

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: P833554

Luminaire Tested: **TTN-D2-740-U-DL-CG-UPL1**

Issue Date: 5/15/2024

**Test Information**

Test Method: LM-79-08  
Report Number: P833554  
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-D2-740-U-DL-CG-UPL1  
Description: TOPTIER NANO LED PARKING GARAGE LUMINAIRE WITH UPLIGHT  
4000K, 70 CRI LEDS AND DRIVE LANE DISTRIBUTION WITH CLEAR GLASS  
Light Source: -  
Ballast/Driver: -

**Summary**

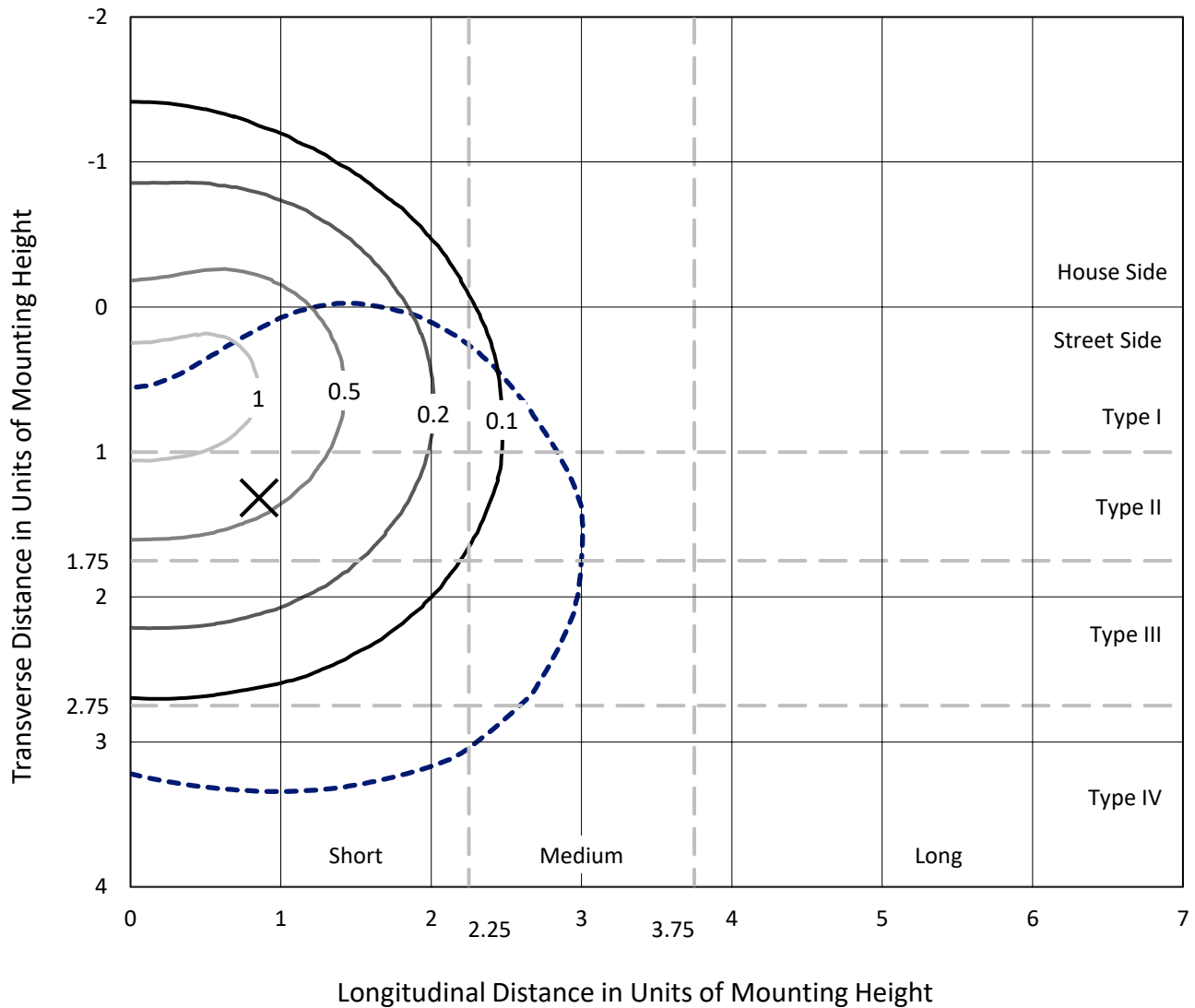
Lumens per Lamp: N/A  
Luminaire Lumens: 5291.9 lumens  
Efficiency: N/A  
Efficacy: 117.3 lumens/watt  
Luminous Opening: Vertical Cylinder (Dia: 0.71' x H: 0.1')  
IES Classification: Type IV - Short  
BUG Rating: B1 - U3 - G1  
  
Input Watts (W): 45.1  
Input Voltage (V): NR  
Input Current (Ain): 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

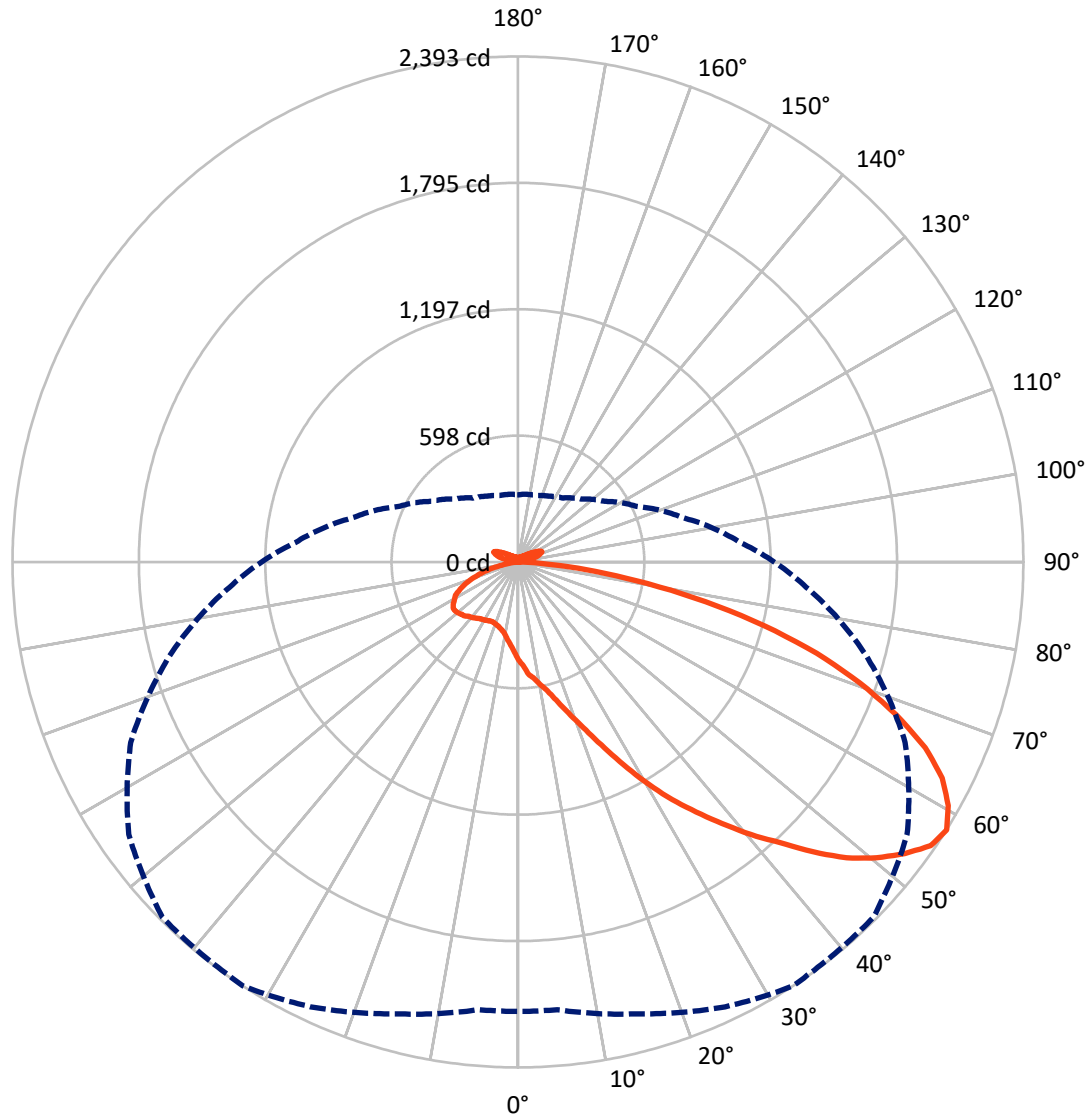
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 1.3 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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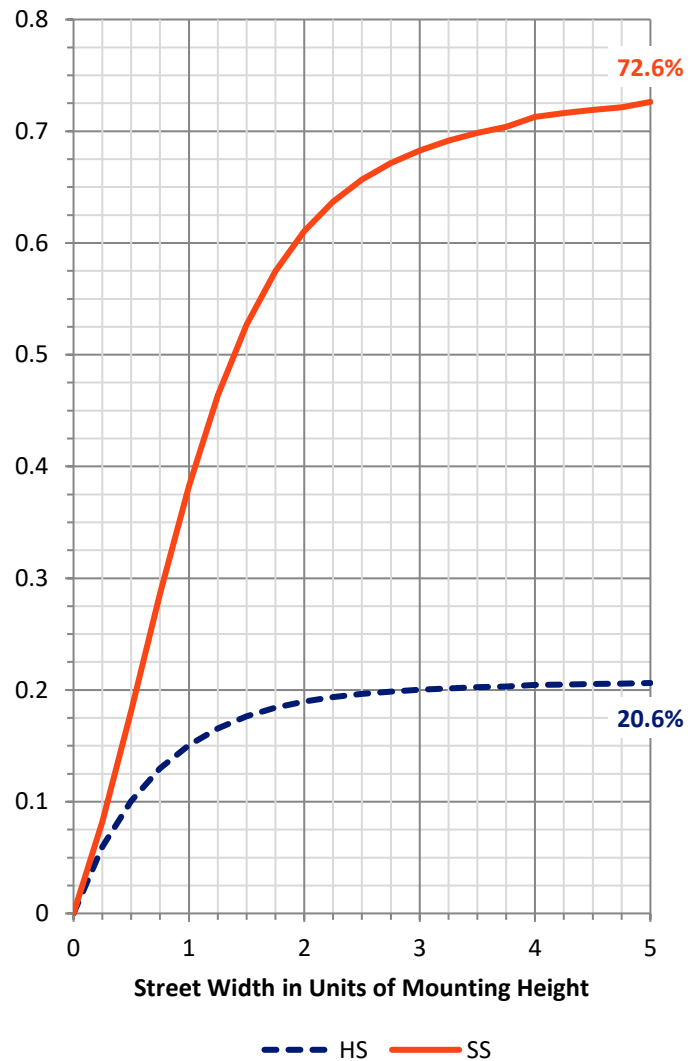
**FLUX DISTRIBUTION:**

		Downward	Upward	Total
<b>House Side</b>	Lumens	1096.5	161.7	1258.2
	% Fixture	20.7	3.1	23.8
<b>Street Side</b>	Lumens	3872.0	161.7	4033.7
	% Fixture	73.2	3.1	76.2
<b>Total</b>	Lumens	4968.5	323.4	5291.9
	% Fixture	93.9	6.1	100.0

**Coefficient of Utilization**

**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	44.6	0.8
10°-20°	144.5	2.7
20°-30°	304.6	5.8
30°-40°	553.2	10.5
40°-50°	874.2	16.5
50°-60°	1161.0	21.9
60°-70°	1117.4	21.1
70°-80°	655.9	12.4
80°-90°	113.0	2.1
90°-100°	7.2	0.1
100°-110°	73.4	1.4
110°-120°	107.3	2.0
120°-130°	62.3	1.2
130°-140°	33.0	0.6
140°-150°	19.6	0.4
150°-160°	12.1	0.2
160°-170°	6.6	0.1
170°-180°	2.1	0.0
0°-90°	4968.5	93.9
0°-180°	5291.9	100.0

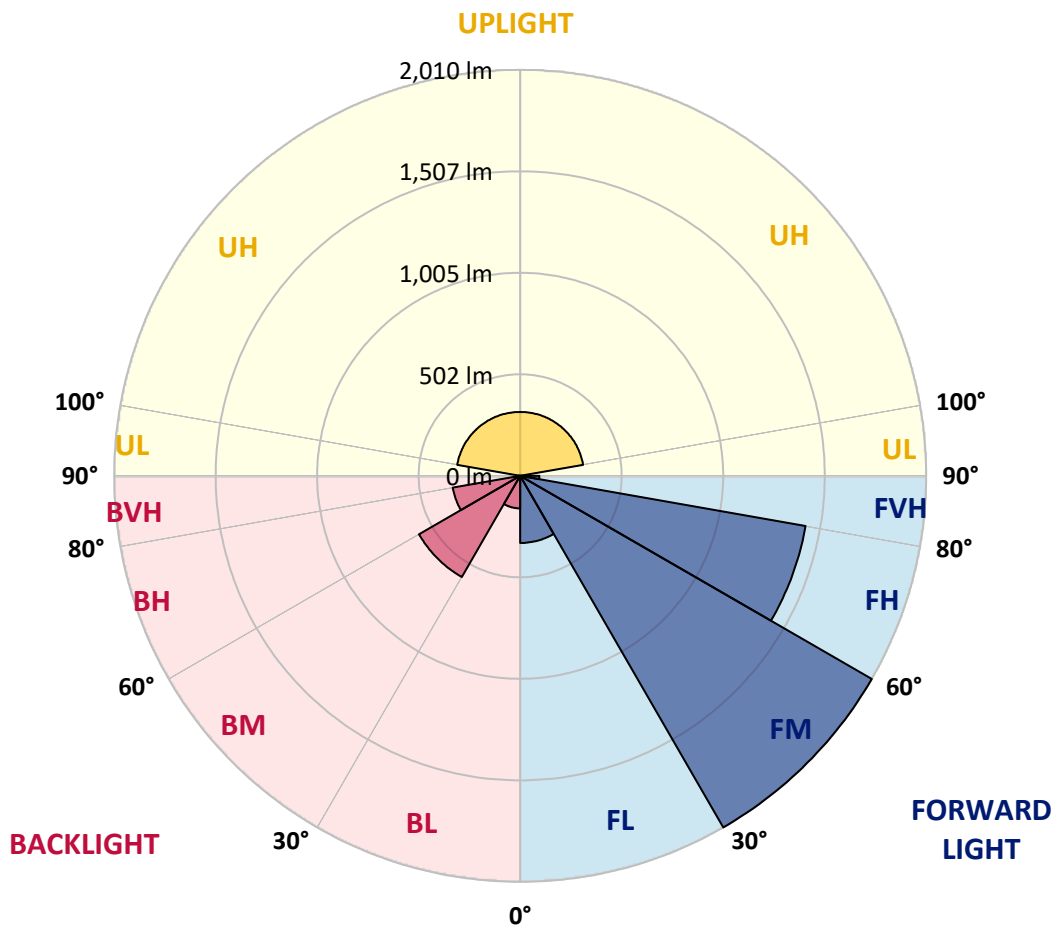


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

Zone	Lumens	% Fixture	Zone Rating/Lumen Limit		
			B	U	G
FL (0°-30°)	332.4	6.3			
FM (30°-60°)	2009.9	38.0			
FH (60°-80°)	1434.4	27.1			G1/1800
FVH (80°-90°)	95.3	1.8			G1/100
BL (0°-30°)	161.3	3.0	B1/500		
BM (30°-60°)	578.5	10.9	B1/1000		
BH (60°-80°)	339.0	6.4	B1/500		G1/500
BVH (80°-90°)	17.7	0.3			G1/100
UL (90°-100°)	7.2	0.1		U1/10	
UH (100°-180°)	316.2	6.0		U3/500	

**BUG Rating: B1-U3-G1**  
 Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

	0°	5°	15°	25°	33°	35°	45°	55°	65°	75°	85°
0°	465.6	465.6	465.6	465.6	465.6	465.6	465.6	465.6	465.6	465.6	465.6
2.5°	496.1	500.4	496.1	496.1	491.7	491.7	487.4	483.0	478.7	474.3	465.6
5°	552.7	552.7	548.3	539.6	535.2	530.9	522.2	509.1	500.4	487.4	474.3
7.5°	578.8	578.8	574.4	565.7	557.0	552.7	539.6	522.2	509.1	491.7	474.3
10°	613.6	617.9	609.2	600.5	591.8	587.5	570.1	548.3	526.5	504.8	478.7
12.5°	652.7	657.1	652.7	639.7	626.6	622.3	604.9	578.8	552.7	522.2	491.7
15°	705.0	713.7	700.6	691.9	678.9	674.5	652.7	622.3	591.8	552.7	513.5
17.5°	765.9	770.2	761.5	748.5	739.8	735.4	713.7	678.9	635.3	591.8	544.0
20°	835.5	839.9	835.5	818.1	809.4	805.0	783.3	744.1	691.9	644.0	583.1
22.5°	918.2	926.9	913.8	900.8	892.1	892.1	866.0	822.5	761.5	700.6	631.0
25°	1013.9	1027.0	1009.6	1000.9	992.2	987.8	966.1	913.8	844.2	770.2	683.2
27.5°	1131.4	1140.1	1127.1	1122.7	1105.3	1105.3	1070.5	1009.6	935.6	848.6	748.5
30°	1235.9	1244.6	1235.9	1235.9	1222.8	1218.4	1183.6	1122.7	1031.3	926.9	805.0
32.5°	1335.9	1344.6	1340.3	1344.6	1340.3	1335.9	1292.4	1227.2	1135.8	1000.9	861.6
35°	1436.0	1449.1	1444.7	1457.8	1453.4	1449.1	1414.3	1335.9	1227.2	1092.3	922.5
37.5°	1540.5	1553.5	1553.5	1566.6	1570.9	1570.9	1531.8	1449.1	1327.2	1174.9	992.2
40°	1653.6	1666.7	1666.7	1688.4	1697.1	1697.1	1653.6	1570.9	1436.0	1266.3	1066.1
42.5°	1762.4	1775.5	1779.8	1801.6	1814.6	1819.0	1784.2	1688.4	1531.8	1357.7	1135.8
45°	1866.8	1879.9	1892.9	1936.5	1958.2	1953.9	1927.8	1827.7	1653.6	1453.4	1209.7
47.5°	1966.9	1984.3	2006.1	2062.7	2093.1	2088.8	2071.4	1958.2	1766.8	1544.8	1275.0
50°	2045.3	2058.3	2101.8	2162.7	2201.9	2206.3	2180.2	2071.4	1862.5	1614.4	1322.9
52.5°	2106.2	2123.6	2175.8	2262.8	2293.3	2306.4	2275.9	2167.1	1958.2	1675.4	1362.1
55°	2149.7	2149.7	2228.0	2328.1	2371.6	2380.3	2380.3	2245.4	2014.8	1714.5	1383.8
57.5°	2127.9	2127.9	2215.0	2323.8	2393.4	2389.0	2380.3	2249.8	2023.5	1705.8	1370.8
60°	2067.0	2080.1	2162.7	2271.5	2341.2	2336.8	2310.7	2193.2	1980.0	1671.0	1344.6
62.5°	1984.3	2006.1	2093.1	2175.8	2254.1	2267.2	2232.4	2127.9	1906.0	1618.8	1296.8
65°	1827.7	1858.1	1966.9	2058.3	2119.2	2145.3	2101.8	2006.1	1805.9	1518.7	1196.7
67.5°	1653.6	1675.4	1766.8	1897.3	1932.1	1958.2	1936.5	1836.4	1666.7	1357.7	1083.6
70°	1453.4	1488.2	1549.2	1679.7	1718.9	1745.0	1745.0	1644.9	1483.9	1192.3	948.7
72.5°	1218.4	1257.6	1331.6	1427.3	1479.5	1497.0	1492.6	1409.9	1266.3	1009.6	800.7
75°	961.7	992.2	1079.2	1148.8	1205.4	1218.4	1214.1	1144.5	1013.9	813.8	635.3
77.5°	709.3	739.8	805.0	857.3	909.5	900.8	900.8	848.6	765.9	604.9	483.0
80°	465.6	491.7	548.3	565.7	622.3	617.9	617.9	578.8	522.2	404.7	322.0
82.5°	256.7	278.5	317.7	335.1	369.9	361.2	365.5	339.4	304.6	226.3	182.8
85°	91.4	108.8	130.5	143.6	161.0	161.0	161.0	139.3	130.5	87.0	74.0
87.5°	4.4	8.7	17.4	17.4	26.1	26.1	26.1	17.4	17.4	4.4	4.4
90°	2.8	2.8	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	2.8
92.5°	2.8	2.8	2.8	3.9	4.3	4.4	3.9	4.4	3.3	3.3	2.8
95°	3.3	3.3	3.9	5.0	5.9	6.1	6.6	6.6	3.9	3.9	3.3
97.5°	4.4	5.0	5.0	6.1	9.2	10.0	18.3	11.1	5.5	5.5	5.0
100°	7.2	7.7	7.7	13.8	26.2	29.3	39.3	28.2	14.4	10.5	7.7
102.5°	23.2	24.3	29.9	44.8	62.1	66.4	60.3	50.9	48.1	33.2	26.6
105°	59.2	58.7	63.1	74.7	89.3	93.0	91.3	84.1	76.4	65.8	60.9
107.5°	78.0	78.0	81.9	91.9	102.9	105.7	123.4	125.1	99.0	86.9	81.3
110°	88.0	88.0	91.3	99.6	114.2	117.9	142.8	141.6	122.3	107.3	100.2



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**CANDELA DISTRIBUTION (continued):**

	0°	5°	15°	25°	33°	35°	45°	55°	65°	75°	85°
112.5°	90.2	90.7	95.2	107.9	123.8	127.8	138.9	133.9	126.2	119.5	114.0
115°	93.5	93.5	98.5	110.7	119.5	121.7	126.2	120.6	114.5	110.1	107.9
117.5°	92.4	94.1	95.2	101.8	107.6	109.0	112.3	109.6	101.3	97.9	96.8
120°	85.8	85.8	86.9	90.2	93.3	94.1	95.7	94.6	89.1	86.3	85.8
122.5°	76.4	76.9	76.4	78.0	80.2	80.8	82.4	81.3	76.9	75.8	75.8
125°	67.0	67.0	66.4	67.5	68.9	69.2	68.6	69.2	67.0	66.4	66.4
127.5°	60.3	59.8	58.7	59.2	59.7	59.8	59.8	60.3	58.1	58.7	59.2
130°	53.7	53.7	52.6	52.6	52.6	52.6	51.5	52.6	51.5	52.0	52.6
132.5°	47.6	47.6	45.9	45.4	45.4	45.4	45.4	45.9	45.4	46.5	47.6
135°	42.6	42.6	40.9	41.5	41.5	41.5	40.9	41.5	40.9	42.1	42.6
137.5°	38.7	38.7	37.6	37.6	37.6	37.6	37.1	37.6	37.6	38.2	39.3
140°	35.4	35.4	34.9	34.9	34.4	34.3	34.9	34.9	34.9	35.4	36.0
142.5°	33.8	33.2	32.6	32.1	32.5	32.6	32.6	32.6	32.1	32.6	33.8
145°	31.0	31.0	30.4	30.4	30.4	30.4	31.0	30.4	30.4	31.0	31.0
147.5°	29.3	29.3	28.8	29.3	29.3	29.3	29.3	29.3	28.8	29.3	29.3
150°	28.8	28.2	27.7	28.2	28.2	28.2	27.7	27.7	27.7	27.7	28.2
152.5°	27.1	27.1	26.6	27.1	26.7	26.6	26.6	26.6	26.6	26.6	27.1
155°	26.0	26.0	25.5	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0
157.5°	24.9	25.5	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	25.5
160°	24.3	24.3	24.3	24.3	23.9	23.8	23.8	23.8	24.3	24.3	24.3
162.5°	23.8	23.8	23.8	23.8	23.3	23.2	23.2	23.2	23.2	23.8	23.8
165°	23.8	23.2	23.2	23.2	22.8	22.7	22.7	22.7	22.7	23.2	23.8
167.5°	22.7	22.7	22.7	22.7	22.7	22.7	22.1	22.1	22.7	22.7	22.7
170°	22.7	22.7	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1
172.5°	22.7	22.7	22.7	22.7	22.2	22.1	22.1	22.1	22.1	22.1	22.7
175°	22.7	22.7	22.7	22.7	22.2	22.1	22.1	22.1	22.7	22.7	22.7
177.5°	22.7	22.7	22.7	22.7	22.2	22.1	22.7	22.7	22.7	22.7	22.7
180°	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7





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**CANDELA DISTRIBUTION (continued):**

	90°	95°	105°	115°	125°	135°	145°	155°	165°	175°	180°
0°	465.6	465.6	465.6	465.6	465.6	465.6	465.6	465.6	465.6	465.6	465.6
2.5°	461.3	456.9	452.6	443.9	439.5	435.2	430.8	426.5	426.5	426.5	426.5
5°	465.6	461.3	448.2	435.2	422.1	409.1	400.3	396.0	391.6	387.3	387.3
7.5°	465.6	456.9	439.5	422.1	409.1	391.6	378.6	365.5	356.8	352.5	352.5
10°	470.0	456.9	435.2	417.8	396.0	374.2	356.8	339.4	330.7	322.0	322.0
12.5°	478.7	465.6	435.2	413.4	387.3	361.2	339.4	322.0	309.0	300.3	300.3
15°	496.1	478.7	443.9	413.4	382.9	352.5	330.7	309.0	295.9	287.2	287.2
17.5°	522.2	500.4	456.9	413.4	378.6	348.1	322.0	300.3	282.9	274.2	274.2
20°	552.7	526.5	474.3	422.1	378.6	343.8	317.7	291.6	274.2	265.4	265.4
22.5°	596.2	557.0	496.1	435.2	387.3	348.1	313.3	287.2	269.8	261.1	261.1
25°	644.0	600.5	522.2	452.6	396.0	348.1	313.3	287.2	269.8	261.1	256.7
27.5°	696.3	648.4	552.7	470.0	404.7	356.8	317.7	287.2	269.8	261.1	261.1
30°	744.1	687.6	583.1	491.7	417.8	361.2	322.0	291.6	269.8	261.1	261.1
32.5°	796.3	731.1	613.6	513.5	430.8	369.9	326.4	295.9	274.2	265.4	261.1
35°	848.6	774.6	644.0	530.9	443.9	378.6	330.7	300.3	278.5	269.8	269.8
37.5°	905.1	822.5	674.5	552.7	456.9	387.3	339.4	304.6	282.9	274.2	274.2
40°	966.1	870.3	705.0	570.1	470.0	396.0	348.1	313.3	291.6	282.9	282.9
42.5°	1027.0	922.5	739.8	591.8	483.0	404.7	352.5	322.0	300.3	291.6	291.6
45°	1087.9	966.1	770.2	613.6	496.1	417.8	365.5	330.7	309.0	300.3	300.3
47.5°	1144.5	1013.9	796.3	626.6	509.1	426.5	369.9	339.4	317.7	313.3	309.0
50°	1183.6	1044.4	813.8	639.7	513.5	430.8	378.6	343.8	326.4	317.7	317.7
52.5°	1214.1	1074.8	826.8	648.4	517.8	435.2	382.9	352.5	335.1	326.4	322.0
55°	1231.5	1079.2	826.8	639.7	513.5	435.2	382.9	352.5	335.1	326.4	326.4
57.5°	1214.1	1057.4	809.4	622.3	500.4	422.1	369.9	343.8	326.4	322.0	317.7
60°	1179.3	1022.6	774.6	596.2	478.7	400.3	352.5	330.7	317.7	313.3	309.0
62.5°	1131.4	979.1	739.8	561.4	448.2	374.2	339.4	313.3	304.6	300.3	295.9
65°	1035.7	896.4	683.2	517.8	409.1	343.8	309.0	291.6	282.9	274.2	269.8
67.5°	931.2	805.0	604.9	465.6	361.2	309.0	278.5	261.1	248.0	248.0	243.7
70°	818.1	709.3	522.2	396.0	313.3	269.8	239.3	226.3	217.6	217.6	213.2
72.5°	683.2	596.2	435.2	322.0	256.7	221.9	200.2	187.1	182.8	182.8	178.4
75°	548.3	470.0	343.8	252.4	200.2	174.1	156.7	148.0	143.6	143.6	139.3
77.5°	404.7	343.8	248.0	182.8	143.6	126.2	113.1	108.8	104.4	104.4	100.1
80°	269.8	226.3	161.0	117.5	87.0	78.3	69.6	69.6	65.3	69.6	65.3
82.5°	148.0	121.8	87.0	60.9	43.5	39.2	34.8	34.8	39.2	39.2	34.8
85°	56.6	43.5	30.5	17.4	13.1	13.1	13.1	13.1	13.1	13.1	8.7
87.5°	4.4	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90°	2.8	2.8	3.3	3.3	3.3	3.3	3.3	3.3	3.3	2.8	2.8
92.5°	2.8	2.8	3.3	3.3	4.4	3.9	4.4	3.9	2.8	2.8	2.8
95°	3.3	3.3	3.9	3.9	6.6	6.6	6.1	5.0	3.9	3.3	3.3
97.5°	4.4	5.0	5.5	5.5	11.1	18.3	10.0	6.1	5.0	5.0	4.4
100°	7.7	7.7	10.5	14.4	28.2	39.3	29.3	13.8	7.7	7.7	7.2
102.5°	25.5	26.6	33.2	48.1	50.9	60.3	66.4	44.8	29.9	24.3	23.2
105°	60.9	60.9	65.8	76.4	84.1	91.3	93.0	74.7	63.1	58.7	59.2
107.5°	80.8	81.3	86.9	99.0	125.1	123.4	105.7	91.9	81.9	78.0	78.0
110°	99.0	100.2	107.3	122.3	141.6	142.8	117.9	99.6	91.3	88.0	88.0



REPORT NUMBER: P833554  
 CATALOG NUMBER: TTN-D2-740-U-DL-CG-UPL1

**CANDELA DISTRIBUTION (continued):**

	90°	95°	105°	115°	125°	135°	145°	155°	165°	175°	180°
112.5°	112.9	114.0	119.5	126.2	133.9	138.9	127.8	107.9	95.2	90.7	90.2
115°	109.0	107.9	110.1	114.5	120.6	126.2	121.7	110.7	98.5	93.5	93.5
117.5°	95.2	96.8	97.9	101.3	109.6	112.3	109.0	101.8	95.2	94.1	92.4
120°	84.7	85.8	86.3	89.1	94.6	95.7	94.1	90.2	86.9	85.8	85.8
122.5°	74.7	75.8	75.8	76.9	81.3	82.4	80.8	78.0	76.4	76.9	76.4
125°	65.8	66.4	66.4	67.0	69.2	68.6	69.2	67.5	66.4	67.0	67.0
127.5°	58.7	59.2	58.7	58.1	60.3	59.8	59.8	59.2	58.7	59.8	60.3
130°	53.1	52.6	52.0	51.5	52.6	51.5	52.6	52.6	52.6	53.7	53.7
132.5°	47.6	47.6	46.5	45.4	45.9	45.4	45.4	45.4	45.9	47.6	47.6
135°	42.6	42.6	42.1	40.9	41.5	40.9	41.5	41.5	40.9	42.6	42.6
137.5°	39.8	39.3	38.2	37.6	37.6	37.1	37.6	37.6	37.6	38.7	38.7
140°	36.0	36.0	35.4	34.9	34.9	34.9	34.3	34.9	34.9	35.4	35.4
142.5°	33.8	33.8	32.6	32.1	32.6	32.6	32.6	32.1	32.6	33.2	33.8
145°	31.5	31.0	31.0	30.4	30.4	31.0	30.4	30.4	30.4	31.0	31.0
147.5°	29.9	29.3	29.3	28.8	29.3	29.3	29.3	29.3	28.8	29.3	29.3
150°	28.2	28.2	27.7	27.7	27.7	27.7	28.2	28.2	27.7	28.2	28.8
152.5°	27.7	27.1	26.6	26.6	26.6	26.6	26.6	27.1	26.6	27.1	27.1
155°	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	25.5	26.0	26.0
157.5°	25.5	25.5	24.9	24.9	24.9	24.9	24.9	24.9	24.9	25.5	24.9
160°	24.9	24.3	24.3	24.3	23.8	23.8	23.8	24.3	24.3	24.3	24.3
162.5°	24.3	23.8	23.8	23.2	23.2	23.2	23.2	23.8	23.8	23.8	23.8
165°	23.2	23.8	23.2	22.7	22.7	22.7	22.7	23.2	23.2	23.2	23.8
167.5°	23.2	22.7	22.7	22.7	22.1	22.1	22.7	22.7	22.7	22.7	22.7
170°	22.7	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.7	22.7
172.5°	22.7	22.7	22.1	22.1	22.1	22.1	22.1	22.7	22.7	22.7	22.7
175°	22.1	22.7	22.7	22.7	22.1	22.1	22.1	22.7	22.7	22.7	22.7
177.5°	22.7	22.7	22.7	22.7	22.7	22.7	22.1	22.7	22.7	22.7	22.7
180°	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7

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: SP1-2411-284-2

Test Date: 11/20/2024

Luminaire Tested: TTN-D0-740-U-WQ

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

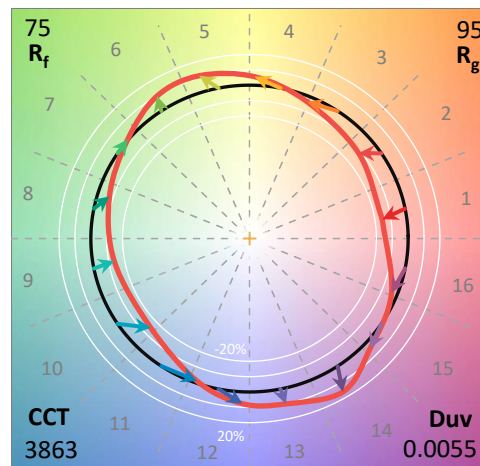
**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2411-284-2  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 11/20/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW EDISON  
 Catalog Number: **TTN-D0-740-U-WQ**  
 Description: TOPTIER NANO LED PARKING GARAGE LUMINAIRE. 4000K, 70 CRI LEDS AND WIDE DISTRIBUTION

**Spectral Parameters**

CCT (K): 3863  
 CIE u': 0.2247  
 CIE v': 0.5111  
 Duv: 0.0055  
 CIE x: 0.3911  
 CIE y: 0.3954  
 CIE z: 0.2136  
 Peak Wavelength (nm): 448  
 Dominant Wavelength (nm): 577  
 Purity: 36.03443  
 Rf: 74.7  
 Rg: 95.4

CRI (Ra):	71.9		
R1:	69.4	R9:	-23.5
R2:	76.9	R10:	45.4
R3:	83.3	R11:	68.7
R4:	72.7	R12:	38.7
R5:	68.4	R13:	70.0
R6:	67.5	R14:	90.3
R7:	82.0	R15:	62.1
R8:	55.3		



**Test Conditions**

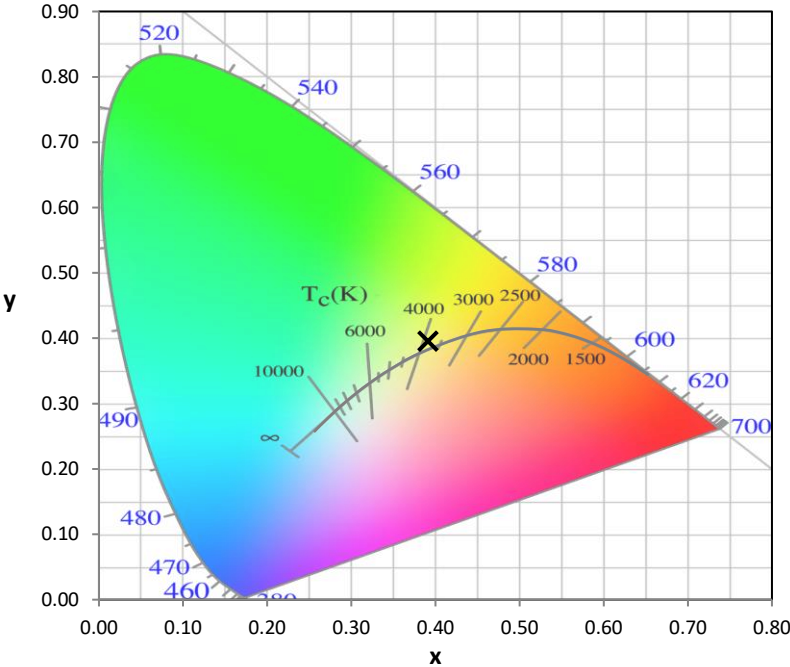
Stabilization Time: 37M  
 Operation Time: 1H 37M  
 Sphere Temperature (°C): 25.0

REPORT NUMBER: SP1-2411-284-2

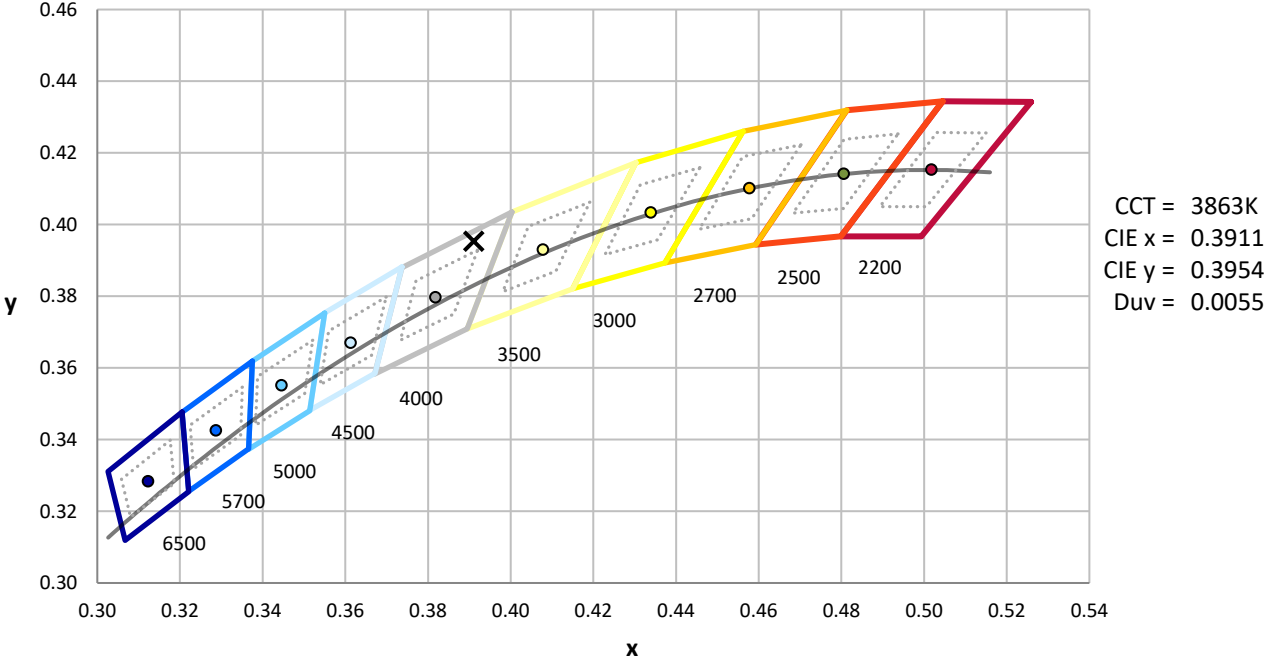
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	6/18/2024	12/18/2024
Power Meter	INXT2011004	2/8/2024	2/8/2025
AC Power Source	IN0063	10/22/2024	10/22/2025
DC Power Source	IN0208	10/22/2024	10/22/2025
Sphere Thermometer	IN0085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

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CIE 1931 Chromaticity Diagram



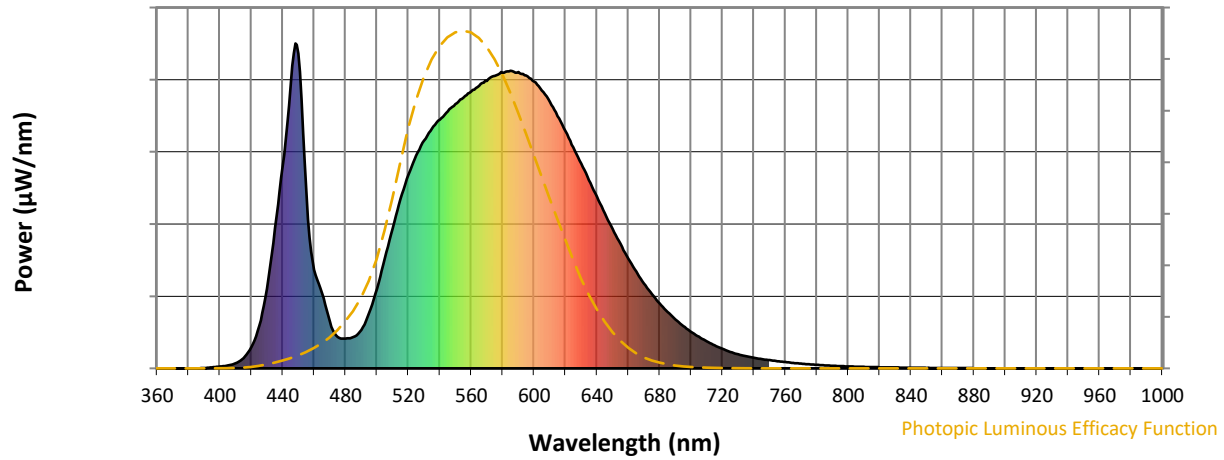
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 4000K 7-step quadrangle

REPORT NUMBER: SP1-2411-284-2

**Photopic Flux vs. Wavelength**

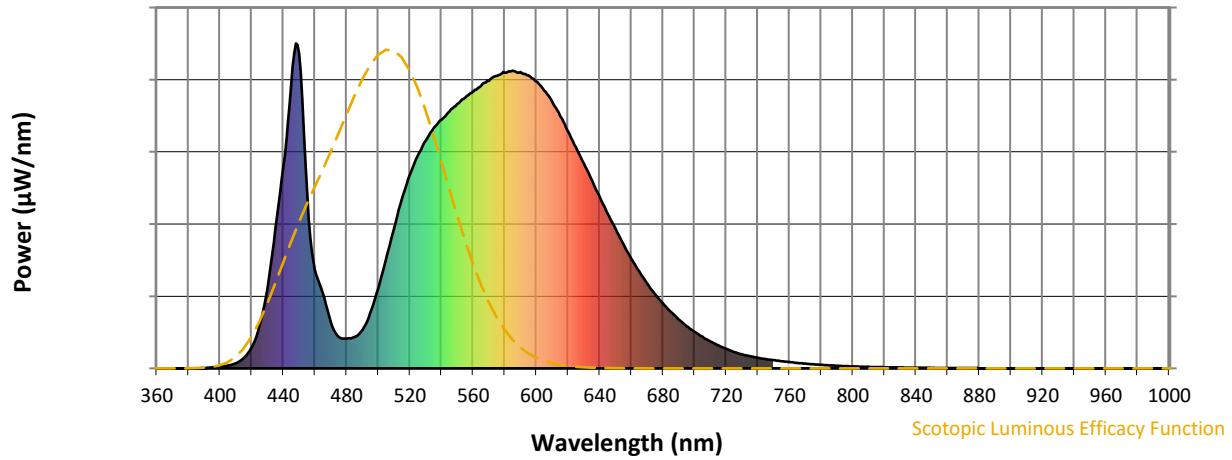


**Photopic Lumens: NR**

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	118	NR	620	730	NR	750	25	NR	880	1	NR
365	0	NR	495	170	NR	625	680	NR	755	22	NR	885	0	NR
370	0	NR	500	245	NR	630	630	NR	760	19	NR	890	0	NR
375	0	NR	505	338	NR	635	579	NR	765	17	NR	895	0	NR
380	0	NR	510	431	NR	640	529	NR	770	14	NR	900	0	NR
385	0	NR	515	521	NR	645	477	NR	775	13	NR	905	0	NR
390	1	NR	520	596	NR	650	429	NR	780	11	NR	910	0	NR
395	3	NR	525	655	NR	655	383	NR	785	9	NR	915	0	NR
400	6	NR	530	701	NR	660	338	NR	790	8	NR	920	0	NR
405	9	NR	535	739	NR	665	298	NR	795	7	NR	925	0	NR
410	16	NR	540	766	NR	670	261	NR	800	6	NR	930	0	NR
415	32	NR	545	791	NR	675	228	NR	805	5	NR	935	0	NR
420	65	NR	550	813	NR	680	200	NR	810	5	NR	940	0	NR
425	131	NR	555	833	NR	685	173	NR	815	4	NR	945	0	NR
430	245	NR	560	852	NR	690	151	NR	820	3	NR	950	0	NR
435	432	NR	565	870	NR	695	130	NR	825	3	NR	955	0	NR
440	622	NR	570	885	NR	700	112	NR	830	3	NR	960	0	NR
445	870	NR	575	900	NR	705	97	NR	835	2	NR	965	0	NR
450	969	NR	580	911	NR	710	83	NR	840	2	NR	970	0	NR
455	544	NR	585	916	NR	715	71	NR	845	2	NR	975	0	NR
460	304	NR	590	912	NR	720	60	NR	850	1	NR	980	0	NR
465	231	NR	595	901	NR	725	51	NR	855	1	NR	985	0	NR
470	142	NR	600	882	NR	730	43	NR	860	1	NR	990	0	NR
475	96	NR	605	855	NR	735	37	NR	865	1	NR	995	0	NR
480	92	NR	610	820	NR	740	32	NR	870	1	NR	1000	0	NR
485	96	NR	615	776	NR	745	29	NR	875	1	NR			

REPORT NUMBER: SP1-2411-284-2

**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

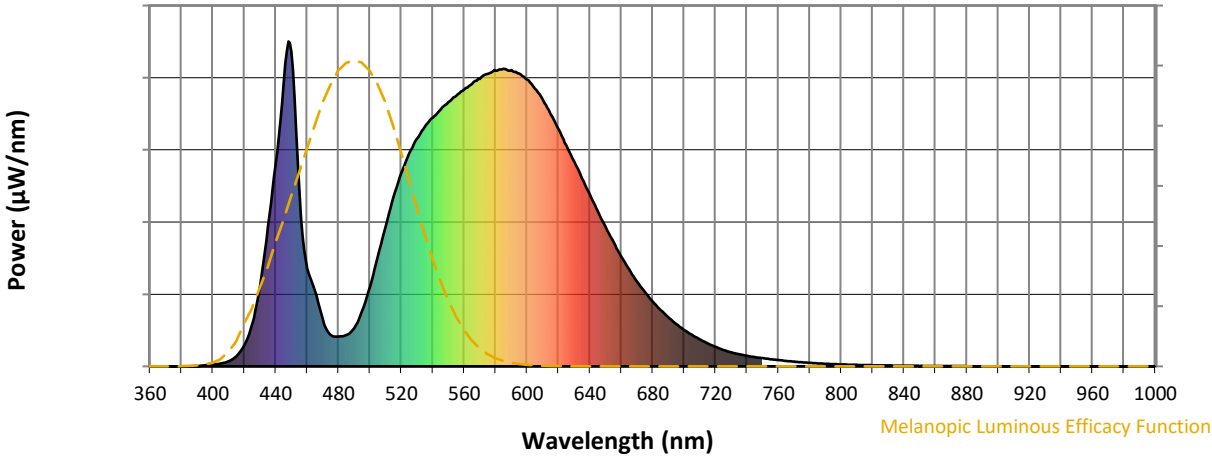
**S/P: 1.45**

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	118	NR	620	730	NR	750	25	NR	880	1	NR
365	0	NR	495	170	NR	625	680	NR	755	22	NR	885	0	NR
370	0	NR	500	245	NR	630	630	NR	760	19	NR	890	0	NR
375	0	NR	505	338	NR	635	579	NR	765	17	NR	895	0	NR
380	0	NR	510	431	NR	640	529	NR	770	14	NR	900	0	NR
385	0	NR	515	521	NR	645	477	NR	775	13	NR	905	0	NR
390	1	NR	520	596	NR	650	429	NR	780	11	NR	910	0	NR
395	3	NR	525	655	NR	655	383	NR	785	9	NR	915	0	NR
400	6	NR	530	701	NR	660	338	NR	790	8	NR	920	0	NR
405	9	NR	535	739	NR	665	298	NR	795	7	NR	925	0	NR
410	16	NR	540	766	NR	670	261	NR	800	6	NR	930	0	NR
415	32	NR	545	791	NR	675	228	NR	805	5	NR	935	0	NR
420	65	NR	550	813	NR	680	200	NR	810	5	NR	940	0	NR
425	131	NR	555	833	NR	685	173	NR	815	4	NR	945	0	NR
430	245	NR	560	852	NR	690	151	NR	820	3	NR	950	0	NR
435	432	NR	565	870	NR	695	130	NR	825	3	NR	955	0	NR
440	622	NR	570	885	NR	700	112	NR	830	3	NR	960	0	NR
445	870	NR	575	900	NR	705	97	NR	835	2	NR	965	0	NR
450	969	NR	580	911	NR	710	83	NR	840	2	NR	970	0	NR
455	544	NR	585	916	NR	715	71	NR	845	2	NR	975	0	NR
460	304	NR	590	912	NR	720	60	NR	850	1	NR	980	0	NR
465	231	NR	595	901	NR	725	51	NR	855	1	NR	985	0	NR
470	142	NR	600	882	NR	730	43	NR	860	1	NR	990	0	NR
475	96	NR	605	855	NR	735	37	NR	865	1	NR	995	0	NR
480	92	NR	610	820	NR	740	32	NR	870	1	NR	1000	0	NR
485	96	NR	615	776	NR	745	29	NR	875	1	NR			



REPORT NUMBER: SP1-2411-284-2

Melanopic Flux vs. Wavelength



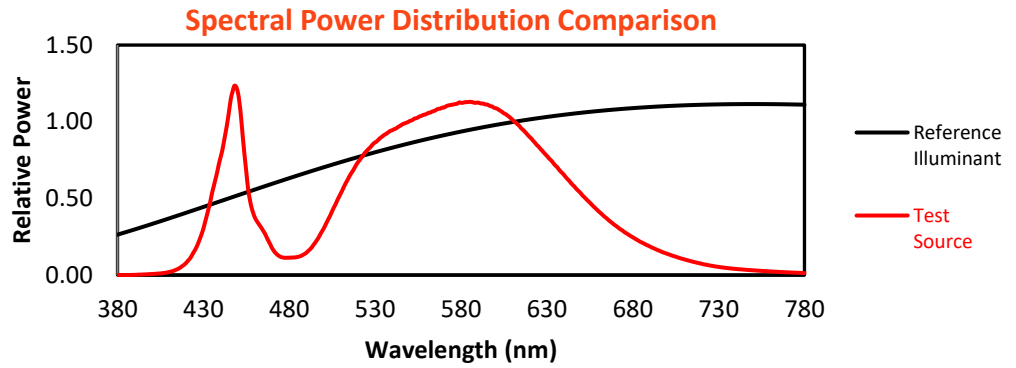
Melanopic Lumens: NR

M/P: 2.72

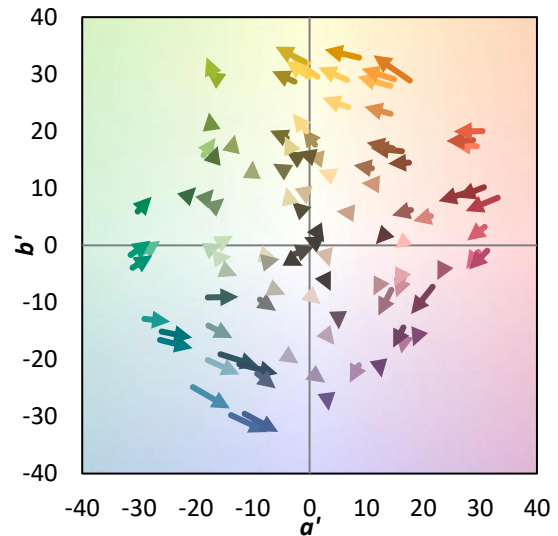
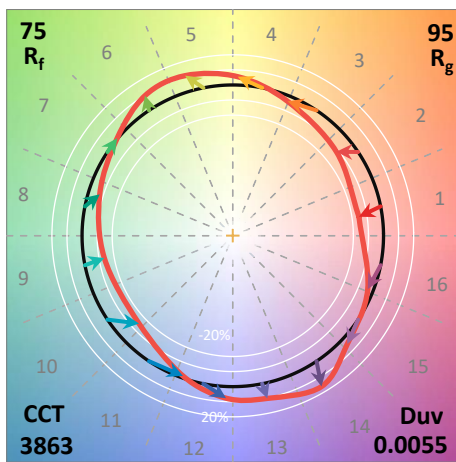
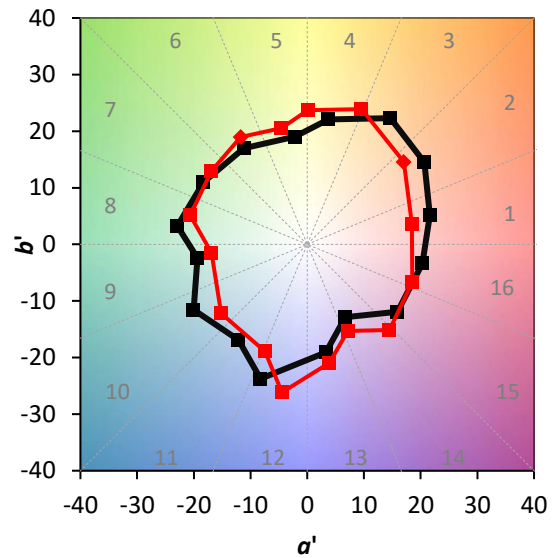
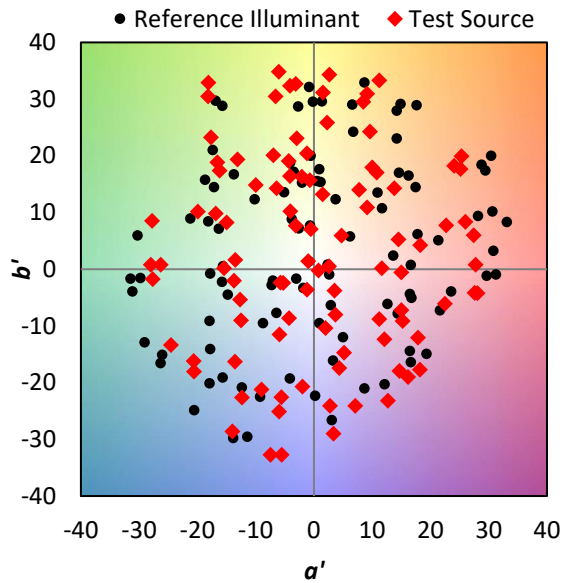
λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)
360	0	NR	490	118	NR	620	730	NR	750	25	NR	880	1	NR
365	0	NR	495	170	NR	625	680	NR	755	22	NR	885	0	NR
370	0	NR	500	245	NR	630	630	NR	760	19	NR	890	0	NR
375	0	NR	505	338	NR	635	579	NR	765	17	NR	895	0	NR
380	0	NR	510	431	NR	640	529	NR	770	14	NR	900	0	NR
385	0	NR	515	521	NR	645	477	NR	775	13	NR	905	0	NR
390	1	NR	520	596	NR	650	429	NR	780	11	NR	910	0	NR
395	3	NR	525	655	NR	655	383	NR	785	9	NR	915	0	NR
400	6	NR	530	701	NR	660	338	NR	790	8	NR	920	0	NR
405	9	NR	535	739	NR	665	298	NR	795	7	NR	925	0	NR
410	16	NR	540	766	NR	670	261	NR	800	6	NR	930	0	NR
415	32	NR	545	791	NR	675	228	NR	805	5	NR	935	0	NR
420	65	NR	550	813	NR	680	200	NR	810	5	NR	940	0	NR
425	131	NR	555	833	NR	685	173	NR	815	4	NR	945	0	NR
430	245	NR	560	852	NR	690	151	NR	820	3	NR	950	0	NR
435	432	NR	565	870	NR	695	130	NR	825	3	NR	955	0	NR
440	622	NR	570	885	NR	700	112	NR	830	3	NR	960	0	NR
445	870	NR	575	900	NR	705	97	NR	835	2	NR	965	0	NR
450	969	NR	580	911	NR	710	83	NR	840	2	NR	970	0	NR
455	544	NR	585	916	NR	715	71	NR	845	2	NR	975	0	NR
460	304	NR	590	912	NR	720	60	NR	850	1	NR	980	0	NR
465	231	NR	595	901	NR	725	51	NR	855	1	NR	985	0	NR
470	142	NR	600	882	NR	730	43	NR	860	1	NR	990	0	NR
475	96	NR	605	855	NR	735	37	NR	865	1	NR	995	0	NR
480	92	NR	610	820	NR	740	32	NR	870	1	NR	1000	0	NR
485	96	NR	615	776	NR	745	29	NR	875	1	NR			

**Summary**

$R_f = 74.7$   
 $R_g = 95.4$   
 CIE  $R_a = 71.9$   
 $R_9 = -23.5$

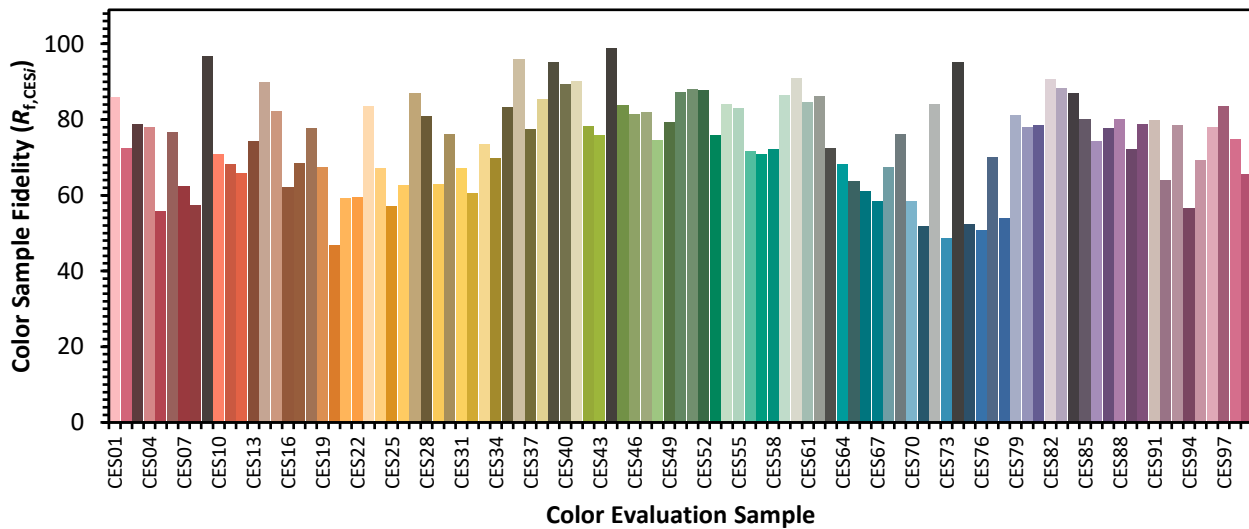


**Color Vector Graphics**

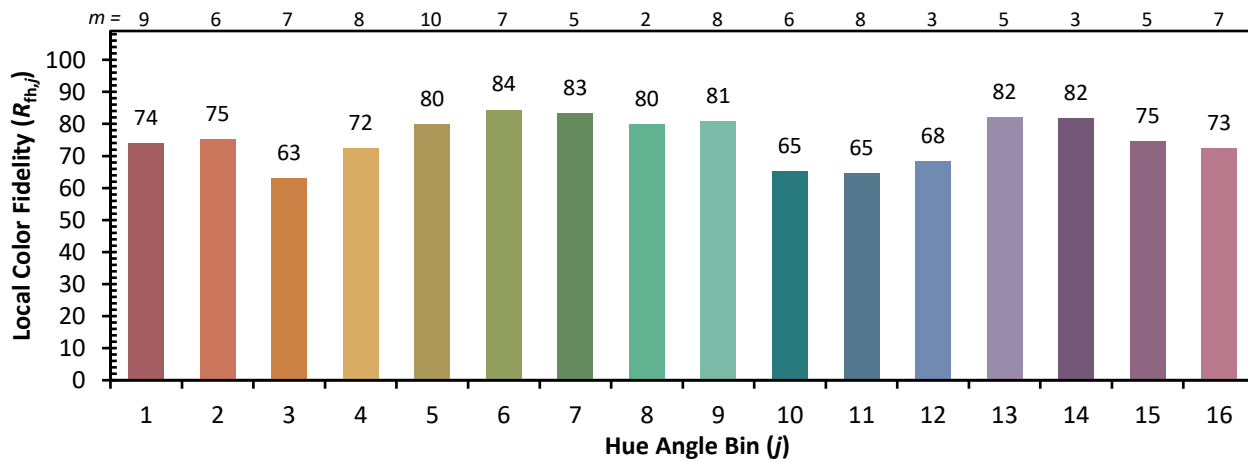
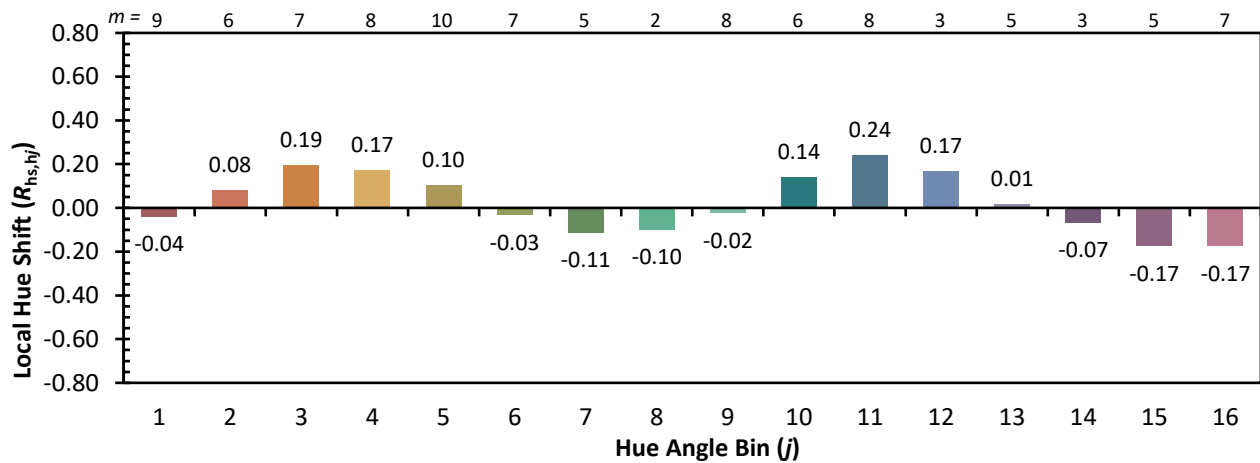
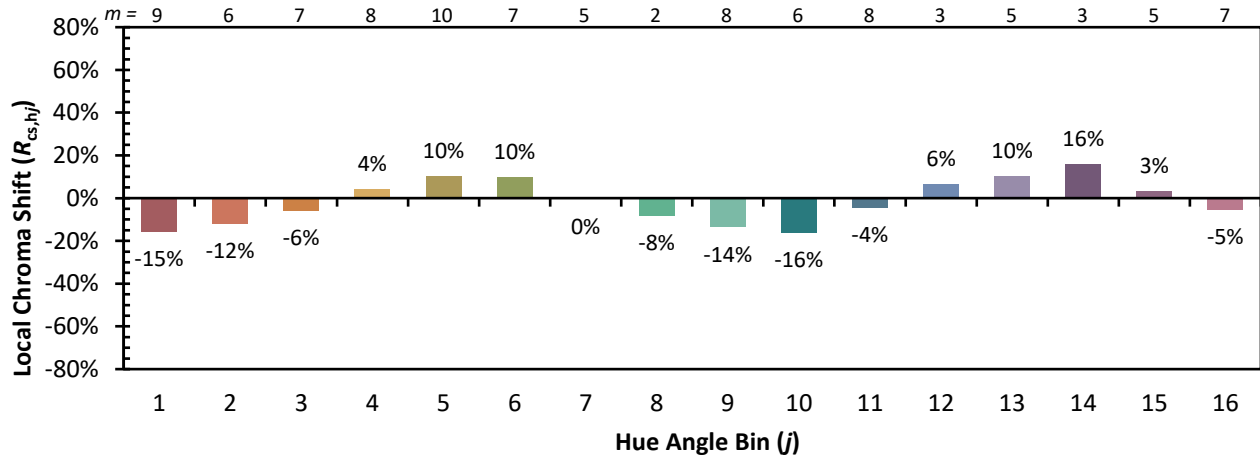


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

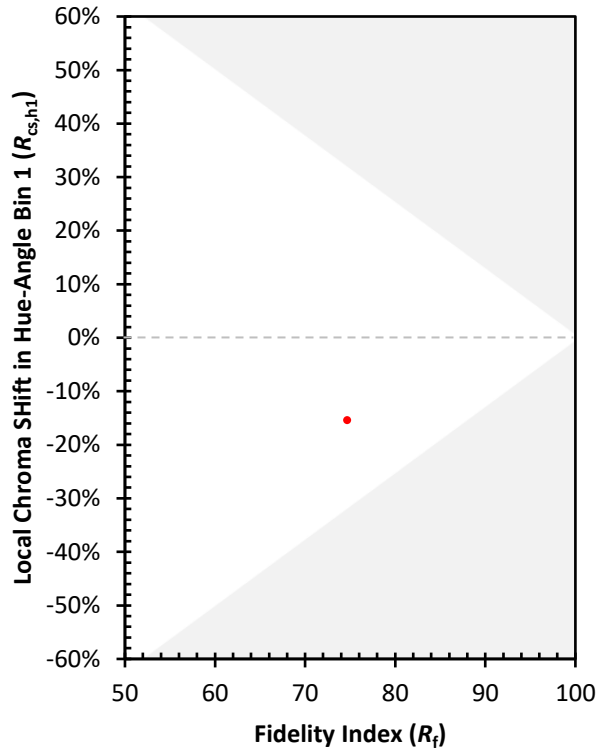
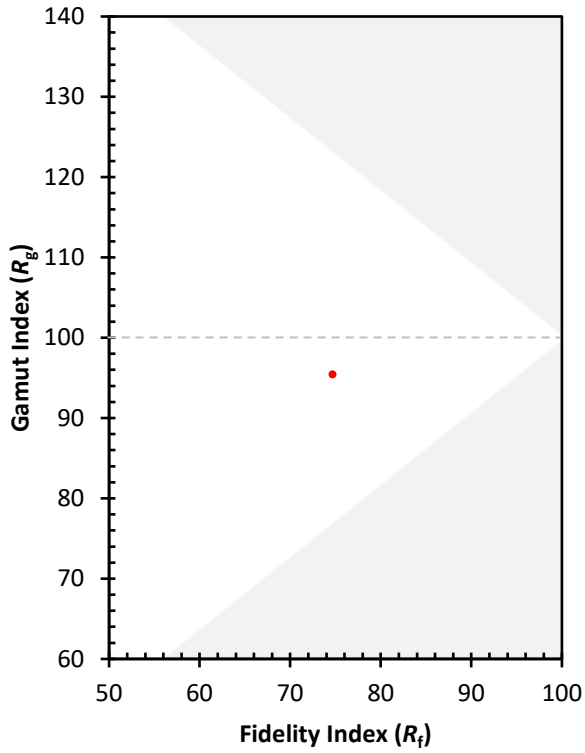
CES01 = 85	CES26 = 63	CES51 = 88	CES76 = 51
CES02 = 61	CES27 = 87	CES52 = 88	CES77 = 70
CES03 = 30	CES28 = 81	CES53 = 76	CES78 = 54
CES04 = 70	CES29 = 63	CES54 = 84	CES79 = 81
CES05 = 47	CES30 = 76	CES55 = 83	CES80 = 78
CES06 = 50	CES31 = 67	CES56 = 72	CES81 = 79
CES07 = 40	CES32 = 61	CES57 = 71	CES82 = 91
CES08 = 39	CES33 = 73	CES58 = 72	CES83 = 88
CES09 = 29	CES34 = 70	CES59 = 86	CES84 = 87
CES10 = 74	CES35 = 83	CES60 = 91	CES85 = 80
CES11 = 57	CES36 = 96	CES61 = 85	CES86 = 74
CES12 = 63	CES37 = 77	CES62 = 86	CES87 = 78
CES13 = 42	CES38 = 85	CES63 = 72	CES88 = 80
CES14 = 74	CES39 = 95	CES64 = 68	CES89 = 72
CES15 = 71	CES40 = 89	CES65 = 64	CES90 = 79
CES16 = 46	CES41 = 90	CES66 = 61	CES91 = 80
CES17 = 49	CES42 = 78	CES67 = 58	CES92 = 64
CES18 = 56	CES43 = 76	CES68 = 67	CES93 = 78
CES19 = 71	CES44 = 99	CES69 = 76	CES94 = 57
CES20 = 65	CES45 = 84	CES70 = 58	CES95 = 69
CES21 = 86	CES46 = 81	CES71 = 52	CES96 = 78
CES22 = 78	CES47 = 82	CES72 = 84	CES97 = 84
CES23 = 92	CES48 = 75	CES73 = 49	CES98 = 75
CES24 = 91	CES49 = 79	CES74 = 95	CES99 = 66
CES25 = 72	CES50 = 87	CES75 = 52	



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)