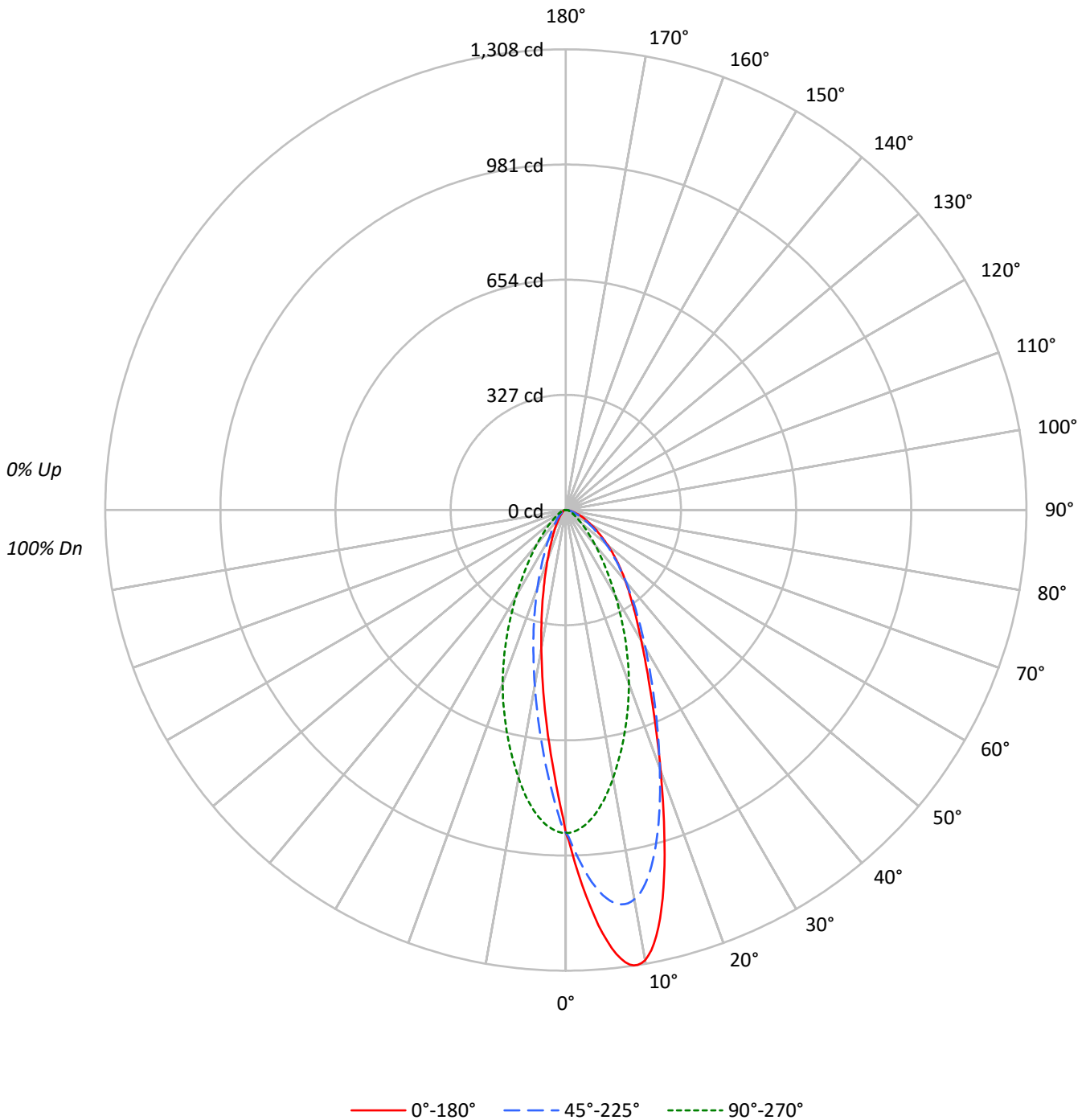
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 749.9 lumens  
Efficiency: N/A  
Efficacy: 75.0 lumens/watt  
Spacing Criteria (0/90/45): 0.66 / 0.7 / 0.73  
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

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### Luminous Intensity Polar Plot





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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	112	109	106	103	110	107	104	101	103	100	98	99	97	95	95	94	93	91	91	91	91
2	105	100	95	91	103	98	93	90	94	91	88	91	88	86	89	86	84	82	82	82	82
3	99	91	86	81	97	90	85	80	87	83	79	85	81	78	82	79	76	75	75	75	75
4	93	84	78	73	91	83	77	73	81	76	72	79	74	71	77	73	70	68	68	68	68
5	88	78	71	67	86	77	71	66	75	70	66	74	69	65	72	68	64	63	63	63	63
6	83	73	66	61	81	72	66	61	70	65	60	69	64	60	68	63	60	58	58	58	58
7	78	68	61	57	77	67	61	56	66	60	56	65	60	56	64	59	55	54	54	54	54
8	74	64	57	53	73	63	57	53	62	56	52	61	56	52	60	55	52	50	50	50	50
9	71	60	54	49	70	60	53	49	59	53	49	58	52	49	57	52	49	47	47	47	47
10	67	57	50	46	66	56	50	46	55	50	46	55	50	46	54	49	46	44	44	44	44

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

	0°	90°	180°
0°	59140	59140	59140
5°	78247	56767	40025
10°	85086	50670	26181
15°	72083	43398	16752
20°	54065	35979	10465
25°	40596	28242	6747
30°	31964	21093	4578
35°	26320	15221	3287
40°	22185	10941	2503
45°	18756	7817	2100
50°	15631	5696	1708
55°	12834	4323	1509
60°	10667	3474	1395
65°	8938	2979	1345
70°	7382	2719	1340
75°	5838	2620	1422
80°	4834	2714	1599
85°	4816	2963	1926



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	82.9	11.1
10°-20°	183.2	24.4
20°-30°	171.0	22.8
30°-40°	126.7	16.9
40°-50°	86.1	11.5
50°-60°	52.6	7.0
60°-70°	28.7	3.8
70°-80°	14.0	1.9
80°-90°	4.7	0.6
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°	437.1	58.3
0°-40°	563.8	75.2
0°-60°	702.5	93.7
0°-90°	749.9	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	749.9	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	916	916	916	916	916	
5°	1207	1086	876	704	618	119
15°	1078	987	649	353	251	294
25°	570	594	396	154	95	265
35°	334	347	193	66	42	210
45°	205	200	86	32	23	159
55°	114	105	38	18	13	103
65°	58	47	20	12	9	59
75°	23	19	10	7	6	26
85°	6	6	4	3	3	7
90°	0	0	0	0	0	



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**CANDELA DISTRIBUTION (FULL):**

	0°	30°	60°	90°	120°	150°	180°
0°	915.9	915.9	915.9	915.9	915.9	915.9	915.9
0.5°	938.7	927.4	927.8	917.2	906.4	905.9	874.4
1°	970.7	954.0	942.6	915.5	888.5	878.2	842.9
1.5°	1002.7	981.0	955.6	913.1	871.1	850.4	811.1
2°	1034.6	1007.5	968.7	909.7	853.2	822.5	780.9
2.5°	1065.9	1032.9	980.9	906.0	834.9	795.6	751.7
3°	1096.2	1058.3	992.3	901.4	816.4	768.3	722.9
3.5°	1126.3	1082.1	1002.3	896.2	798.0	741.4	694.7
4°	1154.8	1104.9	1011.9	890.3	779.1	715.7	668.2
4.5°	1182.3	1126.2	1020.1	883.2	760.2	690.4	642.6
5°	1207.2	1145.9	1026.7	875.8	741.5	666.3	617.5
5.5°	1230.2	1164.1	1032.4	867.8	722.4	642.9	593.1
6°	1250.9	1180.1	1036.4	859.2	703.5	619.3	568.9
6.5°	1268.9	1194.0	1039.6	849.7	685.1	596.7	544.8
7°	1283.6	1205.4	1041.4	839.8	666.9	574.9	521.9
7.5°	1295.3	1214.0	1042.0	830.0	648.7	553.4	499.0
8°	1303.1	1220.3	1041.1	819.2	630.7	532.0	477.5
8.5°	1307.3	1224.4	1038.7	808.2	613.2	511.4	456.9
9°	1307.6	1225.5	1035.3	796.6	596.1	490.5	436.7
9.5°	1304.5	1224.0	1030.8	784.6	578.9	470.7	417.8
10°	1297.7	1219.3	1024.9	772.8	561.7	451.2	399.3
10.5°	1287.0	1212.8	1017.9	760.5	545.4	432.9	381.5
11°	1273.4	1203.9	1010.0	748.1	529.3	415.2	365.1
11.5°	1255.8	1192.0	1001.1	736.0	513.8	398.3	348.2
12°	1236.7	1177.7	991.6	723.7	498.3	381.6	332.5
12.5°	1214.3	1161.7	980.8	711.2	483.3	365.6	317.8
13°	1190.0	1143.4	969.7	699.0	467.9	350.2	303.7
13.5°	1163.8	1123.9	957.4	686.6	453.5	335.5	290.4
14°	1136.2	1102.7	945.1	674.0	439.3	321.2	277.1
14.5°	1107.3	1080.2	931.5	661.7	425.1	307.5	263.9
15°	1078.3	1056.1	917.3	649.2	411.0	294.8	250.6
15.5°	1048.4	1031.6	903.2	636.5	397.7	282.1	237.4
16°	1018.3	1006.3	888.3	623.7	384.2	269.4	225.9
16.5°	987.8	980.3	873.2	611.6	370.8	256.7	215.2
17°	957.2	954.7	857.4	599.2	358.1	244.1	205.1
17.5°	927.4	928.6	841.8	586.8	345.6	233.0	195.0
18°	898.5	902.5	825.7	574.4	333.3	222.6	185.7
18.5°	869.5	877.0	809.3	561.8	321.3	212.6	176.6
19°	841.1	851.5	792.8	549.2	309.7	202.7	168.0
19.5°	813.8	825.8	776.2	536.5	298.2	193.4	159.8
20°	786.8	801.3	759.6	523.6	287.1	184.5	152.3
20.5°	761.7	777.0	743.1	510.9	276.5	176.1	144.9
21°	736.9	753.7	726.0	497.9	265.7	168.0	138.0
21.5°	712.7	731.1	709.9	485.3	255.6	160.2	131.5
22°	690.1	708.8	693.2	472.7	245.5	152.9	125.4



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**CANDELA DISTRIBUTION (continued):**

	0°	30°	60°	90°	120°	150°	180°
22.5°	667.3	687.3	676.6	459.7	235.8	145.9	119.5
23°	645.8	666.6	660.2	446.9	226.4	139.3	114.0
23.5°	625.8	647.1	643.6	434.3	217.3	132.9	108.7
24°	606.2	627.9	628.1	421.5	208.5	126.9	103.8
24.5°	587.8	609.2	612.2	409.1	199.9	121.2	99.1
25°	569.8	591.6	597.0	396.4	191.9	115.8	94.7
25.5°	553.1	574.6	581.6	383.9	183.9	110.7	90.4
26°	536.5	558.5	566.7	371.6	176.4	105.8	86.5
26.5°	521.0	542.5	552.0	359.8	169.0	101.1	82.7
27°	506.2	527.1	537.7	347.9	161.8	96.8	79.2
27.5°	491.7	513.1	523.5	336.2	155.0	92.6	75.8
28°	478.2	499.0	509.8	324.9	148.5	88.6	72.6
28.5°	464.7	485.6	496.1	313.7	142.2	84.8	69.6
29°	452.5	472.7	482.8	303.2	136.2	81.4	66.7
29.5°	440.5	460.0	469.8	293.0	130.6	77.9	64.0
30°	428.7	448.1	457.2	282.9	125.3	74.7	61.4
30.5°	417.8	436.5	445.0	272.7	120.0	71.7	59.0
31°	407.0	425.5	432.9	262.5	114.7	68.9	56.6
31.5°	396.8	414.4	421.1	252.3	109.4	66.1	54.5
32°	386.9	403.8	409.7	242.2	105.0	63.4	52.3
32.5°	377.2	393.9	398.4	233.3	100.6	61.0	50.3
33°	367.9	384.1	387.5	224.8	96.5	58.6	48.4
33.5°	359.0	374.5	376.4	216.6	92.5	56.4	46.6
34°	350.4	365.3	366.1	208.4	88.6	54.2	44.9
34.5°	341.9	356.5	355.5	200.6	85.0	52.2	43.3
35°	333.9	347.8	345.7	193.1	81.6	50.3	41.7
35.5°	325.9	339.4	335.6	185.8	78.3	48.5	40.2
36°	318.2	331.1	326.2	178.8	75.2	46.7	38.8
36.5°	310.7	323.2	316.9	171.8	72.2	45.1	37.5
37°	303.4	315.6	307.7	165.2	69.3	43.5	36.2
37.5°	296.5	308.0	298.8	158.9	66.6	42.0	35.0
38°	289.7	300.7	290.1	152.8	64.0	40.6	33.8
38.5°	282.8	293.4	281.8	146.6	61.5	39.2	32.7
39°	276.1	286.5	273.4	140.7	59.2	37.9	31.6
39.5°	269.6	279.6	265.2	135.1	56.9	36.6	30.6
40°	263.2	272.6	257.5	129.8	54.7	35.5	29.7
40.5°	256.9	265.6	250.0	124.5	52.7	34.3	28.8
41°	250.9	258.6	242.6	119.5	50.8	33.2	27.9
41.5°	245.0	251.6	235.5	114.8	49.0	32.2	27.0
42°	238.8	245.2	228.4	110.0	47.2	31.2	26.3
42.5°	233.2	238.9	221.6	105.5	45.5	30.2	25.5
43°	227.4	232.9	214.9	101.2	43.9	29.3	24.8
43.5°	221.8	226.9	208.6	97.1	42.3	28.5	24.1
44°	216.2	221.4	202.5	93.1	40.9	27.8	23.5
44.5°	210.7	217.1	196.4	89.3	39.7	27.2	23.2



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**CANDELA DISTRIBUTION (continued):**

	0°	30°	60°	90°	120°	150°	180°
45°	205.4	209.7	190.5	85.6	38.2	26.1	23.0
45.5°	200.1	204.1	184.5	82.1	36.9	25.4	22.3
46°	194.9	198.5	178.7	78.8	35.6	24.7	22.2
46.5°	189.7	193.2	173.1	75.6	34.4	24.0	21.7
47°	184.7	187.8	167.7	72.5	33.3	23.4	20.7
47.5°	179.6	182.6	162.4	69.6	32.3	22.8	20.1
48°	174.5	177.3	157.3	66.8	31.2	22.2	19.7
48.5°	169.8	172.3	152.4	64.1	30.3	21.6	19.2
49°	165.0	167.2	147.3	61.5	29.4	21.0	18.1
49.5°	160.3	162.4	142.5	59.1	28.5	20.5	17.4
50°	155.6	157.6	137.8	56.7	27.6	20.0	17.0
50.5°	151.1	152.8	133.3	54.5	26.8	19.5	16.6
51°	146.6	148.1	128.8	52.4	26.0	19.0	16.1
51.5°	142.3	143.5	124.3	50.3	25.3	18.6	15.7
52°	138.0	139.1	119.8	48.3	24.5	18.1	15.3
52.5°	133.9	134.5	115.3	46.5	23.9	17.7	15.0
53°	129.6	130.2	111.3	44.7	23.2	17.3	14.7
53.5°	125.7	125.9	107.4	43.0	22.6	16.9	14.3
54°	121.8	121.7	103.5	41.4	22.0	16.5	14.0
54.5°	117.9	117.6	99.7	39.8	21.4	16.1	13.7
55°	114.0	113.6	96.0	38.4	20.8	15.8	13.4
55.5°	110.4	109.7	92.4	37.0	20.3	15.4	13.1
56°	106.9	105.8	88.8	35.7	19.7	15.1	12.8
56.5°	103.6	102.2	85.5	34.4	19.2	14.8	12.5
57°	100.3	98.5	82.2	33.2	18.8	14.4	12.2
57.5°	97.2	95.0	78.9	32.0	18.3	14.1	12.0
58°	94.1	91.5	75.8	30.9	17.8	13.8	11.7
58.5°	91.0	88.2	72.7	29.8	17.4	13.5	11.5
59°	88.2	84.9	69.7	28.8	17.0	13.2	11.2
59.5°	85.4	81.7	66.9	27.8	16.6	12.9	11.0
60°	82.6	78.6	64.1	26.9	16.2	12.7	10.8
60.5°	79.8	75.6	61.4	26.1	15.8	12.4	10.6
61°	77.1	72.7	58.9	25.2	15.4	12.1	10.3
61.5°	74.5	69.9	56.4	24.4	15.1	11.9	10.1
62°	71.9	67.2	53.9	23.6	14.7	11.6	9.9
62.5°	69.4	64.6	51.7	22.9	14.4	11.4	9.7
63°	67.0	62.1	49.5	22.1	14.0	11.1	9.5
63.5°	64.7	59.7	47.3	21.5	13.7	10.9	9.3
64°	62.5	57.3	45.3	20.8	13.4	10.7	9.2
64.5°	60.5	55.0	43.2	20.1	13.1	10.5	9.0
65°	58.5	52.9	41.4	19.5	12.8	10.2	8.8
65.5°	56.7	50.8	39.5	18.9	12.5	10.0	8.6
66°	54.8	48.7	37.8	18.4	12.2	9.8	8.4
66.5°	52.9	46.8	36.1	17.8	12.0	9.6	8.3
67°	50.9	44.9	34.6	17.3	11.7	9.4	8.1





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**CANDELA DISTRIBUTION (continued):**

	0°	30°	60°	90°	120°	150°	180°
67.5°	48.9	43.1	33.0	16.7	11.4	9.2	7.9
68°	46.8	41.4	31.5	16.2	11.2	9.0	7.8
68.5°	44.9	39.7	30.1	15.7	10.9	8.8	7.6
69°	42.9	38.1	28.8	15.2	10.7	8.6	7.4
69.5°	41.0	36.5	27.5	14.8	10.4	8.4	7.3
70°	39.1	35.0	26.2	14.4	10.2	8.2	7.1
70.5°	37.3	33.5	25.0	13.9	10.0	8.0	7.0
71°	35.5	32.2	23.9	13.5	9.7	7.8	6.8
71.5°	33.8	30.8	22.8	13.1	9.5	7.7	6.7
72°	32.1	29.4	21.7	12.7	9.3	7.5	6.5
72.5°	30.5	28.1	20.7	12.3	9.1	7.3	6.4
73°	28.9	26.9	19.7	11.9	8.8	7.1	6.2
73.5°	27.5	25.7	18.8	11.6	8.6	6.9	6.1
74°	26.0	24.6	18.0	11.2	8.4	6.8	6.0
74.5°	24.7	23.4	17.1	10.9	8.2	6.6	5.8
75°	23.4	22.3	16.3	10.5	8.0	6.4	5.7
75.5°	22.1	21.3	15.5	10.2	7.8	6.3	5.5
76°	20.8	20.3	14.8	9.8	7.5	6.1	5.4
76.5°	19.7	19.3	14.1	9.5	7.3	5.9	5.2
77°	18.6	18.4	13.4	9.2	7.1	5.8	5.1
77.5°	17.5	17.5	12.7	8.9	6.9	5.6	5.0
78°	16.5	16.6	12.1	8.5	6.7	5.4	4.8
78.5°	15.6	15.7	11.5	8.2	6.5	5.3	4.7
79°	14.7	14.9	10.9	7.9	6.3	5.1	4.6
79.5°	13.9	14.1	10.4	7.6	6.0	4.9	4.4
80°	13.0	13.4	9.8	7.3	5.8	4.8	4.3
80.5°	12.3	12.6	9.3	7.0	5.6	4.6	4.1
81°	11.5	11.9	8.8	6.7	5.4	4.4	4.0
81.5°	10.9	11.2	8.3	6.4	5.2	4.3	3.8
82°	10.2	10.6	7.8	6.0	4.9	4.1	3.7
82.5°	9.5	9.9	7.3	5.7	4.7	3.9	3.5
83°	8.9	9.2	6.8	5.4	4.4	3.7	3.4
83.5°	8.3	8.6	6.4	5.1	4.2	3.5	3.2
84°	7.7	8.0	5.9	4.7	3.9	3.3	3.0
84.5°	7.1	7.3	5.4	4.4	3.7	3.1	2.8
85°	6.5	6.7	4.9	4.0	3.4	2.9	2.6
85.5°	6.0	6.1	4.5	3.7	3.1	2.7	2.4
86°	5.4	5.4	4.0	3.3	2.8	2.4	2.2
86.5°	4.8	4.8	3.5	2.9	2.5	2.2	2.0
87°	4.2	4.1	2.9	2.4	2.1	1.9	1.7
87.5°	3.6	3.4	2.4	2.0	1.7	1.6	1.4
88°	2.9	2.7	1.8	1.5	1.4	1.3	1.1
88.5°	2.3	1.9	1.3	1.0	1.0	1.0	0.8
89°	1.6	1.2	0.7	0.7	0.6	0.7	0.5
89.5°	1.0	0.6	0.4	0.3	0.3	0.3	0.3

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

Scaled Data Report



TEST NUMBER: P895876  
CATALOG NUMBER: GRZ-10L-927-ASYMx40-X-UNV-STD-1F

**CANDELA DISTRIBUTION (continued):**

	0°	30°	60°	90°	120°	150°	180°
90°	0.5	0.3	0.3	0.2	0.2	0.2	0.2

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: SP1-2101-124-1

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

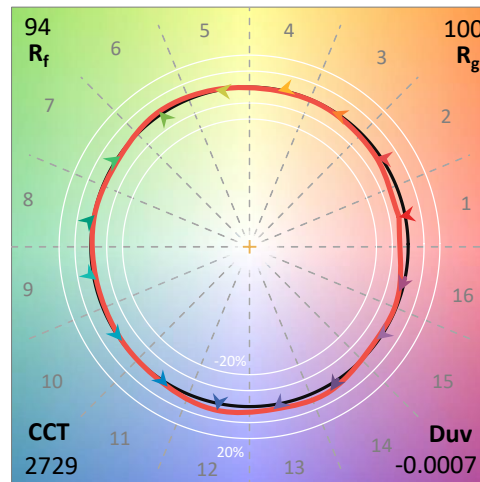
**Spectral Parameters**

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

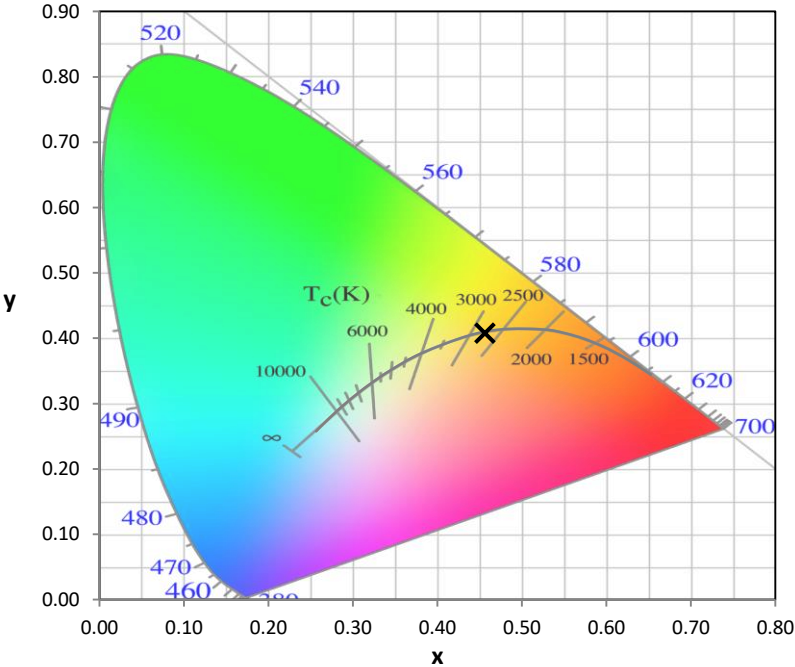


REPORT NUMBER: SP1-2101-124-1

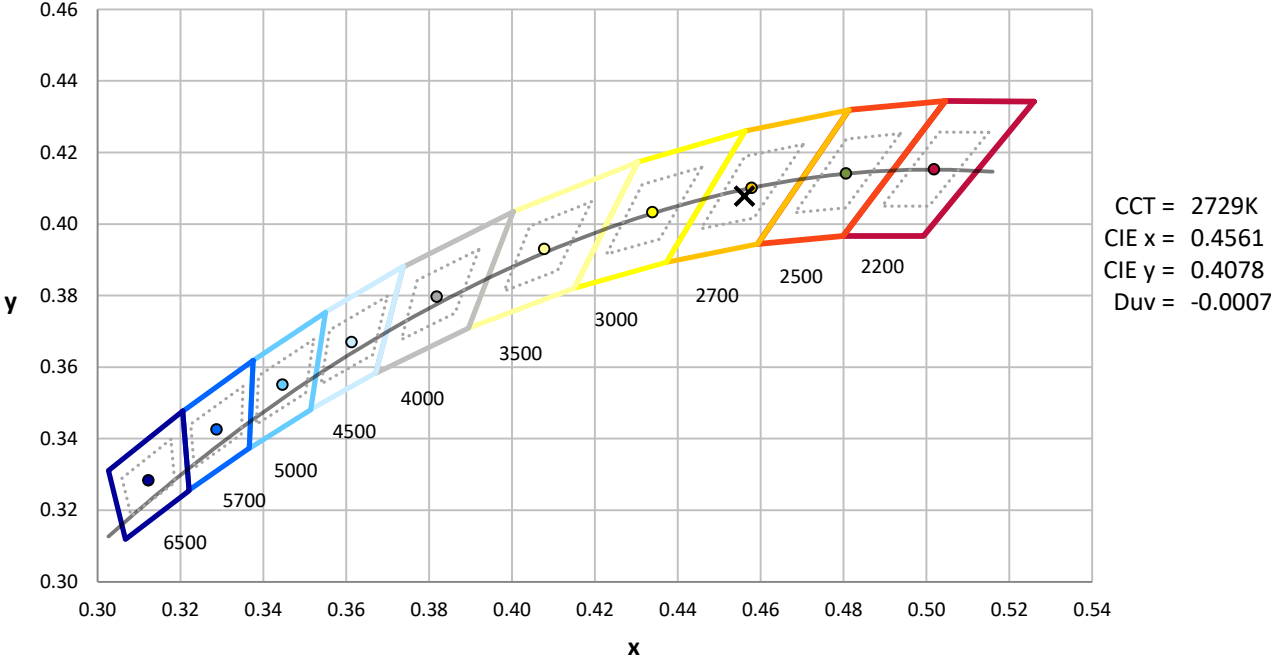
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	1/31/2021	7/31/2021
Power Meter	IN0071	12/1/2020	12/1/2021
AC Power Source	IN0063	12/1/2020	12/1/2021
DC Power Source	IN0208	12/1/2020	12/1/2021
Sphere Thermometer	IN0085	12/1/2020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

REPORT NUMBER: SP1-2101-124-1

CIE 1931 Chromaticity Diagram



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

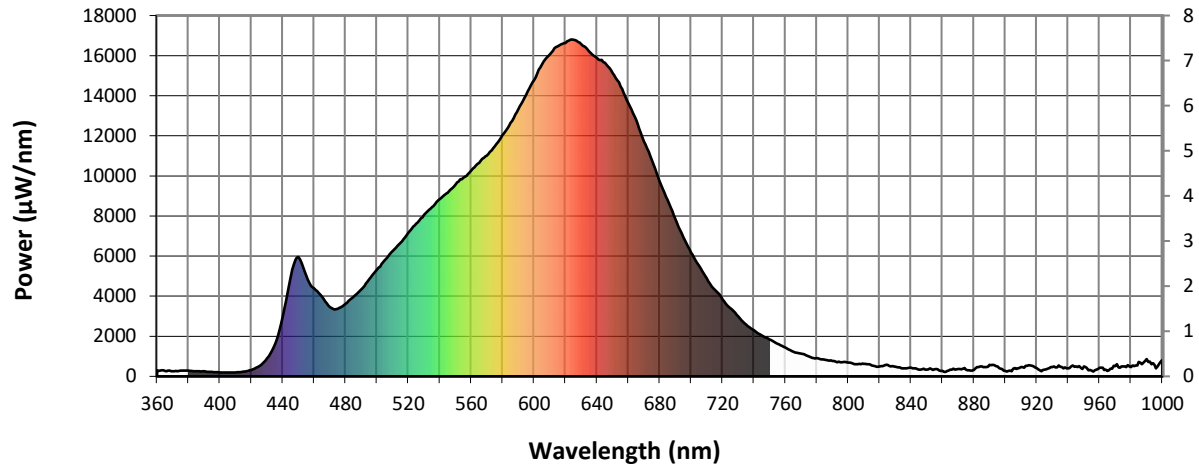


CCT = 2729K  
 CIE x = 0.4561  
 CIE y = 0.4078  
 Duv = -0.0007

Point lies inside the ANSI 2700K 4-step quadrangle

REPORT NUMBER: SP1-2101-124-1

**Photopic Flux vs. Wavelength**

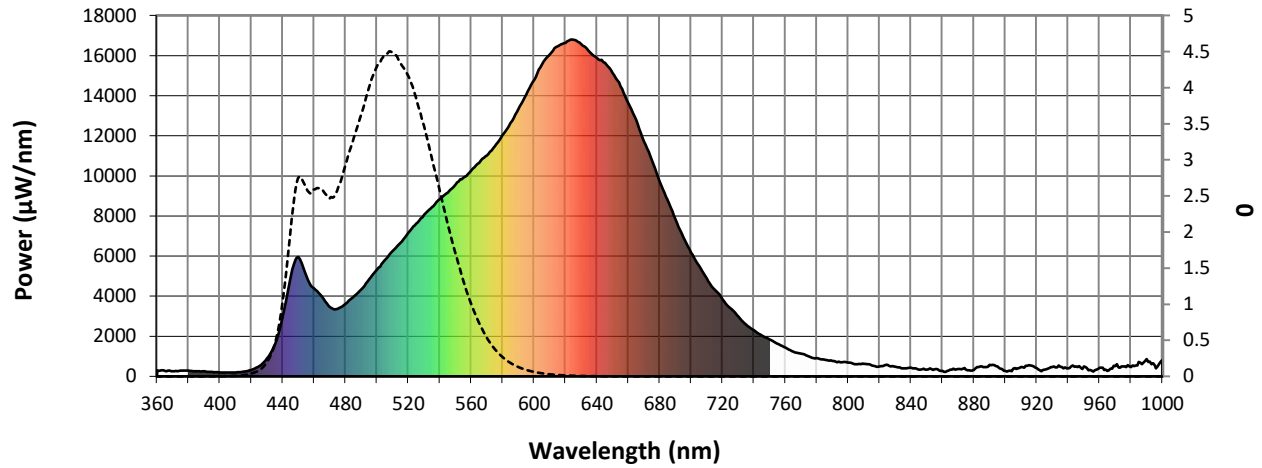


#####

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			

REPORT NUMBER: SP1-2101-124-1

**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 1011.1**

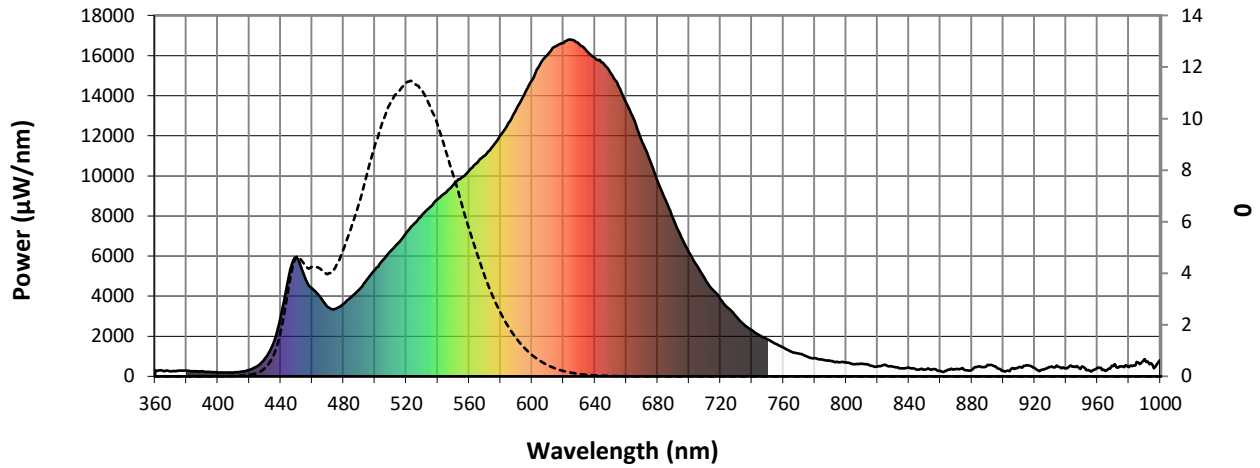
**S/P: 1.32**

$\lambda$ (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**



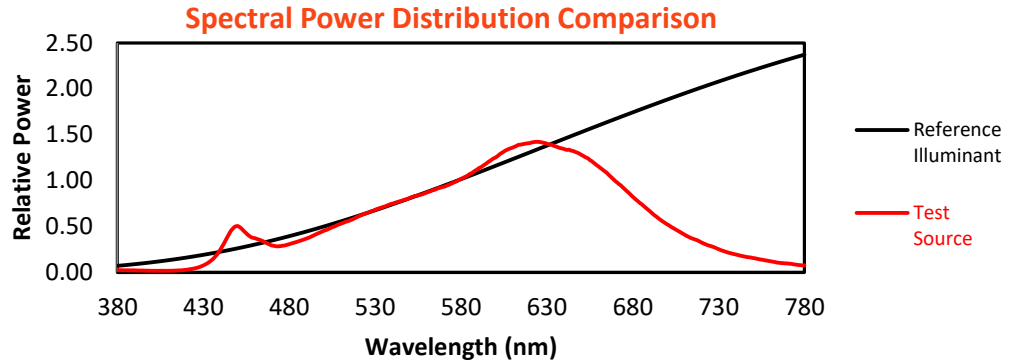
**Melanopic Lumens: 382.4**

**M/P: 0.5**

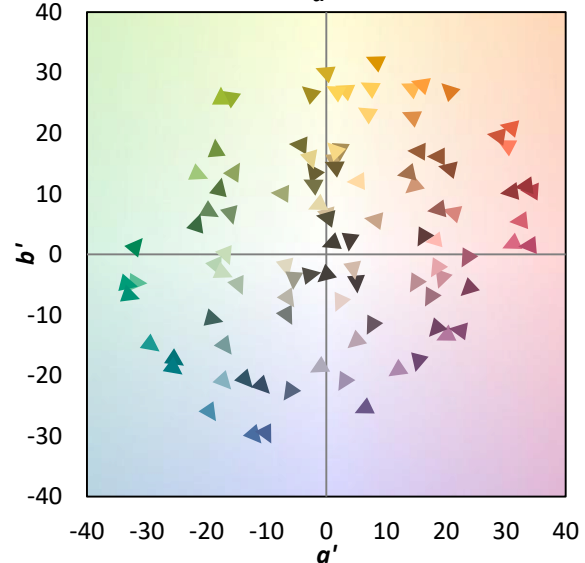
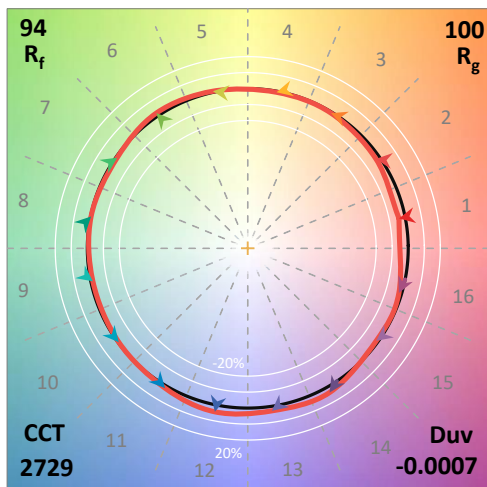
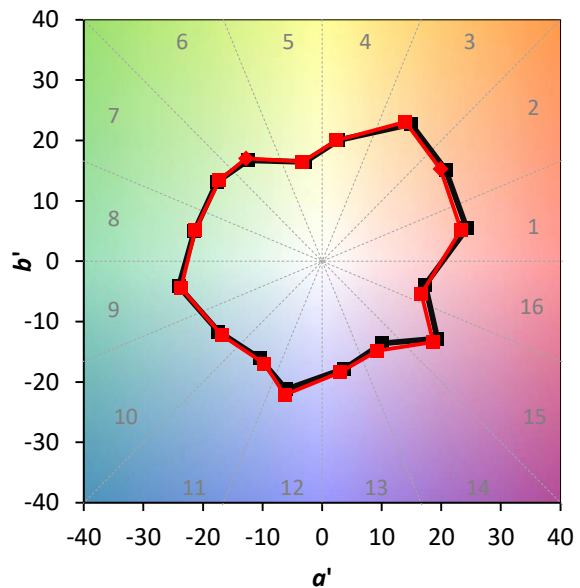
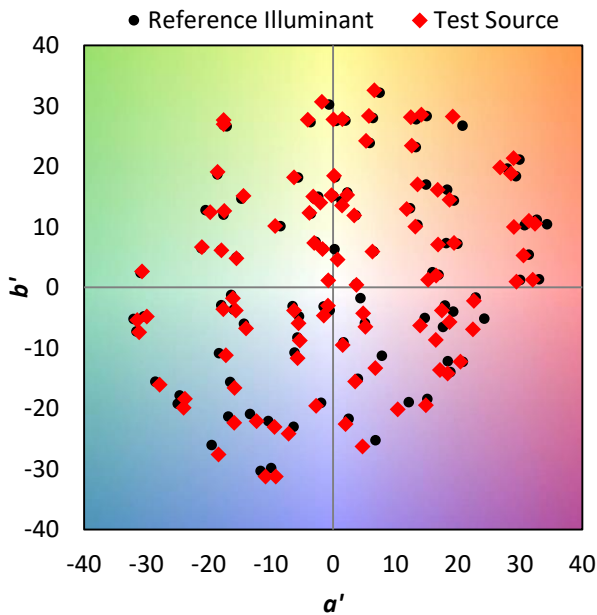
λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)
360	309	0.0	490	4342	3.6	620	16630	0.0	750	1836	0.0	880	324	0.0
365	277	0.0	495	4830	4.0	625	16799	0.0	755	1629	0.0	885	500	0.0
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  $R_a = 94.7$   
 $R_9 = 67.0$

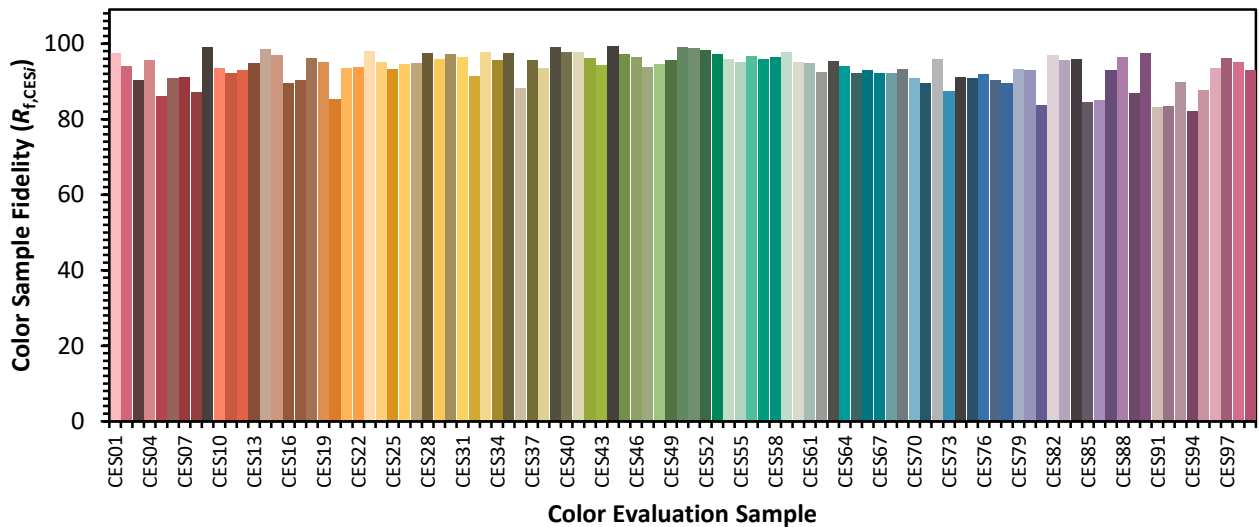


**Color Vector Graphics**

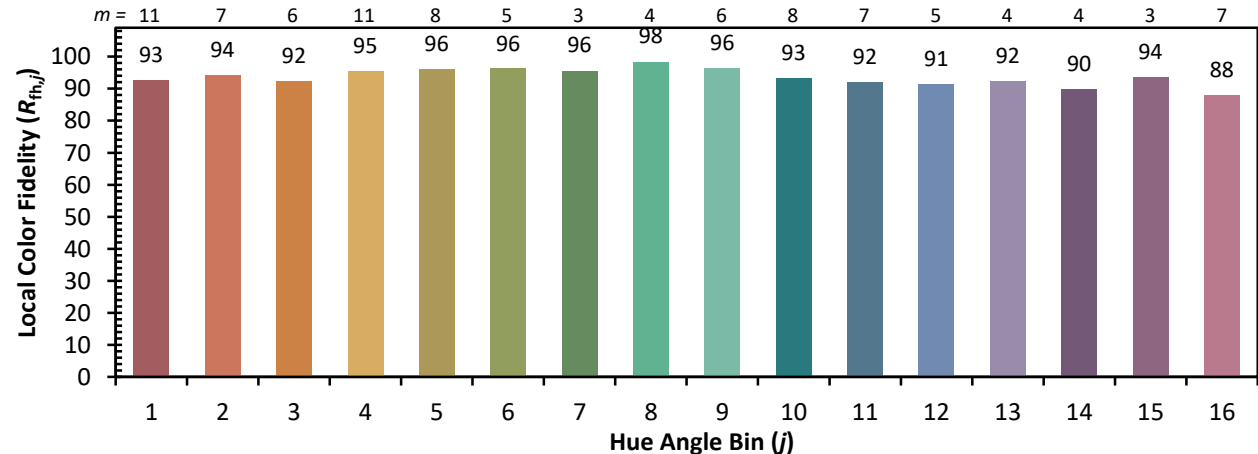
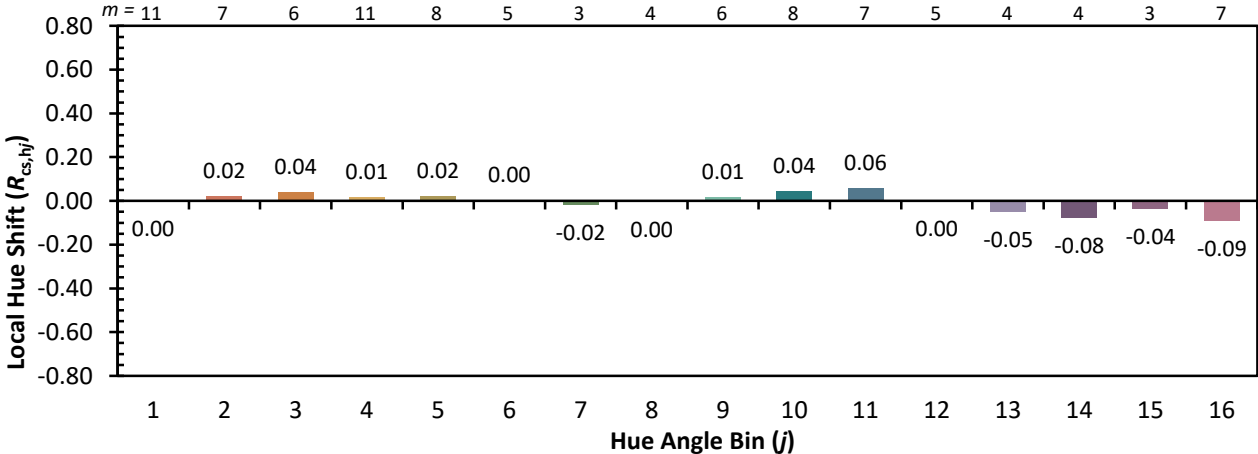
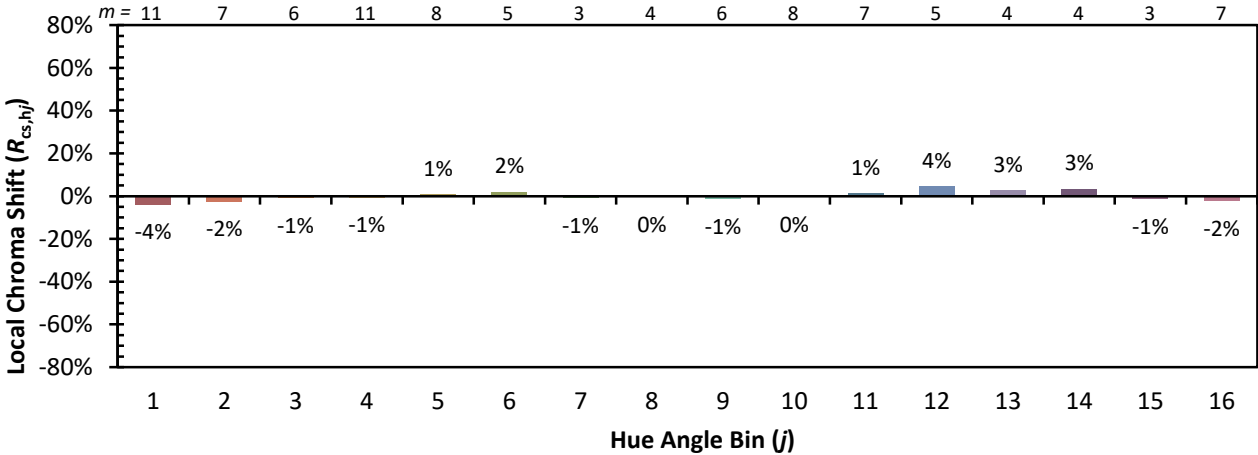


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

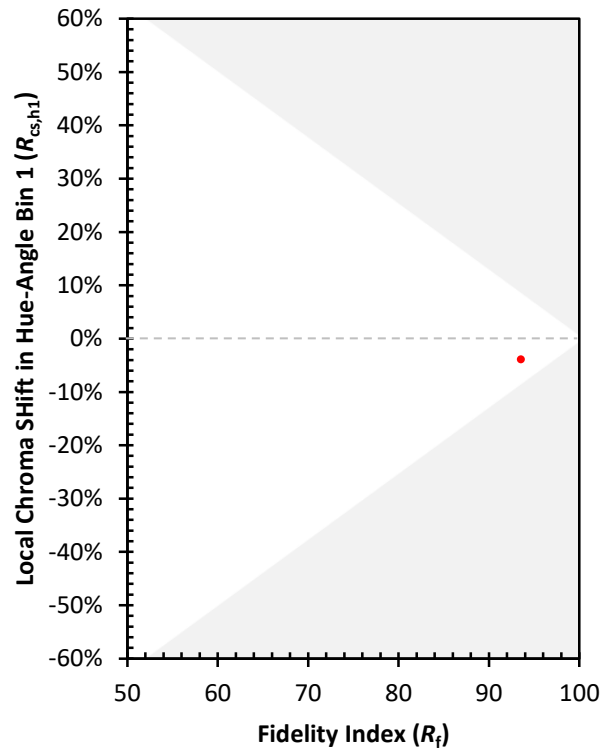
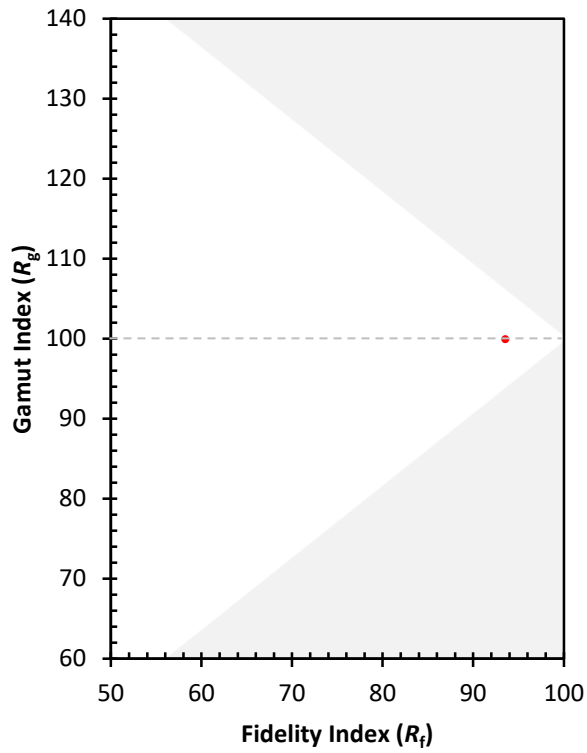
CES01 = 86	CES26 = 95	CES51 = 99	CES76 = 92
CES02 = 64	CES27 = 95	CES52 = 98	CES77 = 90
CES03 = 32	CES28 = 98	CES53 = 97	CES78 = 90
CES04 = 71	CES29 = 96	CES54 = 96	CES79 = 93
CES05 = 51	CES30 = 97	CES55 = 95	CES80 = 93
CES06 = 52	CES31 = 96	CES56 = 97	CES81 = 84
CES07 = 44	CES32 = 91	CES57 = 96	CES82 = 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)