

Signify Classified - Internal  
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: P833675

Luminaire Tested: **TTN-D2-830-U-DL-CG-UPL2**

Issue Date: 5/15/2024

**Test Information**

Test Method: LM-79-08  
Report Number: P833675  
REPORT IS FROM IESNA LM-79-08 TEST DATA - UPLIGHT (G3-2308-121-4) AND  
Test Lab: INNOVATION CENTER  
Issue Date: 5/15/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: TTN-D2-830-U-DL-CG-UPL2  
Description: TOPTIER NANO LED PARKING GARAGE LUMINAIRE WITH UPLIGHT  
3000K, 80 CRI LEDS AND DRIVE LANE DISTRIBUTION WITH CLEAR GLASS  
Light Source: -  
Ballast/Driver: -

**Summary**

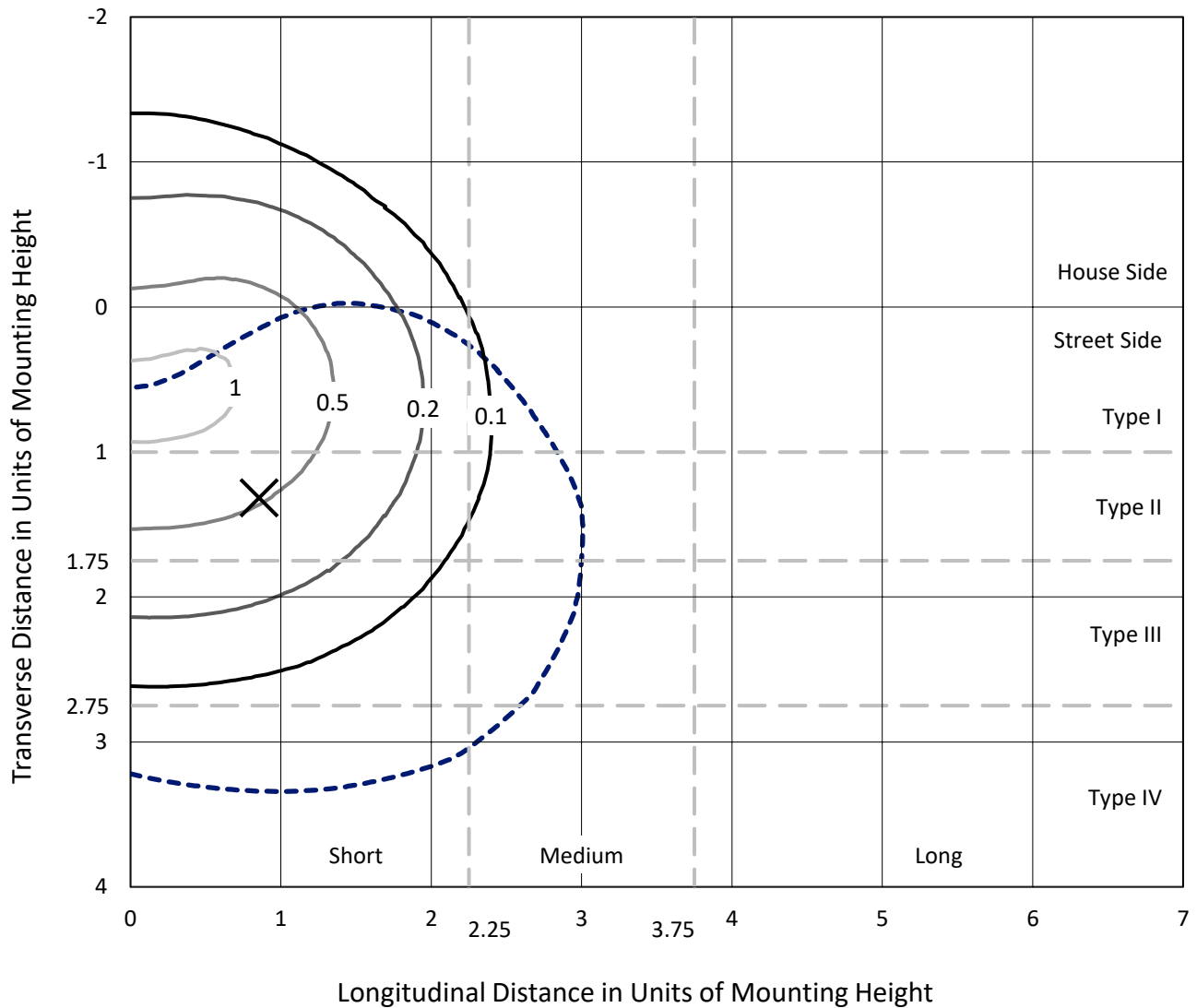
Lumens per Lamp: N/A  
Luminaire Lumens: 4986.8 lumens  
Efficiency: N/A  
Efficacy: 106.1 lumens/watt  
Luminous Opening: Vertical Cylinder (Dia: 0.71' x H: 0.1')  
IES Classification: Type IV - Short  
BUG Rating: B1 - U4 - G1  
  
Input Watts (W): 47  
Input Voltage (V): NR  
Input Current (Ain): 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: 24 FT



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### Iso-Footcandle Lines of Horizontal Illumination

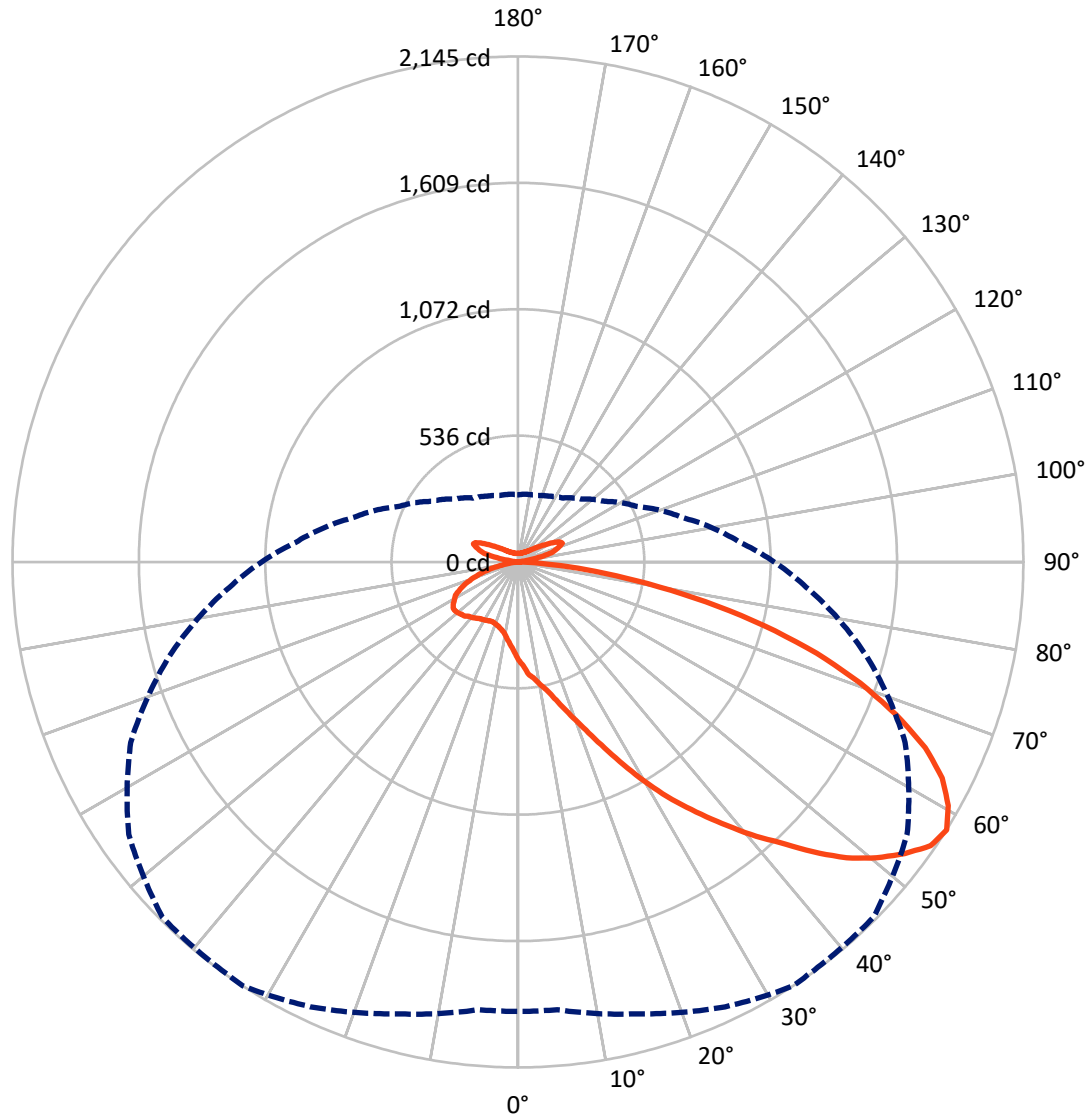
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 1.2 fc  
 Type IV - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 33-Deg Lateral      - - - Horizontal Cone Through 57.5-Deg Vertical

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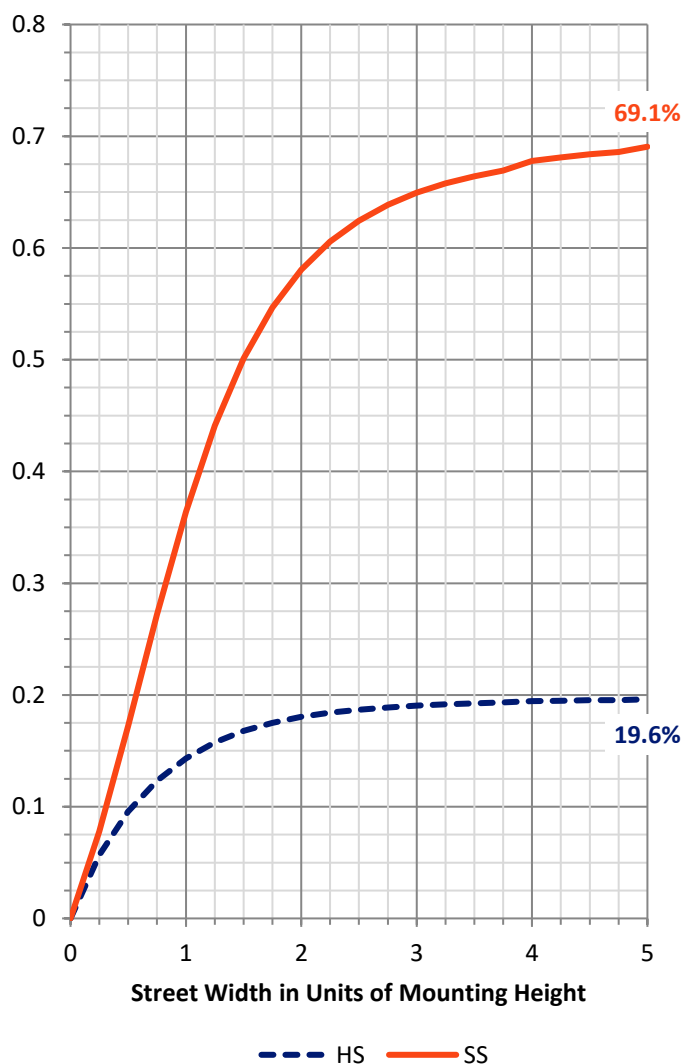
**FLUX DISTRIBUTION:**

		Downward	Upward	Total
<b>House Side</b>	Lumens	982.8	267.0	1249.8
	% Fixture	19.7	5.4	25.1
<b>Street Side</b>	Lumens	3470.0	267.0	3737.0
	% Fixture	69.6	5.4	74.9
<b>Total</b>	Lumens	4452.8	534.0	4986.8
	% Fixture	89.3	10.7	100.0

**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	39.9	0.8
10°-20°	129.5	2.6
20°-30°	273.0	5.5
30°-40°	495.8	9.9
40°-50°	783.4	15.7
50°-60°	1040.4	20.9
60°-70°	1001.4	20.1
70°-80°	587.8	11.8
80°-90°	101.6	2.0
90°-100°	11.9	0.2
100°-110°	121.1	2.4
110°-120°	177.1	3.6
120°-130°	102.8	2.1
130°-140°	54.4	1.1
140°-150°	32.3	0.6
150°-160°	19.9	0.4
160°-170°	10.9	0.2
170°-180°	3.5	0.1
0°-90°	4452.8	89.3
0°-180°	4986.8	100.0

**Coefficient of Utilization**

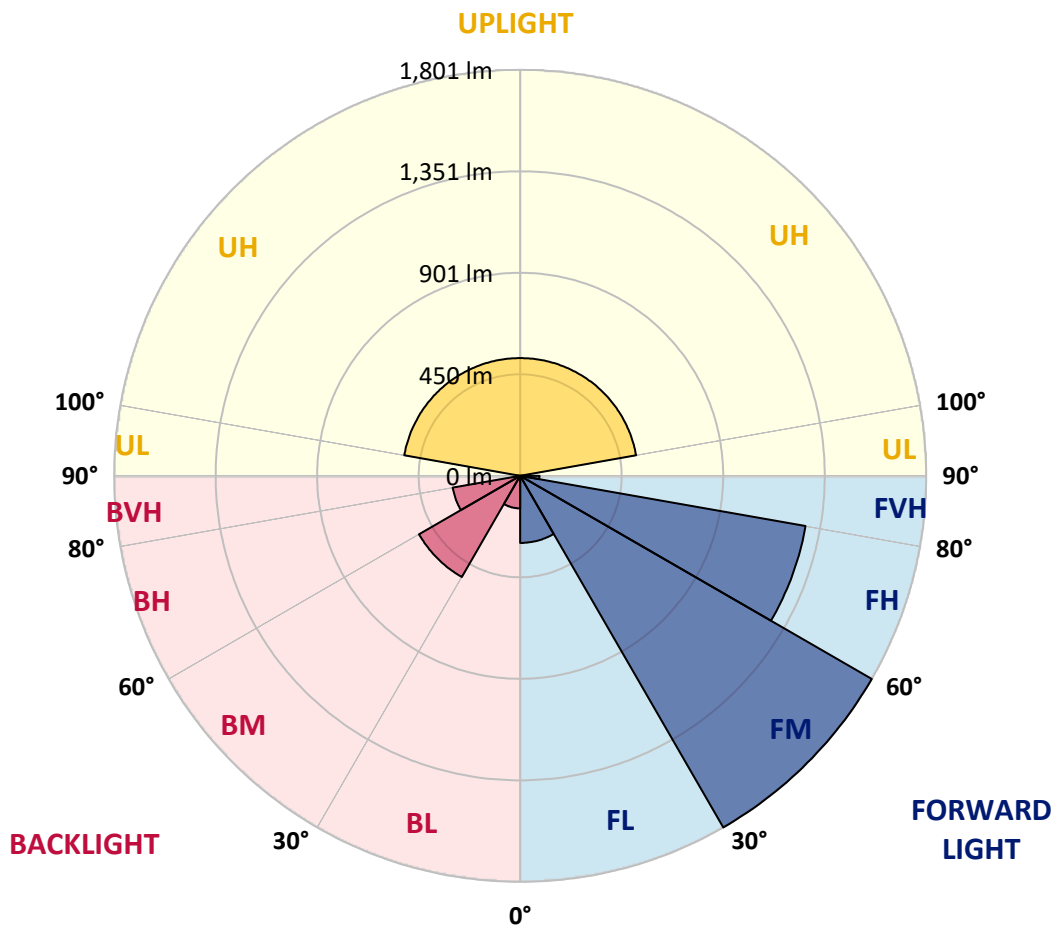


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

Zone	Lumens	% Fixture	Zone Rating/Lumen Limit		
			B	U	G
FL (0°-30°)	297.8	6.0			
FM (30°-60°)	1801.1	36.1			
FH (60°-80°)	1285.4	25.8			G1/1800
FVH (80°-90°)	85.6	1.7			G1/100
BL (0°-30°)	144.5	2.9	B1/500		
BM (30°-60°)	518.4	10.4	B1/1000		
BH (60°-80°)	303.8	6.1	B1/500		G1/500
BVH (80°-90°)	16.0	0.3			G1/100
UL (90°-100°)	11.9	0.2		U2/50	
UH (100°-180°)	522.1	10.5		U4/1000	

**BUG Rating: B1-U4-G1**  
 Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

	0°	5°	15°	25°	33°	35°	45°	55°	65°	75°	85°
0°	417.3	417.3	417.3	417.3	417.3	417.3	417.3	417.3	417.3	417.3	417.3
2.5°	444.6	448.5	444.6	444.6	440.7	440.7	436.8	432.9	429.0	425.1	417.3
5°	495.3	495.3	491.4	483.6	479.7	475.8	468.0	456.3	448.5	436.8	425.1
7.5°	518.7	518.7	514.8	507.0	499.2	495.3	483.6	468.0	456.3	440.7	425.1
10°	549.8	553.7	545.9	538.1	530.3	526.4	510.9	491.4	471.9	452.4	429.0
12.5°	584.9	588.8	584.9	573.2	561.5	557.6	542.0	518.7	495.3	468.0	440.7
15°	631.7	639.5	627.8	620.0	608.3	604.4	584.9	557.6	530.3	495.3	460.2
17.5°	686.3	690.2	682.4	670.7	662.9	659.0	639.5	608.3	569.3	530.3	487.5
20°	748.7	752.6	748.7	733.1	725.3	721.4	701.9	666.8	620.0	577.1	522.6
22.5°	822.8	830.6	818.9	807.2	799.4	799.4	776.0	737.0	682.4	627.8	565.4
25°	908.6	920.3	904.7	896.9	889.1	885.2	865.7	818.9	756.5	690.2	612.2
27.5°	1013.9	1021.7	1010.0	1006.1	990.5	990.5	959.3	904.7	838.4	760.4	670.7
30°	1107.5	1115.3	1107.5	1107.5	1095.8	1091.9	1060.7	1006.1	924.2	830.6	721.4
32.5°	1197.2	1205.0	1201.1	1205.0	1201.1	1197.2	1158.2	1099.7	1017.8	896.9	772.1
35°	1286.9	1298.6	1294.7	1306.4	1302.5	1298.6	1267.4	1197.2	1099.7	978.8	826.7
37.5°	1380.5	1392.2	1392.2	1403.9	1407.8	1407.8	1372.7	1298.6	1189.4	1052.9	889.1
40°	1481.9	1493.6	1493.6	1513.1	1520.9	1520.9	1481.9	1407.8	1286.9	1134.8	955.4
42.5°	1579.3	1591.0	1594.9	1614.4	1626.1	1630.0	1598.8	1513.1	1372.7	1216.7	1017.8
45°	1672.9	1684.6	1696.3	1735.3	1754.8	1750.9	1727.5	1637.8	1481.9	1302.5	1084.1
47.5°	1762.6	1778.2	1797.7	1848.4	1875.7	1871.8	1856.2	1754.8	1583.2	1384.4	1142.6
50°	1832.8	1844.5	1883.5	1938.1	1973.2	1977.1	1953.7	1856.2	1669.0	1446.8	1185.5
52.5°	1887.4	1903.0	1949.8	2027.8	2055.1	2066.8	2039.5	1942.0	1754.8	1501.4	1220.6
55°	1926.4	1926.4	1996.6	2086.3	2125.3	2133.1	2133.1	2012.2	1805.5	1536.5	1240.1
57.5°	1906.9	1906.9	1984.9	2082.4	2144.8	2140.9	2133.1	2016.1	1813.3	1528.7	1228.4
60°	1852.3	1864.0	1938.1	2035.6	2098.0	2094.1	2070.7	1965.4	1774.3	1497.5	1205.0
62.5°	1778.2	1797.7	1875.7	1949.8	2020.0	2031.7	2000.5	1906.9	1708.0	1450.7	1162.1
65°	1637.8	1665.1	1762.6	1844.5	1899.1	1922.5	1883.5	1797.7	1618.3	1361.0	1072.4
67.5°	1481.9	1501.4	1583.2	1700.2	1731.4	1754.8	1735.3	1645.6	1493.6	1216.7	971.0
70°	1302.5	1333.7	1388.3	1505.3	1540.4	1563.8	1563.8	1474.1	1329.8	1068.5	850.1
72.5°	1091.9	1127.0	1193.3	1279.1	1325.9	1341.5	1337.6	1263.5	1134.8	904.7	717.5
75°	861.8	889.1	967.1	1029.5	1080.2	1091.9	1088.0	1025.6	908.6	729.2	569.3
77.5°	635.6	662.9	721.4	768.2	815.0	807.2	807.2	760.4	686.3	542.0	432.9
80°	417.3	440.7	491.4	507.0	557.6	553.7	553.7	518.7	468.0	362.7	288.6
82.5°	230.1	249.6	284.7	300.3	331.5	323.7	327.6	304.2	273.0	202.8	163.8
85°	81.9	97.5	117.0	128.7	144.3	144.3	144.3	124.8	117.0	78.0	66.3
87.5°	3.9	7.8	15.6	15.6	23.4	23.4	23.4	15.6	15.6	3.9	3.9
90°	4.6	4.6	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	4.6
92.5°	4.6	4.6	4.6	6.4	7.1	7.3	6.4	7.3	5.5	5.5	4.6
95°	5.5	5.5	6.4	8.2	9.7	10.1	11.0	11.0	6.4	6.4	5.5
97.5°	7.3	8.2	8.2	10.1	15.1	16.4	30.2	18.3	9.1	9.1	8.2
100°	11.9	12.8	12.8	22.8	43.3	48.4	64.9	46.6	23.8	17.4	12.8
102.5°	38.4	40.2	49.3	74.0	102.5	109.6	99.6	84.1	79.5	54.8	43.9
105°	97.8	96.8	104.2	123.3	147.5	153.5	150.8	138.9	126.1	108.7	100.5
107.5°	128.8	128.8	135.2	151.7	169.9	174.5	203.7	206.5	163.5	143.4	134.3
110°	145.3	145.3	150.8	164.5	188.6	194.6	235.7	233.9	201.9	177.3	165.4



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**CANDELA DISTRIBUTION (continued):**

	0°	5°	15°	25°	33°	35°	45°	55°	65°	75°	85°
112.5°	148.9	149.8	157.1	178.2	204.5	211.1	229.3	221.1	208.3	197.4	188.2
115°	154.4	154.4	162.6	182.7	197.3	201.0	208.3	199.2	189.1	181.8	178.2
117.5°	152.6	155.3	157.1	168.1	177.6	180.0	185.5	180.9	167.2	161.7	159.9
120°	141.6	141.6	143.4	148.9	154.0	155.3	158.1	156.2	147.1	142.5	141.6
122.5°	126.1	127.0	126.1	128.8	132.5	133.4	136.1	134.3	127.0	125.2	125.2
125°	110.6	110.6	109.6	111.5	113.7	114.2	113.3	114.2	110.6	109.6	109.6
127.5°	99.6	98.7	96.8	97.8	98.5	98.7	98.7	99.6	95.9	96.8	97.8
130°	88.6	88.6	86.8	86.8	86.8	86.8	85.0	86.8	85.0	85.9	86.8
132.5°	78.6	78.6	75.8	74.9	74.9	74.9	74.9	75.8	74.9	76.7	78.6
135°	70.4	70.4	67.6	68.5	68.5	68.5	67.6	68.5	67.6	69.4	70.4
137.5°	64.0	64.0	62.1	62.1	62.1	62.1	61.2	62.1	62.1	63.0	64.9
140°	58.5	58.5	57.6	57.6	56.8	56.6	57.6	57.6	57.6	58.5	59.4
142.5°	55.7	54.8	53.9	53.0	53.7	53.9	53.9	53.9	53.0	53.9	55.7
145°	51.2	51.2	50.3	50.3	50.3	50.3	51.2	50.3	50.3	51.2	51.2
147.5°	48.4	48.4	47.5	48.4	48.4	48.4	48.4	48.4	47.5	48.4	48.4
150°	47.5	46.6	45.7	46.6	46.6	46.6	45.7	45.7	45.7	45.7	46.6
152.5°	44.8	44.8	43.9	44.8	44.1	43.9	43.9	43.9	43.9	43.9	44.8
155°	42.9	42.9	42.0	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9
157.5°	41.1	42.0	41.1	41.1	41.1	41.1	41.1	41.1	41.1	41.1	42.0
160°	40.2	40.2	40.2	40.2	39.5	39.3	39.3	39.3	40.2	40.2	40.2
162.5°	39.3	39.3	39.3	39.3	38.6	38.4	38.4	38.4	38.4	39.3	39.3
165°	39.3	38.4	38.4	38.4	37.7	37.5	37.5	37.5	37.5	38.4	39.3
167.5°	37.5	37.5	37.5	37.5	37.5	37.5	36.5	36.5	37.5	37.5	37.5
170°	37.5	37.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5
172.5°	37.5	37.5	37.5	37.5	36.7	36.5	36.5	36.5	36.5	36.5	37.5
175°	37.5	37.5	37.5	37.5	36.7	36.5	36.5	36.5	37.5	37.5	37.5
177.5°	37.5	37.5	37.5	37.5	36.7	36.5	37.5	37.5	37.5	37.5	37.5
180°	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5





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**CANDELA DISTRIBUTION (continued):**

	90°	95°	105°	115°	125°	135°	145°	155°	165°	175°	180°
0°	417.3	417.3	417.3	417.3	417.3	417.3	417.3	417.3	417.3	417.3	417.3
2.5°	413.4	409.5	405.6	397.8	393.9	390.0	386.1	382.2	382.2	382.2	382.2
5°	417.3	413.4	401.7	390.0	378.3	366.6	358.8	354.9	351.0	347.1	347.1
7.5°	417.3	409.5	393.9	378.3	366.6	351.0	339.3	327.6	319.8	315.9	315.9
10°	421.2	409.5	390.0	374.4	354.9	335.4	319.8	304.2	296.4	288.6	288.6
12.5°	429.0	417.3	390.0	370.5	347.1	323.7	304.2	288.6	276.9	269.1	269.1
15°	444.6	429.0	397.8	370.5	343.2	315.9	296.4	276.9	265.2	257.4	257.4
17.5°	468.0	448.5	409.5	370.5	339.3	312.0	288.6	269.1	253.5	245.7	245.7
20°	495.3	471.9	425.1	378.3	339.3	308.1	284.7	261.3	245.7	237.9	237.9
22.5°	534.2	499.2	444.6	390.0	347.1	312.0	280.8	257.4	241.8	234.0	234.0
25°	577.1	538.1	468.0	405.6	354.9	312.0	280.8	257.4	241.8	234.0	230.1
27.5°	623.9	581.0	495.3	421.2	362.7	319.8	284.7	257.4	241.8	234.0	234.0
30°	666.8	616.1	522.6	440.7	374.4	323.7	288.6	261.3	241.8	234.0	234.0
32.5°	713.6	655.1	549.8	460.2	386.1	331.5	292.5	265.2	245.7	237.9	234.0
35°	760.4	694.1	577.1	475.8	397.8	339.3	296.4	269.1	249.6	241.8	241.8
37.5°	811.1	737.0	604.4	495.3	409.5	347.1	304.2	273.0	253.5	245.7	245.7
40°	865.7	779.9	631.7	510.9	421.2	354.9	312.0	280.8	261.3	253.5	253.5
42.5°	920.3	826.7	662.9	530.3	432.9	362.7	315.9	288.6	269.1	261.3	261.3
45°	974.9	865.7	690.2	549.8	444.6	374.4	327.6	296.4	276.9	269.1	269.1
47.5°	1025.6	908.6	713.6	561.5	456.3	382.2	331.5	304.2	284.7	280.8	276.9
50°	1060.7	935.9	729.2	573.2	460.2	386.1	339.3	308.1	292.5	284.7	284.7
52.5°	1088.0	963.2	740.9	581.0	464.1	390.0	343.2	315.9	300.3	292.5	288.6
55°	1103.6	967.1	740.9	573.2	460.2	390.0	343.2	315.9	300.3	292.5	292.5
57.5°	1088.0	947.6	725.3	557.6	448.5	378.3	331.5	308.1	292.5	288.6	284.7
60°	1056.8	916.4	694.1	534.2	429.0	358.8	315.9	296.4	284.7	280.8	276.9
62.5°	1013.9	877.4	662.9	503.1	401.7	335.4	304.2	280.8	273.0	269.1	265.2
65°	928.1	803.3	612.2	464.1	366.6	308.1	276.9	261.3	253.5	245.7	241.8
67.5°	834.5	721.4	542.0	417.3	323.7	276.9	249.6	234.0	222.3	222.3	218.4
70°	733.1	635.6	468.0	354.9	280.8	241.8	214.5	202.8	195.0	195.0	191.1
72.5°	612.2	534.2	390.0	288.6	230.1	198.9	179.4	167.7	163.8	163.8	159.9
75°	491.4	421.2	308.1	226.2	179.4	156.0	140.4	132.6	128.7	128.7	124.8
77.5°	362.7	308.1	222.3	163.8	128.7	113.1	101.4	97.5	93.6	93.6	89.7
80°	241.8	202.8	144.3	105.3	78.0	70.2	62.4	62.4	58.5	62.4	58.5
82.5°	132.6	109.2	78.0	54.6	39.0	35.1	31.2	31.2	35.1	35.1	31.2
85°	50.7	39.0	27.3	15.6	11.7	11.7	11.7	11.7	11.7	11.7	7.8
87.5°	3.9	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90°	4.6	4.6	5.5	5.5	5.5	5.5	5.5	5.5	5.5	4.6	4.6
92.5°	4.6	4.6	5.5	5.5	7.3	6.4	7.3	6.4	4.6	4.6	4.6
95°	5.5	5.5	6.4	6.4	11.0	11.0	10.1	8.2	6.4	5.5	5.5
97.5°	7.3	8.2	9.1	9.1	18.3	30.2	16.4	10.1	8.2	8.2	7.3
100°	12.8	12.8	17.4	23.8	46.6	64.9	48.4	22.8	12.8	12.8	11.9
102.5°	42.0	43.9	54.8	79.5	84.1	99.6	109.6	74.0	49.3	40.2	38.4
105°	100.5	100.5	108.7	126.1	138.9	150.8	153.5	123.3	104.2	96.8	97.8
107.5°	133.4	134.3	143.4	163.5	206.5	203.7	174.5	151.7	135.2	128.8	128.8
110°	163.5	165.4	177.3	201.9	233.9	235.7	194.6	164.5	150.8	145.3	145.3



REPORT NUMBER: P833675  
 CATALOG NUMBER: TTN-D2-830-U-DL-CG-UPL2

**CANDELA DISTRIBUTION (continued):**

	90°	95°	105°	115°	125°	135°	145°	155°	165°	175°	180°
112.5°	186.4	188.2	197.4	208.3	221.1	229.3	211.1	178.2	157.1	149.8	148.9
115°	180.0	178.2	181.8	189.1	199.2	208.3	201.0	182.7	162.6	154.4	154.4
117.5°	157.1	159.9	161.7	167.2	180.9	185.5	180.0	168.1	157.1	155.3	152.6
120°	139.8	141.6	142.5	147.1	156.2	158.1	155.3	148.9	143.4	141.6	141.6
122.5°	123.3	125.2	125.2	127.0	134.3	136.1	133.4	128.8	126.1	127.0	126.1
125°	108.7	109.6	109.6	110.6	114.2	113.3	114.2	111.5	109.6	110.6	110.6
127.5°	96.8	97.8	96.8	95.9	99.6	98.7	98.7	97.8	96.8	98.7	99.6
130°	87.7	86.8	85.9	85.0	86.8	85.0	86.8	86.8	86.8	88.6	88.6
132.5°	78.6	78.6	76.7	74.9	75.8	74.9	74.9	74.9	75.8	78.6	78.6
135°	70.4	70.4	69.4	67.6	68.5	67.6	68.5	68.5	67.6	70.4	70.4
137.5°	65.8	64.9	63.0	62.1	62.1	61.2	62.1	62.1	62.1	64.0	64.0
140°	59.4	59.4	58.5	57.6	57.6	57.6	56.6	57.6	57.6	58.5	58.5
142.5°	55.7	55.7	53.9	53.0	53.9	53.9	53.9	53.0	53.9	54.8	55.7
145°	52.1	51.2	51.2	50.3	50.3	51.2	50.3	50.3	50.3	51.2	51.2
147.5°	49.3	48.4	48.4	47.5	48.4	48.4	48.4	48.4	47.5	48.4	48.4
150°	46.6	46.6	45.7	45.7	45.7	45.7	46.6	46.6	45.7	46.6	47.5
152.5°	45.7	44.8	43.9	43.9	43.9	43.9	43.9	44.8	43.9	44.8	44.8
155°	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.0	42.9	42.9
157.5°	42.0	42.0	41.1	41.1	41.1	41.1	41.1	41.1	41.1	42.0	41.1
160°	41.1	40.2	40.2	40.2	39.3	39.3	39.3	40.2	40.2	40.2	40.2
162.5°	40.2	39.3	39.3	38.4	38.4	38.4	38.4	39.3	39.3	39.3	39.3
165°	38.4	39.3	38.4	37.5	37.5	37.5	37.5	38.4	38.4	38.4	39.3
167.5°	38.4	37.5	37.5	37.5	36.5	36.5	37.5	37.5	37.5	37.5	37.5
170°	37.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	37.5	37.5
172.5°	37.5	37.5	36.5	36.5	36.5	36.5	36.5	37.5	37.5	37.5	37.5
175°	36.5	37.5	37.5	37.5	36.5	36.5	36.5	37.5	37.5	37.5	37.5
177.5°	37.5	37.5	37.5	37.5	37.5	37.5	36.5	37.5	37.5	37.5	37.5
180°	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5

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



LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

MCGRAW EDISON

Report Number: SP1-2411-284-4

Test Date: 11/22/2024

Luminaire Tested: TTN-D0-830-U-WQ

Data in this report applies to TT and TTN families of products

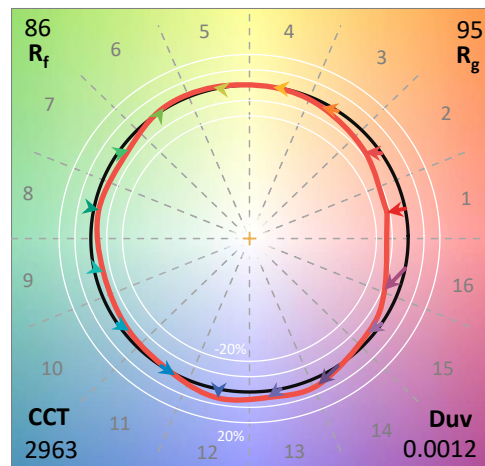
**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2411-284-4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 11/22/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW EDISON  
 Catalog Number: **TTN-D0-830-U-WQ**  
 Description: TOPTIER NANO LED PARKING GARAGE LUMINAIRE. 3000K, 80 CRI LEDS AND WIDE DISTRIBUTION

**Spectral Parameters**

CCT (K): 2963  
 CIE u': 0.2515  
 CIE v': 0.5238  
 Duv: 0.0012  
 CIE x: 0.4414  
 CIE y: 0.4086  
 CIE z: 0.1501  
 Peak Wavelength (nm): 603  
 Dominant Wavelength (nm): 582  
 Purity: 55.12798  
 Rf: 86.1  
 Rg: 94.9

CRI (Ra):	82.9		
R1:	81.4	R9:	3.9
R2:	91.9	R10:	82.5
R3:	95.2	R11:	82.3
R4:	81.6	R12:	76.5
R5:	82.3	R13:	83.9
R6:	91.4	R14:	97.8
R7:	82.0	R15:	72.6
R8:	57.2		



**Test Conditions**

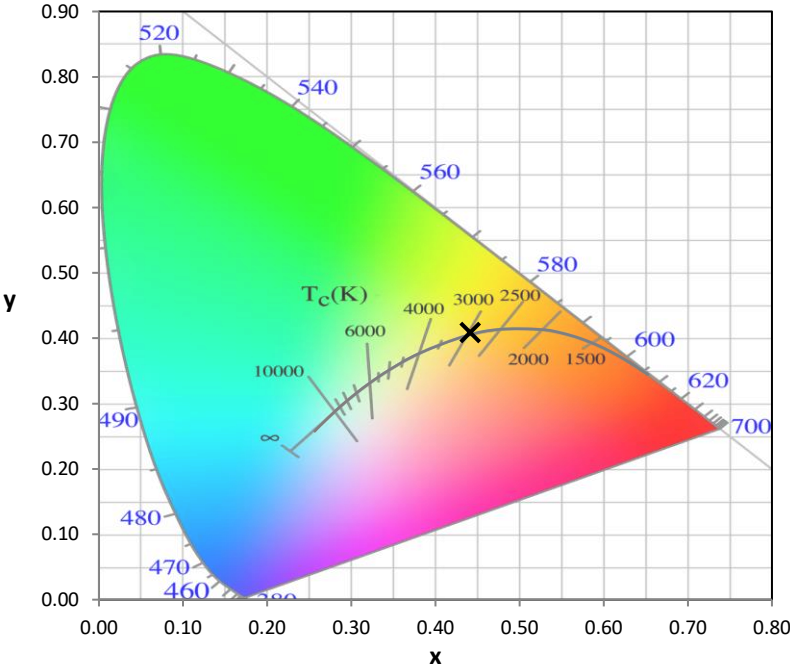
Stabilization Time: 37M  
 Operation Time: 1H 37M  
 Sphere Temperature (°C): 25.0

REPORT NUMBER: SP1-2411-284-4

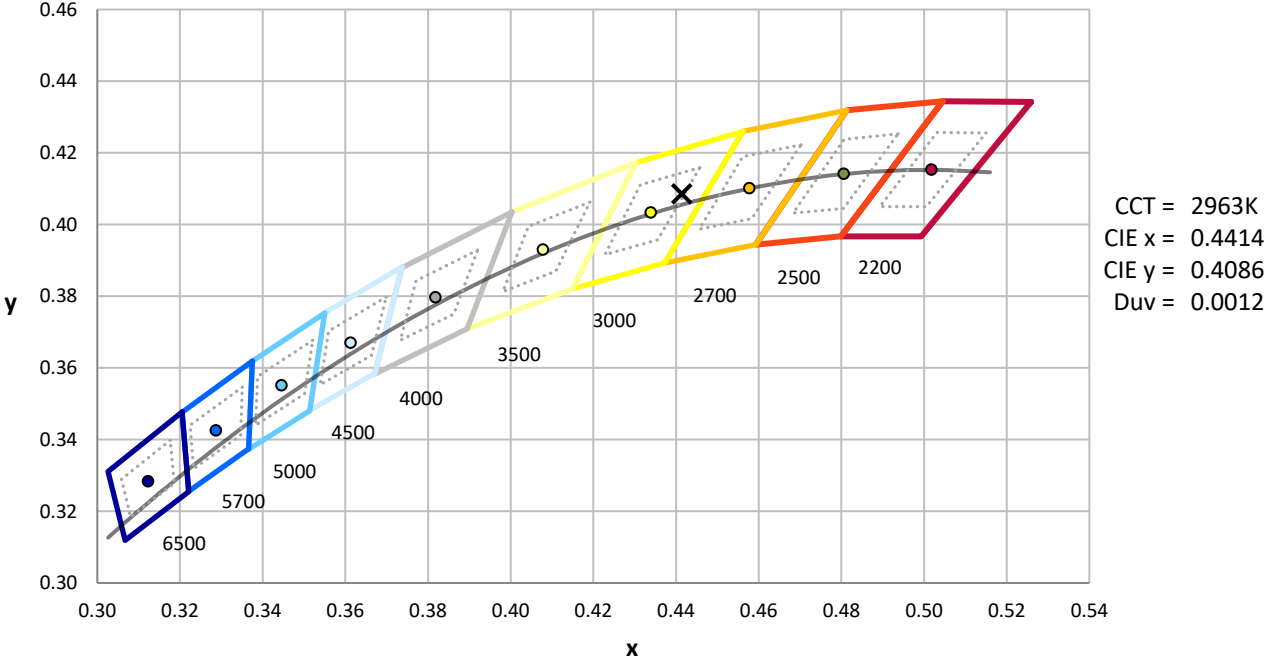
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	6/18/2024	12/18/2024
Power Meter	INXT2011004	2/8/2024	2/8/2025
AC Power Source	IN0063	10/22/2024	10/22/2025
DC Power Source	IN0208	10/22/2024	10/22/2025
Sphere Thermometer	IN0085	10/22/2024	10/22/2025
Room Thermometer	IN0046	10/22/2024	10/22/2025

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CIE 1931 Chromaticity Diagram



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

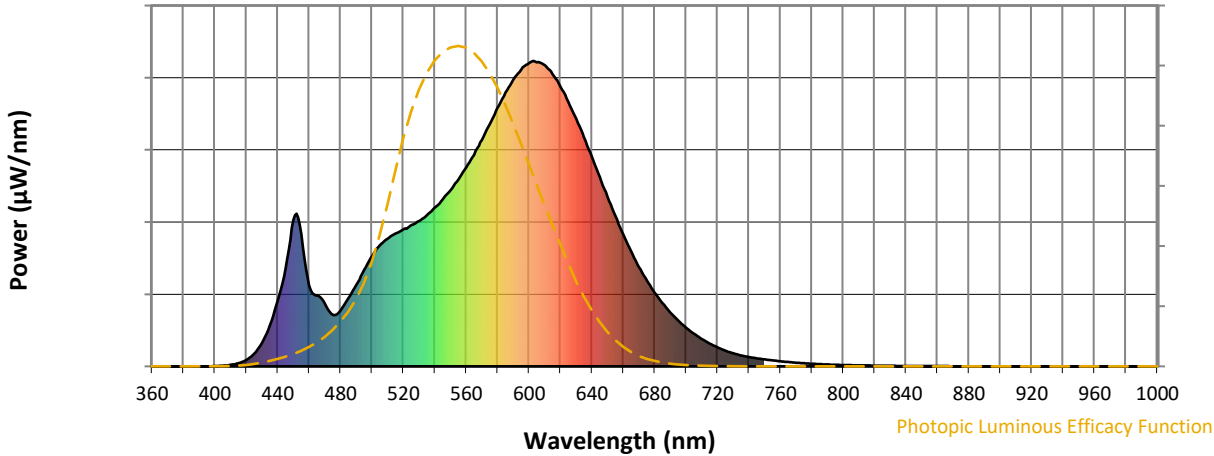


CCT = 2963K  
 CIE x = 0.4414  
 CIE y = 0.4086  
 Duv = 0.0012

Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-2411-284-4

**Photopic Flux vs. Wavelength**

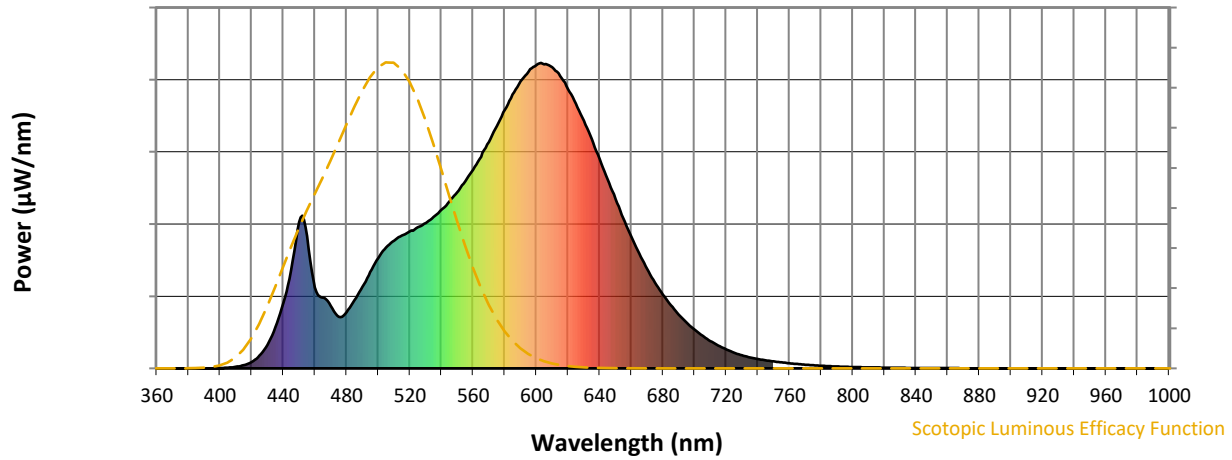


**Photopic Lumens: NR**

λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)
360	0	NR	490	267	NR	620	915	NR	750	23	NR	880	0	NR
365	0	NR	495	315	NR	625	866	NR	755	20	NR	885	0	NR
370	0	NR	500	360	NR	630	811	NR	760	17	NR	890	0	NR
375	0	NR	505	396	NR	635	750	NR	765	14	NR	895	0	NR
380	0	NR	510	418	NR	640	686	NR	770	12	NR	900	0	NR
385	0	NR	515	435	NR	645	619	NR	775	10	NR	905	0	NR
390	0	NR	520	448	NR	650	554	NR	780	9	NR	910	0	NR
395	0	NR	525	462	NR	655	491	NR	785	7	NR	915	0	NR
400	1	NR	530	476	NR	660	431	NR	790	6	NR	920	0	NR
405	2	NR	535	495	NR	665	376	NR	795	5	NR	925	0	NR
410	5	NR	540	520	NR	670	325	NR	800	4	NR	930	0	NR
415	10	NR	545	547	NR	675	280	NR	805	4	NR	935	0	NR
420	21	NR	550	576	NR	680	241	NR	810	3	NR	940	0	NR
425	42	NR	555	612	NR	685	207	NR	815	3	NR	945	0	NR
430	77	NR	560	651	NR	690	176	NR	820	2	NR	950	0	NR
435	135	NR	565	693	NR	695	149	NR	825	2	NR	955	0	NR
440	215	NR	570	741	NR	700	127	NR	830	2	NR	960	0	NR
445	321	NR	575	793	NR	705	107	NR	835	2	NR	965	0	NR
450	479	NR	580	847	NR	710	89	NR	840	1	NR	970	0	NR
455	432	NR	585	897	NR	715	75	NR	845	1	NR	975	0	NR
460	265	NR	590	940	NR	720	62	NR	850	1	NR	980	0	NR
465	231	NR	595	971	NR	725	51	NR	855	1	NR	985	0	NR
470	204	NR	600	993	NR	730	43	NR	860	1	NR	990	0	NR
475	168	NR	605	996	NR	735	36	NR	865	1	NR	995	0	NR
480	183	NR	610	986	NR	740	31	NR	870	1	NR	1000	0	NR
485	223	NR	615	957	NR	745	26	NR	875	0	NR			

REPORT NUMBER: SP1-2411-284-4

**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

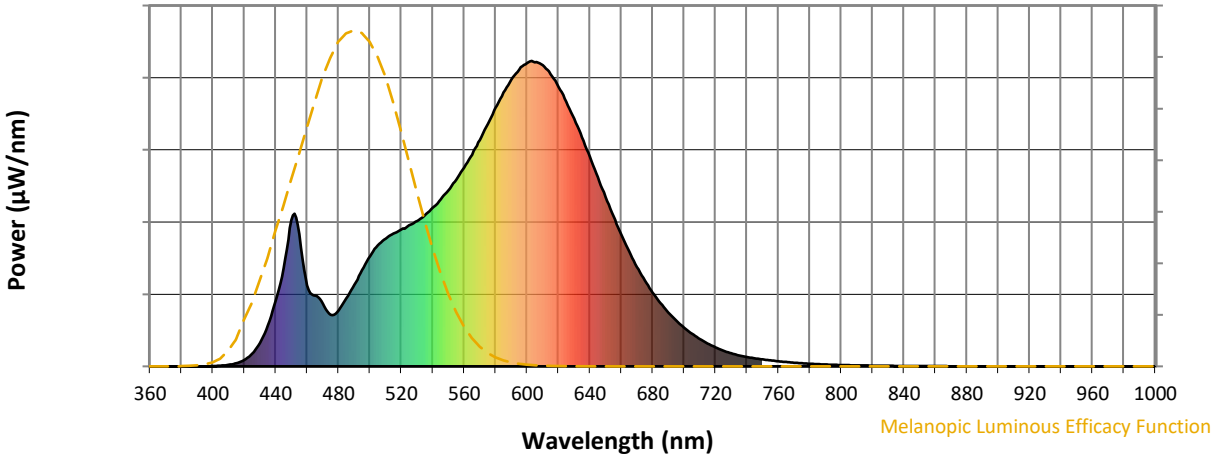
**S/P: 1.34**

λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)
360	0	NR	490	267	NR	620	915	NR	750	23	NR	880	0	NR
365	0	NR	495	315	NR	625	866	NR	755	20	NR	885	0	NR
370	0	NR	500	360	NR	630	811	NR	760	17	NR	890	0	NR
375	0	NR	505	396	NR	635	750	NR	765	14	NR	895	0	NR
380	0	NR	510	418	NR	640	686	NR	770	12	NR	900	0	NR
385	0	NR	515	435	NR	645	619	NR	775	10	NR	905	0	NR
390	0	NR	520	448	NR	650	554	NR	780	9	NR	910	0	NR
395	0	NR	525	462	NR	655	491	NR	785	7	NR	915	0	NR
400	1	NR	530	476	NR	660	431	NR	790	6	NR	920	0	NR
405	2	NR	535	495	NR	665	376	NR	795	5	NR	925	0	NR
410	5	NR	540	520	NR	670	325	NR	800	4	NR	930	0	NR
415	10	NR	545	547	NR	675	280	NR	805	4	NR	935	0	NR
420	21	NR	550	576	NR	680	241	NR	810	3	NR	940	0	NR
425	42	NR	555	612	NR	685	207	NR	815	3	NR	945	0	NR
430	77	NR	560	651	NR	690	176	NR	820	2	NR	950	0	NR
435	135	NR	565	693	NR	695	149	NR	825	2	NR	955	0	NR
440	215	NR	570	741	NR	700	127	NR	830	2	NR	960	0	NR
445	321	NR	575	793	NR	705	107	NR	835	2	NR	965	0	NR
450	479	NR	580	847	NR	710	89	NR	840	1	NR	970	0	NR
455	432	NR	585	897	NR	715	75	NR	845	1	NR	975	0	NR
460	265	NR	590	940	NR	720	62	NR	850	1	NR	980	0	NR
465	231	NR	595	971	NR	725	51	NR	855	1	NR	985	0	NR
470	204	NR	600	993	NR	730	43	NR	860	1	NR	990	0	NR
475	168	NR	605	996	NR	735	36	NR	865	1	NR	995	0	NR
480	183	NR	610	986	NR	740	31	NR	870	1	NR	1000	0	NR
485	223	NR	615	957	NR	745	26	NR	875	0	NR			



REPORT NUMBER: SP1-2411-284-4

Melanopic Flux vs. Wavelength



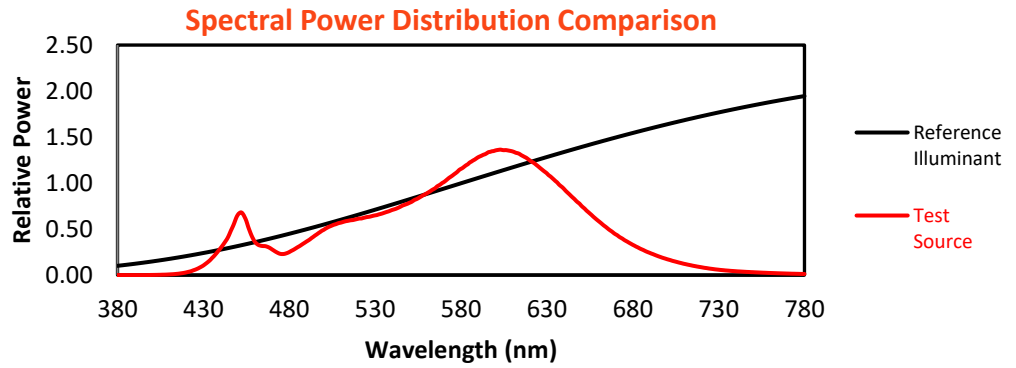
Melanopic Lumens: NR

M/P: 2.58

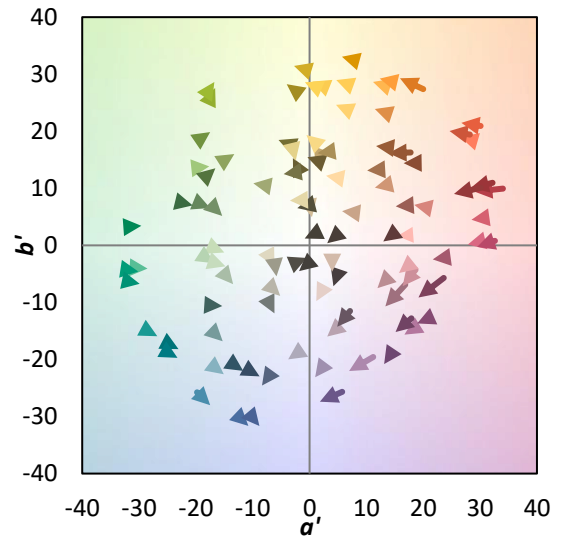
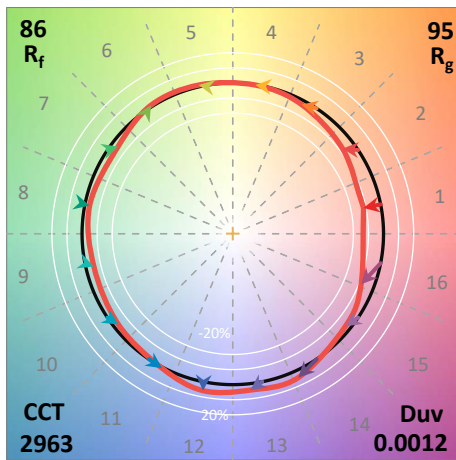
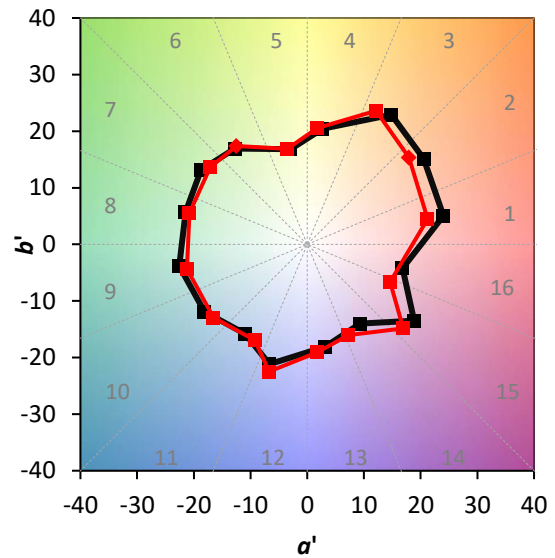
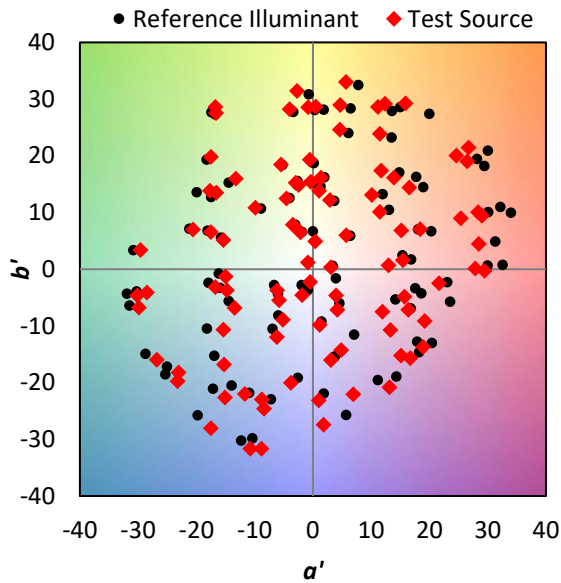
λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)
360	0	NR	490	267	NR	620	915	NR	750	23	NR	880	0	NR
365	0	NR	495	315	NR	625	866	NR	755	20	NR	885	0	NR
370	0	NR	500	360	NR	630	811	NR	760	17	NR	890	0	NR
375	0	NR	505	396	NR	635	750	NR	765	14	NR	895	0	NR
380	0	NR	510	418	NR	640	686	NR	770	12	NR	900	0	NR
385	0	NR	515	435	NR	645	619	NR	775	10	NR	905	0	NR
390	0	NR	520	448	NR	650	554	NR	780	9	NR	910	0	NR
395	0	NR	525	462	NR	655	491	NR	785	7	NR	915	0	NR
400	1	NR	530	476	NR	660	431	NR	790	6	NR	920	0	NR
405	2	NR	535	495	NR	665	376	NR	795	5	NR	925	0	NR
410	5	NR	540	520	NR	670	325	NR	800	4	NR	930	0	NR
415	10	NR	545	547	NR	675	280	NR	805	4	NR	935	0	NR
420	21	NR	550	576	NR	680	241	NR	810	3	NR	940	0	NR
425	42	NR	555	612	NR	685	207	NR	815	3	NR	945	0	NR
430	77	NR	560	651	NR	690	176	NR	820	2	NR	950	0	NR
435	135	NR	565	693	NR	695	149	NR	825	2	NR	955	0	NR
440	215	NR	570	741	NR	700	127	NR	830	2	NR	960	0	NR
445	321	NR	575	793	NR	705	107	NR	835	2	NR	965	0	NR
450	479	NR	580	847	NR	710	89	NR	840	1	NR	970	0	NR
455	432	NR	585	897	NR	715	75	NR	845	1	NR	975	0	NR
460	265	NR	590	940	NR	720	62	NR	850	1	NR	980	0	NR
465	231	NR	595	971	NR	725	51	NR	855	1	NR	985	0	NR
470	204	NR	600	993	NR	730	43	NR	860	1	NR	990	0	NR
475	168	NR	605	996	NR	735	36	NR	865	1	NR	995	0	NR
480	183	NR	610	986	NR	740	31	NR	870	1	NR	1000	0	NR
485	223	NR	615	957	NR	745	26	NR	875	0	NR			

**Summary**

$R_f = 86.1$   
 $R_g = 94.9$   
 CIE  $R_a = 82.9$   
 $R_9 = 3.9$

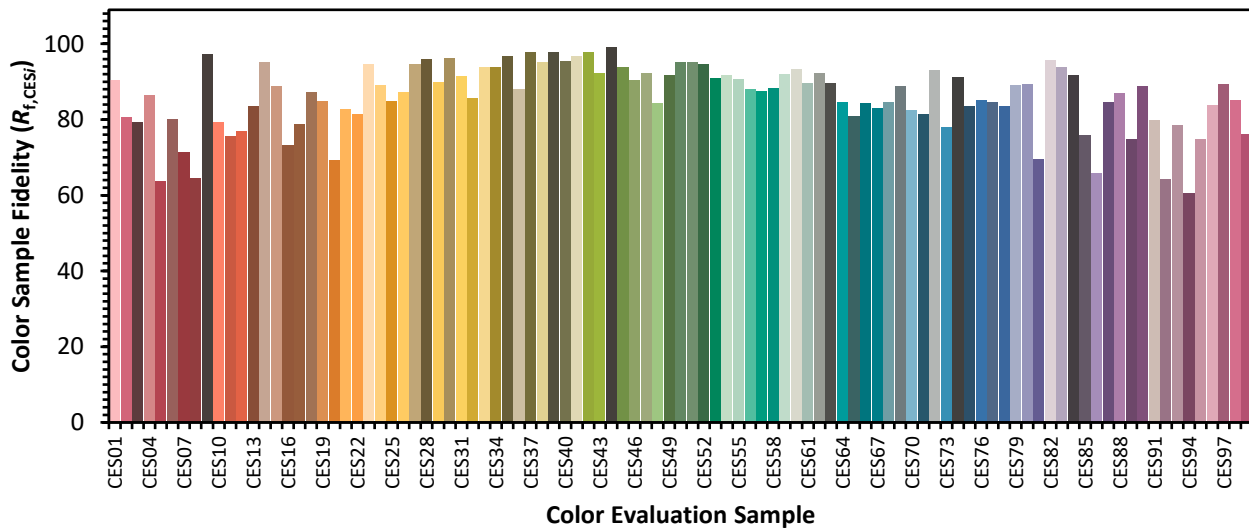


**Color Vector Graphics**

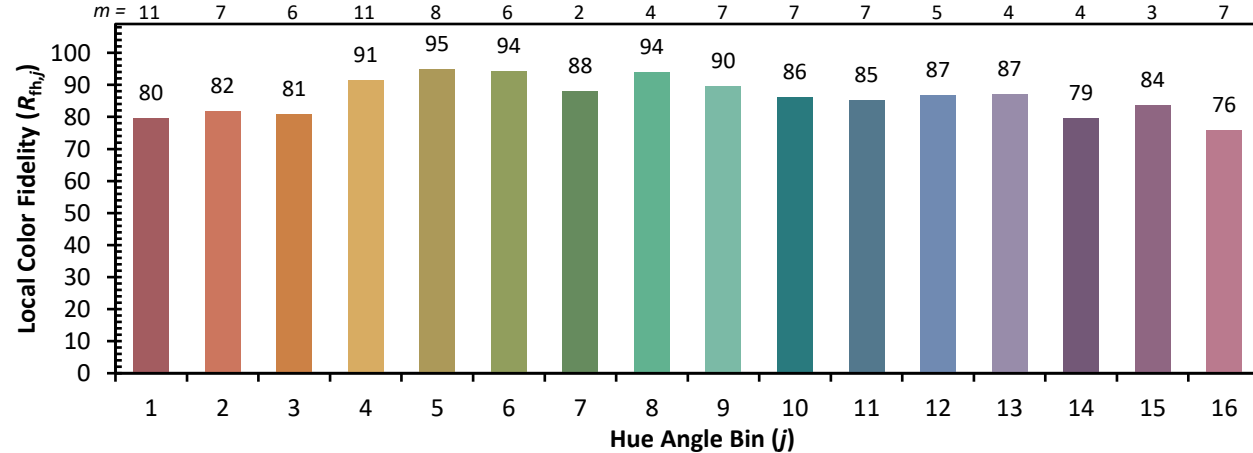
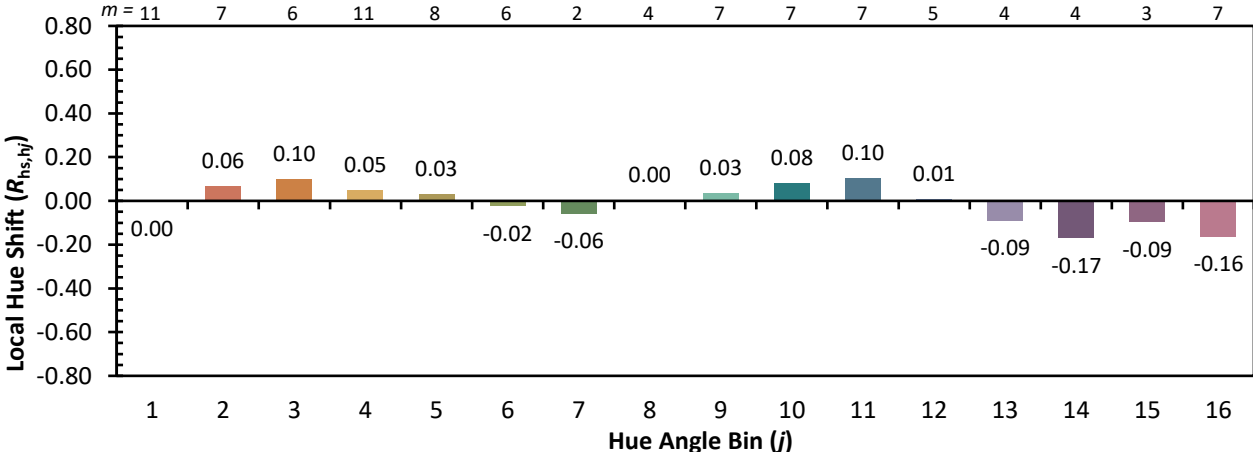
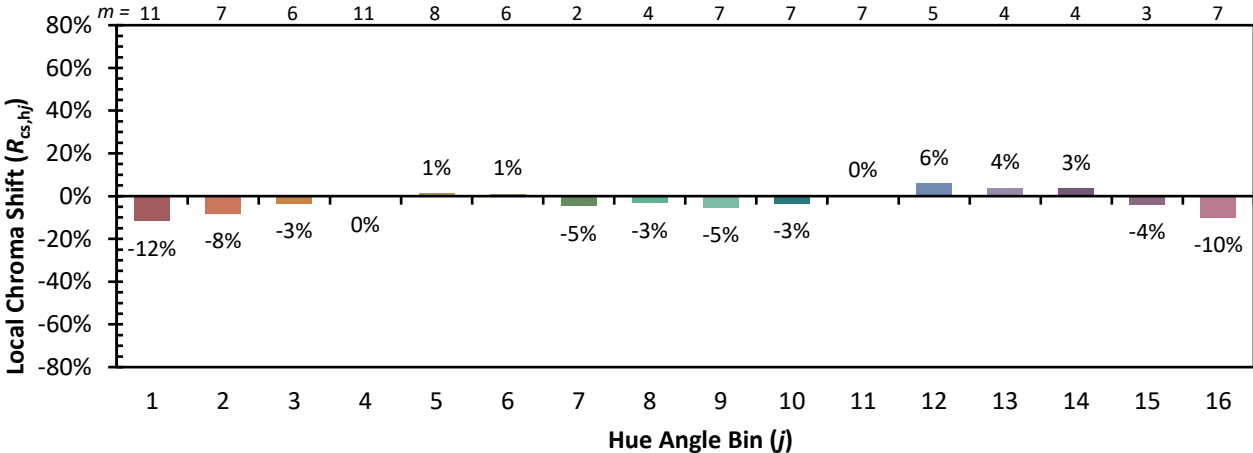


Individual Sample Fidelity Index ( $R_{f,i}$ )

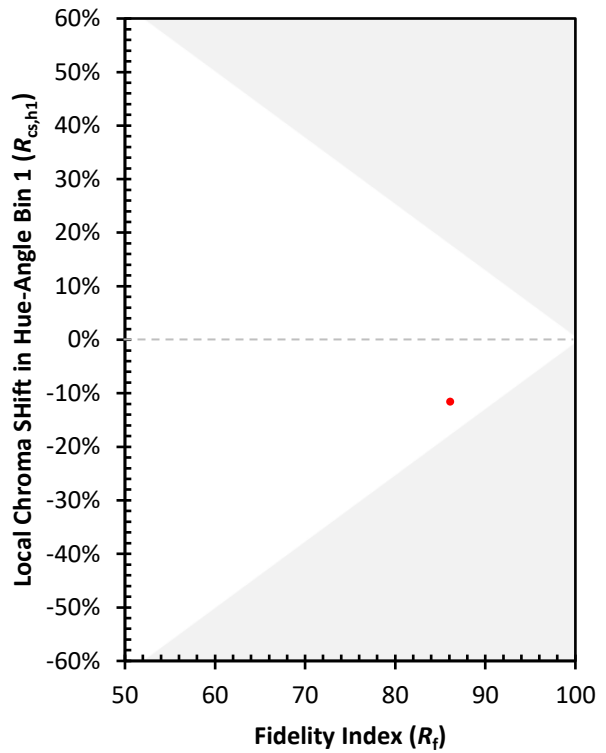
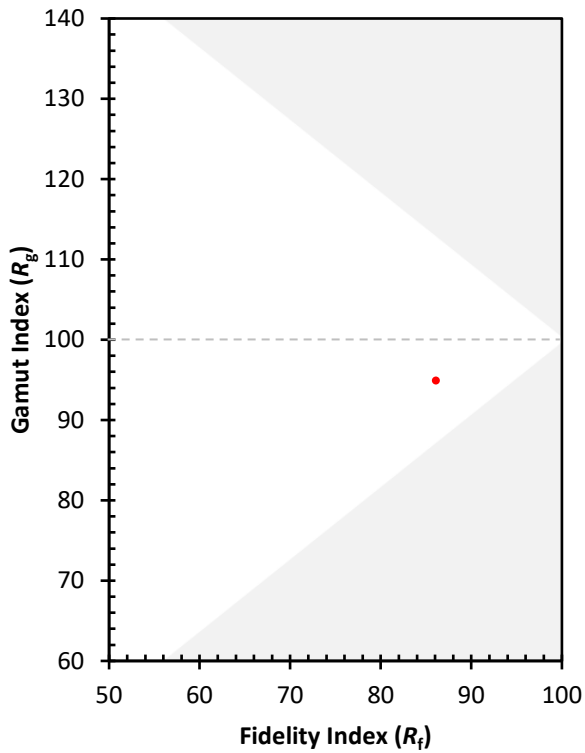
CES01 = 86	CES26 = 87	CES51 = 95	CES76 = 85
CES02 = 63	CES27 = 95	CES52 = 95	CES77 = 85
CES03 = 31	CES28 = 96	CES53 = 91	CES78 = 83
CES04 = 70	CES29 = 90	CES54 = 92	CES79 = 89
CES05 = 50	CES30 = 96	CES55 = 91	CES80 = 89
CES06 = 51	CES31 = 92	CES56 = 88	CES81 = 70
CES07 = 42	CES32 = 86	CES57 = 87	CES82 = 96
CES08 = 41	CES33 = 94	CES58 = 88	CES83 = 94
CES09 = 29	CES34 = 94	CES59 = 92	CES84 = 92
CES10 = 76	CES35 = 97	CES60 = 93	CES85 = 76
CES11 = 59	CES36 = 88	CES61 = 90	CES86 = 66
CES12 = 65	CES37 = 98	CES62 = 92	CES87 = 85
CES13 = 44	CES38 = 95	CES63 = 90	CES88 = 87
CES14 = 74	CES39 = 98	CES64 = 85	CES89 = 75
CES15 = 72	CES40 = 96	CES65 = 81	CES90 = 89
CES16 = 48	CES41 = 97	CES66 = 84	CES91 = 80
CES17 = 50	CES42 = 98	CES67 = 83	CES92 = 64
CES18 = 57	CES43 = 92	CES68 = 85	CES93 = 79
CES19 = 72	CES44 = 99	CES69 = 89	CES94 = 61
CES20 = 67	CES45 = 94	CES70 = 83	CES95 = 75
CES21 = 87	CES46 = 91	CES71 = 81	CES96 = 84
CES22 = 79	CES47 = 92	CES72 = 93	CES97 = 89
CES23 = 92	CES48 = 84	CES73 = 78	CES98 = 85
CES24 = 91	CES49 = 92	CES74 = 91	CES99 = 76
CES25 = 72	CES50 = 95	CES75 = 84	



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)