

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: McGRAW-EDISON

Report Number: P406533

Luminaire Tested: **TT-D4-750-U-DL-UPL**

Issue Date: 7/23/2020

Test Information

Test Method: LM-79-08
Report Number: P406533
REPORT IS FROM IESNA LM-79-08 TEST DATA - UPLIGHT (G2-2002-677-3) AND
Test Lab: INNOVATION CENTER
Issue Date: 7/23/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: MCGRAW-EDISON
Catalog Number: TT-D4-750-U-DL-UPL
Description: TOPTIER LED PARKING GARAGE LUMINAIRE WITH UPLIGHT WITH UPLIGHT
5000K, 70 CRI LEDS AND DRIVE LANE DISTRIBUTION
Light Source: -
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 7218.4 lumens
Efficiency: N/A
Efficacy: 106.5 lumens/watt
Luminous Opening: Vertical Cylinder (Dia: 1.12' x H: 0.1')
IES Classification: Type IV - Short - Non-Cutoff
BUG Rating: B2 - U4 - G3

Input Watts (W): 67.8
Input Voltage (V): NR
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: 28.75 FT

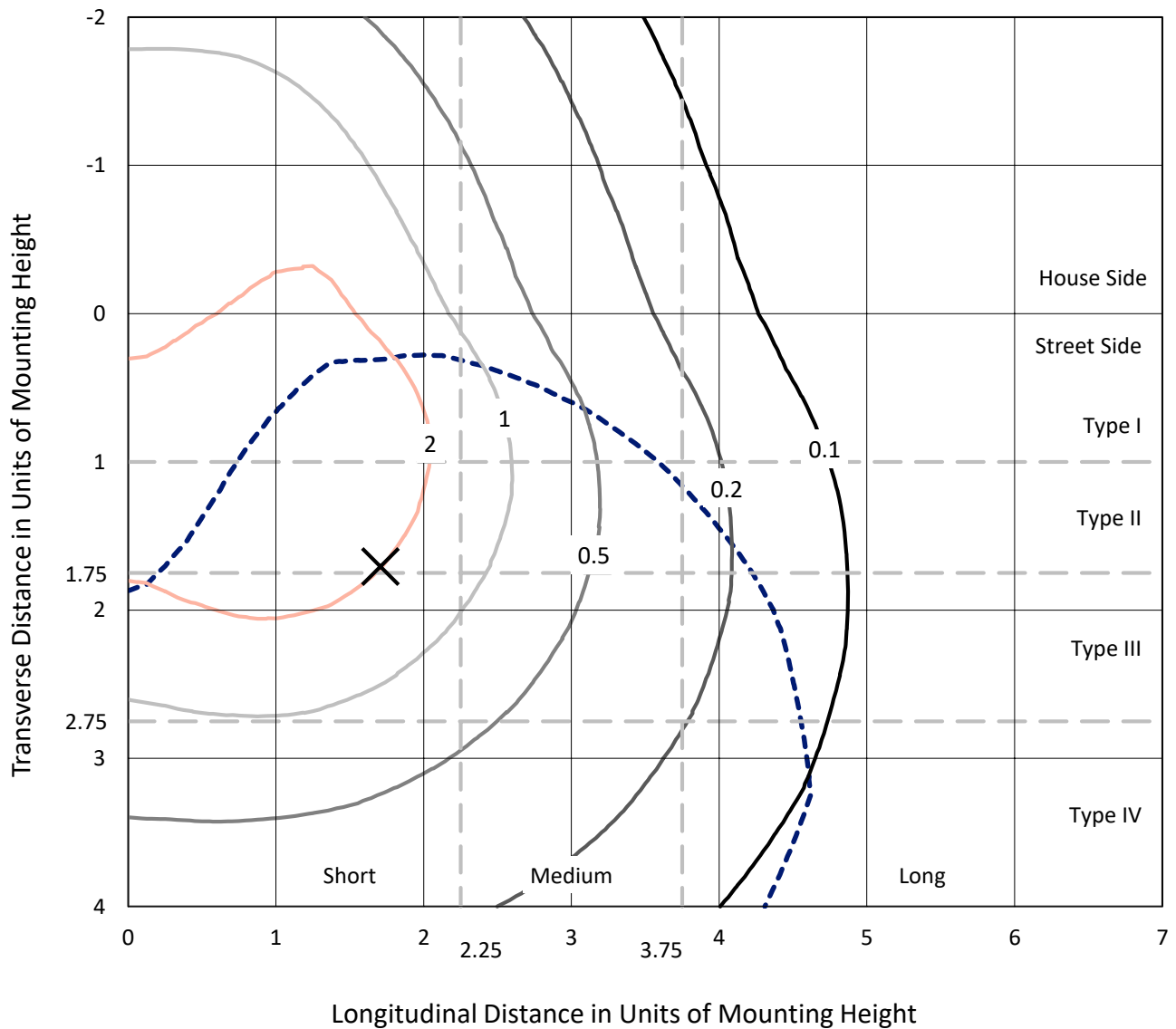


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Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd
 - - - 1/2 Max cd

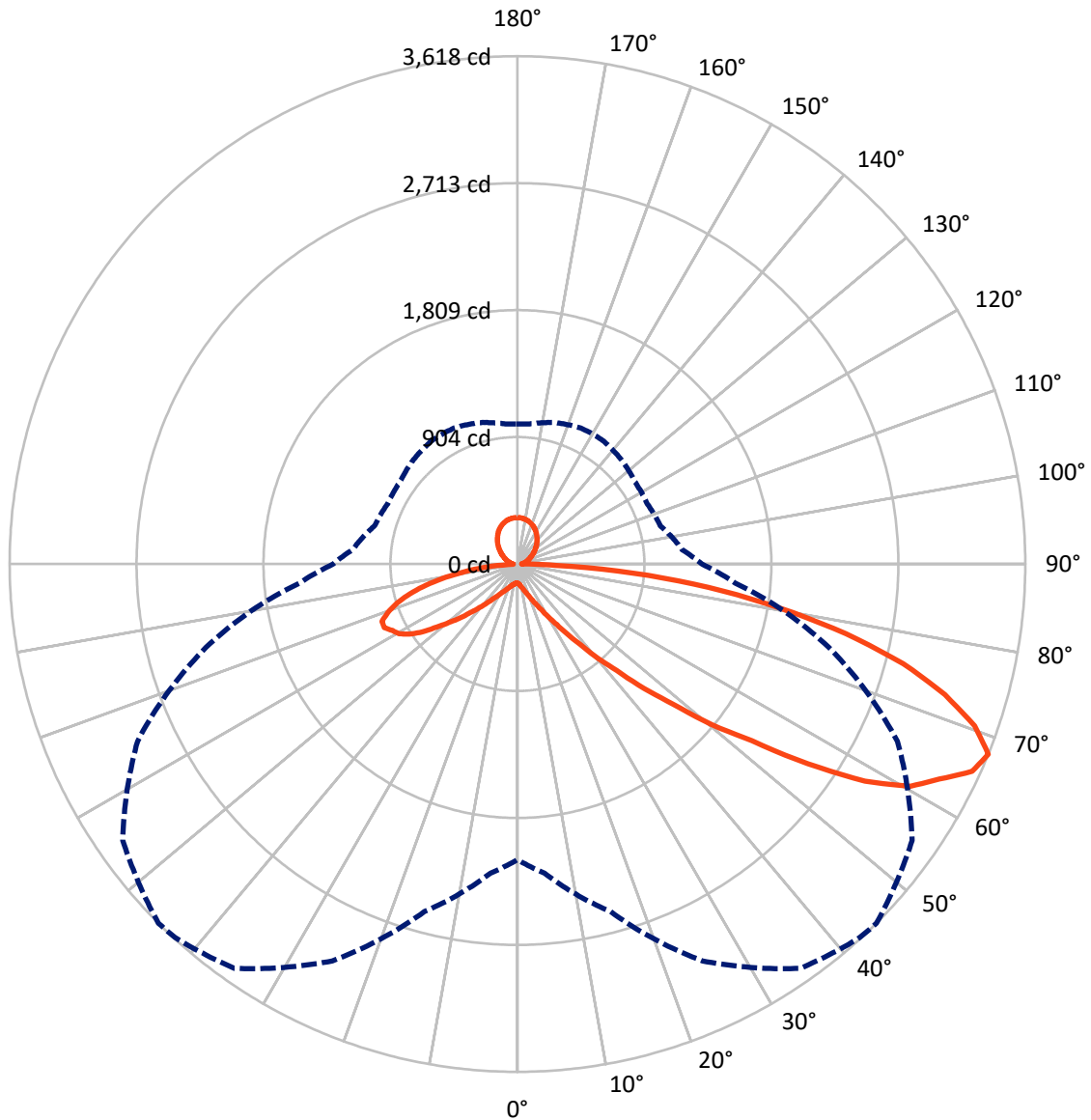


Based on 10 foot mounting height. Maximum calculated value = 4.8 fc
 Type IV - Short - Non-Cutoff

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Luminous Intensity Polar Plot



— Vertical Plane Through 45-Deg Lateral - - - Horizontal Cone Through 67.5-Deg Vertical

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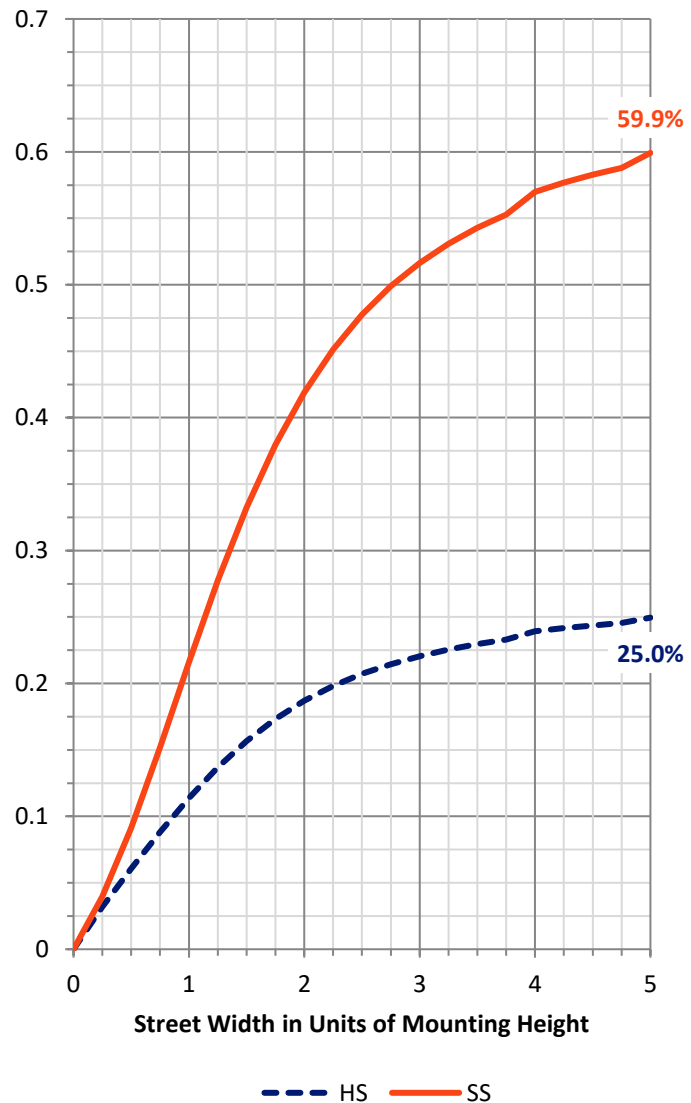
FLUX DISTRIBUTION:

		Downward	Upward	Total
House Side	Lumens	1842.1	450.0	2292.1
	% Fixture	25.5	6.2	31.8
Street Side	Lumens	4476.3	450.0	4926.3
	% Fixture	62.0	6.2	68.2
Total	Lumens	6318.3	900.0	7218.4
	% Fixture	87.5	12.5	100.0

Coefficient of Utilization

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	14.1	0.2
10°-20°	52.4	0.7
20°-30°	123.9	1.7
30°-40°	280.3	3.9
40°-50°	625.0	8.7
50°-60°	1256.4	17.4
60°-70°	1845.3	25.6
70°-80°	1622.7	22.5
80°-90°	498.3	6.9
90°-100°	46.1	0.6
100°-110°	71.4	1.0
110°-120°	99.4	1.4
120°-130°	128.8	1.8
130°-140°	150.0	2.1
140°-150°	152.1	2.1
150°-160°	131.9	1.8
160°-170°	89.0	1.2
170°-180°	31.3	0.4
0°-90°	6318.3	87.5
0°-180°	7218.4	100.0



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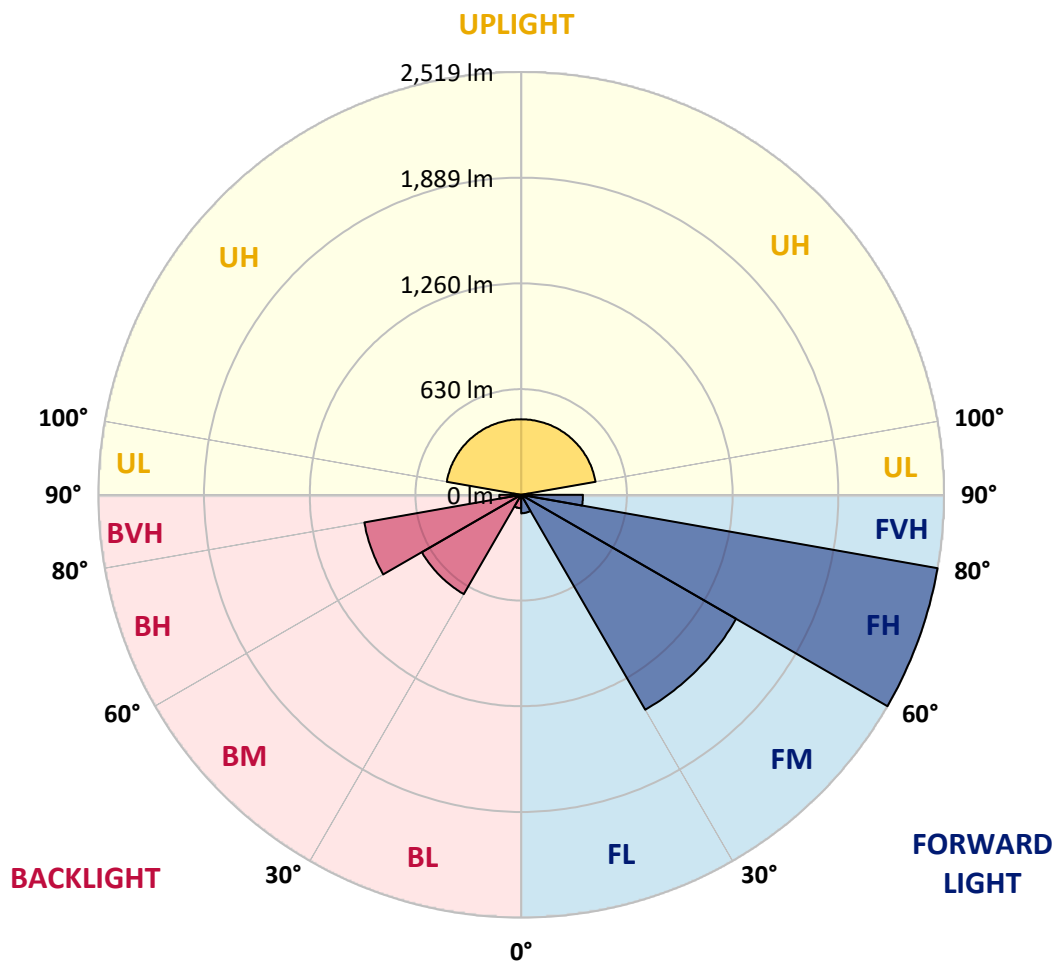
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LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

Zone		Lumens	% Fixture	Zone Rating/Lumen Limit		
				B	U	G
FL	(0°-30°)	110.3	1.5			
FM	(30°-60°)	1478.6	20.5			
FH	(60°-80°)	2519.2	34.9			G2/5000
FVH	(80°-90°)	368.2	5.1			G3/500
BL	(0°-30°)	80.1	1.1	B0/110		
BM	(30°-60°)	683.1	9.5	B1/1000		
BH	(60°-80°)	948.8	13.1	B2/1000		G2/1000
BVH	(80°-90°)	130.1	1.8			G2/225
UL	(90°-100°)	46.1	0.6		U2/50	
UH	(100°-180°)	450.0	6.2		U3/500	

BUG Rating: B2-U4-G3

Type IV Short





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CANDELA DISTRIBUTION (FULL):

	0°	5°	15°	25°	35°	42.5°	45°	55°	65°	75°	85°
0°	137.0	137.0	137.0	137.0	137.0	137.0	137.0	137.0	137.0	137.0	137.0
2.5°	142.9	141.7	141.7	141.7	140.5	140.5	140.5	140.5	139.3	139.3	139.3
5°	151.1	149.9	151.1	148.8	147.6	147.6	146.4	146.4	145.2	144.0	142.9
7.5°	162.9	161.8	161.8	159.4	158.2	157.0	157.0	154.7	153.5	151.1	148.8
10°	175.9	175.9	174.7	173.6	171.2	168.8	168.8	165.3	164.1	160.6	157.0
12.5°	191.3	191.3	191.3	188.9	186.5	185.4	183.0	180.6	177.1	171.2	167.7
15°	210.2	210.2	210.2	207.8	205.4	203.1	201.9	197.2	191.3	185.4	178.3
17.5°	233.8	231.4	231.4	229.0	226.7	225.5	223.1	218.4	210.2	203.1	193.6
20°	259.7	258.6	257.4	257.4	255.0	252.7	251.5	244.4	235.0	222.0	210.2
22.5°	289.3	288.1	288.1	290.4	289.3	285.7	285.7	275.1	262.1	246.8	229.0
25°	325.9	324.7	327.0	331.8	331.8	329.4	325.9	315.2	296.3	275.1	253.8
27.5°	366.0	364.8	369.5	377.8	380.2	376.6	374.3	362.5	341.2	312.9	282.2
30°	414.4	415.6	428.6	438.0	443.9	441.6	440.4	427.4	393.2	360.1	320.0
32.5°	473.4	469.9	486.4	501.8	512.4	518.3	514.8	499.4	469.9	418.0	367.2
35°	536.0	537.2	557.3	579.7	604.5	606.9	613.9	598.6	558.5	497.1	426.2
37.5°	617.5	608.0	634.0	676.5	706.0	732.0	727.3	717.8	670.6	589.1	492.3
40°	690.7	688.3	724.9	784.0	838.3	876.0	880.8	869.0	806.4	690.7	563.2
42.5°	774.5	781.6	832.4	913.8	996.5	1050.8	1037.8	1031.9	958.7	811.1	660.0
45°	859.5	883.1	948.1	1066.1	1162.9	1240.9	1263.3	1243.2	1153.5	1001.2	782.8
47.5°	962.2	994.1	1074.4	1233.8	1392.0	1482.9	1487.6	1547.8	1412.1	1184.2	910.3
50°	1098.0	1112.2	1224.3	1419.2	1636.4	1763.9	1800.5	1801.7	1665.9	1368.4	1054.3
52.5°	1231.4	1242.1	1389.6	1641.1	1936.3	2081.5	2089.8	2135.8	1950.4	1665.9	1260.9
55°	1392.0	1387.3	1590.3	1892.6	2240.9	2452.2	2513.6	2576.2	2340.1	1900.9	1379.0
57.5°	1547.8	1540.8	1785.2	2181.9	2657.7	2867.8	2918.6	2873.7	2523.1	1998.9	1436.9
60°	1691.9	1716.7	2014.2	2501.8	2980.0	3180.7	3214.9	3093.3	2641.1	2074.4	1473.5
62.5°	1841.8	1891.4	2251.5	2768.6	3226.7	3370.8	3373.1	3230.3	2838.3	2220.8	1592.7
65°	1982.3	2061.4	2435.7	2996.5	3399.1	3543.2	3559.7	3431.0	3031.9	2348.3	1612.8
67.5°	2106.3	2211.4	2563.2	3119.3	3516.0	3609.3	3617.5	3432.2	2985.9	2296.4	1557.3
70°	2206.7	2291.7	2642.3	3121.7	3434.5	3460.5	3454.6	3257.4	2858.4	2193.7	1464.0
72.5°	2245.6	2315.3	2604.5	2975.3	3194.9	3189.0	3184.2	3002.4	2648.2	2022.5	1329.4
75°	2190.1	2210.2	2397.9	2662.4	2801.7	2834.8	2839.5	2675.4	2323.5	1768.6	1140.5
77.5°	1961.1	1950.4	2094.5	2269.2	2374.3	2397.9	2393.2	2256.2	1948.1	1469.9	956.3
80°	1554.9	1577.4	1667.1	1782.8	1887.9	1913.8	1897.3	1793.4	1516.0	1146.4	734.4
82.5°	1087.4	1114.5	1190.1	1277.5	1356.6	1356.6	1371.9	1271.6	1074.4	822.9	513.6
85°	586.8	571.4	654.1	753.3	809.9	820.6	826.5	793.4	664.7	497.1	304.6
87.5°	96.8	103.9	128.7	197.2	224.3	259.7	276.3	216.1	131.1	83.8	61.4
90°	32.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5
92.5°	37.6	37.1	37.1	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6
95°	42.7	42.7	42.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7
97.5°	48.3	48.3	48.3	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8
100°	53.9	53.9	53.9	53.9	53.9	53.9	53.9	53.9	53.9	53.9	53.9
102.5°	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	61.0	60.5	60.5
105°	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	68.1	67.1	67.1
107.5°	74.2	74.2	74.7	74.7	74.7	74.7	74.7	74.7	75.2	74.7	74.7
110°	81.3	81.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3



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CANDELA DISTRIBUTION (continued):

	0°	5°	15°	25°	35°	42.5°	45°	55°	65°	75°	85°
112.5°	89.9	89.9	90.9	90.9	90.9	90.9	90.9	91.4	91.4	90.9	90.9
115°	98.6	98.6	99.6	99.6	99.6	99.6	99.6	100.6	100.6	99.6	99.6
117.5°	108.8	108.8	109.2	109.8	109.8	109.8	109.8	110.8	110.8	109.8	109.8
120°	118.9	118.9	118.9	119.9	119.9	119.9	119.9	121.0	121.0	119.9	119.9
122.5°	130.6	130.6	131.1	131.6	131.6	131.6	131.6	132.6	132.6	132.1	132.1
125°	142.3	142.3	143.3	143.3	143.3	143.3	143.3	144.3	144.3	144.3	144.3
127.5°	155.0	155.0	156.0	156.0	156.0	156.0	156.0	157.0	157.0	157.0	157.0
130°	167.7	167.7	168.7	168.7	168.7	168.7	168.7	169.7	169.7	169.7	169.7
132.5°	180.9	180.9	181.4	181.4	181.4	181.8	181.9	182.4	182.4	182.4	182.4
135°	194.1	194.1	194.1	194.1	194.1	194.8	195.1	195.1	195.1	195.1	195.1
137.5°	206.8	206.3	206.8	206.3	206.8	207.2	207.3	207.3	207.3	207.3	207.3
140°	219.5	218.5	219.5	218.5	219.5	219.5	219.5	219.5	219.5	219.5	219.5
142.5°	231.2	230.7	231.2	230.2	231.2	231.2	231.2	231.2	231.2	231.2	231.2
145°	242.9	242.9	242.9	241.9	242.9	242.9	242.9	242.9	242.9	242.9	242.9
147.5°	255.1	254.6	255.1	254.1	255.1	255.1	255.1	255.1	255.1	255.1	255.1
150°	267.3	266.3	267.3	266.3	267.3	267.3	267.3	267.3	267.3	267.3	267.3
152.5°	277.0	276.5	277.5	276.5	277.0	277.0	277.0	277.5	277.0	277.0	277.0
155°	286.6	286.6	287.6	286.6	286.6	286.6	286.6	287.6	286.6	286.6	286.6
157.5°	294.8	294.8	295.8	294.8	294.8	294.8	294.8	295.8	294.8	294.8	294.8
160°	302.9	302.9	303.9	302.9	302.9	302.9	302.9	303.9	302.9	302.9	302.9
162.5°	309.5	309.5	310.5	309.5	309.5	309.5	309.5	310.5	309.5	309.5	309.5
165°	316.1	316.1	317.1	316.1	316.1	316.1	316.1	317.1	316.1	316.1	316.1
167.5°	320.2	320.2	321.2	320.2	320.2	320.2	320.2	321.2	320.2	320.2	320.2
170°	324.2	324.2	325.2	324.2	324.2	324.2	324.2	325.2	324.2	324.2	324.2
172.5°	326.8	326.8	327.8	326.8	327.2	326.9	326.8	327.8	326.8	326.8	326.8
175°	329.3	329.3	330.3	329.3	330.3	329.6	329.3	330.3	329.3	329.3	329.3
177.5°	330.3	330.3	330.8	330.3	330.8	330.4	330.3	330.8	330.3	330.3	330.3
180°	331.3	331.3	331.3	331.3	331.3	331.3	331.3	331.3	331.3	331.3	331.3



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CANDELA DISTRIBUTION (continued):

	90°	95°	105°	115°	125°	135°	145°	155°	165°	175°	180°
0°	137.0	137.0	137.0	137.0	137.0	137.0	137.0	137.0	137.0	137.0	137.0
2.5°	139.3	138.1	137.0	135.8	135.8	134.6	134.6	134.6	135.8	135.8	135.8
5°	142.9	141.7	140.5	139.3	137.0	137.0	137.0	137.0	137.0	137.0	137.0
7.5°	148.8	146.4	145.2	142.9	140.5	140.5	139.3	139.3	139.3	140.5	139.3
10°	155.8	153.5	151.1	147.6	146.4	145.2	144.0	144.0	145.2	145.2	144.0
12.5°	164.1	162.9	158.2	154.7	152.3	151.1	149.9	151.1	149.9	151.1	151.1
15°	175.9	172.4	166.5	162.9	159.4	158.2	157.0	158.2	158.2	159.4	158.2
17.5°	188.9	184.2	178.3	172.4	167.7	166.5	166.5	166.5	167.7	168.8	167.7
20°	204.3	198.4	190.1	183.0	178.3	177.1	177.1	178.3	179.5	180.6	180.6
22.5°	219.6	214.9	203.1	193.6	191.3	190.1	188.9	191.3	193.6	194.8	196.0
25°	243.2	233.8	219.6	209.0	204.3	204.3	205.4	207.8	209.0	211.3	210.2
27.5°	268.0	257.4	239.7	225.5	222.0	220.8	223.1	225.5	230.2	230.2	229.0
30°	302.2	284.5	262.1	249.1	239.7	240.9	244.4	247.9	252.7	255.0	255.0
32.5°	341.2	322.3	291.6	271.6	266.8	268.0	269.2	275.1	279.8	284.5	281.0
35°	392.0	368.4	330.6	308.2	296.3	295.2	299.9	307.0	311.7	314.1	314.1
37.5°	447.5	416.8	369.5	350.7	336.5	335.3	336.5	342.4	348.3	350.7	355.4
40°	514.8	477.0	421.5	390.8	380.2	377.8	382.5	390.8	390.8	394.3	395.5
42.5°	597.4	549.0	487.6	447.5	434.5	434.5	433.3	440.4	440.4	440.4	438.0
45°	702.5	648.2	567.9	526.6	504.1	492.3	495.9	491.2	490.0	493.5	482.9
47.5°	804.0	735.6	641.1	596.2	573.8	566.7	553.7	550.2	544.3	544.3	528.9
50°	922.1	837.1	746.2	682.4	661.2	641.1	630.5	613.9	596.2	592.7	586.8
52.5°	1119.3	1013.0	870.1	801.7	747.4	727.3	702.5	681.2	660.0	643.5	652.9
55°	1199.5	1090.9	955.2	889.0	851.3	832.4	786.3	758.0	726.1	702.5	715.5
57.5°	1239.7	1121.6	995.3	945.7	935.1	917.4	883.1	834.7	798.1	768.6	771.0
60°	1262.1	1138.2	1016.5	971.7	965.8	977.6	959.9	926.8	870.1	840.6	837.1
62.5°	1348.3	1218.4	1076.8	1013.0	1000.0	1008.3	1013.0	992.9	945.7	906.7	896.1
65°	1366.0	1227.9	1088.6	1047.2	1048.4	1050.8	1054.3	1033.1	1009.5	961.1	951.6
67.5°	1312.9	1177.1	1053.1	1018.9	1021.3	1048.4	1069.7	1068.5	1042.5	1001.2	997.7
70°	1232.6	1100.4	985.9	955.2	961.1	985.9	1031.9	1055.5	1050.8	1023.6	1029.5
72.5°	1107.5	989.4	889.0	865.4	879.6	903.2	946.9	989.4	1014.2	1020.1	1033.1
75°	961.1	866.6	772.2	758.0	768.6	795.8	835.9	885.5	939.8	969.3	977.6
77.5°	793.4	707.2	637.6	628.1	643.5	668.3	708.4	747.4	808.8	860.7	872.5
80°	621.0	546.6	497.1	488.8	498.2	519.5	550.2	582.1	641.1	681.2	687.1
82.5°	430.9	386.1	354.2	349.5	355.4	363.6	388.4	418.0	451.0	482.9	486.4
85°	250.3	222.0	213.7	206.6	219.6	219.6	225.5	242.0	258.6	260.9	268.0
87.5°	46.0	43.7	44.9	33.1	41.3	29.5	29.5	37.8	28.3	33.1	27.2
90°	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	32.5
92.5°	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	37.1	37.1	37.6
95°	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	42.7	42.7	42.7
97.5°	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	48.3	48.3	48.3
100°	53.9	53.9	53.9	53.9	53.9	53.9	53.9	53.9	53.9	53.9	53.9
102.5°	60.5	60.5	60.5	61.0	60.5	60.5	60.5	60.5	60.5	60.5	60.5
105°	67.1	67.1	67.1	68.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1
107.5°	74.7	74.7	74.7	75.2	74.7	74.7	74.7	74.7	74.7	74.2	74.2
110°	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3	81.3	81.3



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CATALOG NUMBER: TT-D4-750-U-DL-UPL

CANDELA DISTRIBUTION (continued):

	90°	95°	105°	115°	125°	135°	145°	155°	165°	175°	180°
112.5°	90.9	90.9	90.9	91.4	91.4	90.9	90.9	90.9	90.9	89.9	89.9
115°	99.6	99.6	99.6	100.6	100.6	99.6	99.6	99.6	99.6	98.6	98.6
117.5°	109.8	109.8	109.8	110.8	110.8	109.8	109.8	109.8	109.2	108.8	108.8
120°	119.9	119.9	119.9	121.0	121.0	119.9	119.9	119.9	118.9	118.9	118.9
122.5°	131.6	132.1	132.1	132.6	132.6	131.6	131.6	131.6	131.1	130.6	130.6
125°	143.3	144.3	144.3	144.3	144.3	143.3	143.3	143.3	143.3	142.3	142.3
127.5°	156.0	157.0	157.0	157.0	157.0	156.0	156.0	156.0	156.0	155.0	155.0
130°	168.7	169.7	169.7	169.7	169.7	168.7	168.7	168.7	168.7	167.7	167.7
132.5°	181.9	182.4	182.4	182.4	182.4	181.9	181.4	181.4	181.4	180.9	180.9
135°	195.1	195.1	195.1	195.1	195.1	195.1	194.1	194.1	194.1	194.1	194.1
137.5°	207.3	207.3	207.3	207.3	207.3	207.3	206.8	206.3	206.8	206.3	206.8
140°	219.5	219.5	219.5	219.5	219.5	219.5	219.5	218.5	219.5	218.5	219.5
142.5°	231.2	231.2	231.2	231.2	231.2	231.2	231.2	230.2	231.2	230.7	231.2
145°	242.9	242.9	242.9	242.9	242.9	242.9	242.9	241.9	242.9	242.9	242.9
147.5°	255.1	255.1	255.1	255.1	255.1	255.1	255.1	254.1	255.1	254.6	255.1
150°	267.3	267.3	267.3	267.3	267.3	267.3	267.3	266.3	267.3	266.3	267.3
152.5°	277.0	277.0	277.0	277.0	277.5	277.0	277.0	276.5	277.5	276.5	277.0
155°	286.6	286.6	286.6	286.6	287.6	286.6	286.6	286.6	287.6	286.6	286.6
157.5°	294.8	294.8	294.8	294.8	295.8	294.8	294.8	294.8	295.8	294.8	294.8
160°	302.9	302.9	302.9	302.9	303.9	302.9	302.9	302.9	303.9	302.9	302.9
162.5°	309.5	309.5	309.5	309.5	310.5	309.5	309.5	309.5	310.5	309.5	309.5
165°	316.1	316.1	316.1	316.1	317.1	316.1	316.1	316.1	317.1	316.1	316.1
167.5°	320.2	320.2	320.2	320.2	321.2	320.2	320.2	320.2	321.2	320.2	320.2
170°	324.2	324.2	324.2	324.2	325.2	324.2	324.2	324.2	325.2	324.2	324.2
172.5°	326.8	326.8	326.8	326.8	327.8	326.8	327.2	326.8	327.8	326.8	326.8
175°	329.3	329.3	329.3	329.3	330.3	329.3	330.3	329.3	330.3	329.3	329.3
177.5°	330.3	330.3	330.3	330.3	330.8	330.3	330.8	330.3	330.8	330.3	330.3
180°	331.3	331.3	331.3	331.3	331.3	331.3	331.3	331.3	331.3	331.3	331.3

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

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

McGRAW-EDISON

Report Number: SP1-2006-844-1

Luminaire Tested: TT-D4-750-U-WQ

Test Date: 11/06/2020

Data applicable to product families TT-x-750 and TTN-x-750

Test Information

Test Method: LM-79-08
 Report Number: SP1-2006-844-1
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1
 Measurement Geometry: 4π
 Issue Date: 11/06/2020
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
 Product Line: MCGRAW-EDISON
 Catalog Number: **TT-D4-750-U-WQ**
 Description: MCGRAW EDISON

DISTRIBUTION

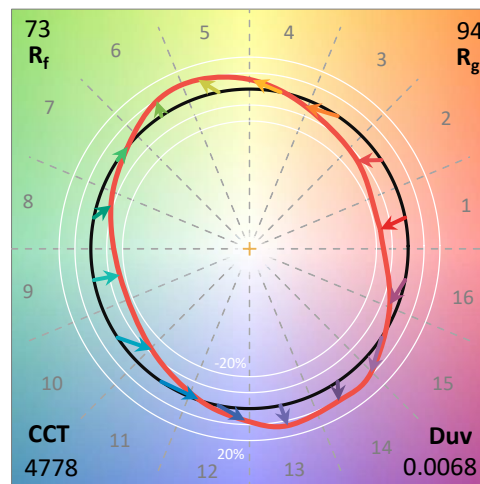
Spectral Parameters

CCT (K): 4778
 CIE u': 0.2092
 CIE v': 0.4955
 Duv: 0.0068
 CIE x: 0.3535
 CIE y: 0.3721
 CIE z: 0.2744
 Peak Wavelength (nm): 449
 Dominant Wavelength (nm): 570
 Purity: 17.8
 Rf: 73.3
 Rg: 94.5

CRI (Ra):	71.0		
R1:	67.7	R9:	-28.7
R2:	75.2	R10:	41.2
R3:	80.8	R11:	67.2
R4:	71.5	R12:	35.9
R5:	67.8	R13:	68.5
R6:	65.6	R14:	89.2
R7:	82.2		
R8:	57.2		

Test Conditions

Stabilization Time: 62M
 Operation Time: 12H
 Room Temperature (°C) / RH%: 24.6/45%
 Sphere Temperature (°C): 24.7

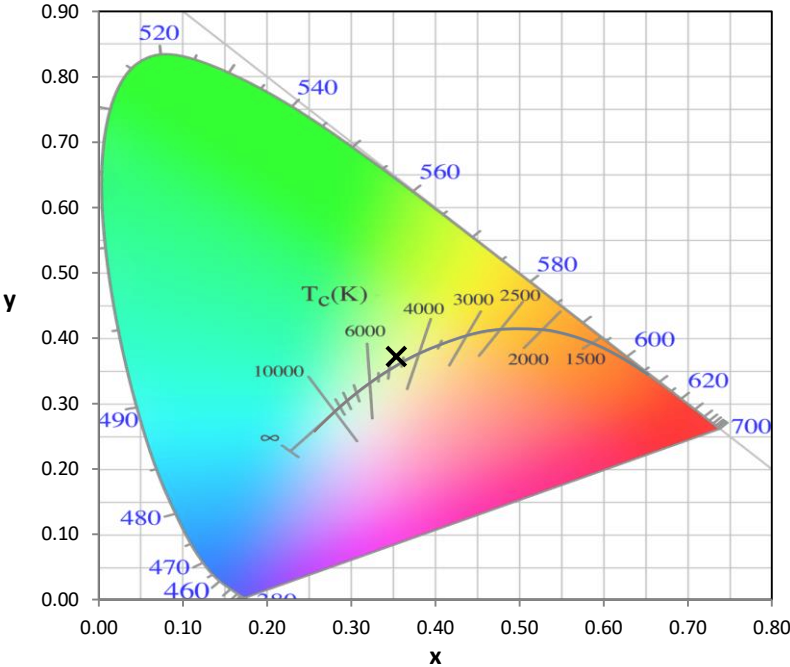


REPORT NUMBER: SP1-2006-844-1

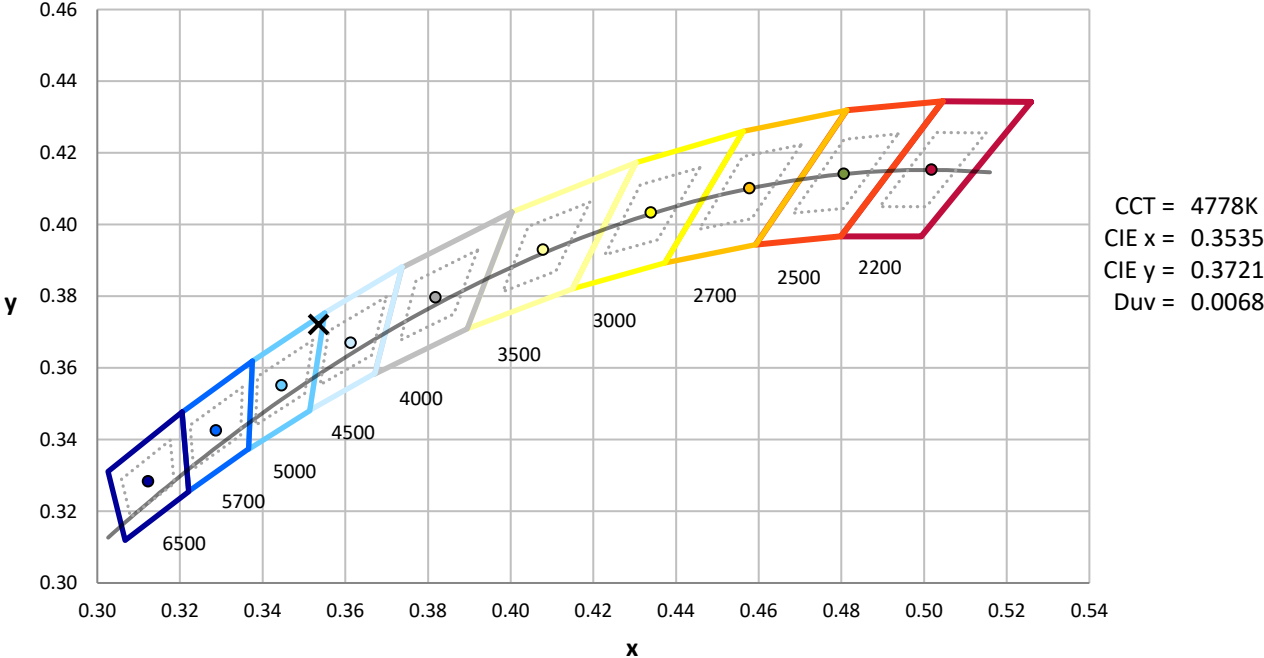
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	7/29/2020	1/29/2021
Power Meter	IN0071	12/3/2019	12/3/2020
AC Power Source	IN0063	12/3/2019	12/3/2020
DC Power Source	IN0208	12/3/2019	12/3/2020
Sphere Thermometer	IN0085	12/3/2019	12/3/2020
Room Thermometer	IN0046	12/3/2019	12/3/2020

REPORT NUMBER: SP1-2006-844-1

CIE 1931 Chromaticity Diagram



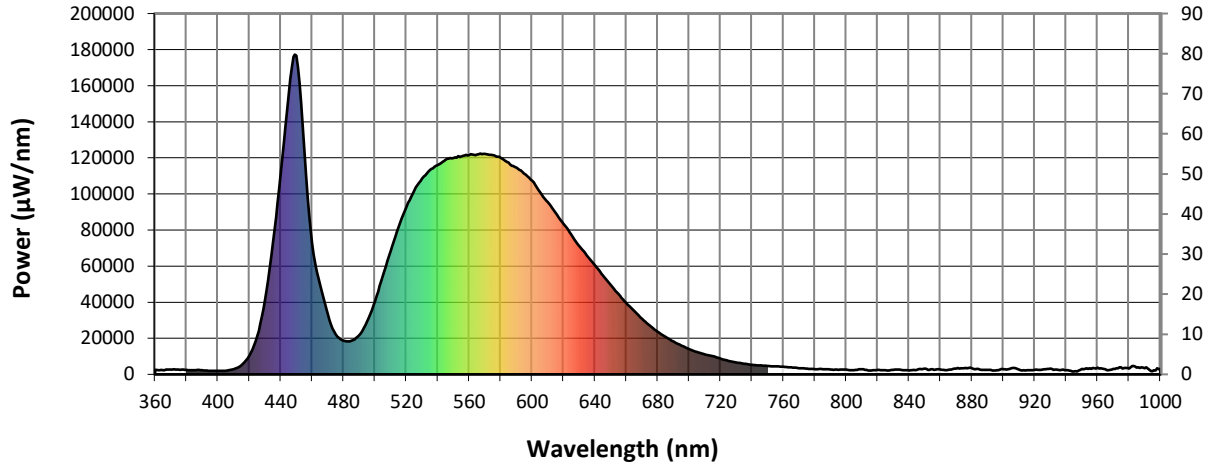
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 5000K 7-step quadrangle

REPORT NUMBER: SP1-2006-844-1

Photopic Flux vs. Wavelength

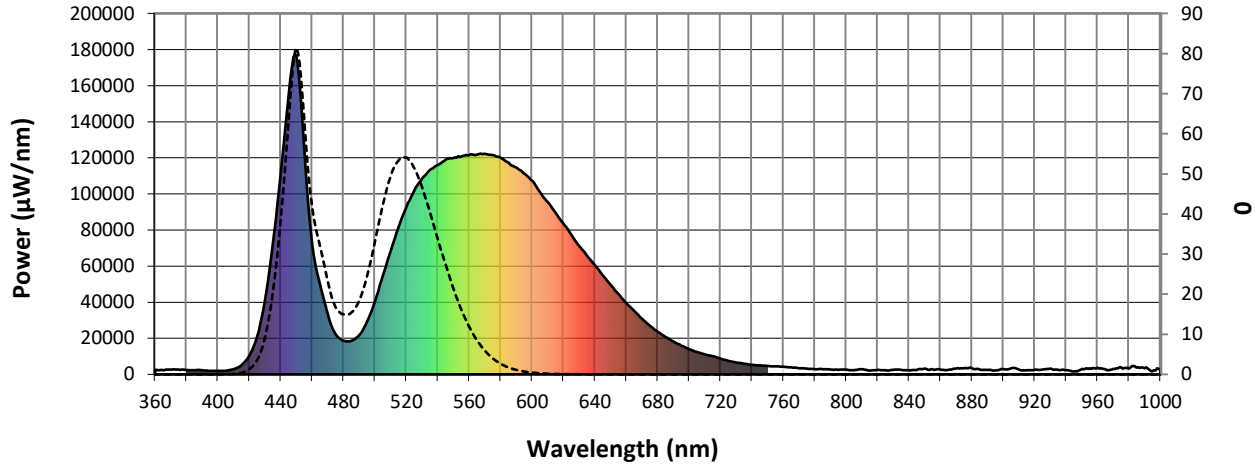


#####

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	2529	0.0	490	21819	3.1	620	83437	21.7	750	4608	0.0	880	3335	0.0
365	2361	0.0	495	29270	5.3	625	77569	17.1	755	4412	0.0	885	2653	0.0
370	2648	0.0	500	40589	9.0	630	71183	12.9	760	4227	0.0	890	2411	0.0
375	2655	0.0	505	54498	15.2	635	65734	9.9	765	3922	0.0	895	2118	0.0
380	2428	0.0	510	68399	23.5	640	60418	7.2	770	3461	0.0	900	2873	0.0
385	2334	0.0	515	81428	33.7	645	54736	5.3	775	3226	0.0	905	3367	0.0
390	2269	0.0	520	92826	45.0	650	49620	3.6	780	2883	0.0	910	2749	0.0
395	2020	0.0	525	101684	54.6	655	44517	2.6	785	2864	0.0	915	2283	0.0
400	1873	0.0	530	108580	63.9	660	39493	1.6	790	2715	0.0	920	2425	0.0
405	2015	0.0	535	113290	70.3	665	35066	1.1	795	2547	0.0	925	2705	0.0
410	2831	0.0	540	116042	75.6	670	30825	0.7	800	2585	0.0	930	3144	0.0
415	5121	0.0	545	118948	79.2	675	27031	0.5	805	2308	0.0	935	2539	0.0
420	10348	0.0	550	119916	81.5	680	23555	0.3	810	2796	0.0	940	2288	0.0
425	21288	0.1	555	120734	82.5	685	20841	0.2	815	2196	0.0	945	1604	0.0
430	41173	0.3	560	121523	82.6	690	18232	0.1	820	2415	0.0	950	3031	0.0
435	73003	0.9	565	121859	81.0	695	16035	0.1	825	2281	0.0	955	3356	0.0
440	111013	1.7	570	122246	79.5	700	14010	0.0	830	2524	0.0	960	3704	0.0
445	154787	3.2	575	121449	75.6	705	12408	0.0	835	2461	0.0	965	2847	0.0
450	176733	4.6	580	120111	71.4	710	11063	0.0	840	2195	0.0	970	2985	0.0
455	124334	4.2	585	117354	65.2	715	10136	0.0	845	2487	0.0	975	3963	0.0
460	72664	3.0	590	114565	59.2	720	8693	0.0	850	3144	0.0	980	3221	0.0
465	49806	2.6	595	111127	52.7	725	7522	0.0	855	2809	0.0	985	3794	0.0
470	32995	2.1	600	107253	46.2	730	6612	0.0	860	2621	0.0	990	3296	0.0
475	22184	1.7	605	101156	39.2	735	5947	0.0	865	2410	0.0	995	1779	0.0
480	18691	1.8	610	95370	32.8	740	5253	0.0	870	3143	0.0	1000	2977	0.0
485	18593	2.2	615	89556	27.0	745	5032	0.0	875	3421	0.0			

REPORT NUMBER: SP1-2006-844-1

Scotopic Flux vs. Wavelength



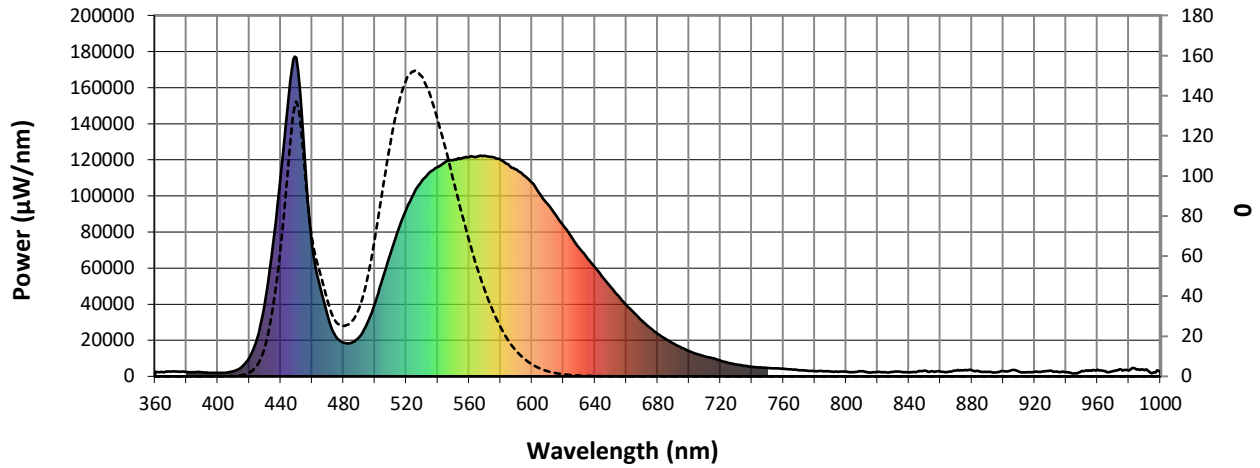
Scotopic Lumens: 4867.6

S/P: 0.66

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	2529	0.0	490	21819	33.6	620	83437	1.0	750	4608	0.0	880	3335	0.0
365	2361	0.0	495	29270	47.3	625	77569	0.7	755	4412	0.0	885	2653	0.0
370	2648	0.0	500	40589	67.9	630	71183	0.4	760	4227	0.0	890	2411	0.0
375	2655	0.0	505	54498	92.6	635	65734	0.2	765	3922	0.0	895	2118	0.0
380	2428	0.0	510	68399	115.9	640	60418	0.2	770	3461	0.0	900	2873	0.0
385	2334	0.0	515	81428	135.0	645	54736	0.1	775	3226	0.0	905	3367	0.0
390	2269	0.0	520	92826	147.5	650	49620	0.1	780	2883	0.0	910	2749	0.0
395	2020	0.0	525	101684	152.1	655	44517	0.0	785	2864	0.0	915	2283	0.0
400	1873	0.0	530	108580	149.7	660	39493	0.0	790	2715	0.0	920	2425	0.0
405	2015	0.1	535	113290	141.2	665	35066	0.0	795	2547	0.0	925	2705	0.0
410	2831	0.2	540	116042	128.2	670	30825	0.0	800	2585	0.0	930	3144	0.0
415	5121	0.5	545	118948	114.0	675	27031	0.0	805	2308	0.0	935	2539	0.0
420	10348	1.7	550	119916	98.1	680	23555	0.0	810	2796	0.0	940	2288	0.0
425	21288	5.2	555	120734	82.5	685	20841	0.0	815	2196	0.0	945	1604	0.0
430	41173	14.0	560	121523	67.9	690	18232	0.0	820	2415	0.0	950	3031	0.0
435	73003	32.6	565	121859	54.7	695	16035	0.0	825	2281	0.0	955	3356	0.0
440	111013	62.0	570	122246	43.1	700	14010	0.0	830	2524	0.0	960	3704	0.0
445	154787	103.6	575	121449	33.1	705	12408	0.0	835	2461	0.0	965	2847	0.0
450	176733	137.0	580	120111	24.7	710	11063	0.0	840	2195	0.0	970	2985	0.0
455	124334	108.6	585	117354	17.9	715	10136	0.0	845	2487	0.0	975	3963	0.0
460	72664	70.2	590	114565	12.8	720	8693	0.0	850	3144	0.0	980	3221	0.0
465	49806	52.6	595	111127	8.9	725	7522	0.0	855	2809	0.0	985	3794	0.0
470	32995	38.0	600	107253	6.0	730	6612	0.0	860	2621	0.0	990	3296	0.0
475	22184	27.7	605	101156	4.0	735	5947	0.0	865	2410	0.0	995	1779	0.0
480	18691	25.2	610	95370	2.6	740	5253	0.0	870	3143	0.0	1000	2977	0.0
485	18593	27.0	615	89556	1.7	745	5032	0.0	875	3421	0.0			

REPORT NUMBER: SP1-2006-844-1

Melanopic Flux vs. Wavelength

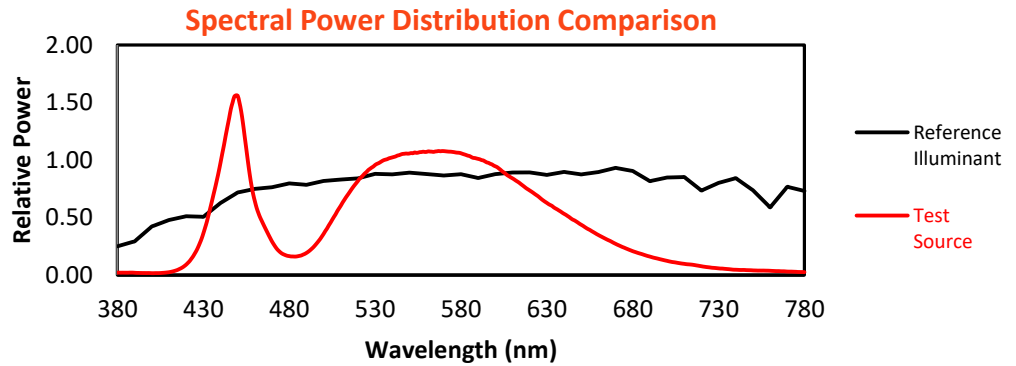


Melanopic Lumens: 12457.9 S/P: 1.7

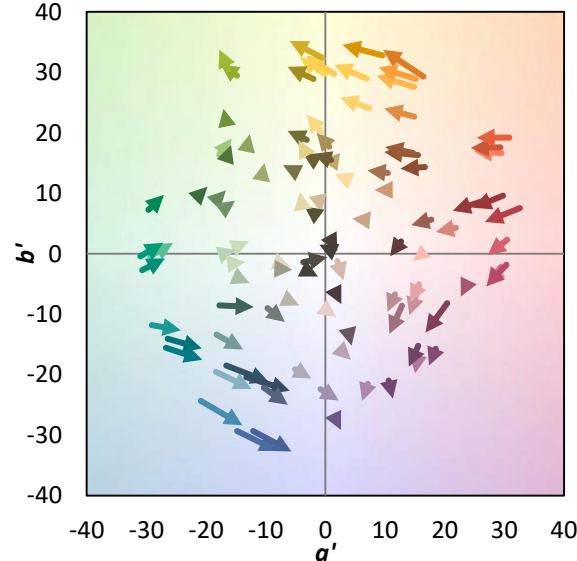
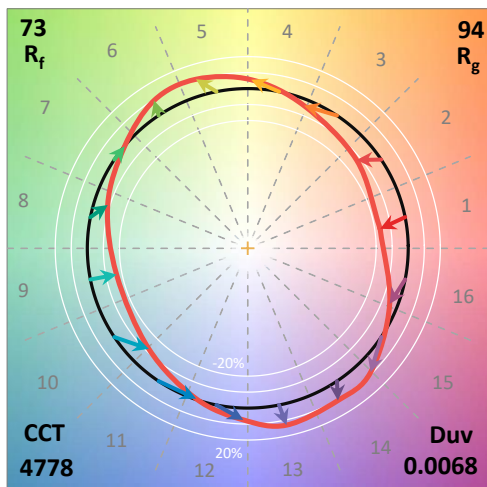
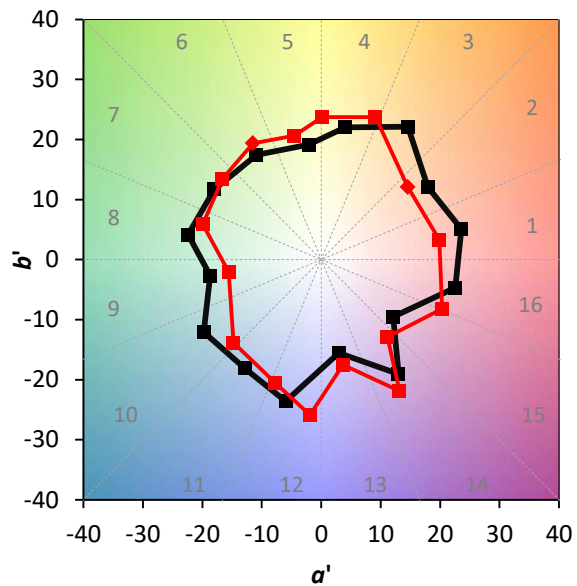
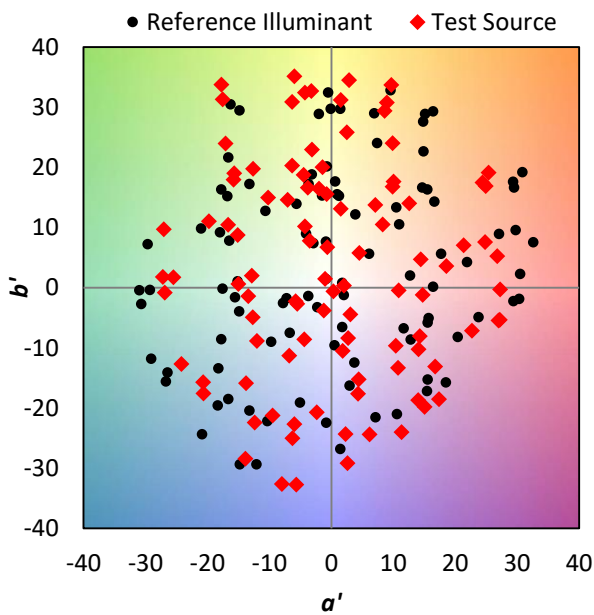
λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)
360	2529	0.0	490	21819	18.2	620	83437	0.1	750	4608	0.0	880	3335	0.0
365	2361	0.0	495	29270	24.2	625	77569	0.0	755	4412	0.0	885	2653	0.0
370	2648	0.0	500	40589	32.6	630	71183	0.0	760	4227	0.0	890	2411	0.0
375	2655	0.0	505	54498	41.8	635	65734	0.0	765	3922	0.0	895	2118	0.0
380	2428	0.0	510	68399	49.1	640	60418	0.0	770	3461	0.0	900	2873	0.0
385	2334	0.0	515	81428	53.2	645	54736	0.0	775	3226	0.0	905	3367	0.0
390	2269	0.0	520	92826	54.0	650	49620	0.0	780	2883	0.0	910	2749	0.0
395	2020	0.0	525	101684	51.6	655	44517	0.0	785	2864	0.0	915	2283	0.0
400	1873	0.0	530	108580	46.9	660	39493	0.0	790	2715	0.0	920	2425	0.0
405	2015	0.0	535	113290	40.8	665	35066	0.0	795	2547	0.0	925	2705	0.0
410	2831	0.1	540	116042	34.0	670	30825	0.0	800	2585	0.0	930	3144	0.0
415	5121	0.3	545	118948	27.6	675	27031	0.0	805	2308	0.0	935	2539	0.0
420	10348	1.2	550	119916	21.5	680	23555	0.0	810	2796	0.0	940	2288	0.0
425	21288	3.3	555	120734	16.3	685	20841	0.0	815	2196	0.0	945	1604	0.0
430	41173	8.7	560	121523	12.0	690	18232	0.0	820	2415	0.0	950	3031	0.0
435	73003	19.5	565	121859	8.6	695	16035	0.0	825	2281	0.0	955	3356	0.0
440	111013	37.1	570	122246	6.0	700	14010	0.0	830	2524	0.0	960	3704	0.0
445	154787	61.1	575	121449	4.0	705	12408	0.0	835	2461	0.0	965	2847	0.0
450	176733	81.4	580	120111	2.7	710	11063	0.0	840	2195	0.0	970	2985	0.0
455	124334	65.1	585	117354	1.7	715	10136	0.0	845	2487	0.0	975	3963	0.0
460	72664	42.8	590	114565	1.1	720	8693	0.0	850	3144	0.0	980	3221	0.0
465	49806	32.5	595	111127	0.7	725	7522	0.0	855	2809	0.0	985	3794	0.0
470	32995	23.6	600	107253	0.5	730	6612	0.0	860	2621	0.0	990	3296	0.0
475	22184	16.9	605	101156	0.3	735	5947	0.0	865	2410	0.0	995	1779	0.0
480	18691	15.0	610	95370	0.2	740	5253	0.0	870	3143	0.0	1000	2977	0.0
485	18593	15.3	615	89556	0.1	745	5032	0.0	875	3421	0.0			

Summary

$R_f = 73.3$
 $R_g = 94.5$
 CIE $R_a = 71.0$
 $R_g = -28.7$

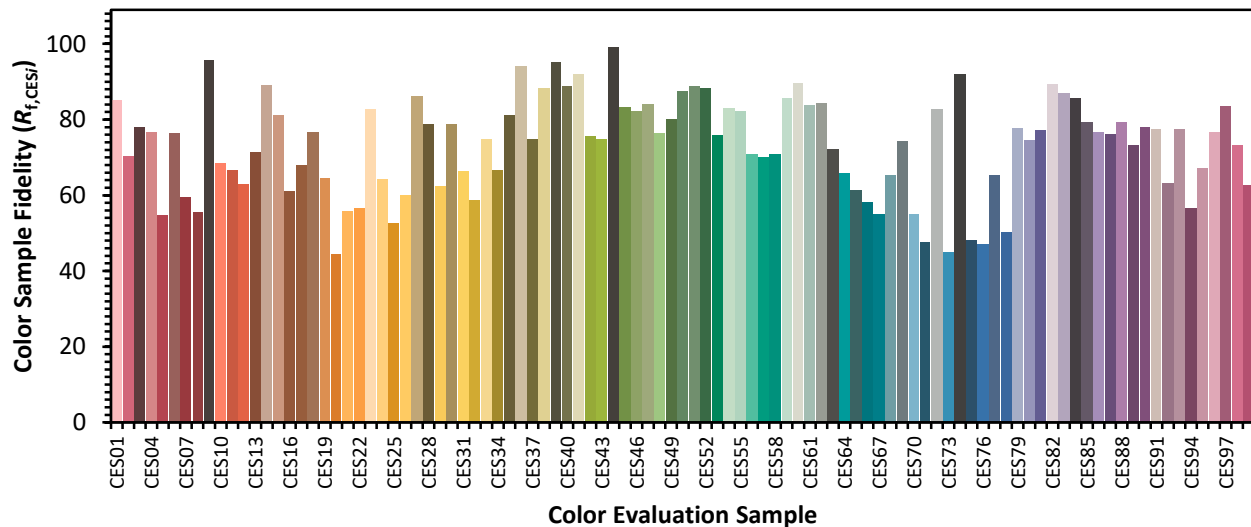


Color Vector Graphics

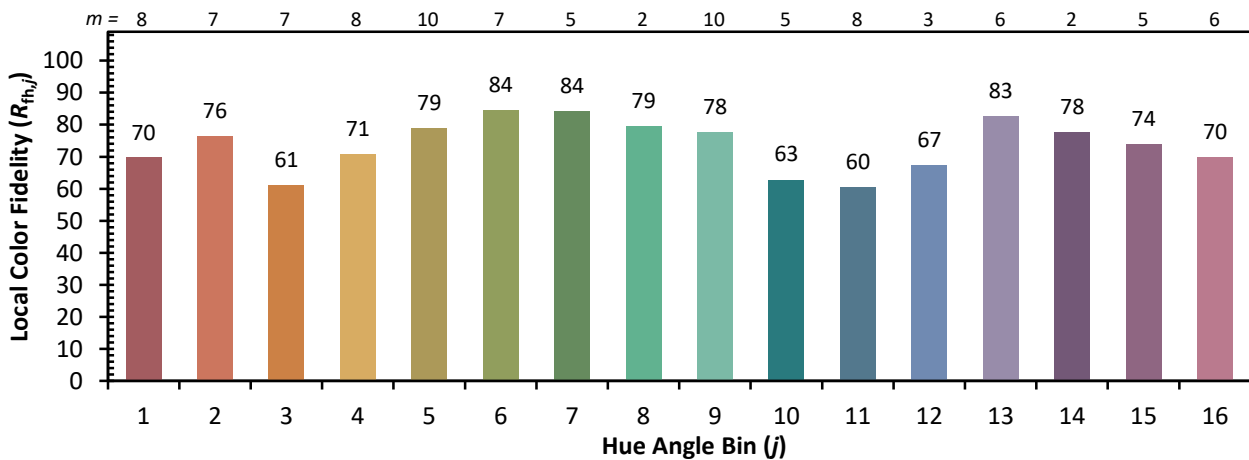
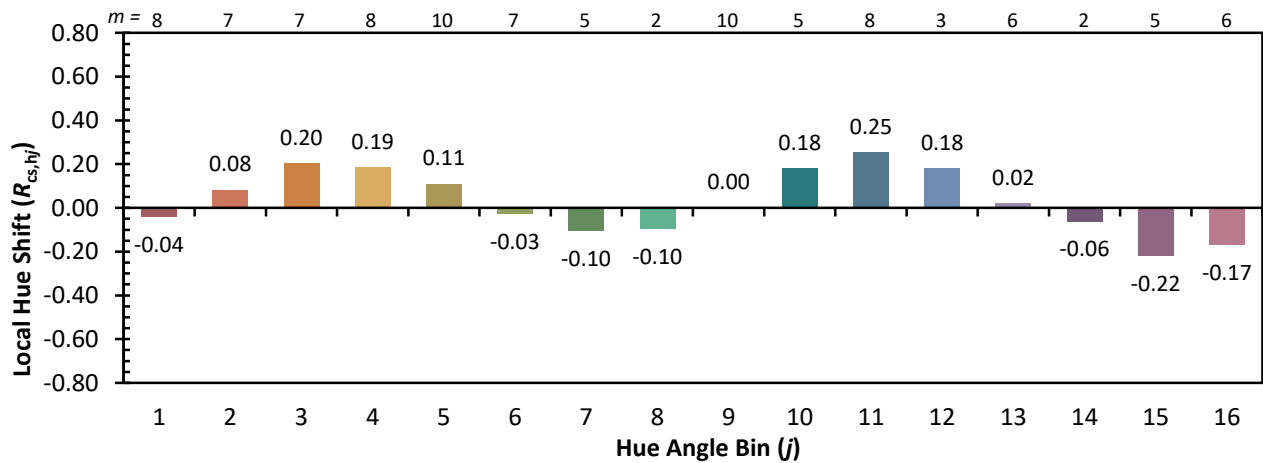
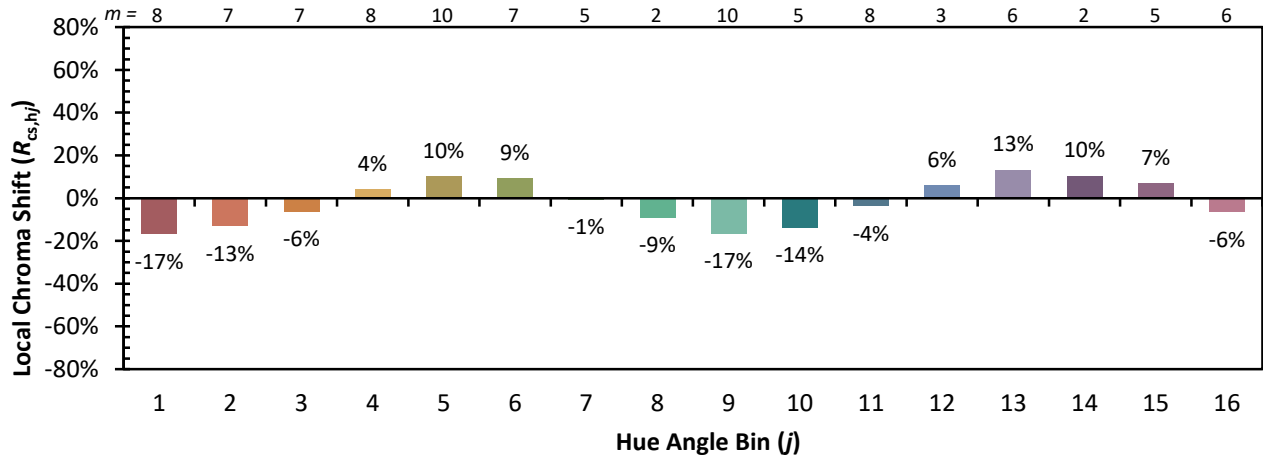


Individual Sample Fidelity Index ($R_{f,i}$)

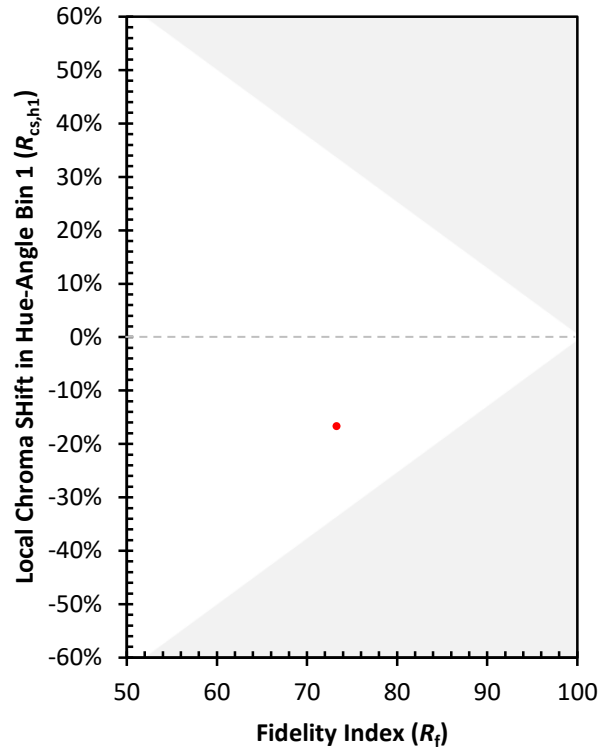
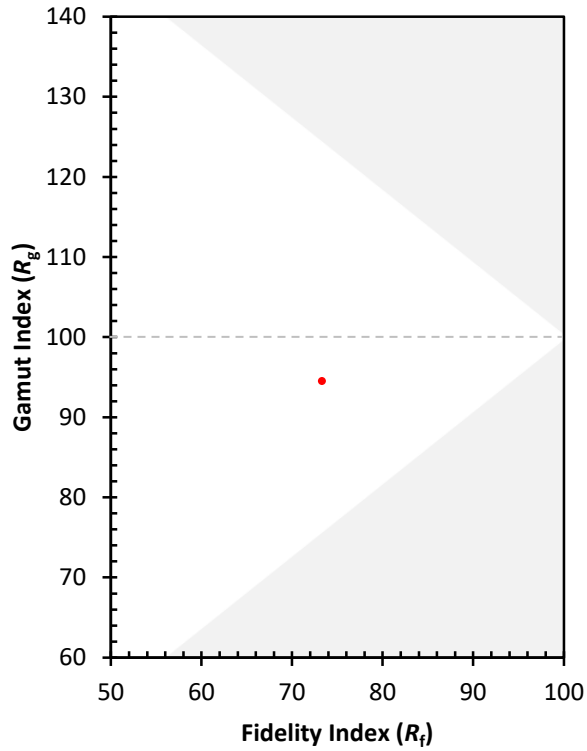
CES01 = 85	CES26 = 60	CES51 = 89	CES76 = 47
CES02 = 59	CES27 = 86	CES52 = 88	CES77 = 65
CES03 = 30	CES28 = 79	CES53 = 76	CES78 = 50
CES04 = 69	CES29 = 62	CES54 = 83	CES79 = 78
CES05 = 46	CES30 = 79	CES55 = 82	CES80 = 74
CES06 = 50	CES31 = 66	CES56 = 71	CES81 = 77
CES07 = 39	CES32 = 59	CES57 = 70	CES82 = 89
CES08 = 38	CES33 = 75	CES58 = 71	CES83 = 87
CES09 = 29	CES34 = 67	CES59 = 86	CES84 = 86
CES10 = 72	CES35 = 81	CES60 = 90	CES85 = 79
CES11 = 56	CES36 = 94	CES61 = 84	CES86 = 77
CES12 = 61	CES37 = 75	CES62 = 84	CES87 = 76
CES13 = 41	CES38 = 88	CES63 = 72	CES88 = 79
CES14 = 74	CES39 = 95	CES64 = 66	CES89 = 73
CES15 = 70	CES40 = 89	CES65 = 61	CES90 = 78
CES16 = 46	CES41 = 92	CES66 = 58	CES91 = 77
CES17 = 49	CES42 = 75	CES67 = 55	CES92 = 63
CES18 = 55	CES43 = 75	CES68 = 65	CES93 = 78
CES19 = 71	CES44 = 99	CES69 = 74	CES94 = 57
CES20 = 64	CES45 = 83	CES70 = 55	CES95 = 67
CES21 = 85	CES46 = 82	CES71 = 48	CES96 = 77
CES22 = 77	CES47 = 84	CES72 = 83	CES97 = 84
CES23 = 91	CES48 = 76	CES73 = 45	CES98 = 73
CES24 = 90	CES49 = 80	CES74 = 92	CES99 = 63
CES25 = 71	CES50 = 88	CES75 = 48	



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)