

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: P833195

Luminaire Tested: **TTN-D1-740-U-DL-CG-UPL2**

Issue Date: 5/15/2024

**Test Information**

Test Method: LM-79-08  
Report Number: P833195  
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-D1-740-U-DL-CG-UPL2  
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**

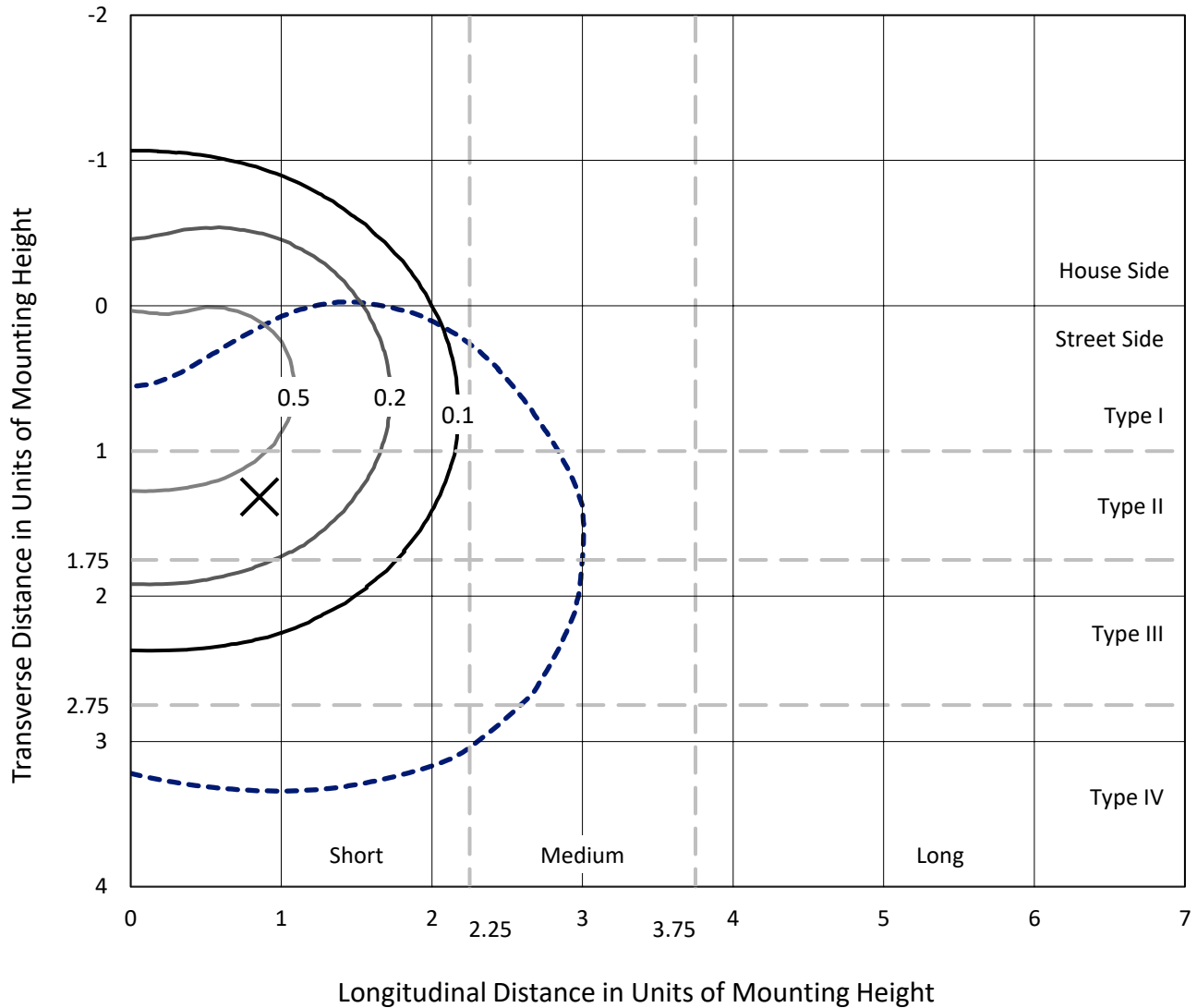
Lumens per Lamp: N/A  
Luminaire Lumens: 3744.7 lumens  
Efficiency: N/A  
Efficacy: 121.2 lumens/watt  
Luminous Opening: Vertical Cylinder (Dia: 0.71' x H: 0.1')  
IES Classification: Type IV - Short  
BUG Rating: B1 - U4 - G1  
  
Input Watts (W): 30.9  
Input Voltage (V): NR  
Input Current (Ain): 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

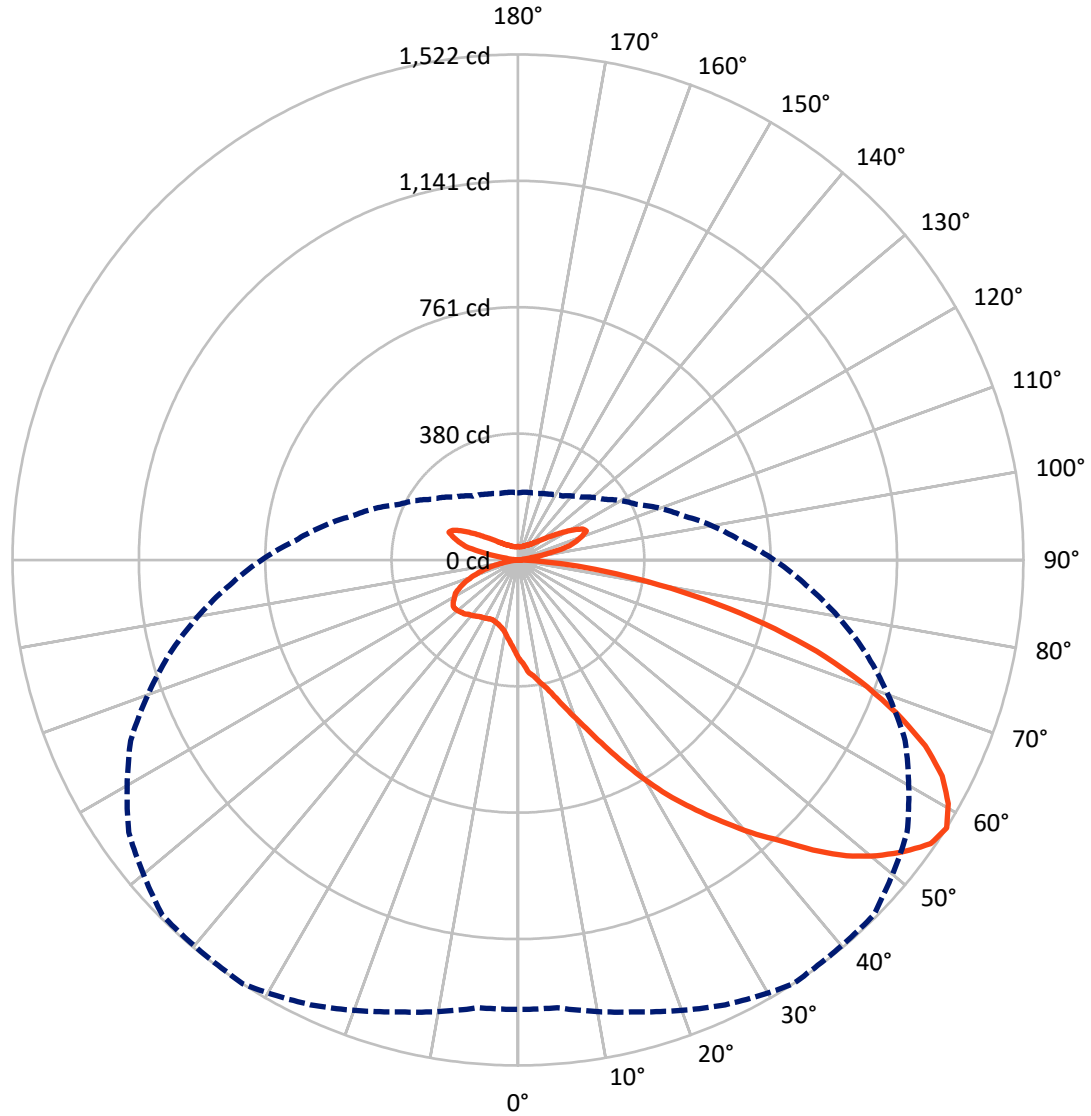
× Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 0.8 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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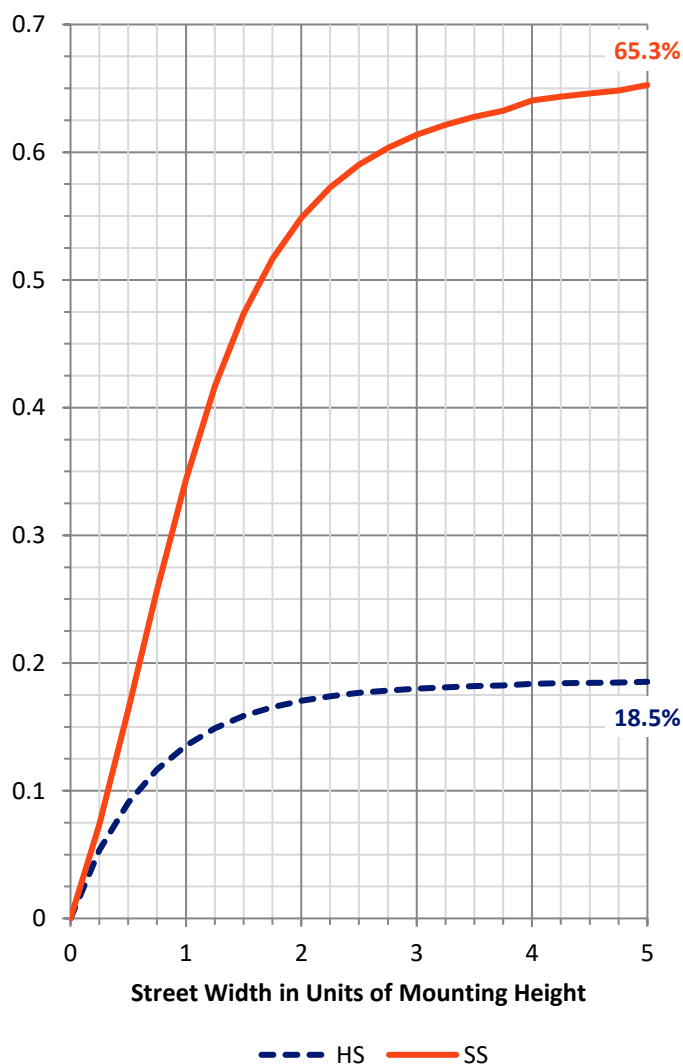
**FLUX DISTRIBUTION:**

		Downward	Upward	Total
<b>House Side</b>	Lumens	697.5	292.5	989.9
	% Fixture	18.6	7.8	26.4
<b>Street Side</b>	Lumens	2462.3	292.5	2754.8
	% Fixture	65.8	7.8	73.6
<b>Total</b>	Lumens	3159.8	584.9	3744.7
	% Fixture	84.4	15.6	100.0

**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	28.3	0.8
10°-20°	91.9	2.5
20°-30°	193.7	5.2
30°-40°	351.8	9.4
40°-50°	555.9	14.8
50°-60°	738.2	19.7
60°-70°	710.5	19.0
70°-80°	417.1	11.1
80°-90°	72.4	1.9
90°-100°	13.1	0.3
100°-110°	132.7	3.5
110°-120°	194.0	5.2
120°-130°	112.6	3.0
130°-140°	59.7	1.6
140°-150°	35.4	0.9
150°-160°	21.8	0.6
160°-170°	11.9	0.3
170°-180°	3.9	0.1
0°-90°	3159.8	84.4
0°-180°	3744.7	100.0

**Coefficient of Utilization**

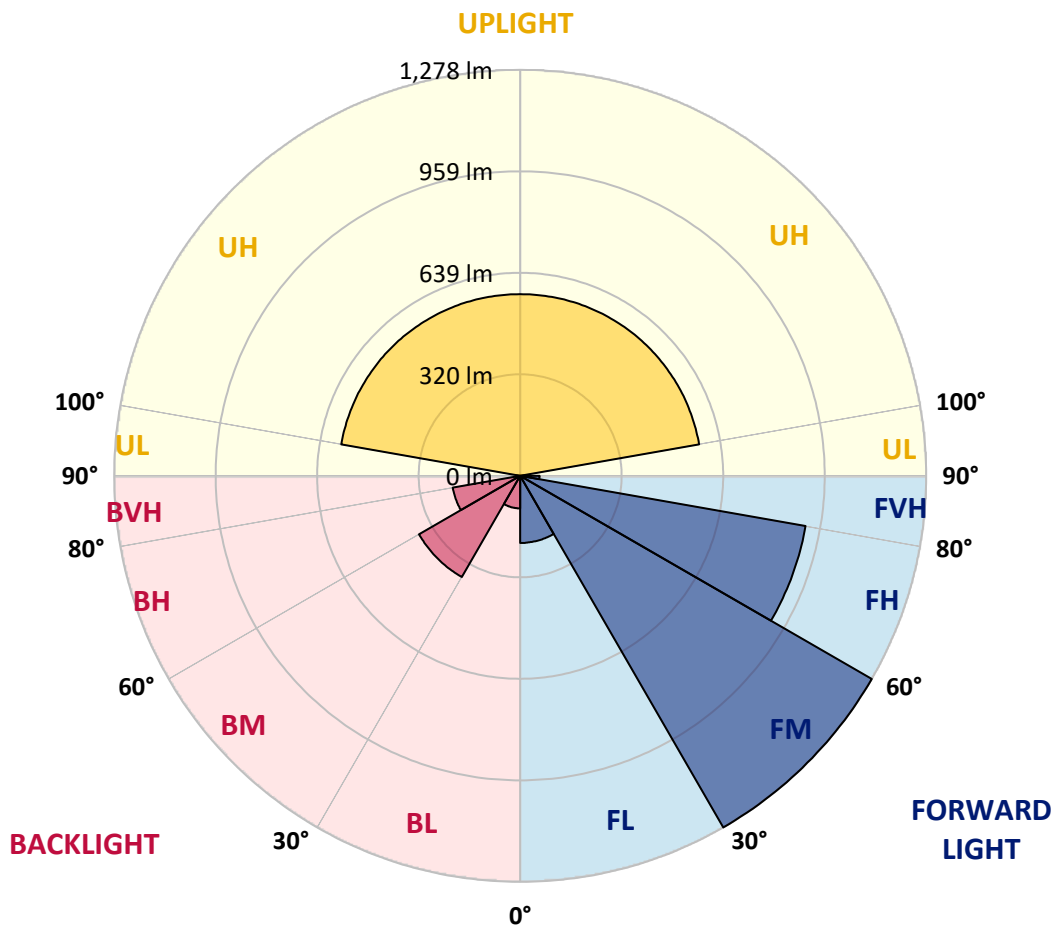


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

Zone	Lumens	% Fixture	Zone Rating/Lumen Limit		
			B	U	G
FL (0°-30°)	211.3	5.6			
FM (30°-60°)	1278.0	34.1			
FH (60°-80°)	912.1	24.4			G1/1800
FVH (80°-90°)	60.9	1.6			G1/100
BL (0°-30°)	102.6	2.7	B0/110		
BM (30°-60°)	367.8	9.8	B1/1000		
BH (60°-80°)	215.6	5.8	B1/500		G1/500
BVH (80°-90°)	11.5	0.3			G1/100
UL (90°-100°)	13.1	0.3		U2/50	
UH (100°-180°)	571.8	15.3		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°	296.1	296.1	296.1	296.1	296.1	296.1	296.1	296.1	296.1	296.1	296.1
2.5°	315.4	318.2	315.4	315.4	312.7	312.7	309.9	307.1	304.4	301.6	296.1
5°	351.4	351.4	348.6	343.1	340.3	337.6	332.0	323.7	318.2	309.9	301.6
7.5°	368.0	368.0	365.3	359.7	354.2	351.4	343.1	332.0	323.7	312.7	301.6
10°	390.2	392.9	387.4	381.9	376.3	373.6	362.5	348.6	334.8	321.0	304.4
12.5°	415.1	417.8	415.1	406.8	398.5	395.7	384.6	368.0	351.4	332.0	312.7
15°	448.3	453.8	445.5	440.0	431.7	428.9	415.1	395.7	376.3	351.4	326.5
17.5°	487.0	489.8	484.2	475.9	470.4	467.6	453.8	431.7	404.0	376.3	345.9
20°	531.3	534.0	531.3	520.2	514.7	511.9	498.1	473.2	440.0	409.5	370.8
22.5°	583.8	589.4	581.1	572.8	567.2	567.2	550.6	523.0	484.2	445.5	401.2
25°	644.7	653.0	642.0	636.4	630.9	628.1	614.3	581.1	536.8	489.8	434.4
27.5°	719.4	725.0	716.7	713.9	702.8	702.8	680.7	642.0	594.9	539.6	475.9
30°	785.8	791.4	785.8	785.8	777.5	774.8	752.6	713.9	655.8	589.4	511.9
32.5°	849.5	855.0	852.3	855.0	852.3	849.5	821.8	780.3	722.2	636.4	547.9
35°	913.1	921.4	918.7	927.0	924.2	921.4	899.3	849.5	780.3	694.5	586.6
37.5°	979.5	987.8	987.8	996.1	998.9	998.9	974.0	921.4	844.0	747.1	630.9
40°	1051.5	1059.8	1059.8	1073.6	1079.2	1079.2	1051.5	998.9	913.1	805.2	677.9
42.5°	1120.7	1129.0	1131.7	1145.6	1153.9	1156.6	1134.5	1073.6	974.0	863.3	722.2
45°	1187.1	1195.4	1203.7	1231.3	1245.2	1242.4	1225.8	1162.2	1051.5	924.2	769.2
47.5°	1250.7	1261.8	1275.6	1311.6	1331.0	1328.2	1317.1	1245.2	1123.4	982.3	810.7
50°	1300.5	1308.8	1336.5	1375.2	1400.1	1402.9	1386.3	1317.1	1184.3	1026.6	841.2
52.5°	1339.3	1350.3	1383.5	1438.9	1458.2	1466.5	1447.2	1378.0	1245.2	1065.3	866.1
55°	1366.9	1366.9	1416.7	1480.4	1508.0	1513.6	1513.6	1427.8	1281.1	1090.2	879.9
57.5°	1353.1	1353.1	1408.4	1477.6	1521.9	1519.1	1513.6	1430.6	1286.7	1084.7	871.6
60°	1314.4	1322.7	1375.2	1444.4	1488.7	1485.9	1469.3	1394.6	1259.0	1062.5	855.0
62.5°	1261.8	1275.6	1331.0	1383.5	1433.3	1441.6	1419.5	1353.1	1212.0	1029.3	824.6
65°	1162.2	1181.5	1250.7	1308.8	1347.6	1364.2	1336.5	1275.6	1148.3	965.7	760.9
67.5°	1051.5	1065.3	1123.4	1206.4	1228.6	1245.2	1231.3	1167.7	1059.8	863.3	689.0
70°	924.2	946.3	985.1	1068.1	1093.0	1109.6	1109.6	1045.9	943.6	758.2	603.2
72.5°	774.8	799.7	846.7	907.6	940.8	951.9	949.1	896.5	805.2	642.0	509.1
75°	611.5	630.9	686.2	730.5	766.5	774.8	772.0	727.7	644.7	517.4	404.0
77.5°	451.0	470.4	511.9	545.1	578.3	572.8	572.8	539.6	487.0	384.6	307.1
80°	296.1	312.7	348.6	359.7	395.7	392.9	392.9	368.0	332.0	257.3	204.8
82.5°	163.3	177.1	202.0	213.1	235.2	229.7	232.4	215.8	193.7	143.9	116.2
85°	58.1	69.2	83.0	91.3	102.4	102.4	102.4	88.5	83.0	55.3	47.0
87.5°	2.8	5.5	11.1	11.1	16.6	16.6	16.6	11.1	11.1	2.8	2.8
90°	5.0	5.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.0
92.5°	5.0	5.0	5.0	7.0	7.8	8.0	7.0	8.0	6.0	6.0	5.0
95°	6.0	6.0	7.0	9.0	10.6	11.0	12.0	12.0	7.0	7.0	6.0
97.5°	8.0	9.0	9.0	11.0	16.6	18.0	33.0	20.0	10.0	10.0	9.0
100°	13.0	14.0	14.0	25.0	47.4	53.0	71.1	51.0	26.0	19.0	14.0
102.5°	42.0	44.0	54.0	81.1	112.3	120.1	109.1	92.1	87.1	60.0	48.0
105°	107.1	106.1	114.1	135.1	161.5	168.1	165.1	152.1	138.1	119.1	110.1
107.5°	141.1	141.1	148.1	166.1	186.1	191.1	223.2	226.2	179.1	157.1	147.1
110°	159.1	159.1	165.1	180.1	206.6	213.2	258.2	256.2	221.2	194.1	181.1



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**CANDELA DISTRIBUTION (continued):**

	0°	5°	15°	25°	33°	35°	45°	55°	65°	75°	85°
112.5°	163.1	164.1	172.1	195.1	224.0	231.2	251.2	242.2	228.2	216.2	206.2
115°	169.1	169.1	178.1	200.2	216.2	220.2	228.2	218.2	207.2	199.2	195.1
117.5°	167.1	170.1	172.1	184.1	194.5	197.1	203.2	198.1	183.1	177.1	175.1
120°	155.1	155.1	157.1	163.1	168.7	170.1	173.1	171.1	161.1	156.1	155.1
122.5°	138.1	139.1	138.1	141.1	145.1	146.1	149.1	147.1	139.1	137.1	137.1
125°	121.1	121.1	120.1	122.1	124.5	125.1	124.1	125.1	121.1	120.1	120.1
127.5°	109.1	108.1	106.1	107.1	107.9	108.1	108.1	109.1	105.1	106.1	107.1
130°	97.1	97.1	95.1	95.1	95.1	95.1	93.1	95.1	93.1	94.1	95.1
132.5°	86.1	86.1	83.1	82.1	82.1	82.1	82.1	83.1	82.1	84.1	86.1
135°	77.1	77.1	74.1	75.1	75.1	75.1	74.1	75.1	74.1	76.1	77.1
137.5°	70.1	70.1	68.1	68.1	68.1	68.1	67.1	68.1	68.1	69.1	71.1
140°	64.0	64.0	63.0	63.0	62.2	62.0	63.0	63.0	63.0	64.0	65.0
142.5°	61.0	60.0	59.0	58.0	58.8	59.0	59.0	59.0	58.0	59.0	61.0
145°	56.0	56.0	55.0	55.0	55.0	55.0	56.0	55.0	55.0	56.0	56.0
147.5°	53.0	53.0	52.0	53.0	53.0	53.0	53.0	53.0	52.0	53.0	53.0
150°	52.0	51.0	50.0	51.0	51.0	51.0	50.0	50.0	50.0	50.0	51.0
152.5°	49.0	49.0	48.0	49.0	48.2	48.0	48.0	48.0	48.0	48.0	49.0
155°	47.0	47.0	46.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0
157.5°	45.0	46.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	46.0
160°	44.0	44.0	44.0	44.0	43.2	43.0	43.0	43.0	44.0	44.0	44.0
162.5°	43.0	43.0	43.0	43.0	42.2	42.0	42.0	42.0	42.0	43.0	43.0
165°	43.0	42.0	42.0	42.0	41.2	41.0	41.0	41.0	41.0	42.0	43.0
167.5°	41.0	41.0	41.0	41.0	41.0	41.0	40.0	40.0	41.0	41.0	41.0
170°	41.0	41.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
172.5°	41.0	41.0	41.0	41.0	40.2	40.0	40.0	40.0	40.0	40.0	41.0
175°	41.0	41.0	41.0	41.0	40.2	40.0	40.0	40.0	41.0	41.0	41.0
177.5°	41.0	41.0	41.0	41.0	40.2	40.0	41.0	41.0	41.0	41.0	41.0
180°	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0





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**CANDELA DISTRIBUTION (continued):**

	90°	95°	105°	115°	125°	135°	145°	155°	165°	175°	180°
0°	296.1	296.1	296.1	296.1	296.1	296.1	296.1	296.1	296.1	296.1	296.1
2.5°	293.3	290.5	287.8	282.2	279.5	276.7	273.9	271.2	271.2	271.2	271.2
5°	296.1	293.3	285.0	276.7	268.4	260.1	254.6	251.8	249.0	246.3	246.3
7.5°	296.1	290.5	279.5	268.4	260.1	249.0	240.7	232.4	226.9	224.1	224.1
10°	298.8	290.5	276.7	265.6	251.8	238.0	226.9	215.8	210.3	204.8	204.8
12.5°	304.4	296.1	276.7	262.9	246.3	229.7	215.8	204.8	196.5	190.9	190.9
15°	315.4	304.4	282.2	262.9	243.5	224.1	210.3	196.5	188.2	182.6	182.6
17.5°	332.0	318.2	290.5	262.9	240.7	221.4	204.8	190.9	179.9	174.3	174.3
20°	351.4	334.8	301.6	268.4	240.7	218.6	202.0	185.4	174.3	168.8	168.8
22.5°	379.1	354.2	315.4	276.7	246.3	221.4	199.2	182.6	171.6	166.0	166.0
25°	409.5	381.9	332.0	287.8	251.8	221.4	199.2	182.6	171.6	166.0	163.3
27.5°	442.7	412.3	351.4	298.8	257.3	226.9	202.0	182.6	171.6	166.0	166.0
30°	473.2	437.2	370.8	312.7	265.6	229.7	204.8	185.4	171.6	166.0	166.0
32.5°	506.4	464.9	390.2	326.5	273.9	235.2	207.5	188.2	174.3	168.8	166.0
35°	539.6	492.5	409.5	337.6	282.2	240.7	210.3	190.9	177.1	171.6	171.6
37.5°	575.5	523.0	428.9	351.4	290.5	246.3	215.8	193.7	179.9	174.3	174.3
40°	614.3	553.4	448.3	362.5	298.8	251.8	221.4	199.2	185.4	179.9	179.9
42.5°	653.0	586.6	470.4	376.3	307.1	257.3	224.1	204.8	190.9	185.4	185.4
45°	691.8	614.3	489.8	390.2	315.4	265.6	232.4	210.3	196.5	190.9	190.9
47.5°	727.7	644.7	506.4	398.5	323.7	271.2	235.2	215.8	202.0	199.2	196.5
50°	752.6	664.1	517.4	406.8	326.5	273.9	240.7	218.6	207.5	202.0	202.0
52.5°	772.0	683.5	525.7	412.3	329.3	276.7	243.5	224.1	213.1	207.5	204.8
55°	783.1	686.2	525.7	406.8	326.5	276.7	243.5	224.1	213.1	207.5	207.5
57.5°	772.0	672.4	514.7	395.7	318.2	268.4	235.2	218.6	207.5	204.8	202.0
60°	749.9	650.3	492.5	379.1	304.4	254.6	224.1	210.3	202.0	199.2	196.5
62.5°	719.4	622.6	470.4	357.0	285.0	238.0	215.8	199.2	193.7	190.9	188.2
65°	658.6	570.0	434.4	329.3	260.1	218.6	196.5	185.4	179.9	174.3	171.6
67.5°	592.1	511.9	384.6	296.1	229.7	196.5	177.1	166.0	157.7	157.7	155.0
70°	520.2	451.0	332.0	251.8	199.2	171.6	152.2	143.9	138.4	138.4	135.6
72.5°	434.4	379.1	276.7	204.8	163.3	141.1	127.3	119.0	116.2	116.2	113.4
75°	348.6	298.8	218.6	160.5	127.3	110.7	99.6	94.1	91.3	91.3	88.5
77.5°	257.3	218.6	157.7	116.2	91.3	80.2	71.9	69.2	66.4	66.4	63.6
80°	171.6	143.9	102.4	74.7	55.3	49.8	44.3	44.3	41.5	44.3	41.5
82.5°	94.1	77.5	55.3	38.7	27.7	24.9	22.1	22.1	24.9	24.9	22.1
85°	36.0	27.7	19.4	11.1	8.3	8.3	8.3	8.3	8.3	8.3	5.5
87.5°	2.8	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90°	5.0	5.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.0	5.0
92.5°	5.0	5.0	6.0	6.0	8.0	7.0	8.0	7.0	5.0	5.0	5.0
95°	6.0	6.0	7.0	7.0	12.0	12.0	11.0	9.0	7.0	6.0	6.0
97.5°	8.0	9.0	10.0	10.0	20.0	33.0	18.0	11.0	9.0	9.0	8.0
100°	14.0	14.0	19.0	26.0	51.0	71.1	53.0	25.0	14.0	14.0	13.0
102.5°	46.0	48.0	60.0	87.1	92.1	109.1	120.1	81.1	54.0	44.0	42.0
105°	110.1	110.1	119.1	138.1	152.1	165.1	168.1	135.1	114.1	106.1	107.1
107.5°	146.1	147.1	157.1	179.1	226.2	223.2	191.1	166.1	148.1	141.1	141.1
110°	179.1	181.1	194.1	221.2	256.2	258.2	213.2	180.1	165.1	159.1	159.1



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 CATALOG NUMBER: TTN-D1-740-U-DL-CG-UPL2

**CANDELA DISTRIBUTION (continued):**

	90°	95°	105°	115°	125°	135°	145°	155°	165°	175°	180°
112.5°	204.2	206.2	216.2	228.2	242.2	251.2	231.2	195.1	172.1	164.1	163.1
115°	197.1	195.1	199.2	207.2	218.2	228.2	220.2	200.2	178.1	169.1	169.1
117.5°	172.1	175.1	177.1	183.1	198.1	203.2	197.1	184.1	172.1	170.1	167.1
120°	153.1	155.1	156.1	161.1	171.1	173.1	170.1	163.1	157.1	155.1	155.1
122.5°	135.1	137.1	137.1	139.1	147.1	149.1	146.1	141.1	138.1	139.1	138.1
125°	119.1	120.1	120.1	121.1	125.1	124.1	125.1	122.1	120.1	121.1	121.1
127.5°	106.1	107.1	106.1	105.1	109.1	108.1	108.1	107.1	106.1	108.1	109.1
130°	96.1	95.1	94.1	93.1	95.1	93.1	95.1	95.1	95.1	97.1	97.1
132.5°	86.1	86.1	84.1	82.1	83.1	82.1	82.1	82.1	83.1	86.1	86.1
135°	77.1	77.1	76.1	74.1	75.1	74.1	75.1	75.1	74.1	77.1	77.1
137.5°	72.1	71.1	69.1	68.1	68.1	67.1	68.1	68.1	68.1	70.1	70.1
140°	65.0	65.0	64.0	63.0	63.0	63.0	62.0	63.0	63.0	64.0	64.0
142.5°	61.0	61.0	59.0	58.0	59.0	59.0	59.0	58.0	59.0	60.0	61.0
145°	57.0	56.0	56.0	55.0	55.0	56.0	55.0	55.0	55.0	56.0	56.0
147.5°	54.0	53.0	53.0	52.0	53.0	53.0	53.0	53.0	52.0	53.0	53.0
150°	51.0	51.0	50.0	50.0	50.0	50.0	51.0	51.0	50.0	51.0	52.0
152.5°	50.0	49.0	48.0	48.0	48.0	48.0	48.0	49.0	48.0	49.0	49.0
155°	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	46.0	47.0	47.0
157.5°	46.0	46.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	46.0	45.0
160°	45.0	44.0	44.0	44.0	43.0	43.0	43.0	44.0	44.0	44.0	44.0
162.5°	44.0	43.0	43.0	42.0	42.0	42.0	42.0	43.0	43.0	43.0	43.0
165°	42.0	43.0	42.0	41.0	41.0	41.0	41.0	42.0	42.0	42.0	43.0
167.5°	42.0	41.0	41.0	41.0	40.0	40.0	41.0	41.0	41.0	41.0	41.0
170°	41.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	41.0	41.0
172.5°	41.0	41.0	40.0	40.0	40.0	40.0	40.0	41.0	41.0	41.0	41.0
175°	40.0	41.0	41.0	41.0	40.0	40.0	40.0	41.0	41.0	41.0	41.0
177.5°	41.0	41.0	41.0	41.0	41.0	41.0	40.0	41.0	41.0	41.0	41.0
180°	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0

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

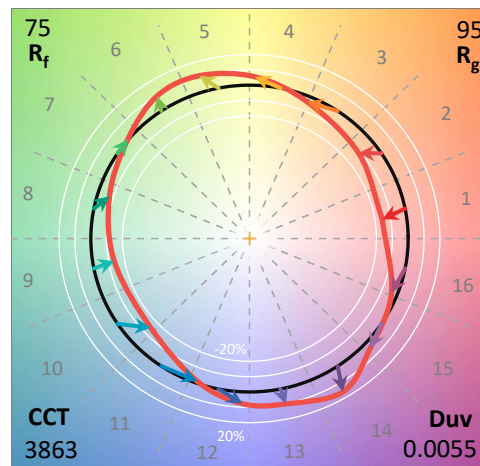
**Test Information**

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**

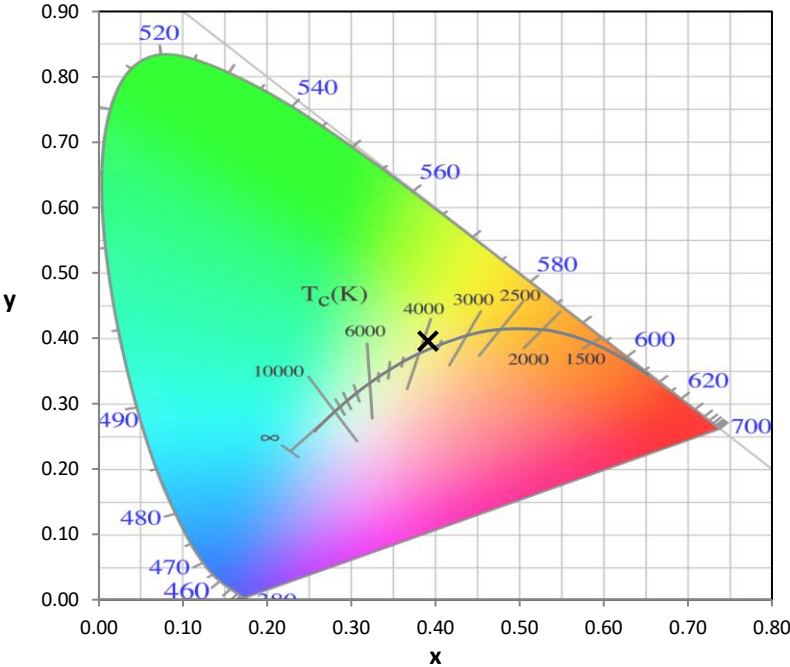
Stabilization Time: 37M  
 Operation Time: 1H 37M  
 Sphere Temperature (°C): 25.0

REPORT NUMBER: SP1-2411-284-2

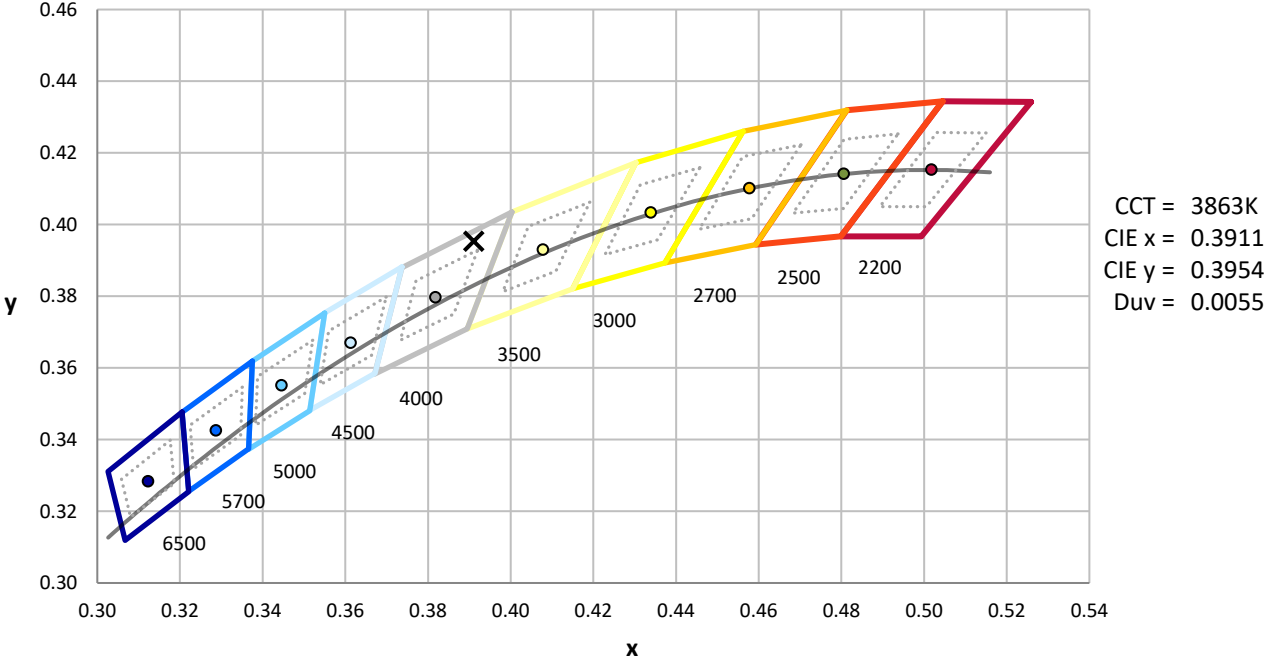
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	6/18/2024	12/18/2024
Power Meter	INXT2011004	2/8/2024	2/8/2025
AC Power Source	IN0063	10/22/2024	10/22/2025
DC Power Source	IN0208	10/22/2024	10/22/2025
Sphere Thermometer	IN0085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

REPORT NUMBER: SP1-2411-284-2

**CIE 1931 Chromaticity Diagram**



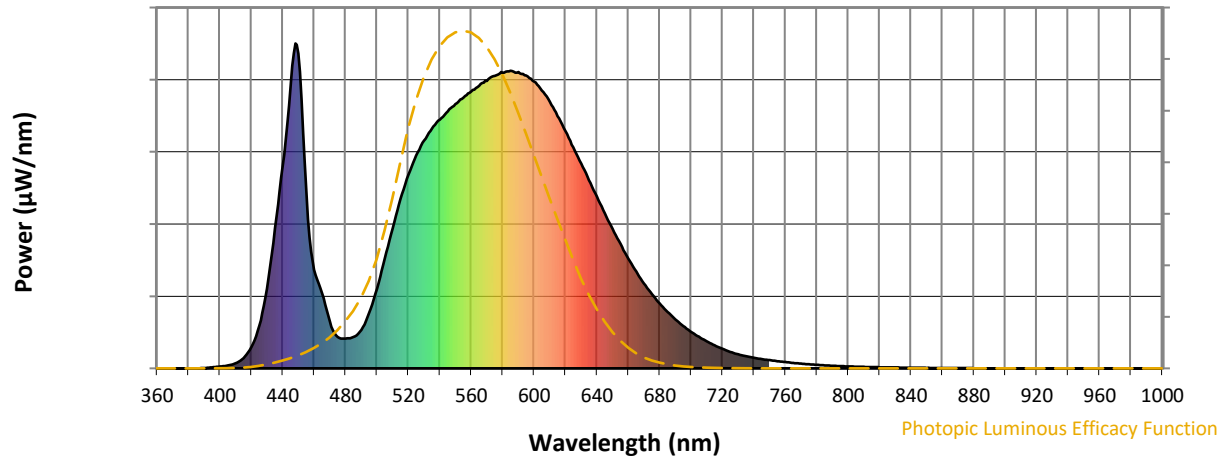
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 4000K 7-step quadrangle

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**Photopic Flux vs. Wavelength**

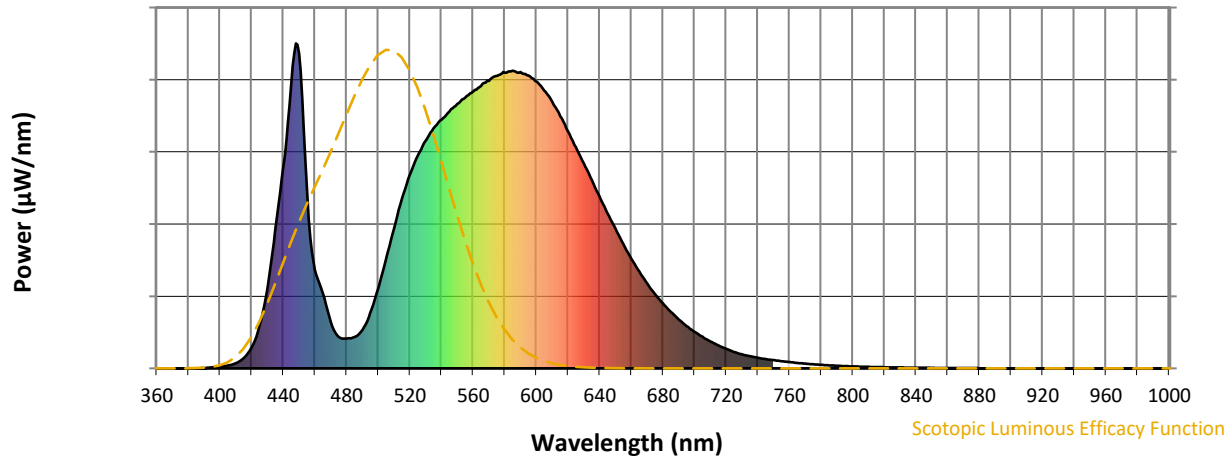


**Photopic Lumens: NR**

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**

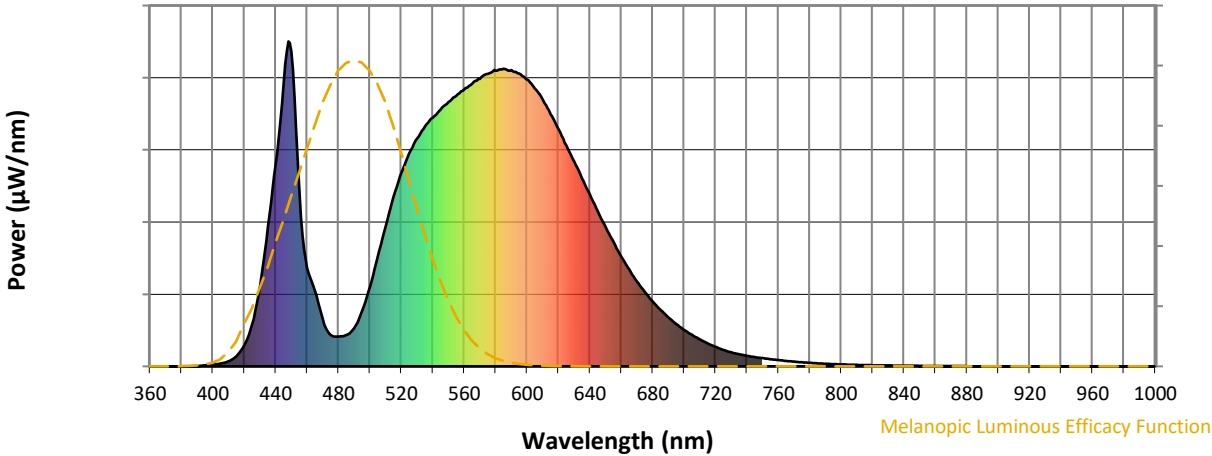
**S/P: 1.45**

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



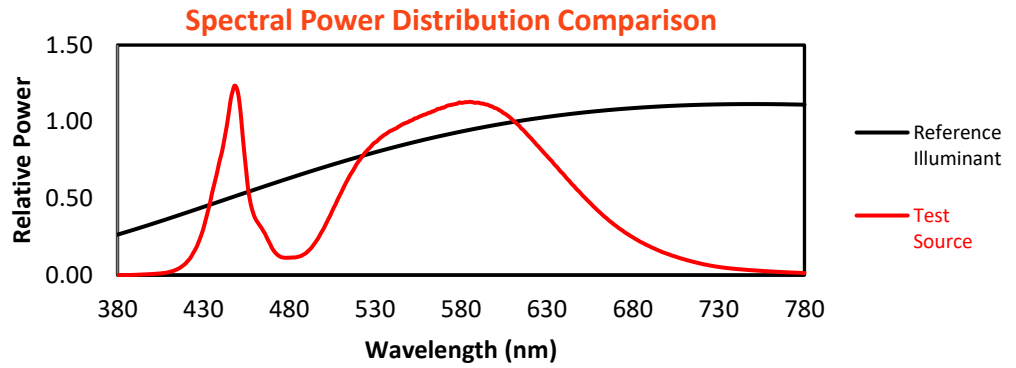
Melanopic Lumens: NR

M/P: 2.72

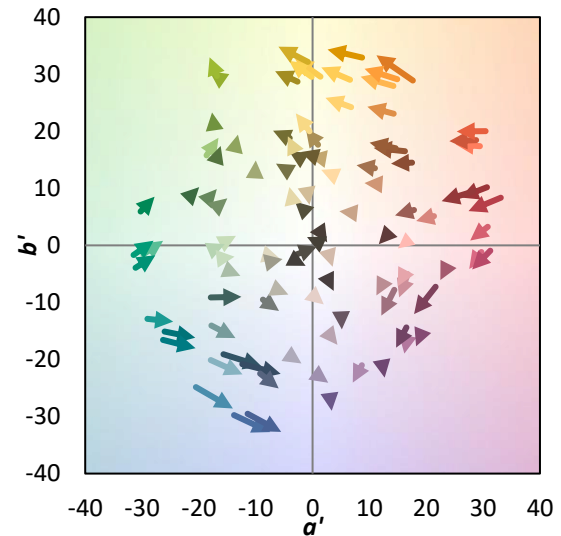
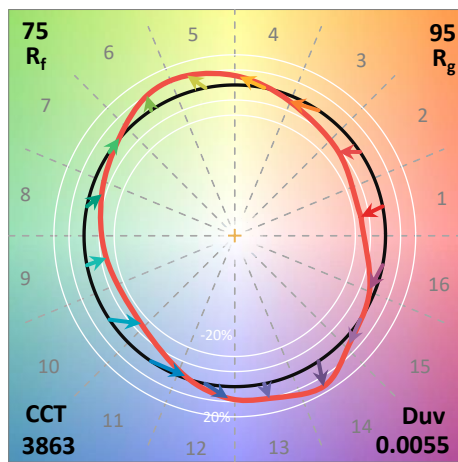
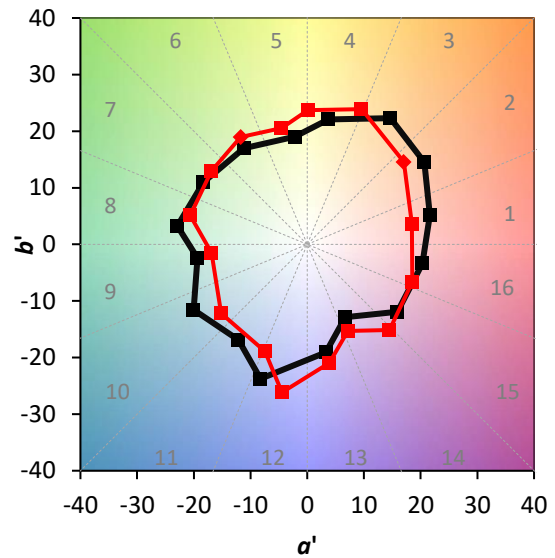
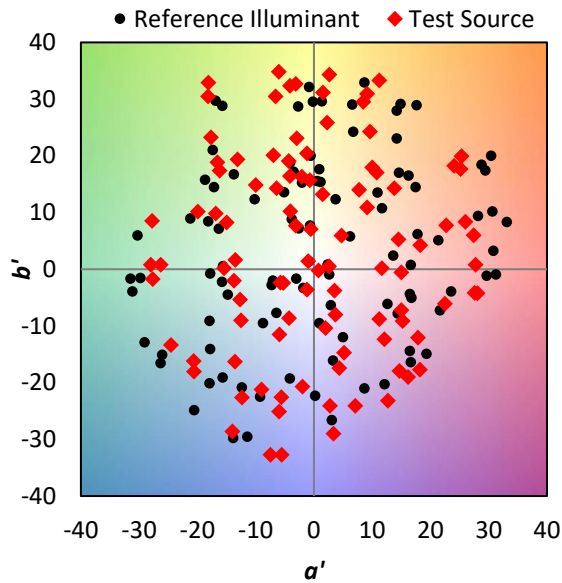
λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)
360	0	NR	490	118	NR	620	730	NR	750	25	NR	880	1	NR
365	0	NR	495	170	NR	625	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**

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

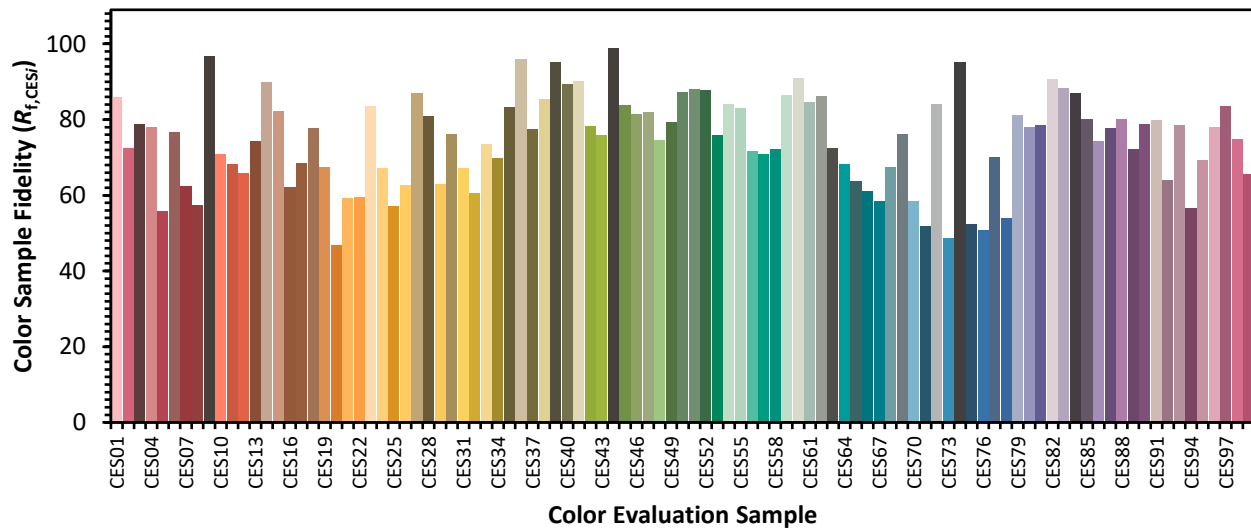


**Color Vector Graphics**

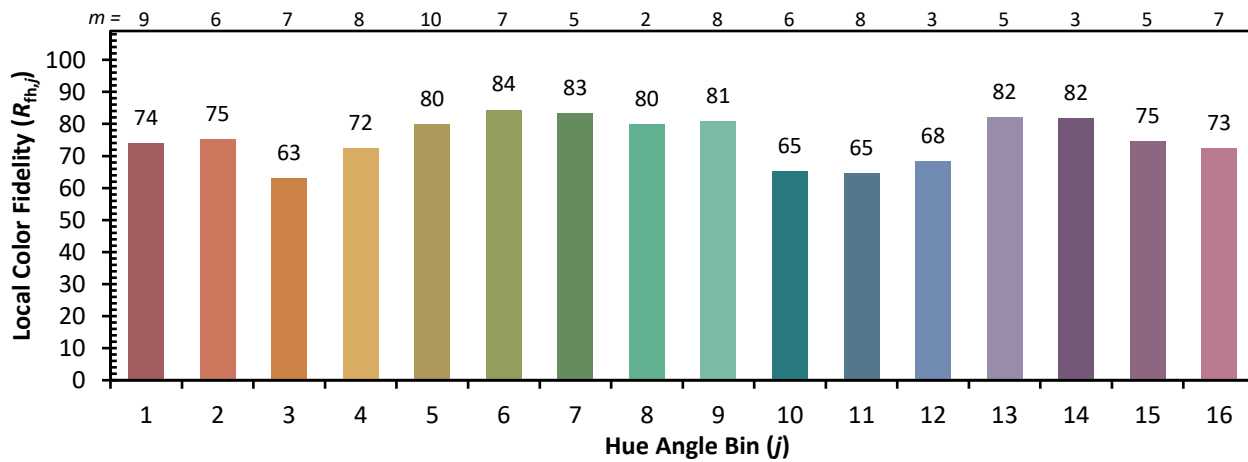
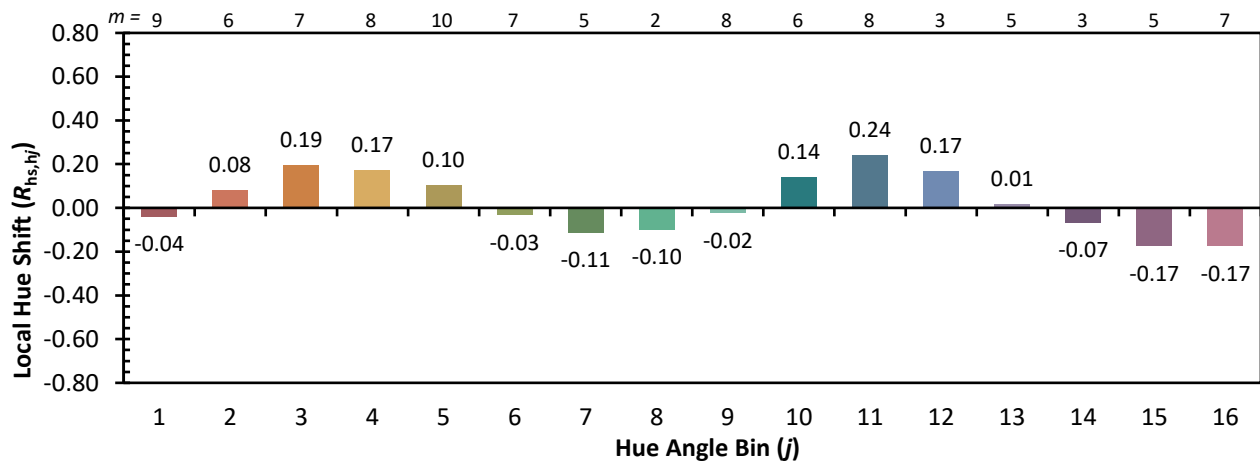
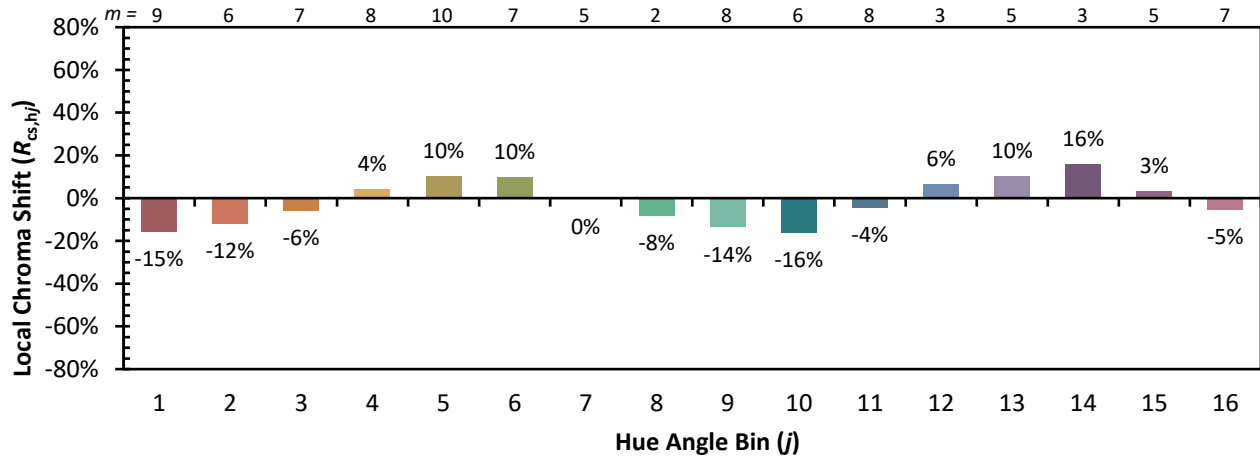


Individual Sample Fidelity Index ( $R_{f,i}$ )

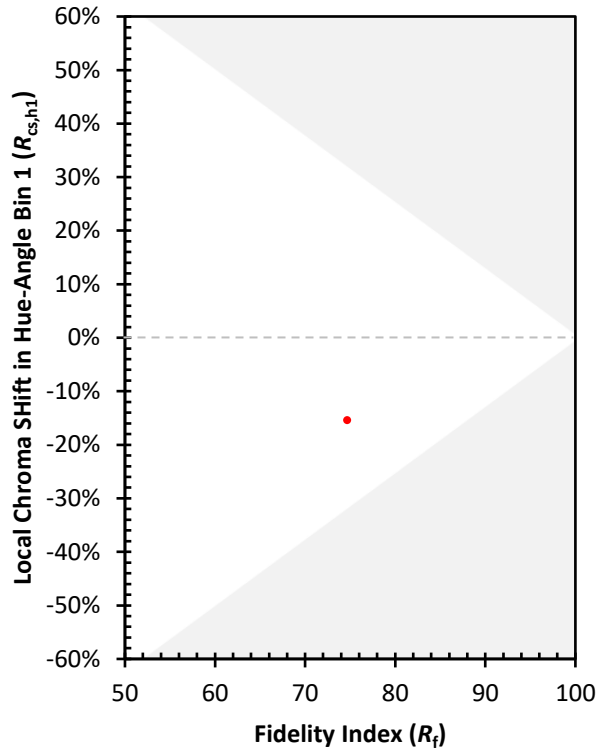
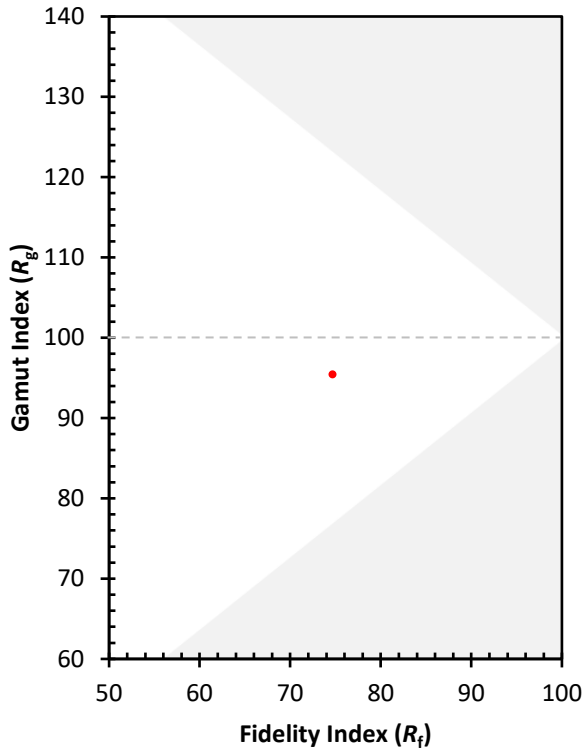
CES01 = 85	CES26 = 63	CES51 = 88	CES76 = 51
CES02 = 61	CES27 = 87	CES52 = 88	CES77 = 70
CES03 = 30	CES28 = 81	CES53 = 76	CES78 = 54
CES04 = 70	CES29 = 63	CES54 = 84	CES79 = 81
CES05 = 47	CES30 = 76	CES55 = 83	CES80 = 78
CES06 = 50	CES31 = 67	CES56 = 72	CES81 = 79
CES07 = 40	CES32 = 61	CES57 = 71	CES82 = 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)