

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: P895883

Luminaire Tested: **GRZ-15L-935-ASYMx40-X-UNV-STD-1F**

Issue Date: 11/20/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P895883  
Test Lab: EVERFINE  
Issue Date: 11/20/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: io LED  
Catalog Number: GRZ-15L-935-ASYMx40-X-UNV-STD-1F  
Description: iO LED 90CRI 3500K GRAZER 1500 lumens per ft WITH Asymmetric x 40 deg OPTIC  
Light Source: 3500K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

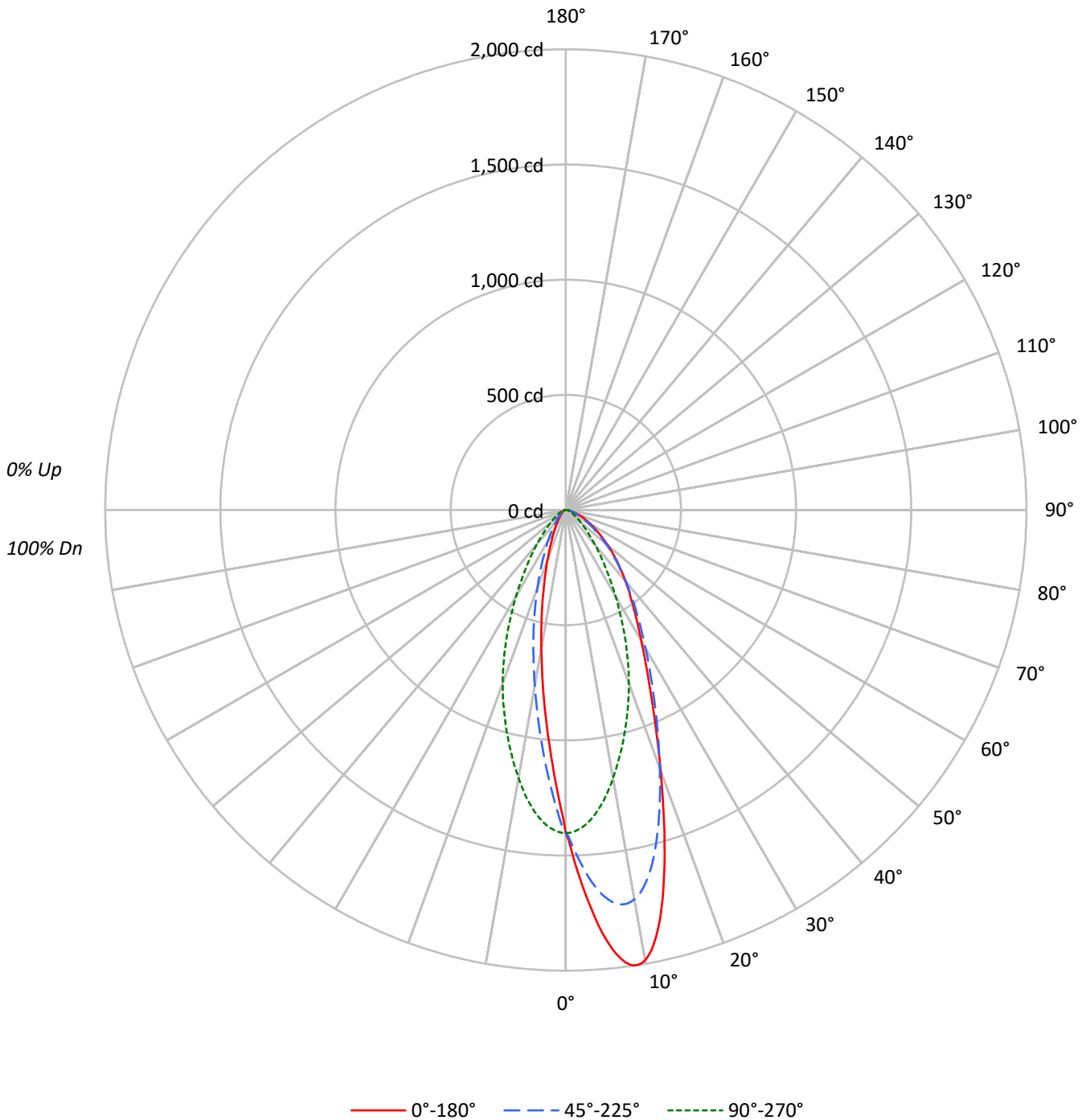
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 1146.8 lumens  
Efficiency: N/A  
Efficacy: 77.0 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): 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

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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	102	102	102	100
1	112	109	106	103	110	107	104	101	103	100	98	99	97	95	95	94	93	95	94	93	91
2	105	100	95	91	103	98	93	90	94	91	88	91	88	86	89	86	84	89	86	84	82
3	99	91	86	81	97	90	85	80	87	83	79	85	81	78	82	79	76	82	79	76	75
4	93	84	78	73	91	83	77	73	81	76	72	79	74	71	77	73	70	77	73	70	68
5	88	78	71	67	86	77	71	66	75	70	66	74	69	65	72	68	64	72	68	64	63
6	83	73	66	61	81	72	66	61	70	65	60	69	64	60	68	63	60	68	63	60	58
7	78	68	61	57	77	67	61	56	66	60	56	65	60	56	64	59	55	64	59	55	54
8	74	64	57	53	73	63	57	53	62	56	52	61	56	52	60	55	52	60	55	52	50
9	71	60	54	49	70	60	53	49	59	53	49	58	52	49	57	52	49	57	52	49	47
10	67	57	50	46	66	56	50	46	55	50	46	55	50	46	54	49	46	54	49	46	44

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

	0°	90°	180°
0°	90444	90444	90444
5°	119666	86810	61207
10°	130124	77487	40035
15°	110233	66374	25616
20°	82677	55020	16004
25°	62091	43196	10316
30°	48881	32255	7009
35°	40249	23277	5029
40°	33927	16732	3827
45°	28692	11953	3214
50°	23898	8719	2612
55°	19622	6608	2297
60°	16311	5321	2131
65°	13674	4568	2047
70°	11290	4153	2058
75°	8906	4017	2170
80°	7400	4165	2417
85°	7409	4519	2963



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	126.8	11.1
10°-20°	280.1	24.4
20°-30°	261.5	22.8
30°-40°	193.8	16.9
40°-50°	131.7	11.5
50°-60°	80.4	7.0
60°-70°	43.8	3.8
70°-80°	21.5	1.9
80°-90°	7.2	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°	668.4	58.3
0°-40°	862.2	75.2
0°-60°	1074.3	93.7
0°-90°	1146.8	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1146.8	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	1401	1401	1401	1401	1401	
5°	1846	1661	1339	1076	944	181
15°	1649	1509	993	540	383	450
25°	872	909	606	235	145	405
35°	511	530	295	101	64	321
45°	314	306	131	49	35	243
55°	174	160	59	28	20	158
65°	90	72	30	18	13	90
75°	36	30	16	11	9	39
85°	10	9	6	5	4	11
90°	1	0	0	0	0	



TEST NUMBER: P895883

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**CANDELA DISTRIBUTION (FULL):**

	0°	30°	60°	90°	120°	150°	180°
0°	1400.7	1400.7	1400.7	1400.7	1400.7	1400.7	1400.7
0.5°	1435.5	1418.2	1418.9	1402.6	1386.2	1385.3	1337.2
1°	1484.5	1458.9	1441.5	1400.0	1358.8	1343.1	1289.0
1.5°	1533.4	1500.2	1461.4	1396.4	1332.1	1300.5	1240.4
2°	1582.2	1540.7	1481.4	1391.1	1304.7	1257.8	1194.1
2.5°	1630.1	1579.7	1500.1	1385.6	1276.7	1216.7	1149.6
3°	1676.4	1618.4	1517.4	1378.5	1248.6	1174.9	1105.6
3.5°	1722.4	1654.8	1532.8	1370.5	1220.3	1133.8	1062.4
4°	1766.0	1689.6	1547.5	1361.5	1191.4	1094.6	1021.8
4.5°	1808.0	1722.3	1560.0	1350.6	1162.5	1055.8	982.7
5°	1846.2	1752.4	1570.0	1339.3	1133.9	1018.9	944.3
5.5°	1881.4	1780.2	1578.8	1327.1	1104.8	983.2	907.0
6°	1913.0	1804.7	1585.0	1313.9	1075.9	947.0	870.0
6.5°	1940.5	1825.9	1589.9	1299.5	1047.7	912.5	833.2
7°	1963.0	1843.3	1592.6	1284.3	1019.8	879.2	798.1
7.5°	1980.9	1856.5	1593.5	1269.3	992.1	846.4	763.1
8°	1992.8	1866.2	1592.2	1252.8	964.4	813.6	730.2
8.5°	1999.2	1872.4	1588.5	1235.9	937.7	782.0	698.7
9°	1999.7	1874.1	1583.3	1218.2	911.6	750.2	667.8
9.5°	1994.9	1871.8	1576.3	1199.9	885.3	719.8	638.9
10°	1984.6	1864.6	1567.4	1181.8	859.0	690.1	610.6
10.5°	1968.2	1854.8	1556.7	1163.0	834.1	662.0	583.4
11°	1947.4	1841.0	1544.6	1144.0	809.5	634.9	558.3
11.5°	1920.5	1822.9	1530.9	1125.6	785.7	609.1	532.5
12°	1891.3	1801.0	1516.4	1106.8	762.1	583.6	508.5
12.5°	1857.0	1776.5	1499.9	1087.7	739.2	559.1	486.0
13°	1819.9	1748.6	1482.9	1068.9	715.6	535.5	464.4
13.5°	1779.8	1718.8	1464.1	1049.9	693.6	513.0	444.1
14°	1737.5	1686.4	1445.4	1030.8	671.7	491.2	423.8
14.5°	1693.4	1651.9	1424.5	1011.9	650.1	470.3	403.5
15°	1649.0	1615.1	1402.8	992.9	628.6	450.8	383.2
15.5°	1603.2	1577.6	1381.3	973.5	608.3	431.4	363.0
16°	1557.3	1539.0	1358.4	953.8	587.6	412.0	345.5
16.5°	1510.5	1499.2	1335.3	935.3	567.1	392.6	329.1
17°	1463.8	1459.9	1311.2	916.3	547.7	373.3	313.7
17.5°	1418.3	1420.1	1287.3	897.4	528.5	356.3	298.2
18°	1374.0	1380.1	1262.7	878.4	509.6	340.4	284.0
18.5°	1329.7	1341.2	1237.6	859.2	491.3	325.1	270.0
19°	1286.2	1302.1	1212.3	839.8	473.7	310.0	257.0
19.5°	1244.5	1262.8	1187.0	820.4	456.0	295.7	244.4
20°	1203.2	1225.4	1161.6	800.7	439.1	282.1	232.9
20.5°	1164.9	1188.2	1136.5	781.3	422.8	269.3	221.6
21°	1127.0	1152.7	1110.3	761.5	406.3	257.0	211.1
21.5°	1089.9	1118.1	1085.7	742.2	390.9	245.0	201.1
22°	1055.4	1084.0	1060.2	722.9	375.4	233.8	191.7



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**CANDELA DISTRIBUTION (continued):**

	0°	30°	60°	90°	120°	150°	180°
22.5°	1020.4	1051.1	1034.8	703.0	360.6	223.1	182.8
23°	987.6	1019.5	1009.7	683.5	346.2	213.1	174.3
23.5°	957.1	989.6	984.3	664.2	332.4	203.3	166.2
24°	927.0	960.3	960.5	644.6	318.8	194.0	158.7
24.5°	898.9	931.7	936.2	625.6	305.7	185.3	151.6
25°	871.5	904.7	913.0	606.3	293.5	177.2	144.8
25.5°	845.9	878.7	889.4	587.1	281.2	169.3	138.3
26°	820.5	854.2	866.7	568.3	269.7	161.8	132.3
26.5°	796.7	829.7	844.1	550.2	258.4	154.6	126.5
27°	774.1	806.1	822.3	532.1	247.5	148.1	121.1
27.5°	751.9	784.6	800.5	514.2	237.0	141.6	116.0
28°	731.2	763.2	779.6	496.9	227.1	135.5	111.0
28.5°	710.6	742.6	758.6	479.8	217.5	129.7	106.4
29°	692.0	723.0	738.3	463.7	208.2	124.4	102.0
29.5°	673.7	703.5	718.5	448.1	199.7	119.2	97.9
30°	655.6	685.3	699.2	432.6	191.6	114.3	94.0
30.5°	639.0	667.6	680.6	417.0	183.5	109.7	90.3
31°	622.5	650.6	662.1	401.4	175.4	105.3	86.6
31.5°	606.8	633.7	644.0	385.9	167.3	101.1	83.3
32°	591.7	617.6	626.5	370.4	160.6	97.0	80.0
32.5°	576.9	602.3	609.2	356.8	153.8	93.2	77.0
33°	562.7	587.4	592.5	343.8	147.5	89.6	74.0
33.5°	548.9	572.7	575.6	331.2	141.4	86.2	71.3
34°	535.8	558.7	559.8	318.7	135.4	83.0	68.7
34.5°	522.8	545.2	543.7	306.8	130.0	79.9	66.2
35°	510.6	531.9	528.6	295.3	124.7	76.9	63.8
35.5°	498.5	519.1	513.3	284.1	119.7	74.1	61.5
36°	486.6	506.3	498.9	273.4	114.9	71.4	59.4
36.5°	475.2	494.2	484.6	262.8	110.4	68.9	57.3
37°	464.0	482.7	470.5	252.7	106.0	66.5	55.4
37.5°	453.5	471.0	456.9	243.0	101.8	64.2	53.5
38°	443.1	459.9	443.7	233.7	97.9	62.0	51.7
38.5°	432.5	448.6	430.9	224.2	94.1	59.9	50.0
39°	422.2	438.2	418.1	215.2	90.5	57.9	48.4
39.5°	412.3	427.5	405.5	206.7	87.1	56.0	46.9
40°	402.5	416.8	393.8	198.5	83.6	54.2	45.4
40.5°	392.9	406.2	382.3	190.4	80.6	52.5	44.0
41°	383.6	395.5	371.0	182.7	77.7	50.8	42.6
41.5°	374.7	384.8	360.1	175.5	74.9	49.2	41.3
42°	365.2	375.0	349.4	168.2	72.1	47.7	40.2
42.5°	356.6	365.4	338.9	161.4	69.6	46.3	39.0
43°	347.8	356.2	328.7	154.8	67.1	44.9	37.9
43.5°	339.2	347.0	319.0	148.4	64.8	43.6	36.9
44°	330.7	338.6	309.6	142.4	62.5	42.6	35.9
44.5°	322.3	332.0	300.3	136.5	60.7	41.5	35.5



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**CANDELA DISTRIBUTION (continued):**

	0°	30°	60°	90°	120°	150°	180°
45°	314.2	320.7	291.3	130.9	58.4	40.0	35.2
45.5°	306.0	312.1	282.1	125.5	56.4	38.8	34.2
46°	298.0	303.5	273.3	120.4	54.4	37.7	33.9
46.5°	290.1	295.4	264.8	115.6	52.7	36.7	33.1
47°	282.5	287.1	256.5	110.8	51.0	35.7	31.7
47.5°	274.6	279.3	248.4	106.4	49.3	34.8	30.7
48°	266.9	271.1	240.6	102.1	47.8	33.9	30.1
48.5°	259.7	263.4	233.0	98.1	46.3	33.0	29.4
49°	252.3	255.7	225.3	94.1	44.9	32.1	27.7
49.5°	245.2	248.3	218.0	90.3	43.5	31.3	26.7
50°	237.9	241.0	210.7	86.8	42.2	30.6	26.0
50.5°	231.1	233.6	203.9	83.3	41.0	29.8	25.3
51°	224.2	226.5	197.0	80.1	39.8	29.1	24.6
51.5°	217.5	219.4	190.1	76.9	38.7	28.4	24.0
52°	211.0	212.7	183.3	73.9	37.5	27.7	23.5
52.5°	204.7	205.7	176.4	71.0	36.5	27.1	22.9
53°	198.3	199.2	170.2	68.4	35.5	26.5	22.5
53.5°	192.3	192.6	164.2	65.8	34.5	25.8	21.9
54°	186.3	186.2	158.3	63.3	33.6	25.2	21.4
54.5°	180.3	179.8	152.5	60.9	32.7	24.7	20.9
55°	174.3	173.7	146.8	58.7	31.8	24.1	20.4
55.5°	168.8	167.7	141.3	56.6	31.0	23.6	20.0
56°	163.4	161.9	135.9	54.5	30.2	23.1	19.6
56.5°	158.4	156.3	130.7	52.5	29.4	22.6	19.1
57°	153.4	150.7	125.7	50.7	28.7	22.1	18.7
57.5°	148.6	145.2	120.7	48.9	27.9	21.6	18.3
58°	143.9	140.0	115.9	47.2	27.3	21.1	17.9
58.5°	139.2	134.8	111.2	45.6	26.6	20.7	17.5
59°	134.9	129.8	106.7	44.0	26.0	20.2	17.2
59.5°	130.5	124.9	102.3	42.6	25.3	19.8	16.8
60°	126.3	120.2	98.0	41.2	24.7	19.4	16.5
60.5°	122.1	115.6	93.9	39.9	24.1	19.0	16.1
61°	117.9	111.2	90.0	38.5	23.6	18.6	15.8
61.5°	113.9	106.9	86.2	37.3	23.0	18.2	15.5
62°	109.9	102.7	82.5	36.1	22.5	17.8	15.2
62.5°	106.2	98.8	79.0	35.0	22.0	17.4	14.9
63°	102.5	94.9	75.6	33.9	21.5	17.0	14.6
63.5°	98.9	91.3	72.3	32.8	21.0	16.7	14.3
64°	95.6	87.6	69.2	31.8	20.5	16.3	14.0
64.5°	92.4	84.2	66.1	30.8	20.0	16.0	13.7
65°	89.5	80.8	63.3	29.9	19.6	15.7	13.4
65.5°	86.7	77.7	60.5	29.0	19.1	15.3	13.2
66°	83.8	74.5	57.9	28.1	18.7	15.0	12.9
66.5°	80.8	71.6	55.3	27.2	18.3	14.7	12.6
67°	77.8	68.7	52.9	26.4	17.9	14.3	12.4





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**CANDELA DISTRIBUTION (continued):**

	0°	30°	60°	90°	120°	150°	180°
67.5°	74.7	66.0	50.5	25.6	17.5	14.0	12.1
68°	71.6	63.3	48.2	24.8	17.1	13.7	11.9
68.5°	68.6	60.7	46.1	24.0	16.7	13.4	11.6
69°	65.6	58.2	44.0	23.3	16.3	13.1	11.4
69.5°	62.7	55.8	42.0	22.6	16.0	12.8	11.1
70°	59.8	53.5	40.1	22.0	15.6	12.5	10.9
70.5°	57.0	51.3	38.3	21.3	15.3	12.3	10.7
71°	54.3	49.2	36.5	20.7	14.9	12.0	10.4
71.5°	51.7	47.0	34.8	20.0	14.5	11.7	10.2
72°	49.1	45.0	33.2	19.4	14.2	11.4	10.0
72.5°	46.7	43.0	31.7	18.9	13.8	11.2	9.7
73°	44.3	41.1	30.2	18.3	13.5	10.9	9.5
73.5°	42.0	39.3	28.8	17.7	13.2	10.6	9.3
74°	39.8	37.6	27.5	17.1	12.8	10.4	9.1
74.5°	37.7	35.8	26.2	16.6	12.5	10.1	8.9
75°	35.7	34.1	24.9	16.1	12.2	9.8	8.7
75.5°	33.8	32.6	23.7	15.6	11.9	9.6	8.5
76°	31.9	31.0	22.6	15.0	11.5	9.3	8.2
76.5°	30.1	29.5	21.5	14.5	11.2	9.1	8.0
77°	28.4	28.1	20.5	14.0	10.9	8.8	7.8
77.5°	26.8	26.7	19.5	13.5	10.6	8.6	7.6
78°	25.3	25.4	18.5	13.1	10.2	8.3	7.4
78.5°	23.8	24.1	17.6	12.6	9.9	8.1	7.2
79°	22.5	22.8	16.7	12.1	9.6	7.8	7.0
79.5°	21.2	21.6	15.9	11.6	9.3	7.6	6.7
80°	19.9	20.5	15.0	11.2	8.9	7.3	6.5
80.5°	18.8	19.3	14.2	10.7	8.6	7.0	6.3
81°	17.6	18.2	13.4	10.2	8.2	6.8	6.1
81.5°	16.6	17.2	12.7	9.7	7.9	6.5	5.8
82°	15.6	16.2	11.9	9.2	7.5	6.2	5.6
82.5°	14.6	15.1	11.2	8.8	7.2	6.0	5.4
83°	13.6	14.1	10.4	8.3	6.8	5.7	5.1
83.5°	12.7	13.1	9.7	7.8	6.4	5.4	4.9
84°	11.8	12.2	9.0	7.2	6.0	5.1	4.6
84.5°	10.9	11.2	8.3	6.7	5.6	4.8	4.3
85°	10.0	10.2	7.6	6.1	5.2	4.4	4.0
85.5°	9.1	9.3	6.8	5.6	4.7	4.1	3.7
86°	8.3	8.3	6.1	5.0	4.2	3.7	3.3
86.5°	7.4	7.3	5.3	4.4	3.8	3.3	3.0
87°	6.4	6.3	4.5	3.7	3.2	2.9	2.6
87.5°	5.5	5.2	3.7	3.0	2.7	2.5	2.2
88°	4.5	4.1	2.8	2.3	2.1	2.0	1.7
88.5°	3.4	2.9	1.9	1.6	1.5	1.5	1.3
89°	2.4	1.9	1.1	1.0	0.9	1.0	0.8
89.5°	1.5	1.0	0.5	0.4	0.5	0.5	0.4

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

Scaled Data Report



TEST NUMBER: P895883  
CATALOG NUMBER: GRZ-15L-935-ASYMx40-X-UNV-STD-1F

**CANDELA DISTRIBUTION (continued):**

	0°	30°	60°	90°	120°	150°	180°
90°	0.7	0.5	0.4	0.3	0.3	0.3	0.3

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: SP1-2101-124-3

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

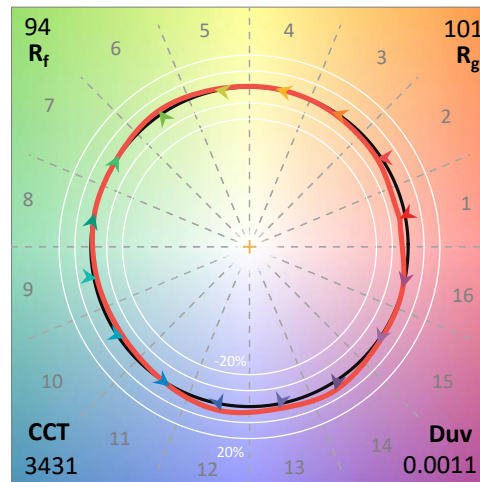
**Spectral Parameters**

CCT (K): 3431  
 CIE u': 0.2369  
 CIE v': 0.5141  
 Duv: 0.0011  
 CIE x: 0.4104  
 CIE y: 0.3958  
 CIE z: 0.1938  
 Peak Wavelength (nm): 624  
 Dominant Wavelength (nm): 580  
 Purity: 42.2  
  
 Rf: 93.6  
 Rg: 100.6

CRI (Ra):	94.0		
R1:	94.7	R9:	69.9
R2:	95.5	R10:	88.4
R3:	95.0	R11:	95.7
R4:	95.4	R12:	83.2
R5:	94.1	R13:	94.8
R6:	94.0	R14:	96.6
R7:	95.4		
R8:	88.3		

**Test Conditions**

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

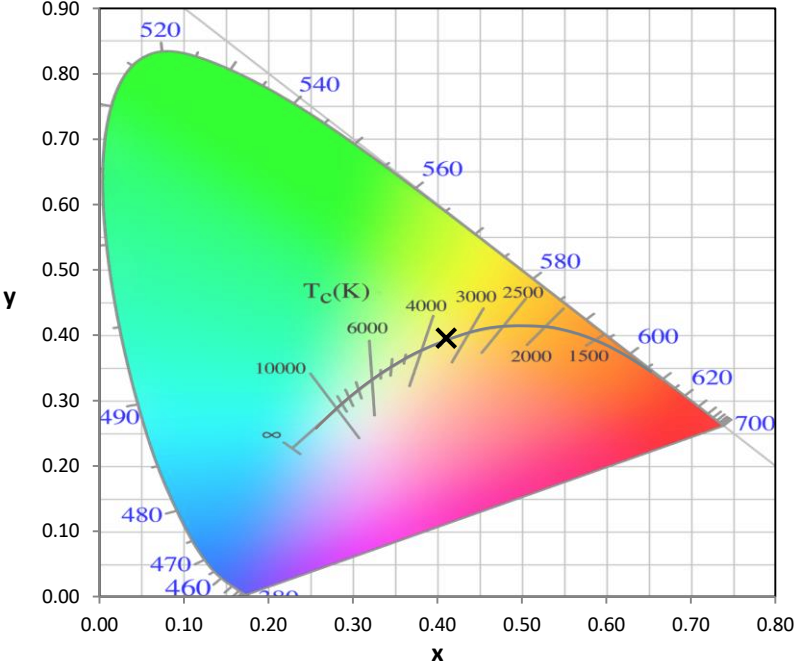


REPORT NUMBER: SP1-2101-124-3

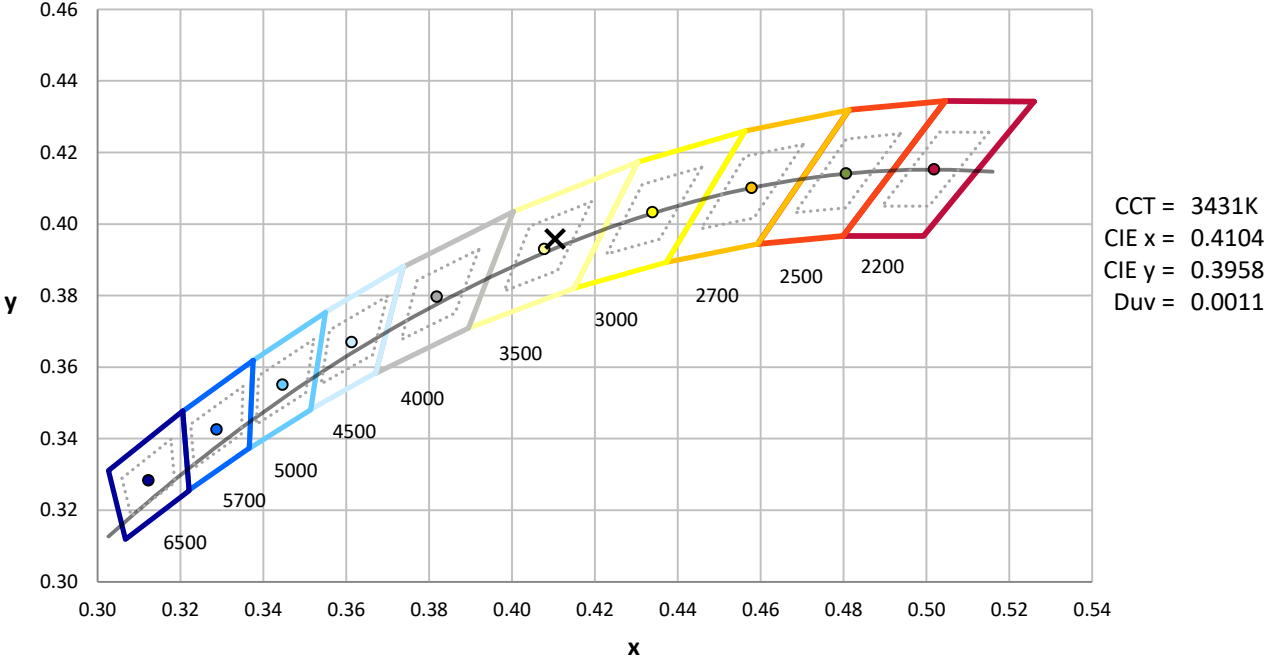
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	1/31/2021	7/31/2021
Power Meter	IN0071	12/1/2020	12/1/2021
AC Power Source	IN0063	12/1/2020	12/1/2021
DC Power Source	IN0208	12/1/2020	12/1/2021
Sphere Thermometer	IN0085	12/1/2020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

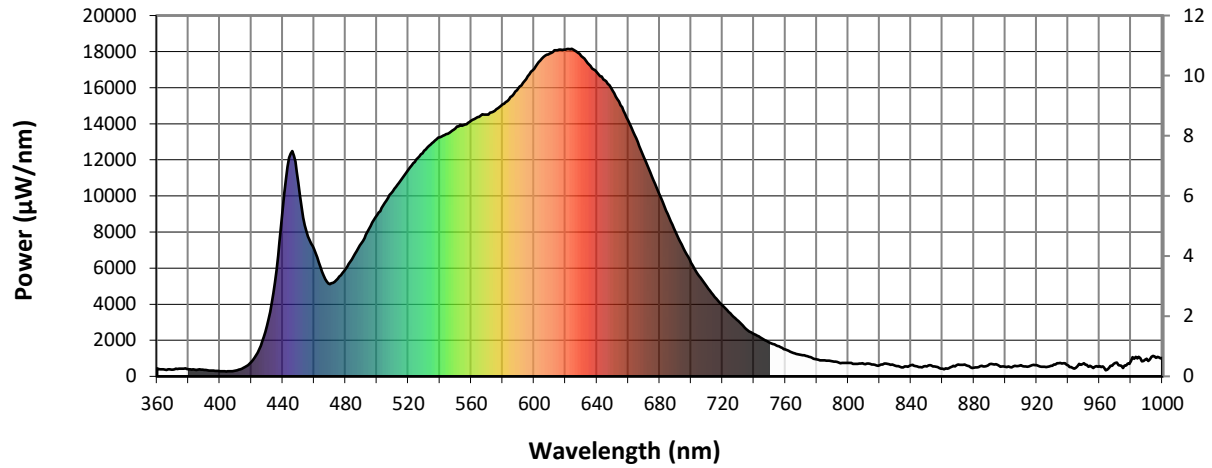


CCT = 3431K  
 CIE x = 0.4104  
 CIE y = 0.3958  
 Duv = 0.0011

Point lies inside the ANSI 3500K 4-step quadrangle

REPORT NUMBER: SP1-2101-124-3

**Photopic Flux vs. Wavelength**

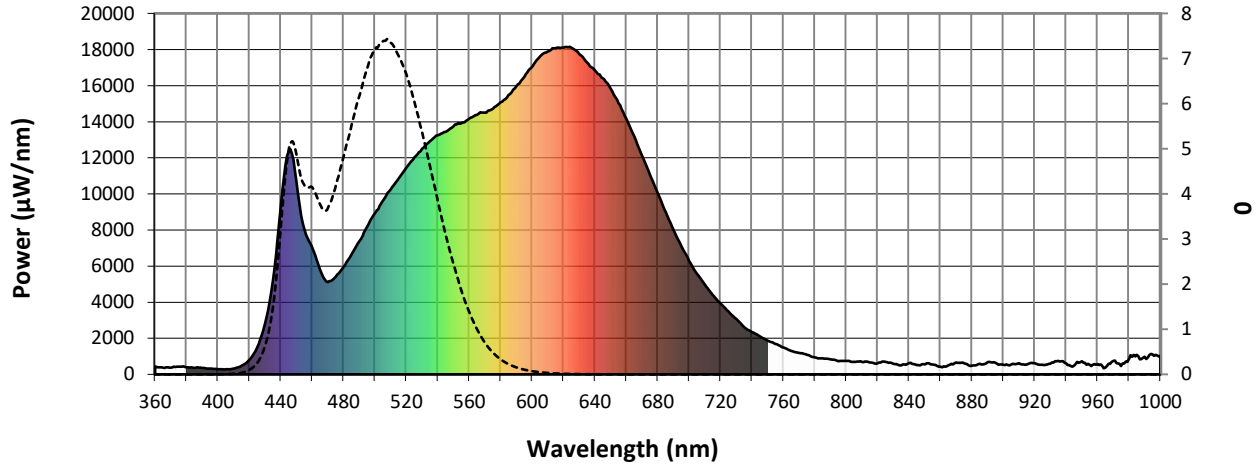


#####

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	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**

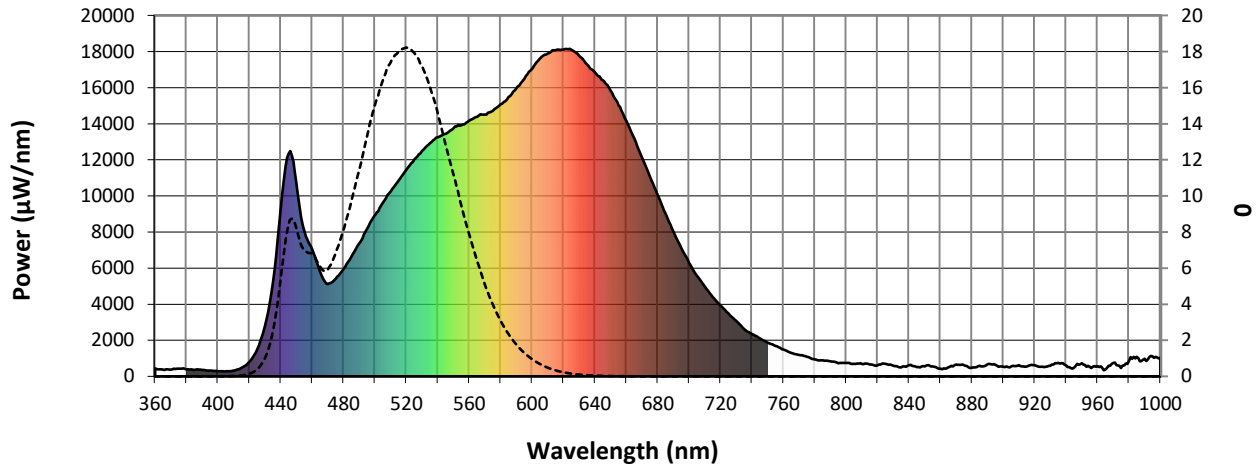
**S/P: 1.59**

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			



REPORT NUMBER: SP1-2101-124-3

**Melanopic Flux vs. Wavelength**



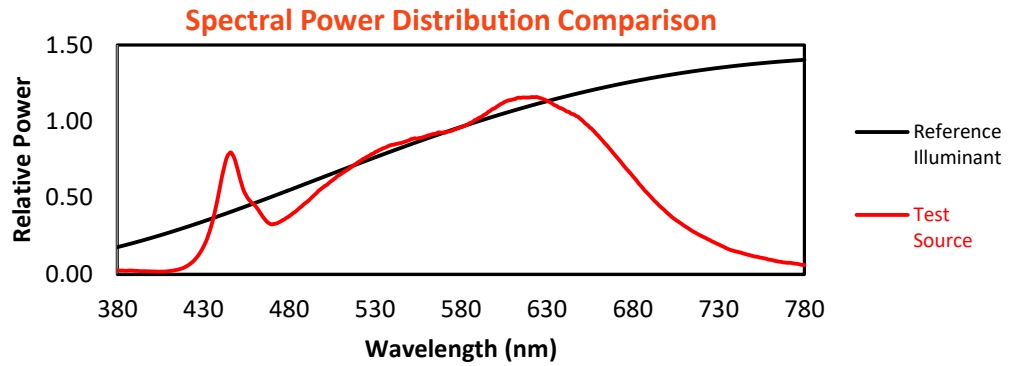
**Melanopic Lumens: 631**

**M/P: 0.63**

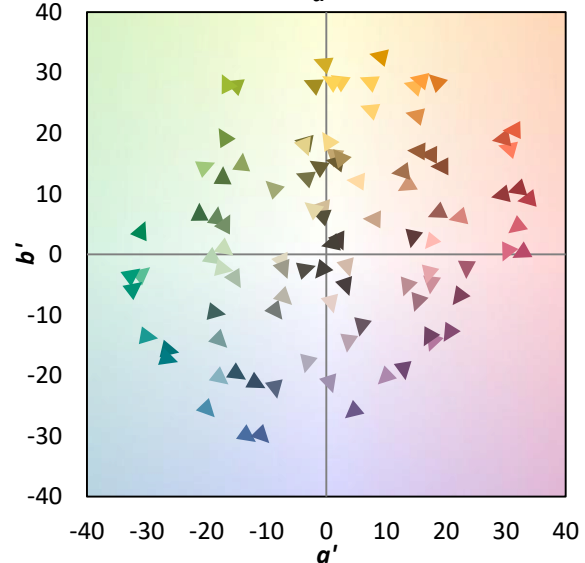
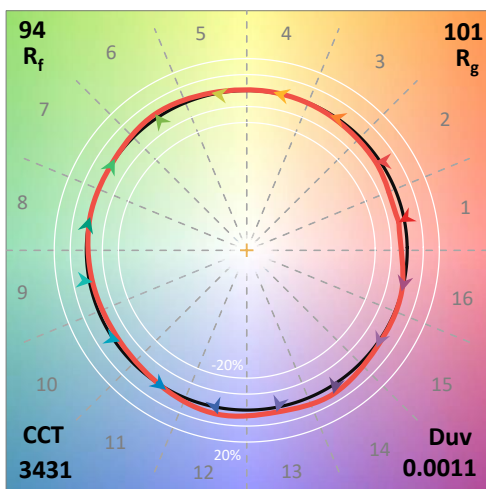
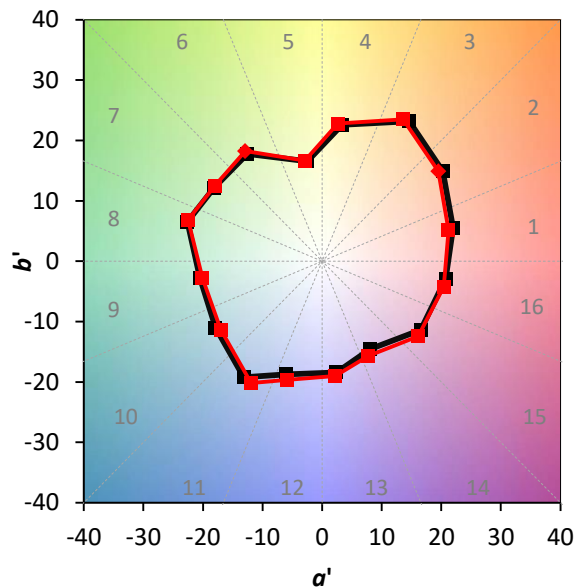
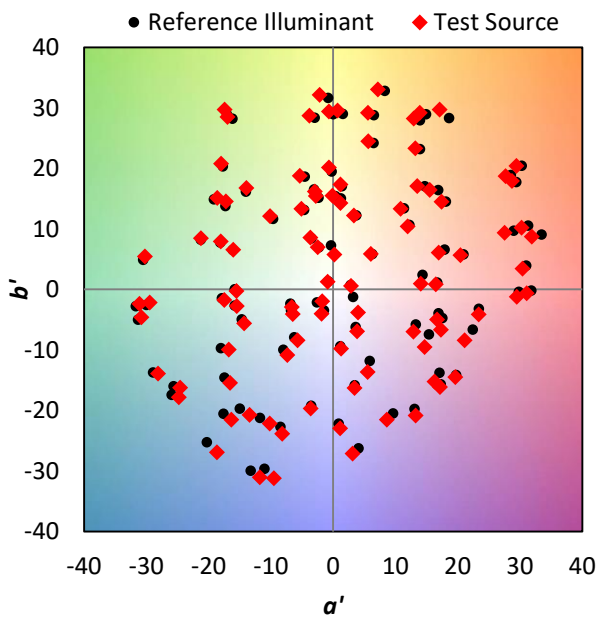
λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)
360	436	0.0	490	7373	6.1	620	18112	0.0	750	1864	0.0	880	485	0.0
365	370	0.0	495	8181	6.8	625	18107	0.0	755	1693	0.0	885	593	0.0
370	381	0.0	500	8943	7.2	630	17758	0.0	760	1498	0.0	890	677	0.0
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  $R_a = 94.0$   
 $R_9 = 69.9$

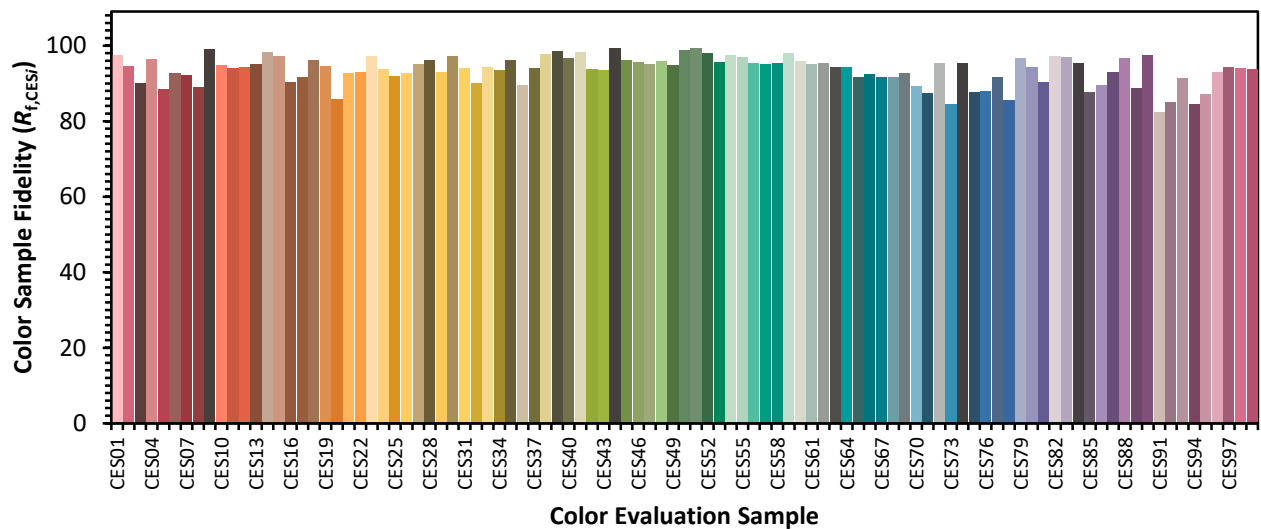


**Color Vector Graphics**

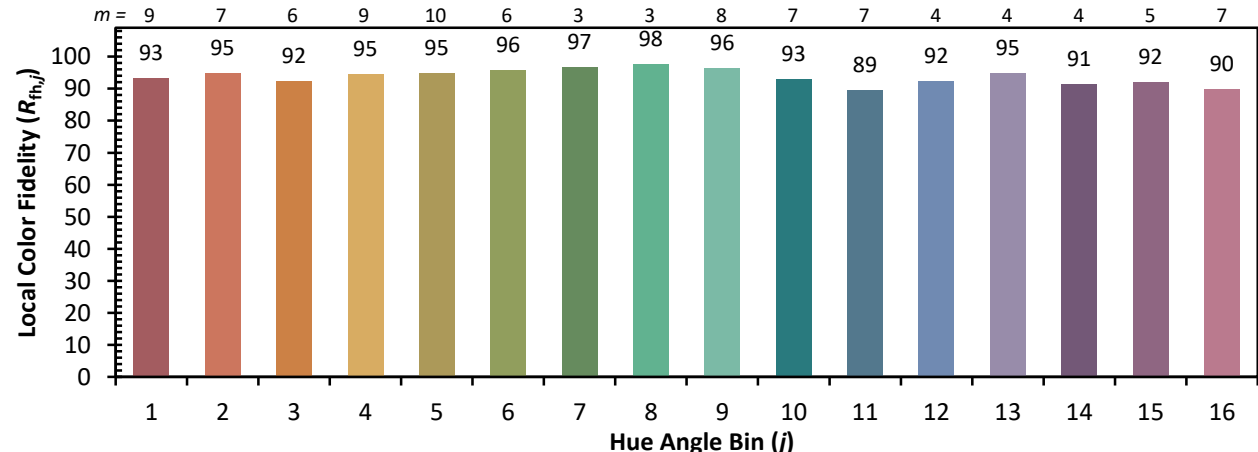
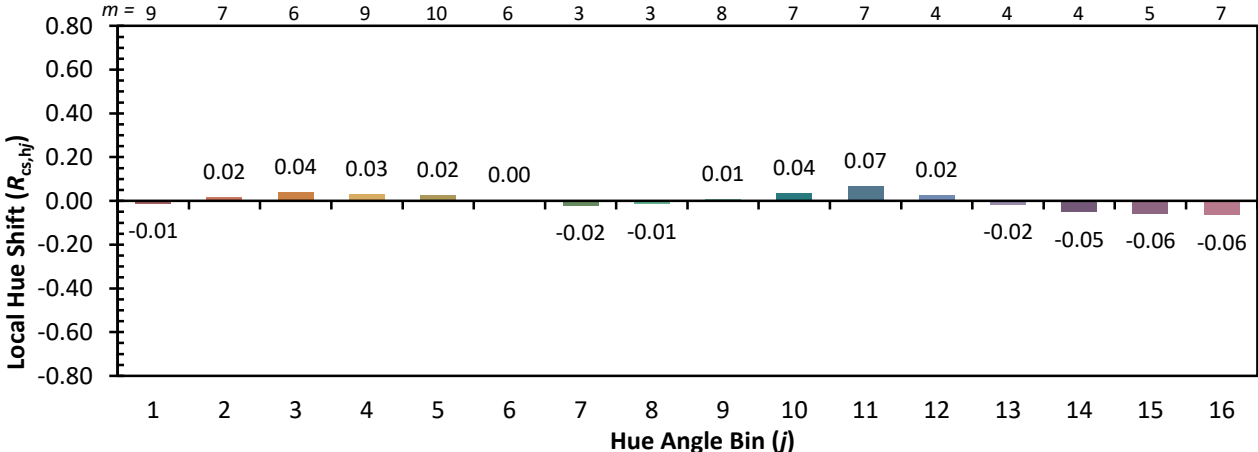
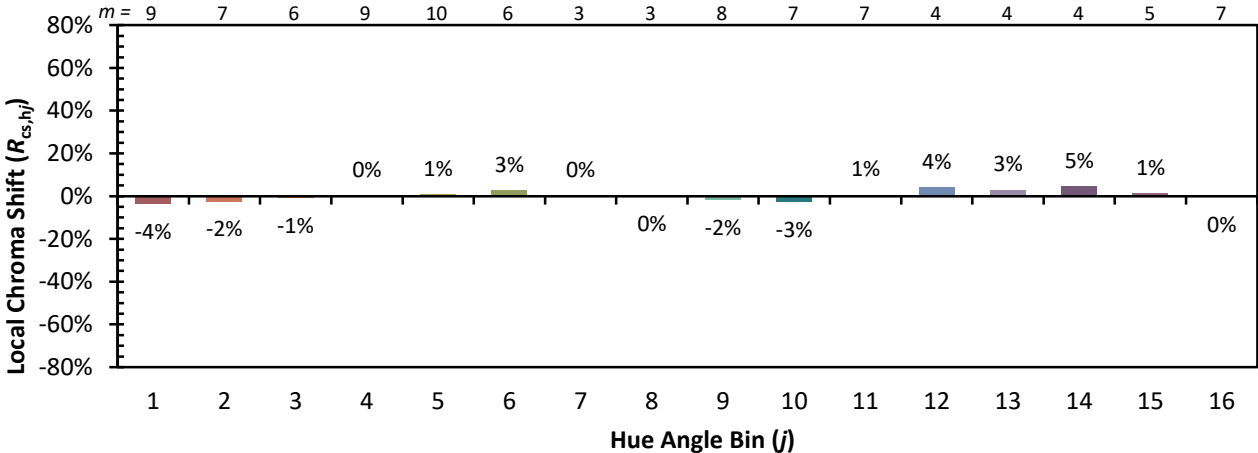


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

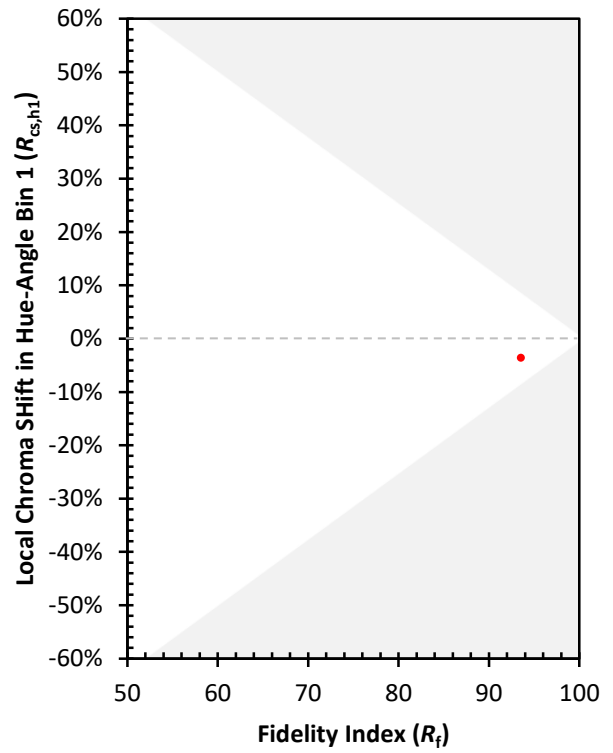
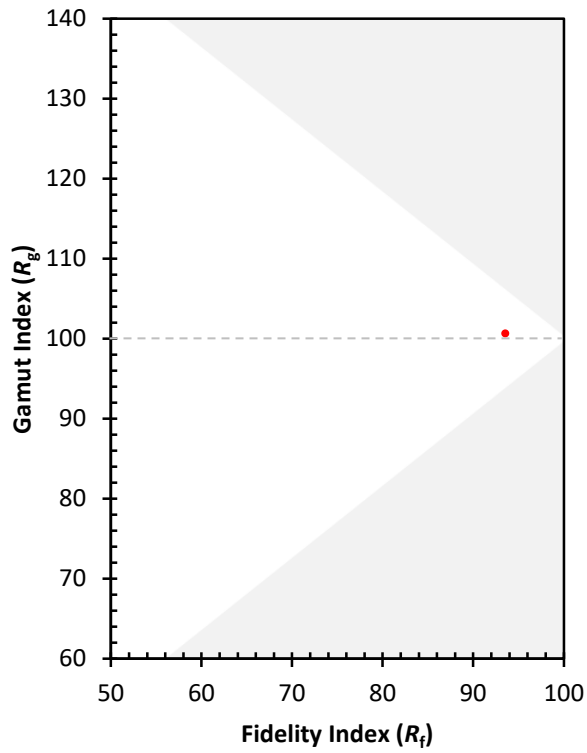
CES01 = 86	CES26 = 93	CES51 = 99	CES76 = 88
CES02 = 62	CES27 = 95	CES52 = 98	CES77 = 92
CES03 = 31	CES28 = 96	CES53 = 96	CES78 = 86
CES04 = 70	CES29 = 93	CES54 = 98	CES79 = 97
CES05 = 50	CES30 = 97	CES55 = 97	CES80 = 94
CES06 = 51	CES31 = 94	CES56 = 95	CES81 = 90
CES07 = 43	CES32 = 90	CES57 = 95	CES82 = 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)