

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: P834035

Luminaire Tested: **TTN-D3-830-U-DL-CG-UPL2**

Issue Date: 5/15/2024

Test Information

Test Method: LM-79-08
Report Number: P834035
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-D3-830-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: 6459.8 lumens
Efficiency: N/A
Efficacy: 101.4 lumens/watt
Luminous Opening: Vertical Cylinder (Dia: 0.71' x H: 0.1')
IES Classification: Type IV - Short
BUG Rating: B1 - U4 - G2

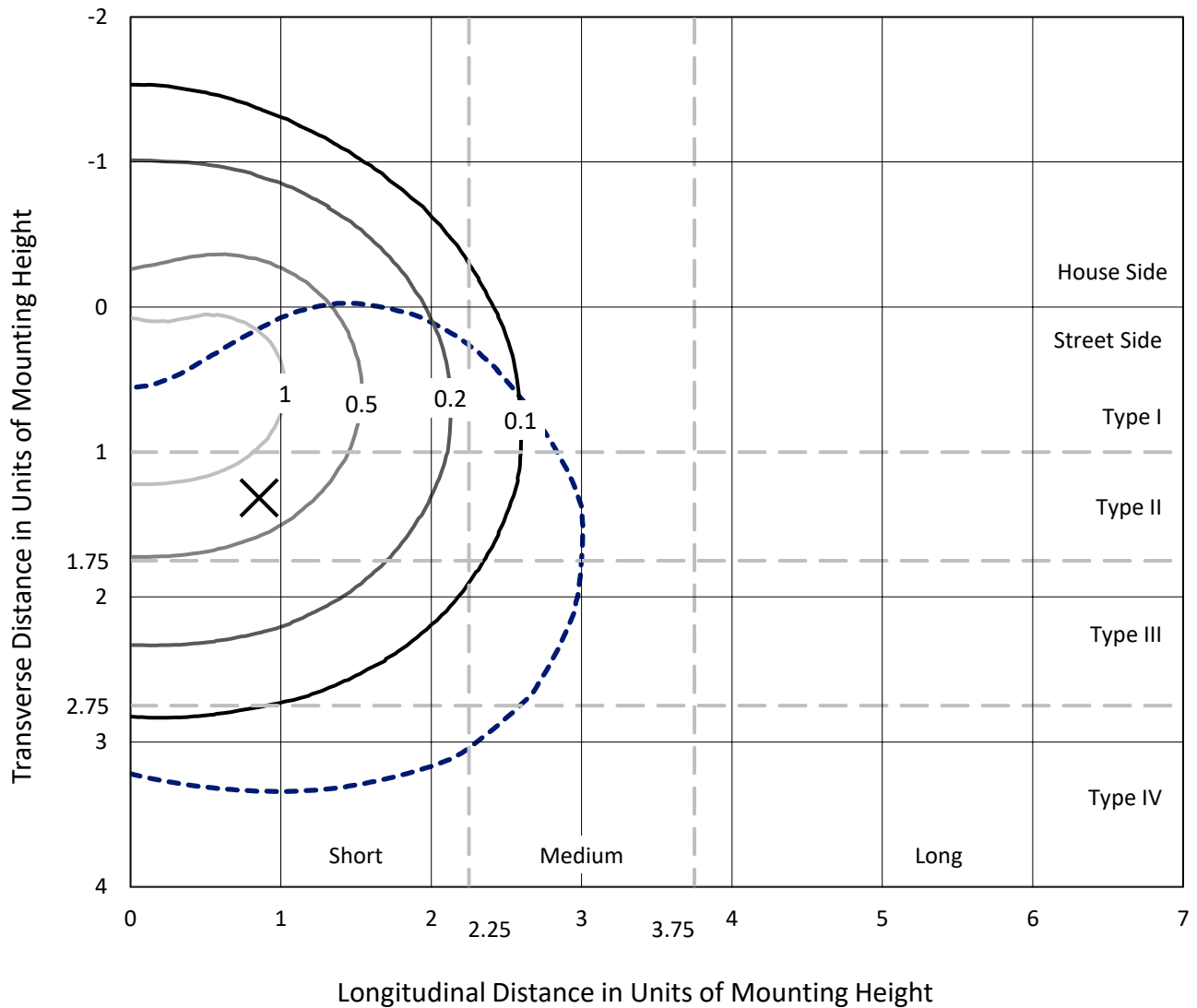
Input Watts (W): 63.7
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT



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Iso-Footcandle Lines of Horizontal Illumination

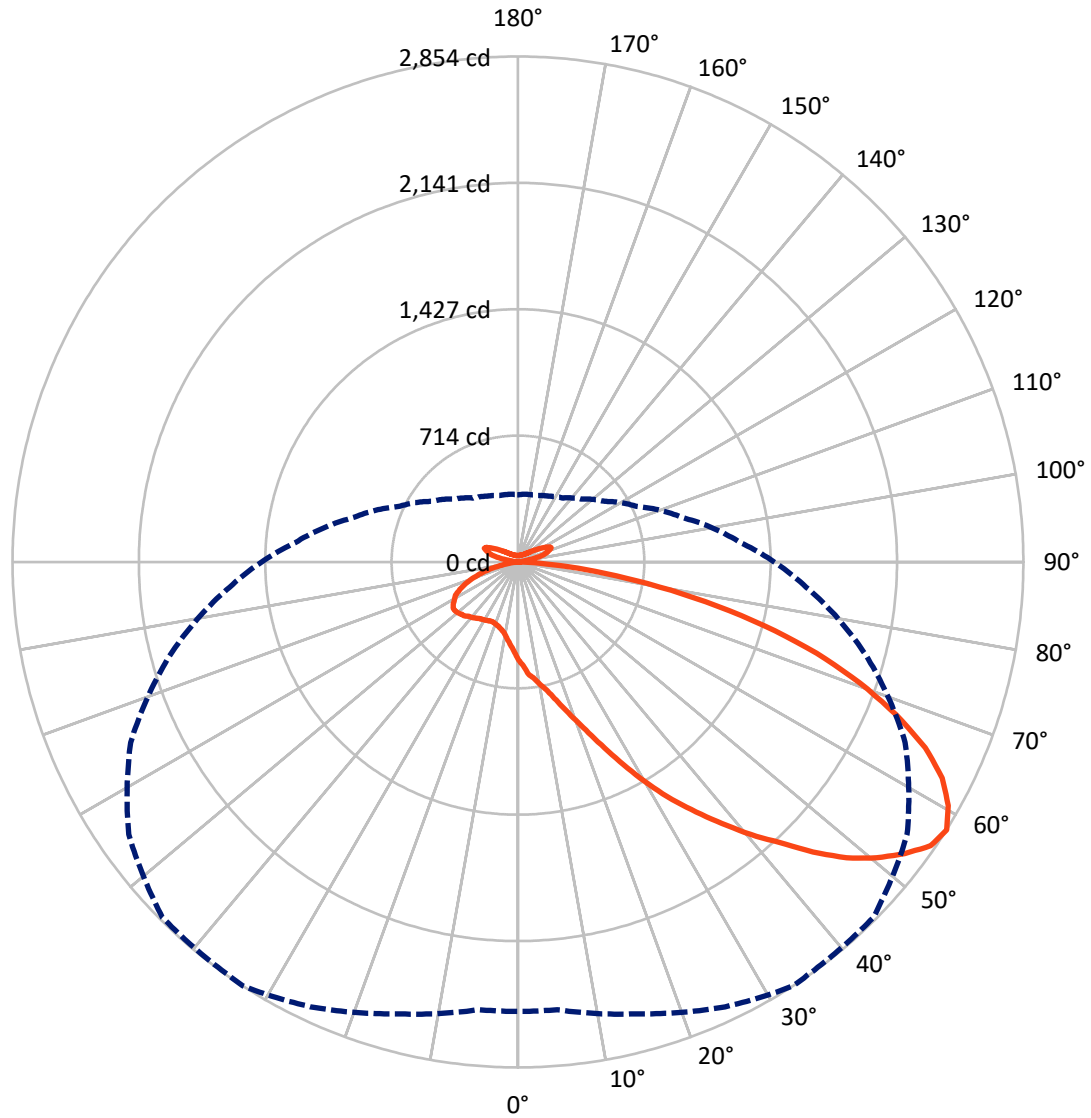
× Max cd
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 1.5 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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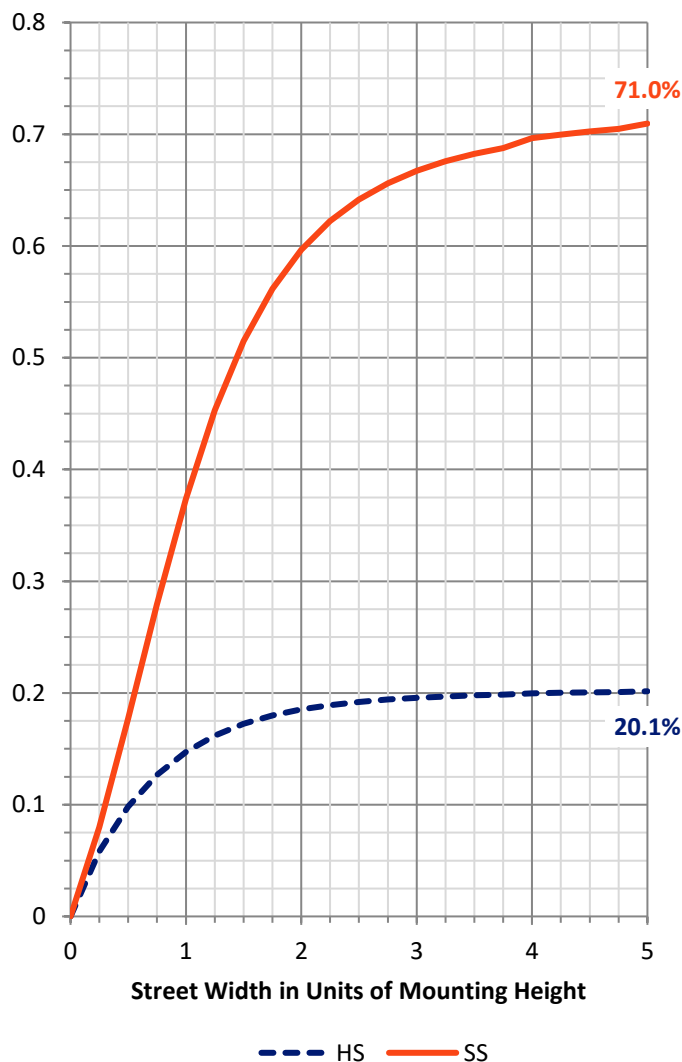
FLUX DISTRIBUTION:

		Downward	Upward	Total
House Side	Lumens	1307.8	267.0	1574.8
	% Fixture	20.2	4.1	24.4
Street Side	Lumens	4618.0	267.0	4885.0
	% Fixture	71.5	4.1	75.6
Total	Lumens	5925.7	534.0	6459.8
	% Fixture	91.7	8.3	100.0

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	53.1	0.8
10°-20°	172.3	2.7
20°-30°	363.3	5.6
30°-40°	659.8	10.2
40°-50°	1042.6	16.1
50°-60°	1384.6	21.4
60°-70°	1332.7	20.6
70°-80°	782.3	12.1
80°-90°	135.0	2.1
90°-100°	11.9	0.2
100°-110°	121.1	1.9
110°-120°	177.1	2.7
120°-130°	102.8	1.6
130°-140°	54.4	0.8
140°-150°	32.3	0.5
150°-160°	19.9	0.3
160°-170°	10.9	0.2
170°-180°	3.5	0.1
0°-90°	5925.7	91.7
0°-180°	6459.8	100.0

Coefficient of Utilization

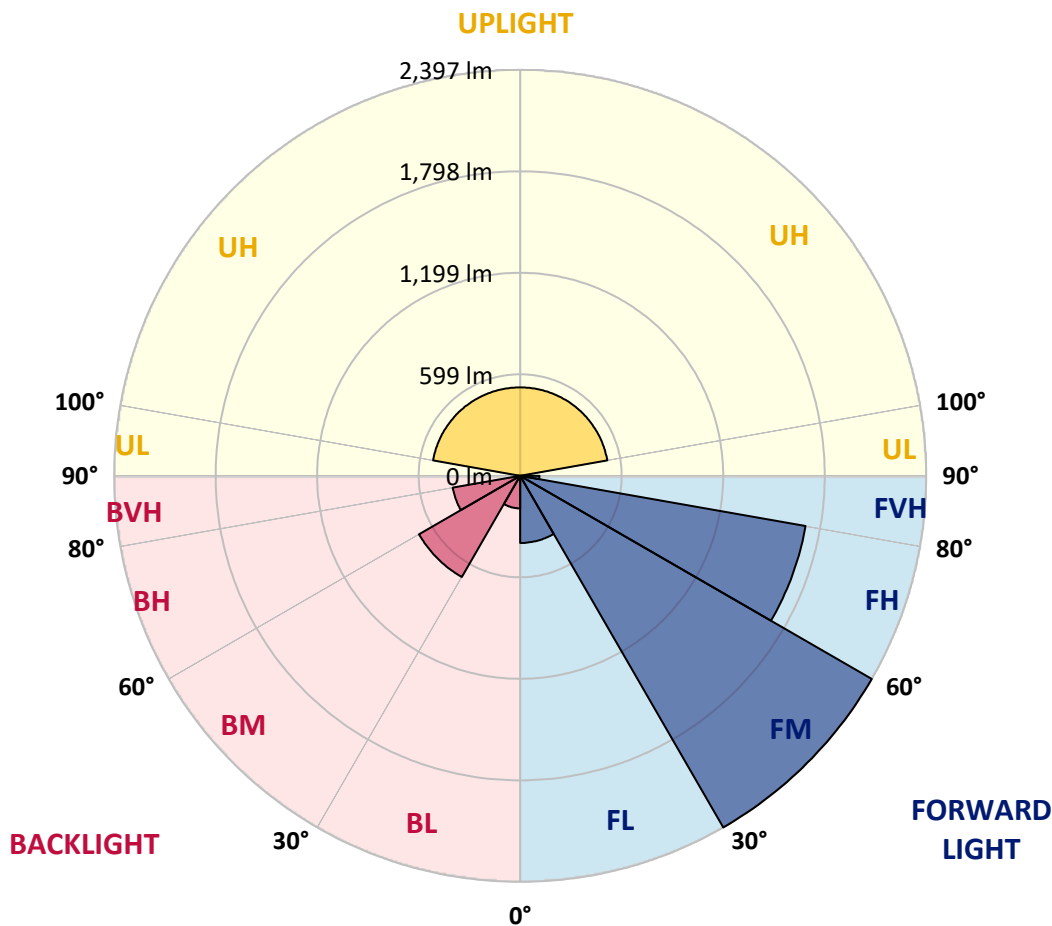


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LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

Zone	Lumens	% Fixture	Zone Rating/Lumen Limit		
			B	U	G
FL (0°-30°)	396.4	6.1			
FM (30°-60°)	2397.1	37.1			
FH (60°-80°)	1710.7	26.5			G1/1800
FVH (80°-90°)	113.8	1.8			G2/225
BL (0°-30°)	192.3	3.0	B1/500		
BM (30°-60°)	689.9	10.7	B1/1000		
BH (60°-80°)	404.3	6.3	B1/500		G1/500
BVH (80°-90°)	21.2	0.3			G1/100
UL (90°-100°)	11.9	0.2		U2/50	
UH (100°-180°)	522.1	8.1		U4/1000	

BUG Rating: B1-U4-G2
 Type IV Short





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CANDELA DISTRIBUTION (FULL):

	0°	5°	15°	25°	33°	35°	45°	55°	65°	75°	85°
0°	555.3	555.3	555.3	555.3	555.3	555.3	555.3	555.3	555.3	555.3	555.3
2.5°	591.6	596.8	591.6	591.6	586.5	586.5	581.3	576.1	570.9	565.7	555.3
5°	659.1	659.1	653.9	643.5	638.4	633.2	622.8	607.2	596.8	581.3	565.7
7.5°	690.3	690.3	685.1	674.7	664.3	659.1	643.5	622.8	607.2	586.5	565.7
10°	731.8	737.0	726.6	716.2	705.8	700.6	679.9	653.9	628.0	602.0	570.9
12.5°	778.5	783.7	778.5	762.9	747.3	742.2	721.4	690.3	659.1	622.8	586.5
15°	840.8	851.1	835.6	825.2	809.6	804.4	778.5	742.2	705.8	659.1	612.4
17.5°	913.4	918.6	908.2	892.7	882.3	877.1	851.1	809.6	757.7	705.8	648.7
20°	996.5	1001.6	996.5	975.7	965.3	960.1	934.2	887.5	825.2	768.1	695.4
22.5°	1095.1	1105.4	1089.9	1074.3	1063.9	1063.9	1032.8	980.9	908.2	835.6	752.5
25°	1209.2	1224.8	1204.0	1193.7	1183.3	1178.1	1152.2	1089.9	1006.8	918.6	814.8
27.5°	1349.4	1359.7	1344.2	1339.0	1318.2	1318.2	1276.7	1204.0	1115.8	1012.0	892.7
30°	1473.9	1484.3	1473.9	1473.9	1458.4	1453.2	1411.6	1339.0	1230.0	1105.4	960.1
32.5°	1593.3	1603.7	1598.5	1603.7	1598.5	1593.3	1541.4	1463.5	1354.6	1193.7	1027.6
35°	1712.7	1728.2	1723.0	1738.6	1733.4	1728.2	1686.7	1593.3	1463.5	1302.7	1100.3
37.5°	1837.2	1852.8	1852.8	1868.4	1873.5	1873.5	1826.8	1728.2	1582.9	1401.3	1183.3
40°	1972.2	1987.7	1987.7	2013.7	2024.0	2024.0	1972.2	1873.5	1712.7	1510.3	1271.5
42.5°	2101.9	2117.5	2122.7	2148.6	2164.2	2169.4	2127.8	2013.7	1826.8	1619.2	1354.6
45°	2226.5	2242.0	2257.6	2309.5	2335.4	2330.3	2299.1	2179.7	1972.2	1733.4	1442.8
47.5°	2345.8	2366.6	2392.5	2460.0	2496.3	2491.1	2470.4	2335.4	2107.1	1842.4	1520.6
50°	2439.2	2454.8	2506.7	2579.4	2626.1	2631.3	2600.1	2470.4	2221.3	1925.4	1577.7
52.5°	2511.9	2532.7	2594.9	2698.7	2735.1	2750.6	2714.3	2584.6	2335.4	1998.1	1624.4
55°	2563.8	2563.8	2657.2	2776.6	2828.5	2838.9	2838.9	2678.0	2402.9	2044.8	1650.4
57.5°	2537.8	2537.8	2641.6	2771.4	2854.4	2849.2	2838.9	2683.2	2413.3	2034.4	1634.8
60°	2465.2	2480.8	2579.4	2709.1	2792.1	2787.0	2755.8	2615.7	2361.4	1992.9	1603.7
62.5°	2366.6	2392.5	2496.3	2594.9	2688.4	2703.9	2662.4	2537.8	2273.2	1930.6	1546.6
65°	2179.7	2216.1	2345.8	2454.8	2527.5	2558.6	2506.7	2392.5	2153.8	1811.3	1427.2
67.5°	1972.2	1998.1	2107.1	2262.8	2304.3	2335.4	2309.5	2190.1	1987.7	1619.2	1292.3
70°	1733.4	1774.9	1847.6	2003.3	2050.0	2081.1	2081.1	1961.8	1769.7	1422.0	1131.4
72.5°	1453.2	1499.9	1588.1	1702.3	1764.6	1785.3	1780.1	1681.5	1510.3	1204.0	954.9
75°	1147.0	1183.3	1287.1	1370.1	1437.6	1453.2	1448.0	1364.9	1209.2	970.5	757.7
77.5°	845.9	882.3	960.1	1022.4	1084.7	1074.3	1074.3	1012.0	913.4	721.4	576.1
80°	555.3	586.5	653.9	674.7	742.2	737.0	737.0	690.3	622.8	482.7	384.1
82.5°	306.2	332.2	378.9	399.6	441.1	430.8	435.9	404.8	363.3	269.9	218.0
85°	109.0	129.7	155.7	171.3	192.0	192.0	192.0	166.1	155.7	103.8	88.2
87.5°	5.2	10.4	20.8	20.8	31.1	31.1	31.1	20.8	20.8	5.2	5.2
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°	555.3	555.3	555.3	555.3	555.3	555.3	555.3	555.3	555.3	555.3	555.3
2.5°	550.1	544.9	539.7	529.4	524.2	519.0	513.8	508.6	508.6	508.6	508.6
5°	555.3	550.1	534.6	519.0	503.4	487.8	477.5	472.3	467.1	461.9	461.9
7.5°	555.3	544.9	524.2	503.4	487.8	467.1	451.5	435.9	425.6	420.4	420.4
10°	560.5	544.9	519.0	498.2	472.3	446.3	425.6	404.8	394.4	384.1	384.1
12.5°	570.9	555.3	519.0	493.0	461.9	430.8	404.8	384.1	368.5	358.1	358.1
15°	591.6	570.9	529.4	493.0	456.7	420.4	394.4	368.5	352.9	342.5	342.5
17.5°	622.8	596.8	544.9	493.0	451.5	415.2	384.1	358.1	337.3	327.0	327.0
20°	659.1	628.0	565.7	503.4	451.5	410.0	378.9	347.7	327.0	316.6	316.6
22.5°	711.0	664.3	591.6	519.0	461.9	415.2	373.7	342.5	321.8	311.4	311.4
25°	768.1	716.2	622.8	539.7	472.3	415.2	373.7	342.5	321.8	311.4	306.2
27.5°	830.4	773.3	659.1	560.5	482.7	425.6	378.9	342.5	321.8	311.4	311.4
30°	887.5	820.0	695.4	586.5	498.2	430.8	384.1	347.7	321.8	311.4	311.4
32.5°	949.7	871.9	731.8	612.4	513.8	441.1	389.2	352.9	327.0	316.6	311.4
35°	1012.0	923.8	768.1	633.2	529.4	451.5	394.4	358.1	332.2	321.8	321.8
37.5°	1079.5	980.9	804.4	659.1	544.9	461.9	404.8	363.3	337.3	327.0	327.0
40°	1152.2	1038.0	840.8	679.9	560.5	472.3	415.2	373.7	347.7	337.3	337.3
42.5°	1224.8	1100.3	882.3	705.8	576.1	482.7	420.4	384.1	358.1	347.7	347.7
45°	1297.5	1152.2	918.6	731.8	591.6	498.2	435.9	394.4	368.5	358.1	358.1
47.5°	1364.9	1209.2	949.7	747.3	607.2	508.6	441.1	404.8	378.9	373.7	368.5
50°	1411.6	1245.6	970.5	762.9	612.4	513.8	451.5	410.0	389.2	378.9	378.9
52.5°	1448.0	1281.9	986.1	773.3	617.6	519.0	456.7	420.4	399.6	389.2	384.1
55°	1468.7	1287.1	986.1	762.9	612.4	519.0	456.7	420.4	399.6	389.2	389.2
57.5°	1448.0	1261.1	965.3	742.2	596.8	503.4	441.1	410.0	389.2	384.1	378.9
60°	1406.5	1219.6	923.8	711.0	570.9	477.5	420.4	394.4	378.9	373.7	368.5
62.5°	1349.4	1167.7	882.3	669.5	534.6	446.3	404.8	373.7	363.3	358.1	352.9
65°	1235.2	1069.1	814.8	617.6	487.8	410.0	368.5	347.7	337.3	327.0	321.8
67.5°	1110.6	960.1	721.4	555.3	430.8	368.5	332.2	311.4	295.8	295.8	290.6
70°	975.7	845.9	622.8	472.3	373.7	321.8	285.4	269.9	259.5	259.5	254.3
72.5°	814.8	711.0	519.0	384.1	306.2	264.7	238.7	223.2	218.0	218.0	212.8
75°	653.9	560.5	410.0	301.0	238.7	207.6	186.8	176.5	171.3	171.3	166.1
77.5°	482.7	410.0	295.8	218.0	171.3	150.5	134.9	129.7	124.6	124.6	119.4
80°	321.8	269.9	192.0	140.1	103.8	93.4	83.0	83.0	77.8	83.0	77.8
82.5°	176.5	145.3	103.8	72.7	51.9	46.7	41.5	41.5	46.7	46.7	41.5
85°	67.5	51.9	36.3	20.8	15.6	15.6	15.6	15.6	15.6	15.6	10.4
87.5°	5.2	5.2	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: P834035
 CATALOG NUMBER: TTN-D3-830-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

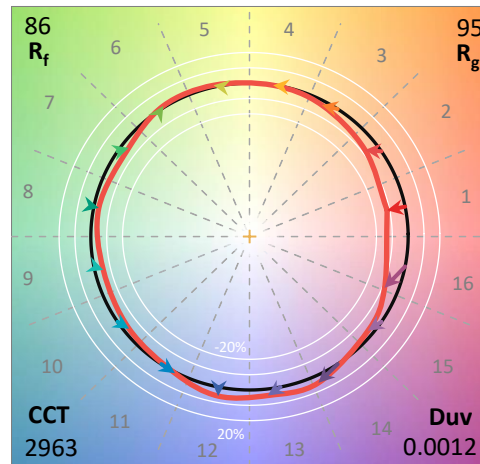
Test Information

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
 R_f: 86.1
 R_g: 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

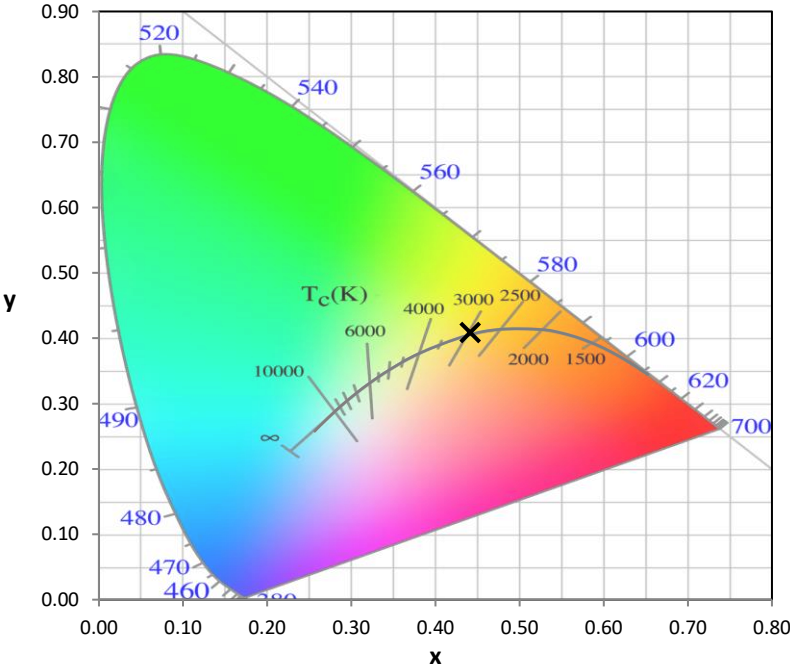
Stabilization Time: 37M
 Operation Time: 1H 37M
 Sphere Temperature (°C): 25.0

REPORT NUMBER: SP1-2411-284-4

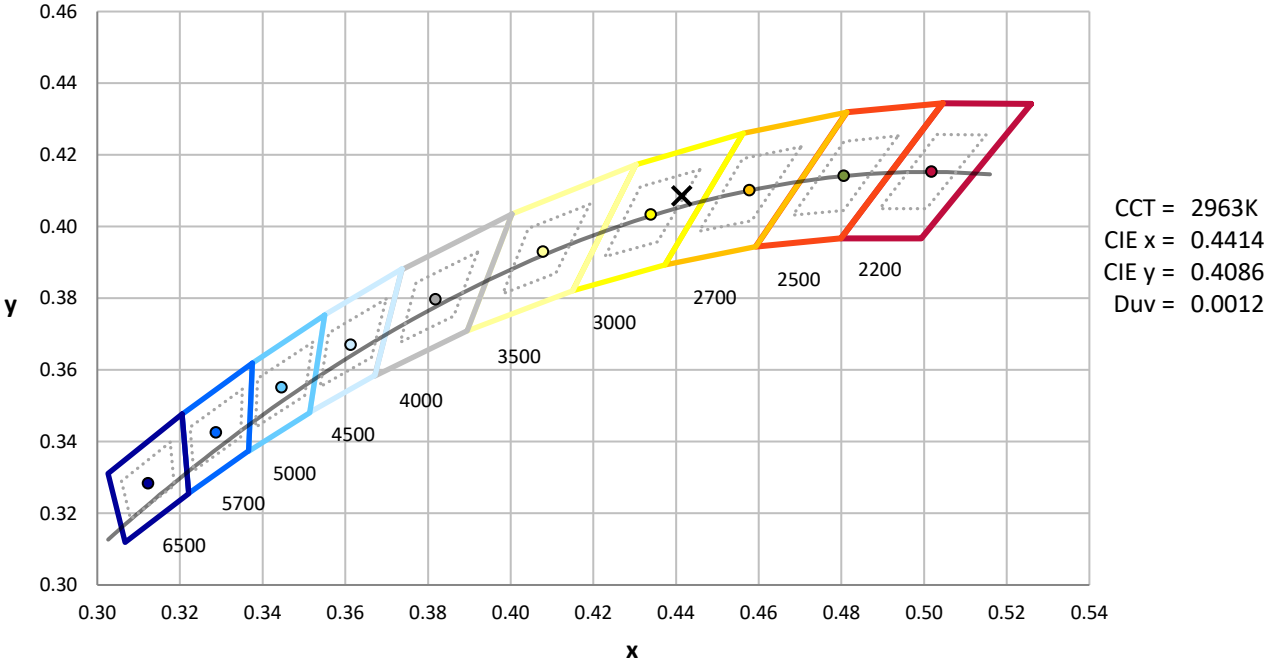
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	6/18/2024	12/18/2024
Power Meter	INXT2011004	2/8/2024	2/8/2025
AC Power Source	IN0063	10/22/2024	10/22/2025
DC Power Source	IN0208	10/22/2024	10/22/2025
Sphere Thermometer	IN0085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

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CIE 1931 Chromaticity Diagram



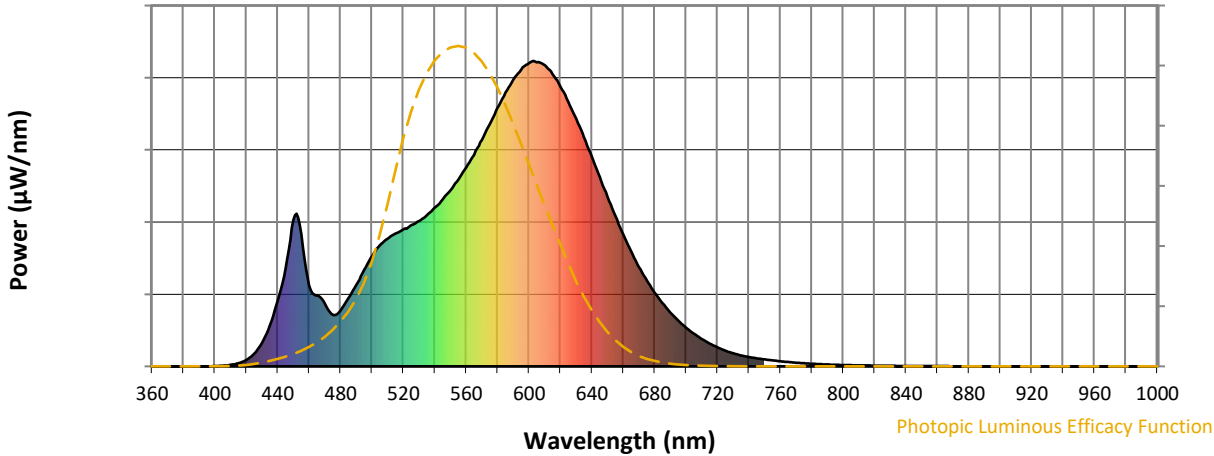
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-2411-284-4

Photopic Flux vs. Wavelength

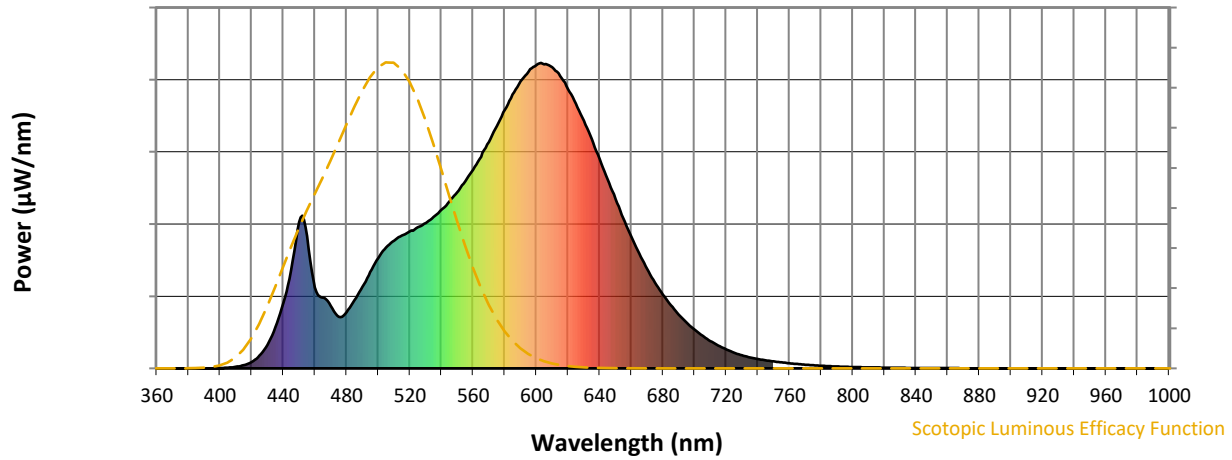


Photopic Lumens: NR

λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /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			

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Scotopic Flux vs. Wavelength



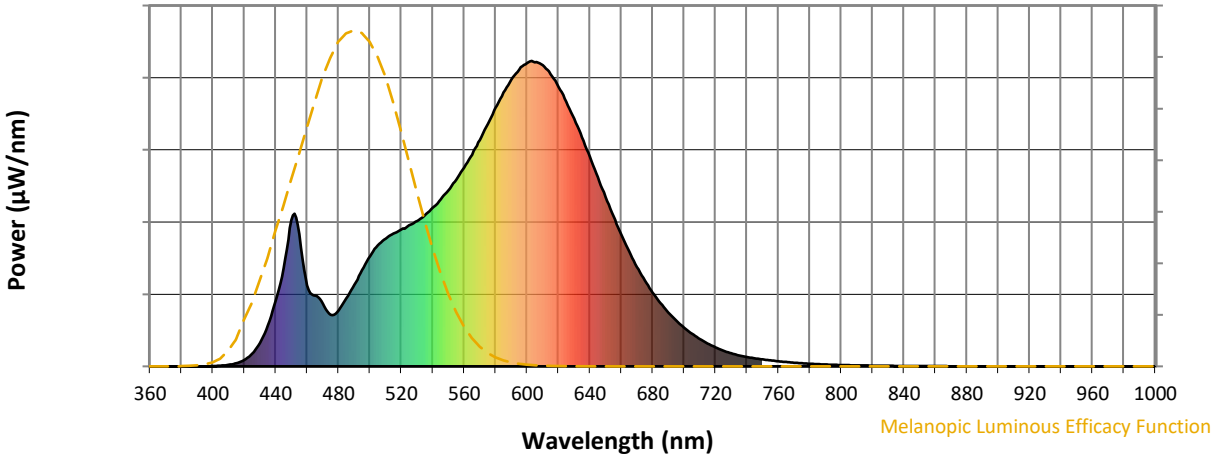
Scotopic Lumens: NR

S/P: 1.34

λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /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



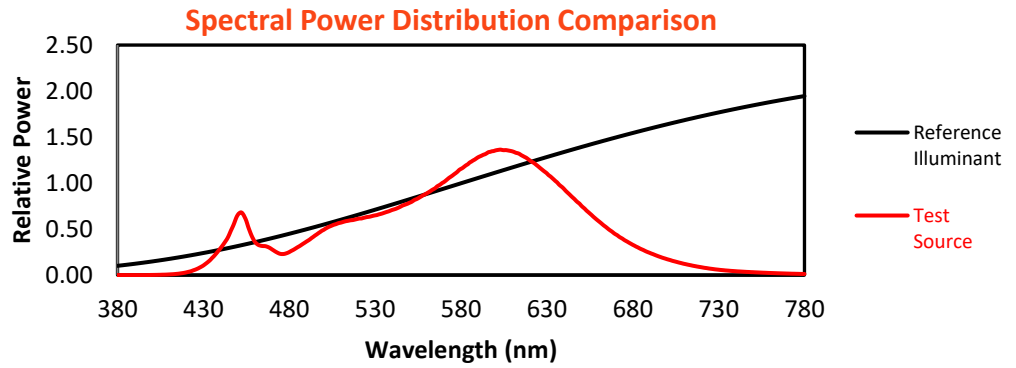
Melanopic Lumens: NR

M/P: 2.58

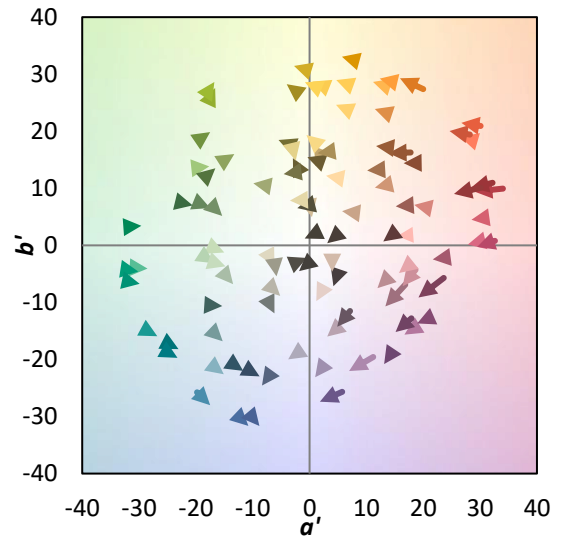
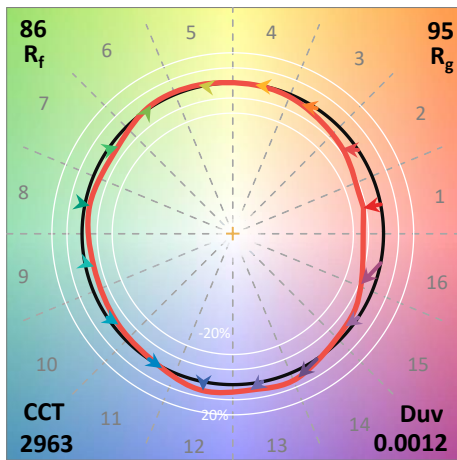
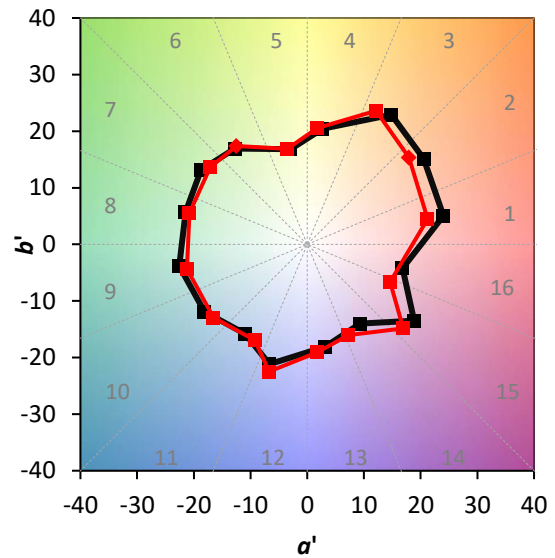
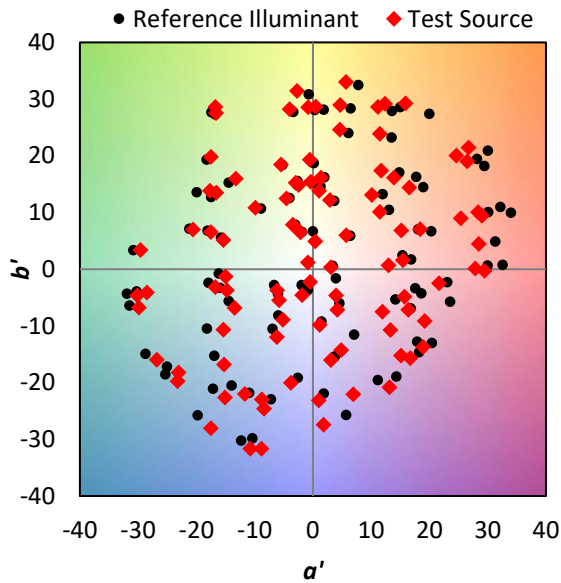
λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)
360	0	NR	490	267	NR	620	915	NR	750	23	NR	880	0	NR
365	0	NR	495	315	NR	625	866	NR	755	20	NR	885	0	NR
370	0	NR	500	360	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 $R_a = 82.9$
 $R_9 = 3.9$

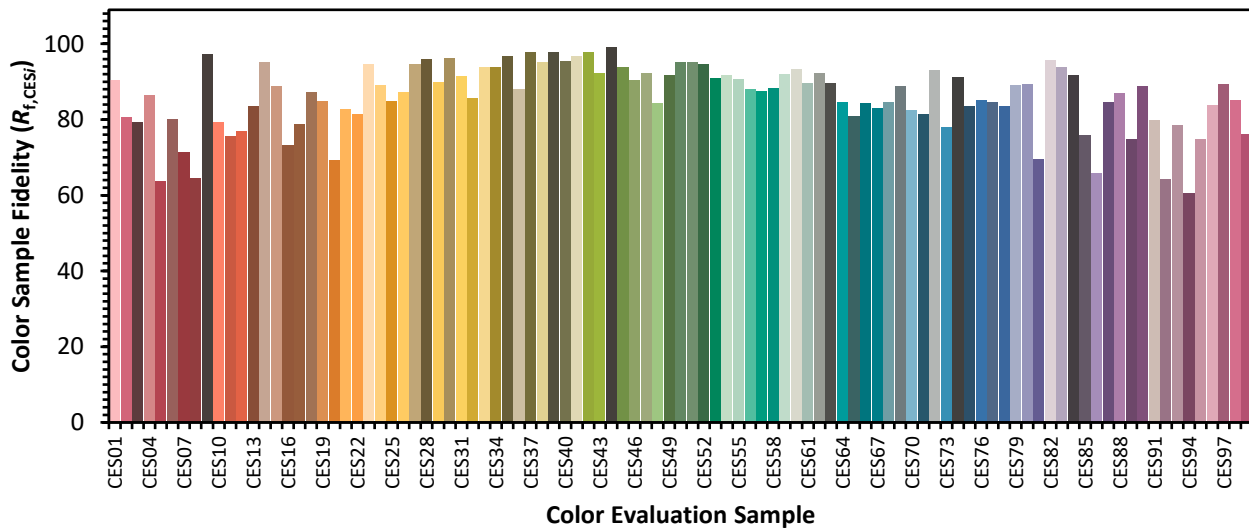


Color Vector Graphics

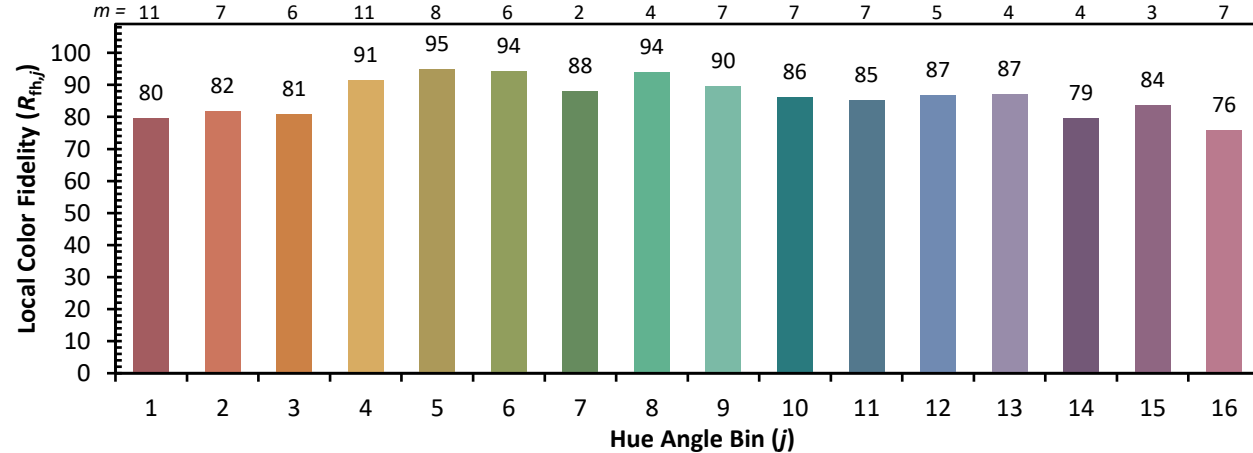
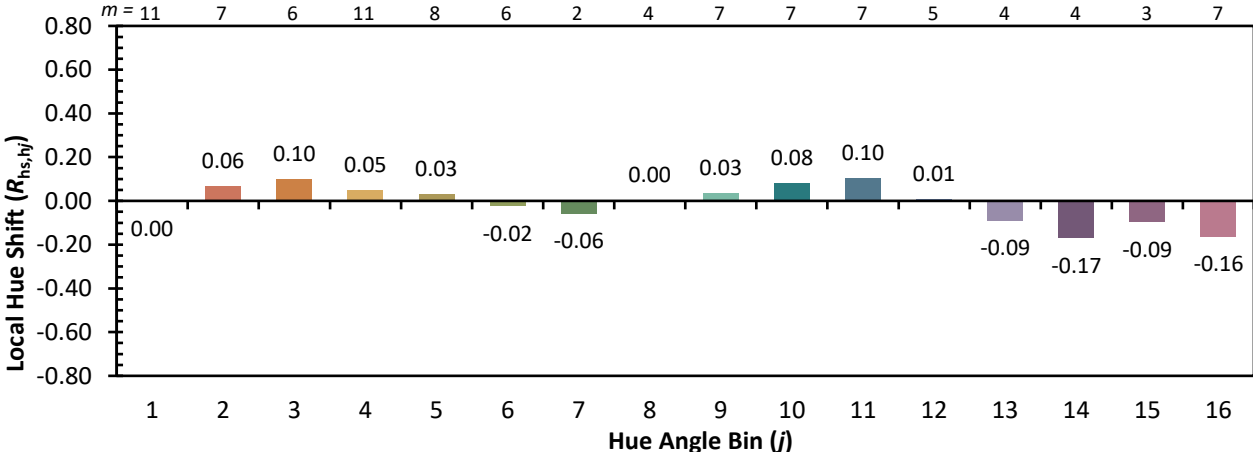
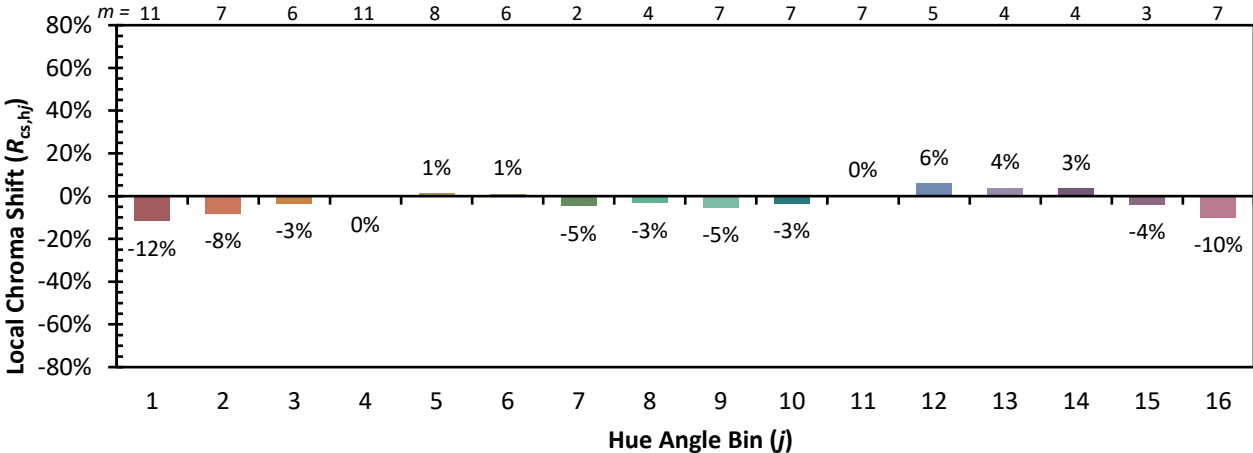


Individual Sample Fidelity Index ($R_{f,i}$)

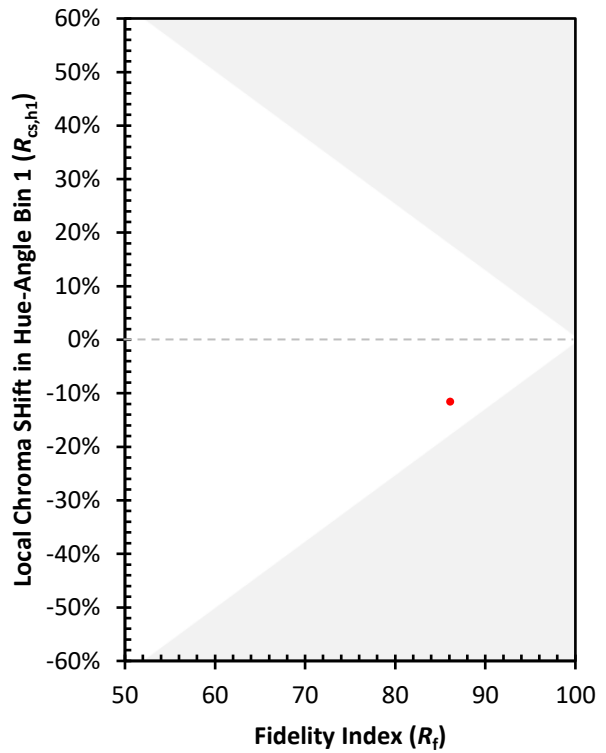
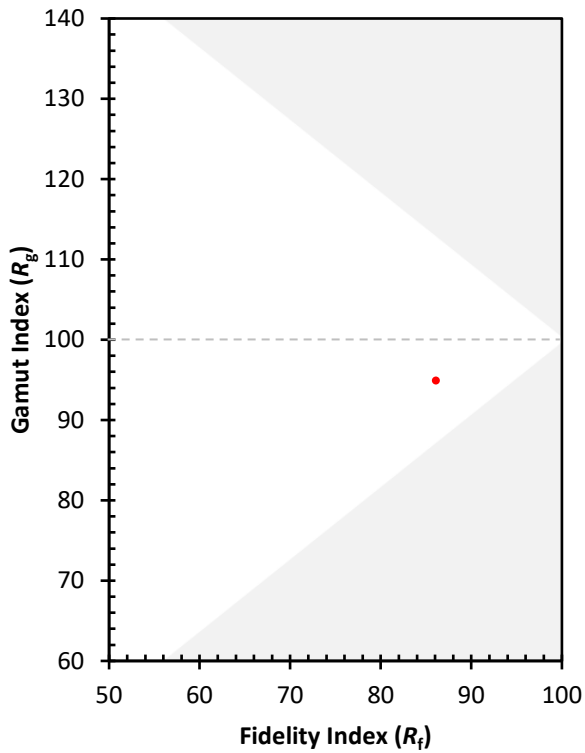
CES01 = 86	CES26 = 87	CES51 = 95	CES76 = 85
CES02 = 63	CES27 = 95	CES52 = 95	CES77 = 85
CES03 = 31	CES28 = 96	CES53 = 91	CES78 = 83
CES04 = 70	CES29 = 90	CES54 = 92	CES79 = 89
CES05 = 50	CES30 = 96	CES55 = 91	CES80 = 89
CES06 = 51	CES31 = 92	CES56 = 88	CES81 = 70
CES07 = 42	CES32 = 86	CES57 = 87	CES82 = 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)