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: P895808

Luminaire Tested: **GRZ-15L-930-10x10FR-X-UNV-STD-1F**

Issue Date: 11/20/2024

Report Generated By 670245763 / DESKTOP-DVLU35A

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

Scaled Data Report

Test Information

Test Method:	LM-79-08
Report Number:	P895808
Test Lab:	INNOVATION CENTER(G3)
Issue Date:	11/20/2024
Manufacturer:	COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line:	io LED
Catalog Number:	GRZ-15L-930-10x10FR-X-UNV-STD-1F
Description:	iO LED 90CRI 3000K GRAZER 1500 lumens per ft WITH 10 deg x 10 deg, 1/3 Frosted OPTIC
Light Source:	3000K CCT, 90 CRI LEDS
Ballast/Driver:	ELECTRONIC DRIVER

Summary

Lumens per Lamp:	N/A
Luminaire Lumens:	1261.5 lumens
Efficiency:	N/A
Efficacy:	84.7 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):	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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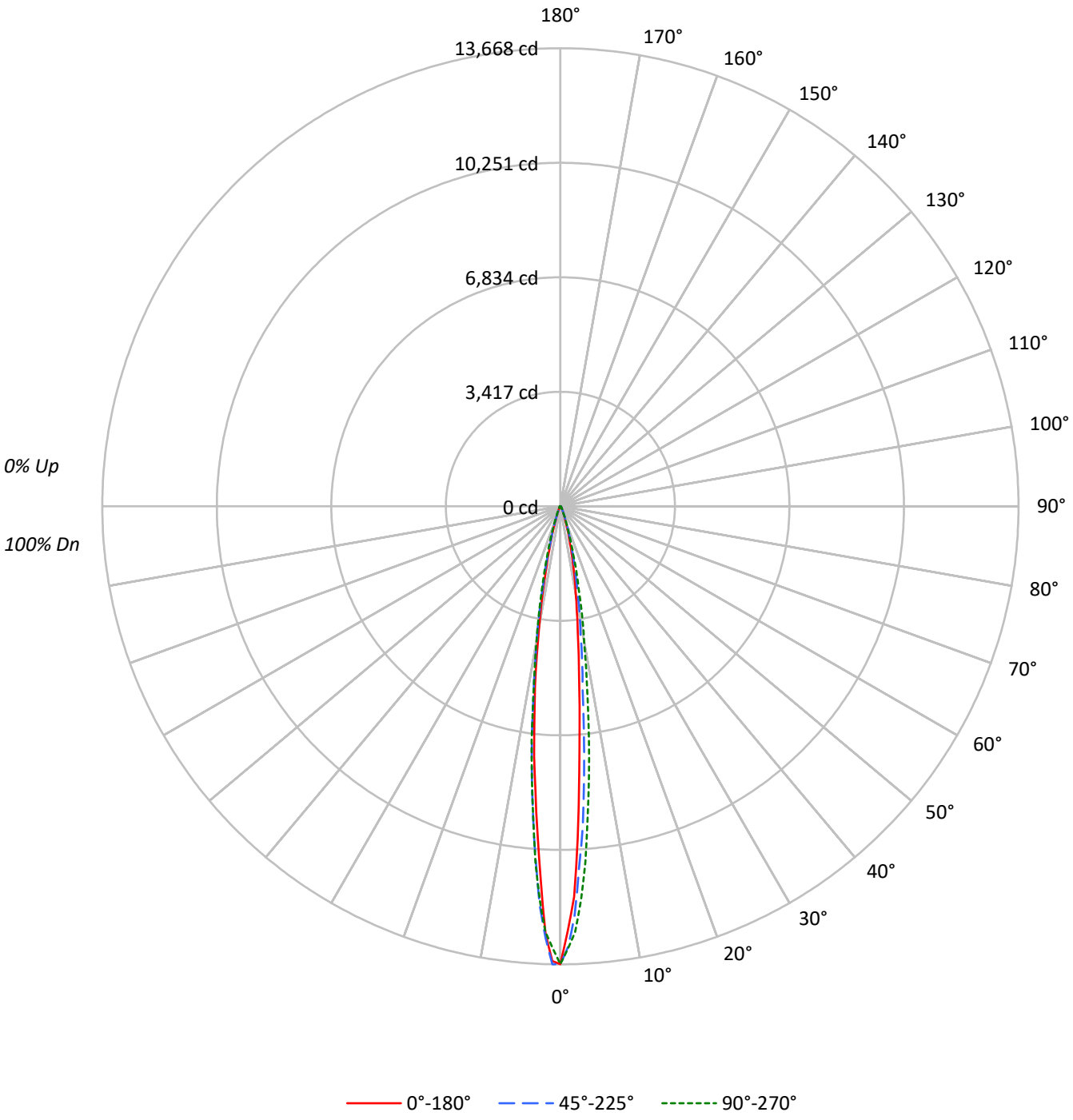
Luminous Intensity Polar Plot



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COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:

RF	20				20				20			20			20			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	115	113	111	109	113	111	109	107	107	105	104	103	102	101	100	99	98	97
2	111	108	105	102	109	106	103	101	103	101	99	100	98	97	97	96	95	93
3	108	103	100	97	106	102	99	96	100	97	95	97	95	93	95	93	92	91
4	105	100	96	93	103	99	95	92	97	94	91	95	92	90	93	91	89	88
5	102	96	93	90	101	96	92	89	94	91	89	93	90	88	91	89	87	86
6	100	94	90	87	98	93	89	87	92	89	86	91	88	86	89	87	85	84
7	97	91	87	85	96	91	87	84	90	86	84	89	86	84	88	85	83	82
8	95	89	85	83	94	89	85	83	88	85	82	87	84	82	86	84	82	81
9	93	87	83	81	92	87	83	81	86	83	81	85	82	80	85	82	80	79
10	91	85	82	79	91	85	82	79	84	81	79	84	81	79	83	81	79	78

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	882241	882241	882241
5°	425908	602904	552055
10°	172060	268122	236073
15°	68205	98628	73072
20°	26641	32605	21473
25°	12283	12931	9882
30°	7247	7053	5801
35°	4903	4903	3886
40°	3717	3936	3060
45°	3196	3434	2603
50°	2732	3124	2210
55°	2477	2916	2038
60°	2170	2841	2015
65°	1986	2765	1986
70°	1718	2700	1718
75°	1297	2270	1622
80°	967	1934	1450
85°	963	963	963

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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	658.5	52.2
10°-20°	398.0	31.5
20°-30°	88.8	7.0
30°-40°	38.4	3.0
40°-50°	27.6	2.2
50°-60°	21.9	1.7
60°-70°	16.3	1.3
70°-80°	9.5	0.8
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°	1145.4	90.8
0°-40°	1183.7	93.8
0°-60°	1233.3	97.8
0°-90°	1261.5	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1261.5	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	13663	13663	13663	13663	13663	
5°	6571	8109	9302	9344	8517	512
15°	1020	1315	1475	1215	1093	313
25°	172	196	182	143	139	88
35°	62	62	62	54	49	40
45°	35	38	38	34	28	27
55°	22	27	26	23	18	19
65°	13	19	18	16	13	13
75°	5	10	9	9	6	6
85°	1	3	1	3	1	1
90°	0	0	0	0	0	

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CANDELA DISTRIBUTION (FULL):

	0°	5°	15°	25°	35°	45°	55°	65°	75°	85°	90°
0°	13663.2	13663.2	13663.2	13663.2	13663.2	13663.2	13663.2	13663.2	13663.2	13663.2	13663.2
1°	*12677.7*	*13075.7*	*12977.2*	*13070.6*	*13087.4*	*13150.9*	*13192.5*	*13221.1*	*13289.7*	*13265.1*	*13180.7*
2°	11662.5	11882.9	11869.9	11927.1	12252.4	12207.1	12323.8	12570.1	12531.2	12588.3	12707.5
3°	9926.4	10410.0	10298.6	10288.2	10600.7	10735.5	11198.4	11307.3	11578.3	11761.0	11764.9
4°	8019.3	8332.9	8406.8	9004.6	8970.9	9562.1	9838.3	10065.1	10276.5	10937.7	10650.0
5°	6570.9	6803.1	7033.8	7328.1	7400.7	8108.7	8265.5	8592.3	9164.0	9411.7	9301.6
6°	5379.4	5607.6	5606.3	5902.0	6172.9	6678.5	6853.6	7323.0	7788.4	8115.2	8129.4
7°	4474.4	4605.4	4688.4	4878.9	5181.0	5449.5	5859.2	6167.7	6467.2	6808.3	7015.6
8°	3721.2	3846.9	3893.6	4067.2	4246.3	4627.5	5037.2	5277.0	5590.8	5887.7	5828.0
9°	3127.3	3323.1	3295.9	3398.3	3601.8	3859.9	4104.8	4460.1	4662.5	4955.4	4888.0
10°	2624.2	2748.6	2829.2	2957.5	3032.6	3315.3	3464.4	3695.3	3949.3	3989.5	4089.3
12.5°	1721.8	1750.3	1767.2	1830.7	1968.2	2105.6	2254.7	2376.5	2451.8	2467.4	2541.3
15°	1020.3	1069.6	1080.0	1166.9	1242.1	1314.7	1409.3	1427.5	1467.6	1452.1	1475.4
17.5°	627.5	632.7	671.7	673.0	754.6	792.2	858.3	873.9	851.8	840.2	840.2
20°	387.7	390.3	400.6	427.9	443.4	484.9	518.6	522.5	510.8	486.2	474.5
22.5°	251.6	259.4	251.6	262.0	277.5	300.8	316.4	319.0	303.4	294.4	293.1
25°	172.4	173.7	180.2	173.7	181.5	195.7	200.9	204.8	191.8	187.9	181.5
27.5°	127.0	127.0	127.0	127.0	129.6	129.6	132.2	133.5	129.6	127.0	128.3
30°	97.2	95.9	97.2	97.2	94.6	97.2	98.5	98.5	95.9	95.9	94.6
32.5°	75.2	76.5	77.8	76.5	75.2	76.5	77.8	76.5	76.5	77.8	75.2
35°	62.2	62.2	63.5	62.2	62.2	62.2	63.5	63.5	63.5	63.5	62.2
37.5°	50.5	51.8	53.1	53.1	53.1	53.1	54.4	54.4	55.7	53.1	51.8
40°	44.1	44.1	45.4	45.4	46.7	45.4	46.7	48.0	48.0	46.7	46.7
42.5°	38.9	38.9	40.2	40.2	40.2	41.5	42.8	42.8	42.8	42.8	41.5
45°	35.0	33.7	35.0	36.3	37.6	37.6	38.9	40.2	38.9	38.9	37.6
47.5°	31.1	31.1	31.1	32.4	33.7	35.0	35.0	36.3	36.3	35.0	33.7
50°	27.2	27.2	28.5	29.8	31.1	32.4	32.4	33.7	33.7	32.4	31.1
52.5°	23.3	23.3	24.6	27.2	28.5	29.8	29.8	31.1	31.1	29.8	28.5
55°	22.0	20.7	22.0	23.3	25.9	27.2	28.5	28.5	28.5	27.2	25.9
57.5°	18.1	18.1	19.4	20.7	23.3	25.9	25.9	27.2	25.9	24.6	24.6
60°	16.8	16.8	18.1	19.4	22.0	24.6	24.6	24.6	23.3	22.0	22.0
62.5°	14.3	14.3	15.6	16.8	19.4	22.0	23.3	23.3	22.0	20.7	19.4
65°	13.0	13.0	13.0	15.6	18.1	19.4	20.7	20.7	19.4	18.1	18.1
67.5°	10.4	10.4	11.7	13.0	15.6	16.8	18.1	19.4	18.1	16.8	15.6
70°	9.1	9.1	9.1	11.7	14.3	15.6	16.8	16.8	15.6	14.3	14.3
72.5°	6.5	6.5	7.8	9.1	11.7	13.0	14.3	14.3	13.0	11.7	11.7
75°	5.2	5.2	6.5	7.8	9.1	10.4	11.7	11.7	11.7	10.4	9.1
77.5°	3.9	3.9	5.2	6.5	7.8	9.1	9.1	9.1	9.1	7.8	7.8
80°	2.6	2.6	3.9	3.9	5.2	6.5	6.5	6.5	6.5	5.2	5.2
82.5°	2.6	1.3	2.6	2.6	3.9	3.9	5.2	5.2	3.9	3.9	3.9
85°	1.3	1.3	1.3	1.3	2.6	2.6	2.6	2.6	2.6	2.6	1.3
87.5°	0.0	0.0	0.0	0.0	1.3	1.3	1.3	1.3	1.3	1.3	1.3
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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TEST NUMBER: P895808
CATALOG NUMBER: GRZ-15L-930-10x10FR-X-UNV-STD-1F

CANDELA DISTRIBUTION (continued):

	95°	105°	115°	125°	135°	145°	155°	165°	175°	180°
0°	13663.2	13663.2	13663.2	13663.2	13663.2	13663.2	*13663.2*	13663.2	13663.2	13663.2
1°	*13388.3*	*13584.0*	*13454.4*	*13599.5*	*13668.4*	*13668.4*	*13691.7*	*13593.0*	*13528.2*	*13576.2*
2°	12759.5	12930.6	12981.1	12952.6	12865.8	12878.7	*12714.0*	12697.1	12480.7	12730.8
3°	11854.4	12043.7	11966.0	11866.0	11882.9	11697.5	*11433.0*	11308.5	11232.1	11197.1
4°	10767.9	10889.8	10869.0	10799.0	10579.8	10363.4	*10123.5*	10204.0	9715.0	9780.0
5°	9586.7	9722.8	9652.8	9422.1	9344.3	9110.9	*8990.4*	8741.4	8478.2	8517.1
6°	8247.4	8202.0	8335.5	8173.5	8135.9	7724.9	*7660.1*	7701.6	7517.4	7500.5
7°	6884.7	7201.1	7112.8	6997.5	6953.4	6708.5	*6669.4*	6418.0	6433.5	6337.6
8°	5991.4	6022.5	6104.2	5947.3	5804.6	5774.8	*5624.5*	5476.7	5509.1	5441.7
9°	4981.4	5078.7	5012.5	5028.1	4842.6	4650.8	*4579.5*	4618.4	4508.1	4523.6
10°	4036.1	4193.1	4151.6	4116.6	4080.2	3881.9	*3848.2*	3760.1	3701.7	3600.5
12.5°	2541.3	2482.9	2511.5	2398.7	2354.5	2200.2	*2170.4*	2132.8	2007.1	2007.1
15°	1546.9	1423.6	1467.6	1325.1	1214.9	1182.5	*1100.8*	1102.1	1098.3	1093.1
17.5°	814.3	814.3	796.1	683.3	649.6	591.2	*583.4*	591.2	571.7	575.6
20°	478.4	461.6	434.3	381.2	357.9	333.2	*328.1*	324.2	324.2	312.5
22.5°	294.4	280.1	264.6	232.2	213.9	206.1	*198.3*	202.2	202.2	203.5
25°	187.9	176.3	169.8	150.4	142.6	141.3	*137.4*	132.2	133.5	138.7
27.5°	125.7	120.5	115.4	107.6	102.4	99.8	*99.8*	101.1	98.5	95.9
30°	94.6	88.1	85.5	83.0	79.1	79.1	*79.1*	77.8	76.5	77.8
32.5°	75.2	71.3	68.7	66.1	64.8	63.5	*64.8*	63.5	62.2	60.9
35°	62.2	58.3	57.0	55.7	54.4	53.1	*53.1*	53.1	50.5	49.3
37.5°	51.8	50.5	50.5	48.0	46.7	45.4	*45.4*	45.4	42.8	42.8
40°	46.7	45.4	44.1	42.8	41.5	40.2	*38.9*	38.9	36.3	36.3
42.5°	41.5	40.2	40.2	38.9	37.6	35.0	*35.0*	33.7	32.4	32.4
45°	37.6	36.3	36.3	35.0	33.7	32.4	*31.1*	29.8	28.5	28.5
47.5°	35.0	33.7	33.7	32.4	29.8	28.5	*27.2*	25.9	25.9	25.9
50°	31.1	31.1	31.1	29.8	28.5	27.2	*24.6*	23.3	22.0	22.0
52.5°	28.5	28.5	27.2	27.2	25.9	24.6	*22.0*	20.7	20.7	20.7
55°	27.2	25.9	25.9	24.6	23.3	23.3	*20.7*	19.4	18.1	18.1
57.5°	24.6	23.3	23.3	22.0	22.0	20.7	*18.1*	18.1	16.8	16.8
60°	22.0	20.7	20.7	19.4	19.4	18.1	*16.8*	15.6	15.6	15.6
62.5°	19.4	18.1	19.4	18.1	18.1	16.8	*15.6*	14.3	14.3	14.3
65°	18.1	16.8	16.8	16.8	15.6	15.6	*14.3*	13.0	13.0	13.0
67.5°	15.6	14.3	15.6	14.3	14.3	13.0	*13.0*	11.7	11.7	10.4
70°	13.0	13.0	13.0	13.0	13.0	11.7	*10.4*	10.4	9.1	9.1
72.5°	11.7	11.7	11.7	11.7	10.4	10.4	*9.1*	9.1	7.8	7.8
75°	9.1	9.1	9.1	9.1	9.1	9.1	*7.8*	7.8	6.5	6.5
77.5°	7.8	7.8	7.8	7.8	7.8	6.5	*6.5*	5.2	5.2	5.2
80°	5.2	5.2	5.2	5.2	5.2	5.2	*5.2*	3.9	3.9	3.9
82.5°	3.9	3.9	3.9	3.9	3.9	2.6	*2.6*	2.6	2.6	2.6
85°	2.6	2.6	2.6	2.6	2.6	1.3	*1.3*	1.3	1.3	1.3
87.5°	1.3	1.3	1.3	1.3	1.3	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

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LM-79-08: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

iO LED

Report Number: SP1-2101-124-2

Luminaire Tested: GRZ-05L-930-10X10-X-UNV-STD-2F

Test Date: 02/10/2021

Report Generated By controller / USPTCWHP6086842

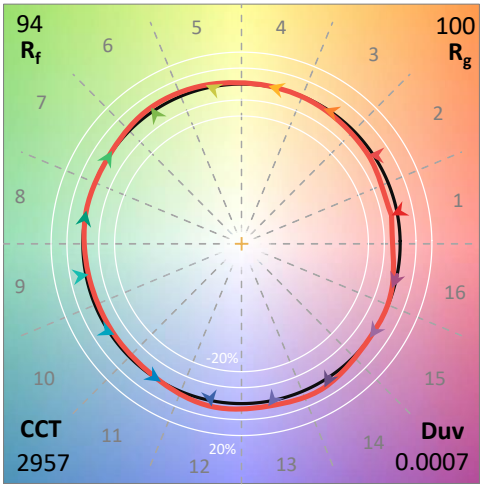
Test Information

Test Method:	LM-79-08
Report Number:	SP1-2101-124-2
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-930-10X10-X-UNV-STD-2F**
Description:	IO LED Wall Grazer GRZ

Spectral Parameters

CCT (K):	2957	CRI (Ra):	94.1		
CIE u':	0.2518	R1:	94.6	R9:	66.4
CIE v':	0.5232	R2:	96.3	R10:	90.2
Duv:	0.0007	R3:	96.6	R11:	96.1
CIE x:	0.4409	R4:	95.3	R12:	86.8
CIE y:	0.4072	R5:	94.2	R13:	95.0
CIE z:	0.1519	R6:	95.7	R14:	97.3
Peak Wavelength (nm):	624	R7:	94.2		
Dominant Wavelength (nm):	582	R8:	85.7		
Purity:	54.9				

Rf:	93.7
Rg:	100.3



Test Conditions

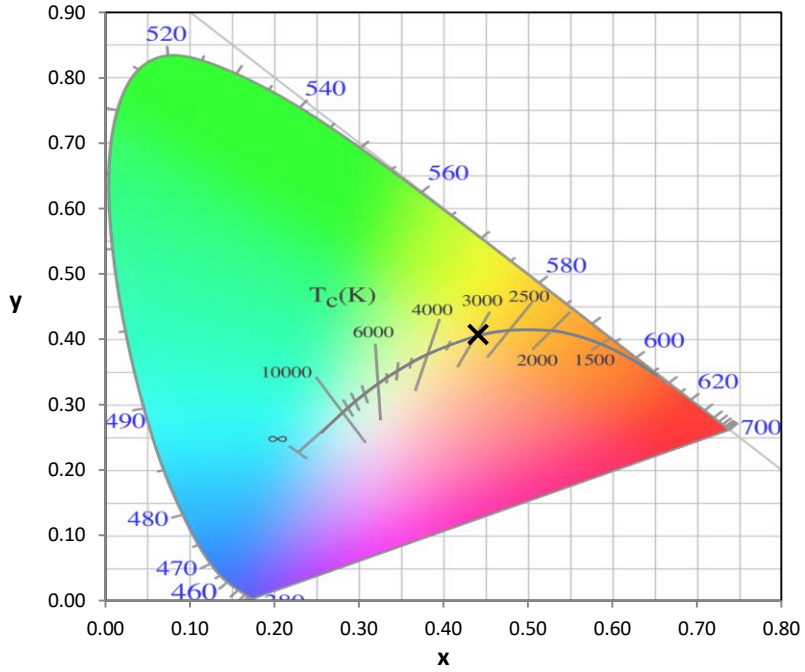
Stabilization Time:	48M
Operation Time:	12H
Room Temperature (°C) / RH%:	25.4/38%
Sphere Temperature (°C):	24.4

REPORT NUMBER: SP1-2101-124-2

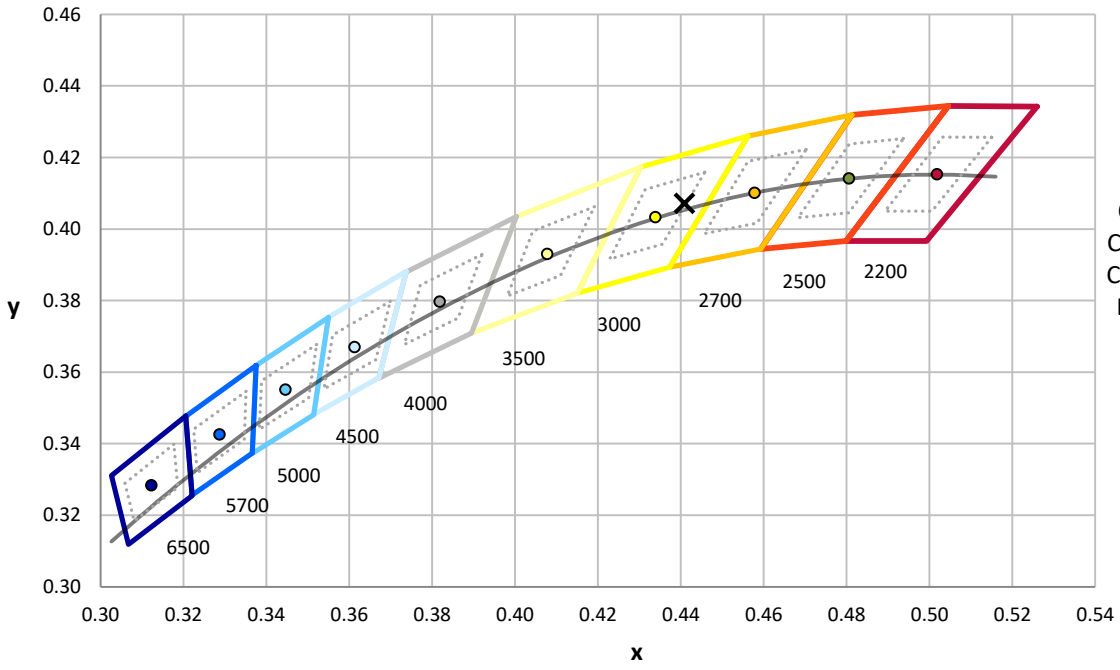
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	1/31/2021	7/31/2021
Power Meter	IN0071	12/1/2020	12/1/2021
AC Power Source	IN0063	12/1/2020	12/1/2021
DC Power Source	IN0208	12/1/2020	12/1/2021
Sphere Thermometer	IN0085	12/1/2020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

REPORT NUMBER: SP1-2101-124-2

CIE 1931 Chromaticity Diagram



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



CCT = 2957K
CIE x = 0.4409
CIE y = 0.4072
Duv = 0.0007

Point lies inside the ANSI 3000K 4-step quadrangle

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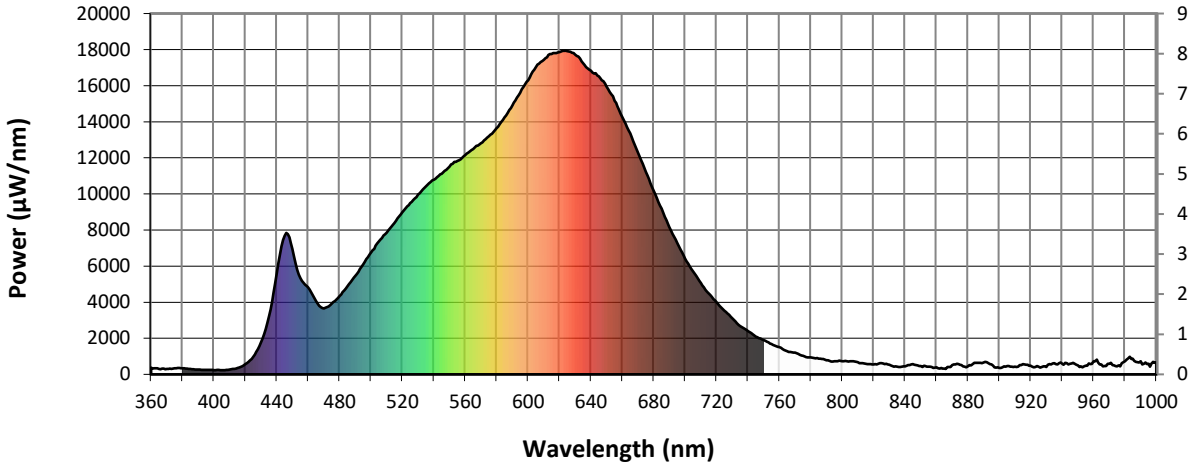
Photopic Flux vs. Wavelength



######

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	368	0.0	490	5466	0.8	620	17862	4.6	750	1898	0.0	880	436	0.0
365	310	0.0	495	6091	1.1	625	17922	4.0	755	1681	0.0	885	632	0.0
370	293	0.0	500	6757	1.5	630	17723	3.2	760	1509	0.0	890	653	0.0
375	346	0.0	505	7358	2.1	635	17256	2.6	765	1279	0.0	895	546	0.0
380	338	0.0	510	7854	2.7	640	16836	2.0	770	1201	0.0	900	354	0.0
385	299	0.0	515	8389	3.5	645	16513	1.6	775	1028	0.0	905	454	0.0
390	270	0.0	520	8991	4.4	650	15949	1.2	780	937	0.0	910	426	0.0
395	252	0.0	525	9495	5.1	655	15172	0.9	785	877	0.0	915	565	0.0
400	234	0.0	530	9972	5.9	660	14269	0.6	790	784	0.0	920	483	0.0
405	236	0.0	535	10431	6.5	665	13357	0.4	795	723	0.0	925	418	0.0
410	267	0.0	540	10792	7.0	670	12286	0.3	800	735	0.0	930	416	0.0
415	349	0.0	545	11118	7.4	675	11211	0.2	805	729	0.0	935	626	0.0
420	560	0.0	550	11517	7.8	680	10179	0.1	810	667	0.0	940	584	0.0
425	974	0.0	555	11837	8.1	685	9184	0.1	815	584	0.0	945	579	0.0
430	1769	0.0	560	12154	8.3	690	8166	0.0	820	546	0.0	950	504	0.0
435	3208	0.0	565	12489	8.3	695	7279	0.0	825	620	0.0	955	485	0.0
440	5576	0.1	570	12803	8.3	700	6419	0.0	830	532	0.0	960	719	0.0
445	7682	0.2	575	13201	8.2	705	5709	0.0	835	420	0.0	965	552	0.0
450	6958	0.2	580	13645	8.1	710	5055	0.0	840	444	0.0	970	586	0.0
455	5347	0.2	585	14250	7.9	715	4482	0.0	845	562	0.0	975	439	0.0
460	4823	0.2	590	14919	7.7	720	3984	0.0	850	454	0.0	980	736	0.0
465	4070	0.2	595	15606	7.4	725	3526	0.0	855	433	0.0	985	863	0.0
470	3650	0.2	600	16305	7.0	730	3109	0.0	860	383	0.0	990	722	0.0
475	3914	0.3	605	17030	6.6	735	2684	0.0	865	322	0.0	995	579	0.0
480	4339	0.4	610	17428	6.0	740	2396	0.0	870	523	0.0	1000	672	0.0
485	4881	0.6	615	17762	5.4	745	2098	0.0	875	541	0.0			

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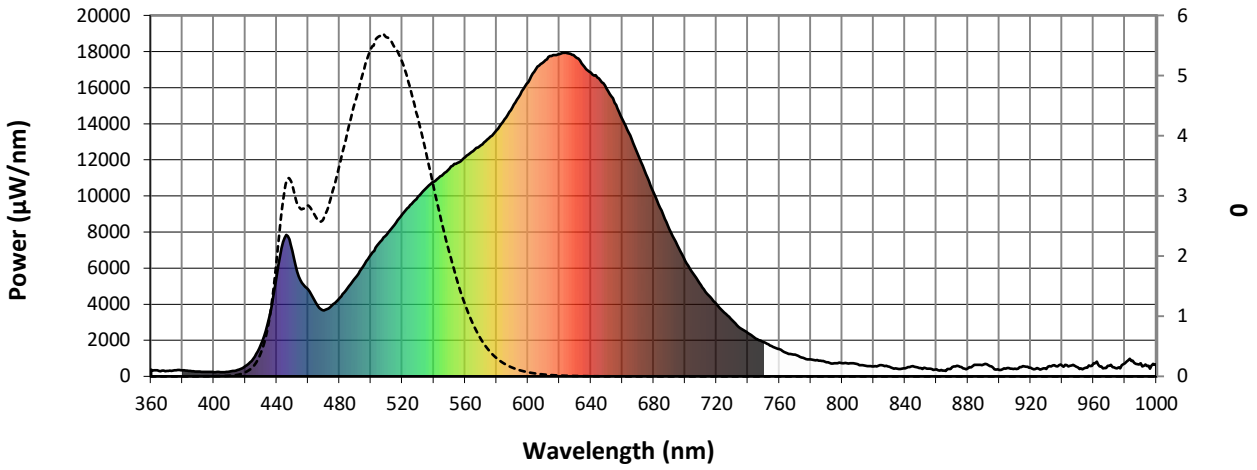
Scotopic Flux vs. Wavelength



Scotopic Lumens: 1239 **S/P: 1.4**

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	368	0.0	490	5466	8.4	620	17862	0.2	750	1898	0.0	880	436	0.0
365	310	0.0	495	6091	9.8	625	17922	0.2	755	1681	0.0	885	632	0.0
370	293	0.0	500	6757	11.3	630	17723	0.1	760	1509	0.0	890	653	0.0
375	346	0.0	505	7358	12.5	635	17256	0.1	765	1279	0.0	895	546	0.0
380	338	0.0	510	7854	13.3	640	16836	0.0	770	1201	0.0	900	354	0.0
385	299	0.0	515	8389	13.9	645	16513	0.0	775	1028	0.0	905	454	0.0
390	270	0.0	520	8991	14.3	650	15949	0.0	780	937	0.0	910	426	0.0
395	252	0.0	525	9495	14.2	655	15172	0.0	785	877	0.0	915	565	0.0
400	234	0.0	530	9972	13.7	660	14269	0.0	790	784	0.0	920	483	0.0
405	236	0.0	535	10431	13.0	665	13357	0.0	795	723	0.0	925	418	0.0
410	267	0.0	540	10792	11.9	670	12286	0.0	800	735	0.0	930	416	0.0
415	349	0.0	545	11118	10.7	675	11211	0.0	805	729	0.0	935	626	0.0
420	560	0.1	550	11517	9.4	680	10179	0.0	810	667	0.0	940	584	0.0
425	974	0.2	555	11837	8.1	685	9184	0.0	815	584	0.0	945	579	0.0
430	1769	0.6	560	12154	6.8	690	8166	0.0	820	546	0.0	950	504	0.0
435	3208	1.4	565	12489	5.6	695	7279	0.0	825	620	0.0	955	485	0.0
440	5576	3.1	570	12803	4.5	700	6419	0.0	830	532	0.0	960	719	0.0
445	7682	5.1	575	13201	3.6	705	5709	0.0	835	420	0.0	965	552	0.0
450	6958	5.4	580	13645	2.8	710	5055	0.0	840	444	0.0	970	586	0.0
455	5347	4.7	585	14250	2.2	715	4482	0.0	845	562	0.0	975	439	0.0
460	4823	4.7	590	14919	1.7	720	3984	0.0	850	454	0.0	980	736	0.0
465	4070	4.3	595	15606	1.2	725	3526	0.0	855	433	0.0	985	863	0.0
470	3650	4.2	600	16305	0.9	730	3109	0.0	860	383	0.0	990	722	0.0
475	3914	4.9	605	17030	0.7	735	2684	0.0	865	322	0.0	995	579	0.0
480	4339	5.9	610	17428	0.5	740	2396	0.0	870	523	0.0	1000	672	0.0
485	4881	7.1	615	17762	0.3	745	2098	0.0	875	541	0.0			

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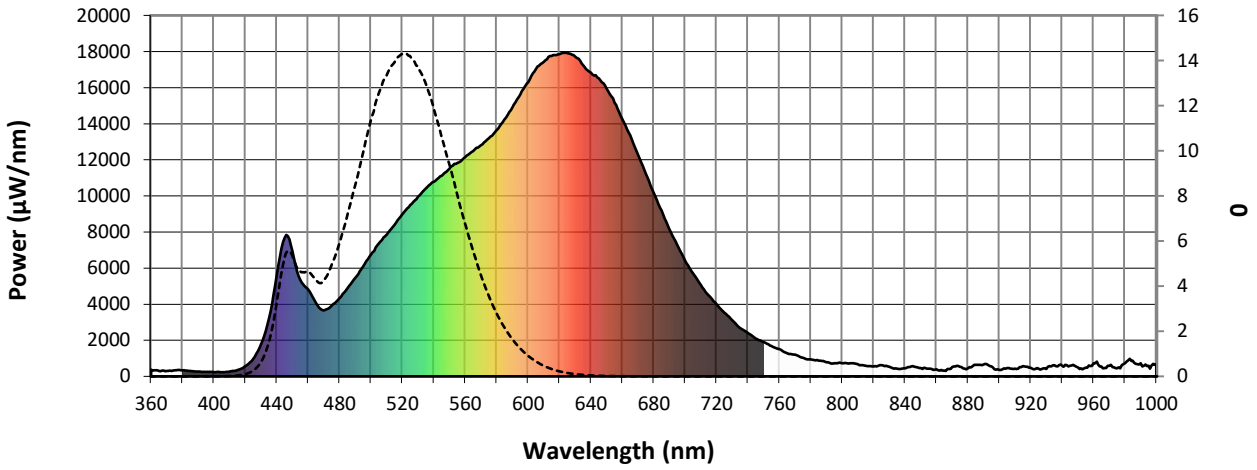
Melanopic Flux vs. Wavelength



Melanopic Lumens: 471.9 **M/P: 0.53**

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	368	0.0	490	5466	4.5	620	17862	0.0	750	1898	0.0	880	436	0.0
365	310	0.0	495	6091	5.0	625	17922	0.0	755	1681	0.0	885	632	0.0
370	293	0.0	500	6757	5.4	630	17723	0.0	760	1509	0.0	890	653	0.0
375	346	0.0	505	7358	5.6	635	17256	0.0	765	1279	0.0	895	546	0.0
380	338	0.0	510	7854	5.6	640	16836	0.0	770	1201	0.0	900	354	0.0
385	299	0.0	515	8389	5.5	645	16513	0.0	775	1028	0.0	905	454	0.0
390	270	0.0	520	8991	5.2	650	15949	0.0	780	937	0.0	910	426	0.0
395	252	0.0	525	9495	4.8	655	15172	0.0	785	877	0.0	915	565	0.0
400	234	0.0	530	9972	4.3	660	14269	0.0	790	784	0.0	920	483	0.0
405	236	0.0	535	10431	3.8	665	13357	0.0	795	723	0.0	925	418	0.0
410	267	0.0	540	10792	3.2	670	12286	0.0	800	735	0.0	930	416	0.0
415	349	0.0	545	11118	2.6	675	11211	0.0	805	729	0.0	935	626	0.0
420	560	0.1	550	11517	2.1	680	10179	0.0	810	667	0.0	940	584	0.0
425	974	0.2	555	11837	1.6	685	9184	0.0	815	584	0.0	945	579	0.0
430	1769	0.4	560	12154	1.2	690	8166	0.0	820	546	0.0	950	504	0.0
435	3208	0.9	565	12489	0.9	695	7279	0.0	825	620	0.0	955	485	0.0
440	5576	1.9	570	12803	0.6	700	6419	0.0	830	532	0.0	960	719	0.0
445	7682	3.0	575	13201	0.4	705	5709	0.0	835	420	0.0	965	552	0.0
450	6958	3.2	580	13645	0.3	710	5055	0.0	840	444	0.0	970	586	0.0
455	5347	2.8	585	14250	0.2	715	4482	0.0	845	562	0.0	975	439	0.0
460	4823	2.8	590	14919	0.1	720	3984	0.0	850	454	0.0	980	736	0.0
465	4070	2.7	595	15606	0.1	725	3526	0.0	855	433	0.0	985	863	0.0
470	3650	2.6	600	16305	0.1	730	3109	0.0	860	383	0.0	990	722	0.0
475	3914	3.0	605	17030	0.0	735	2684	0.0	865	322	0.0	995	579	0.0
480	4339	3.5	610	17428	0.0	740	2396	0.0	870	523	0.0	1000	672	0.0
485	4881	4.0	615	17762	0.0	745	2098	0.0	875	541	0.0			

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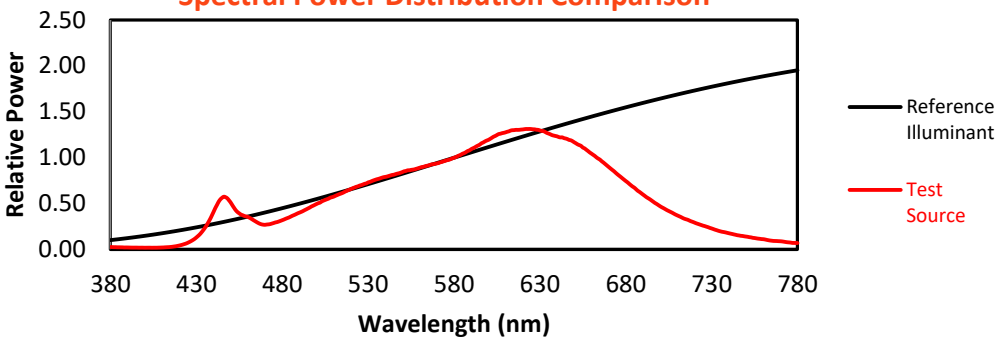
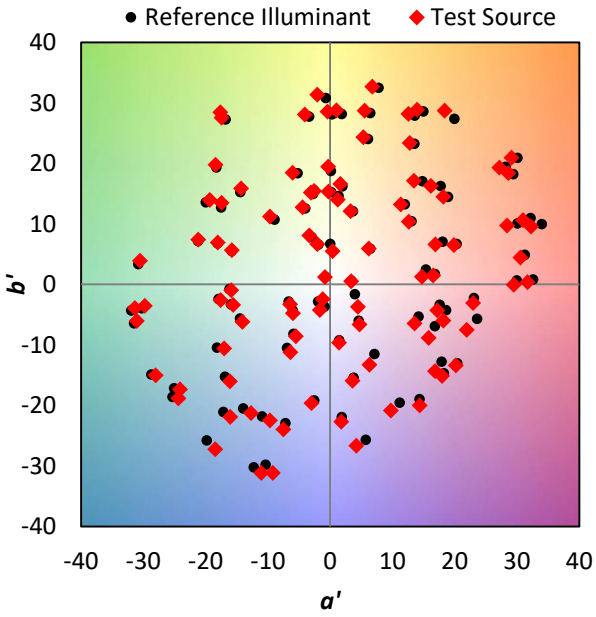
Summary

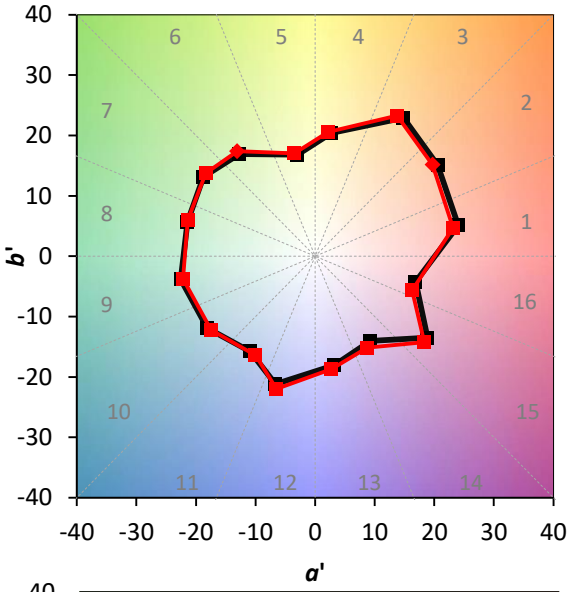
R_f = 93.7
R_g = 100.3
CIE R_a = 94.1
R_9 = 66.4

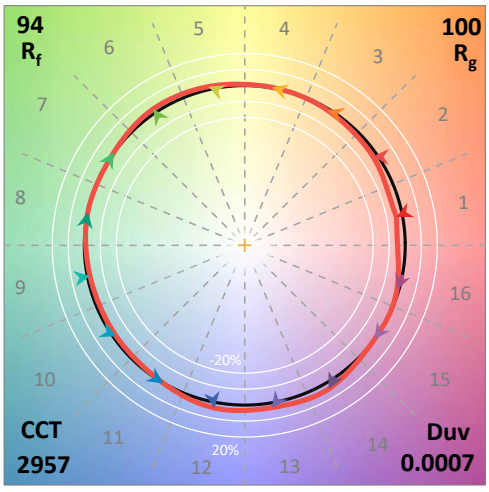
Spectral Power Distribution Comparison

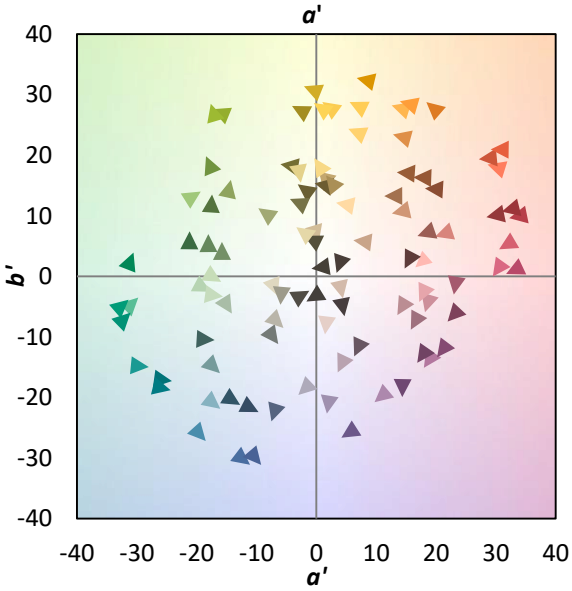


Color Vector Graphics









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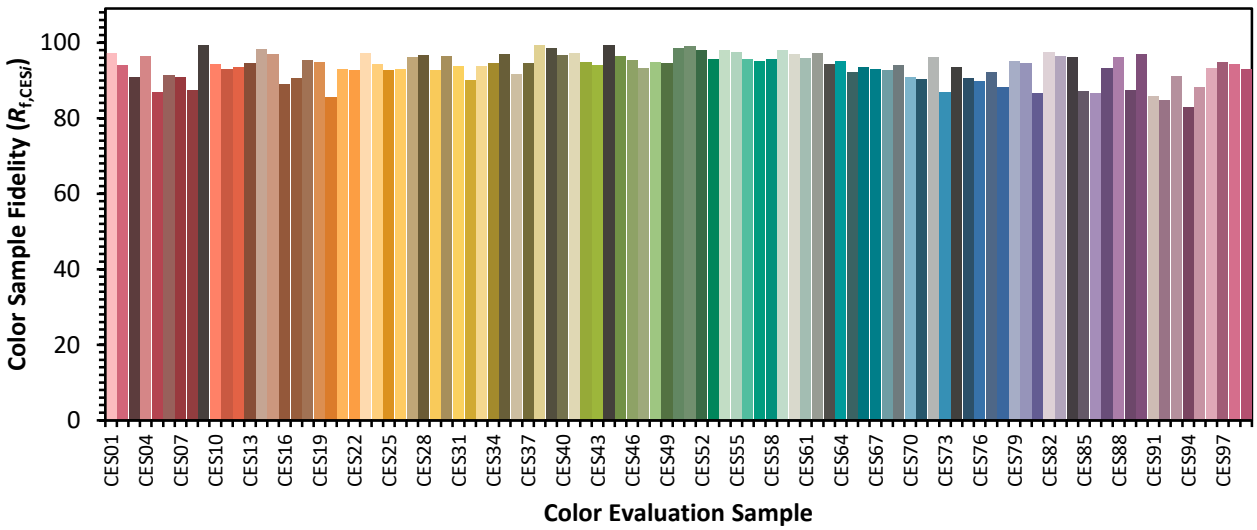
Individual Sample Fidelity Index ($R_{f,i}$)

CES01 = 86	CES26 = 93	CES51 = 99	CES76 = 90
CES02 = 63	CES27 = 96	CES52 = 98	CES77 = 92
CES03 = 32	CES28 = 97	CES53 = 96	CES78 = 88
CES04 = 70	CES29 = 93	CES54 = 98	CES79 = 95
CES05 = 51	CES30 = 96	CES55 = 98	CES80 = 95
CES06 = 51	CES31 = 94	CES56 = 96	CES81 = 87
CES07 = 44	CES32 = 90	CES57 = 95	CES82 = 97
CES08 = 42	CES33 = 94	CES58 = 96	CES83 = 96
CES09 = 29	CES34 = 94	CES59 = 98	CES84 = 96
CES10 = 76	CES35 = 97	CES60 = 97	CES85 = 87
CES11 = 59	CES36 = 92	CES61 = 96	CES86 = 87
CES12 = 65	CES37 = 95	CES62 = 97	CES87 = 93
CES13 = 44	CES38 = 99	CES63 = 94	CES88 = 96
CES14 = 74	CES39 = 99	CES64 = 95	CES89 = 87
CES15 = 72	CES40 = 97	CES65 = 92	CES90 = 97
CES16 = 48	CES41 = 97	CES66 = 94	CES91 = 86
CES17 = 50	CES42 = 95	CES67 = 93	CES92 = 85
CES18 = 57	CES43 = 94	CES68 = 93	CES93 = 91
CES19 = 72	CES44 = 99	CES69 = 94	CES94 = 83
CES20 = 67	CES45 = 96	CES70 = 91	CES95 = 88
CES21 = 86	CES46 = 95	CES71 = 90	CES96 = 93
CES22 = 79	CES47 = 93	CES72 = 96	CES97 = 95
CES23 = 92	CES48 = 95	CES73 = 87	CES98 = 94
CES24 = 91	CES49 = 95	CES74 = 94	CES99 = 93
CES25 = 72	CES50 = 99	CES75 = 90	



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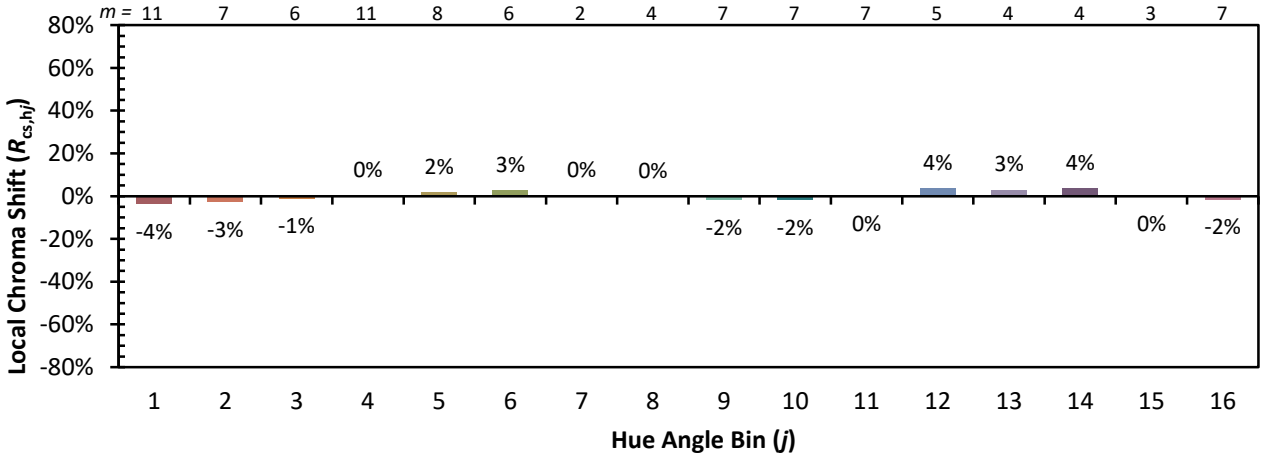
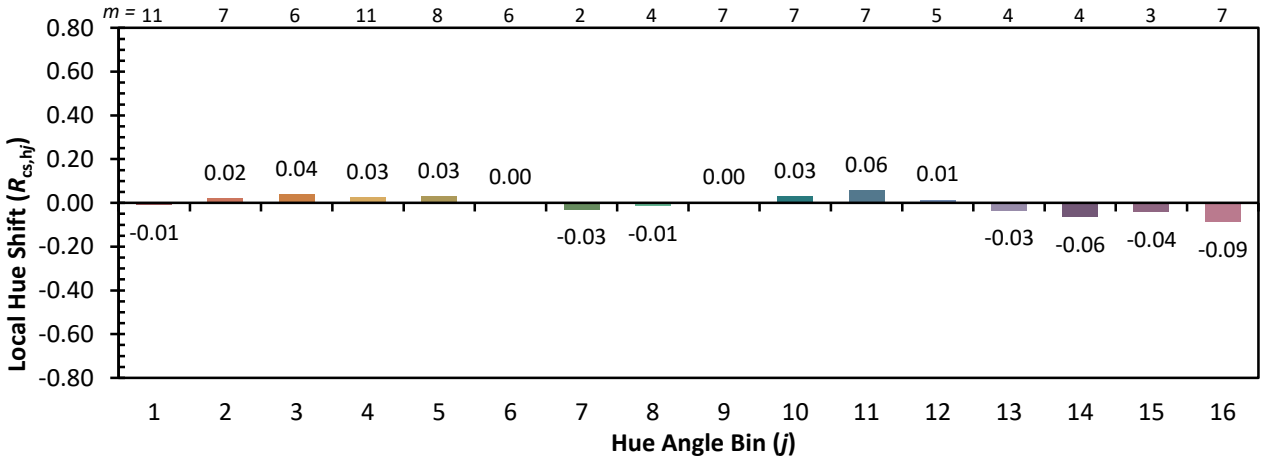
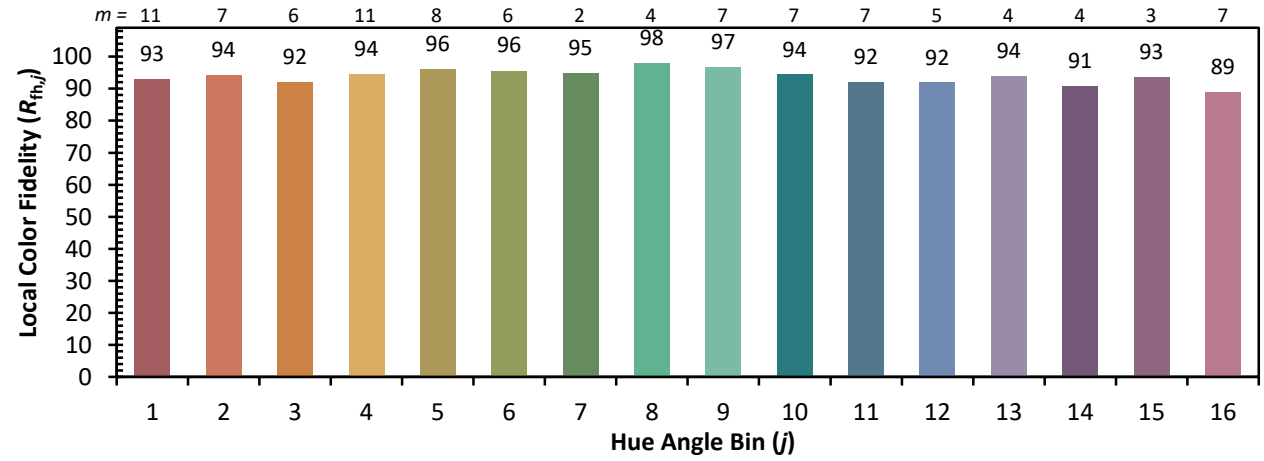
Color Rendition by Hue-Angle Bin







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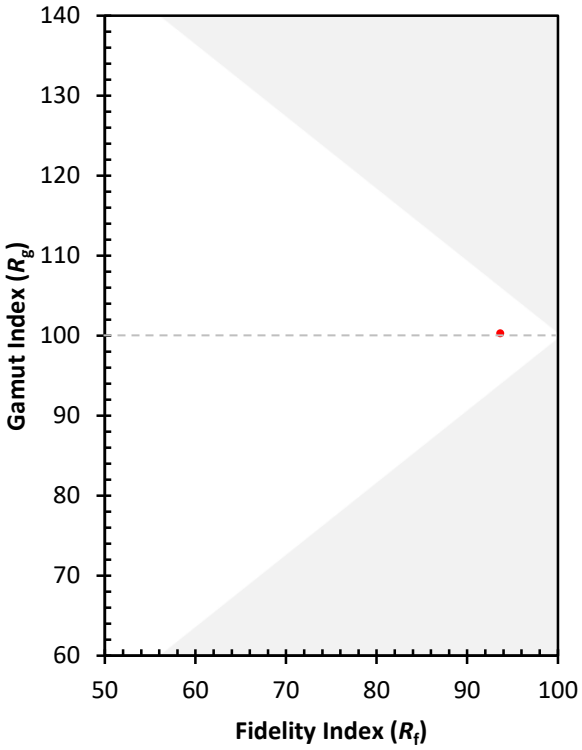
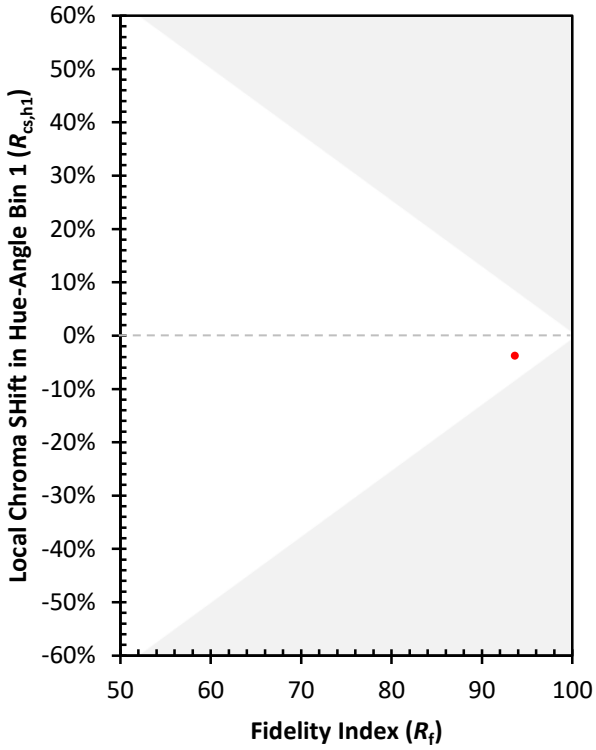
Measure Comparisons





(END OF REPORT)