

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: P833314

Luminaire Tested: **TTN-D1-830-U-DL-CG-UPL1**

Issue Date: 5/15/2024

**Test Information**

Test Method: LM-79-08  
Report Number: P833314  
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-D1-830-U-DL-CG-UPL1  
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**

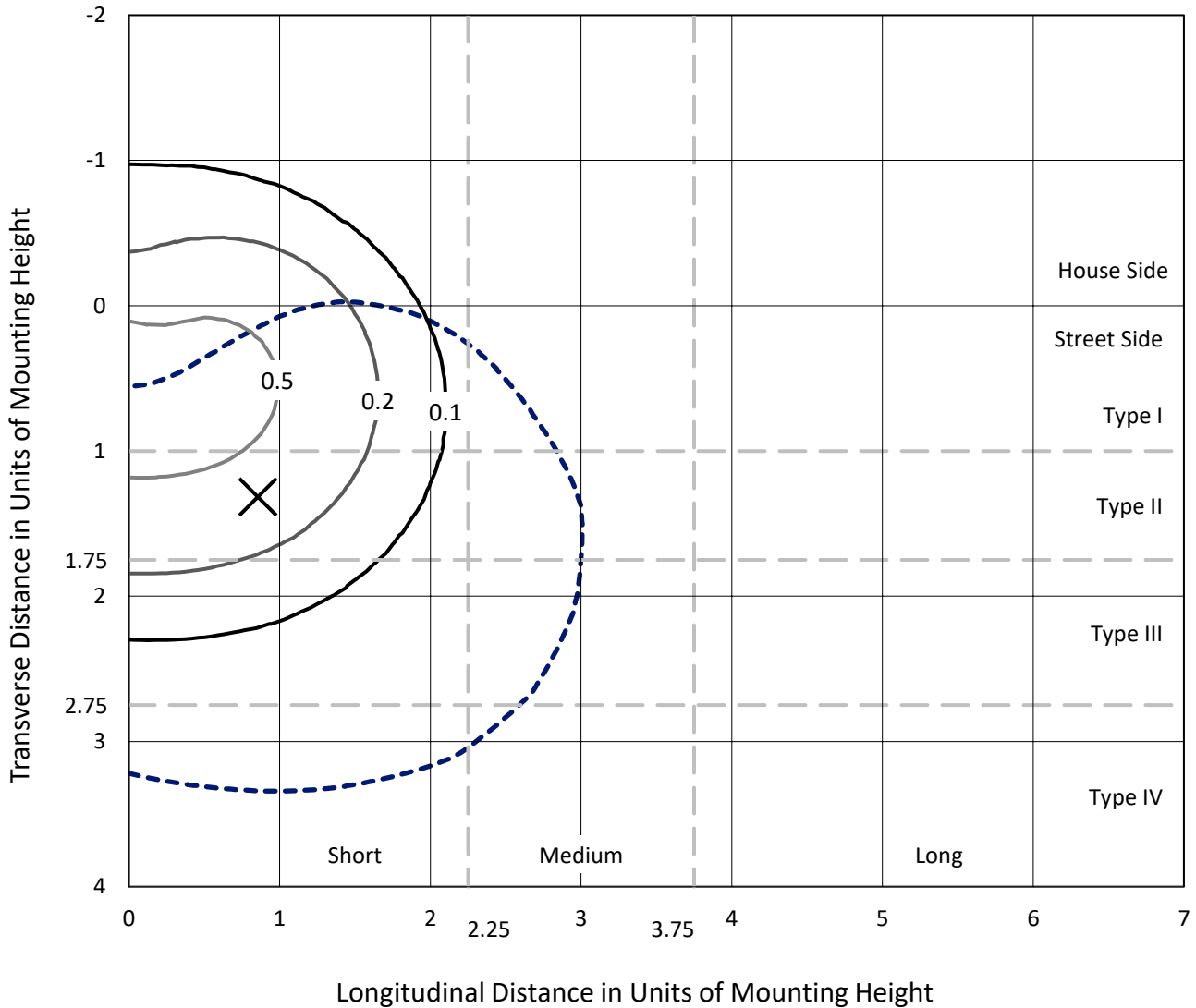
Lumens per Lamp: N/A  
Luminaire Lumens: 3126.9 lumens  
Efficiency: N/A  
Efficacy: 107.8 lumens/watt  
Luminous Opening: Vertical Cylinder (Dia: 0.71' x H: 0.1')  
IES Classification: Type IV - Short  
BUG Rating: B1 - U3 - G1  
  
Input Watts (W): 29  
Input Voltage (V): NR  
Input Current (Ain): 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

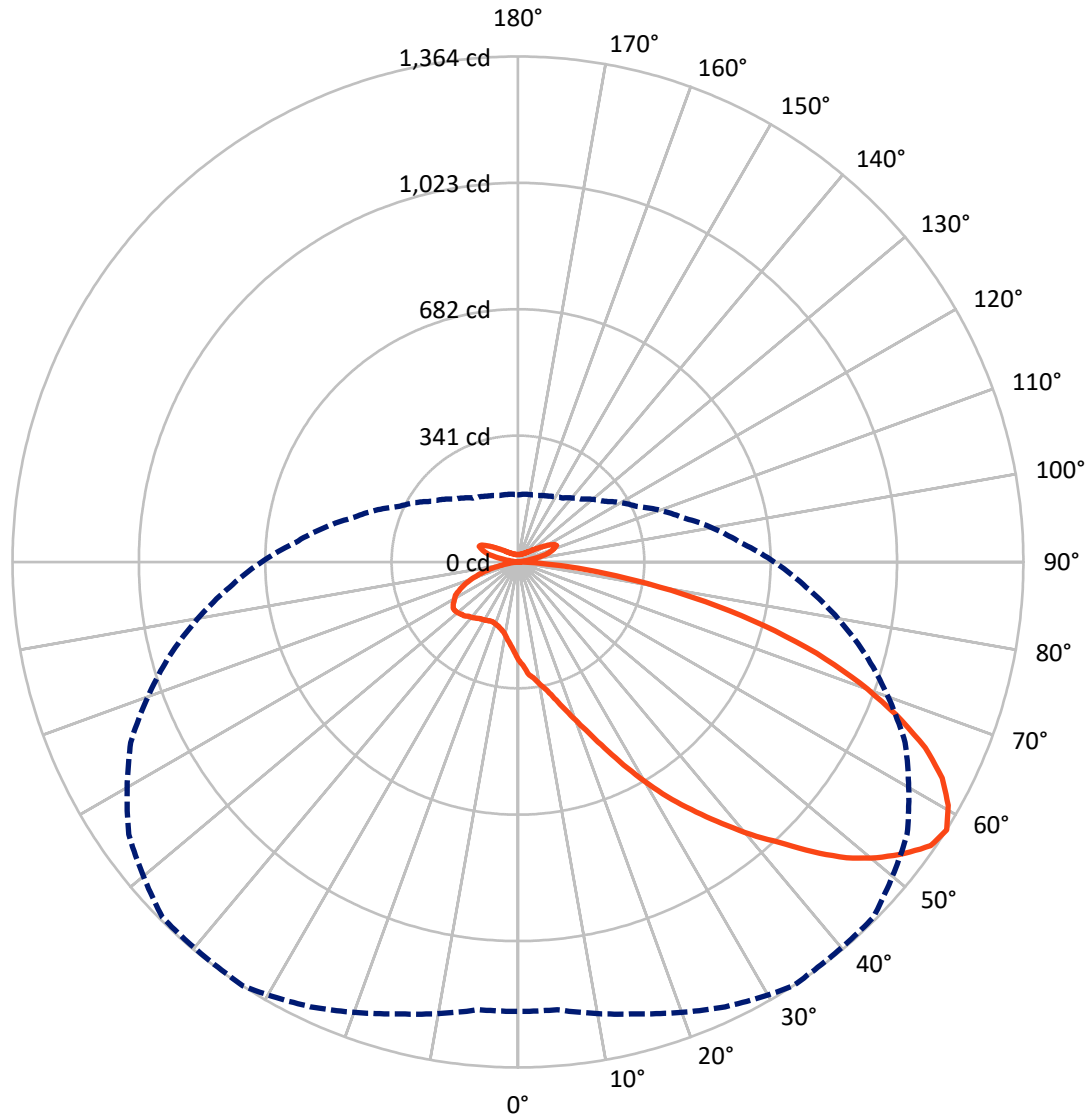
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 0.7 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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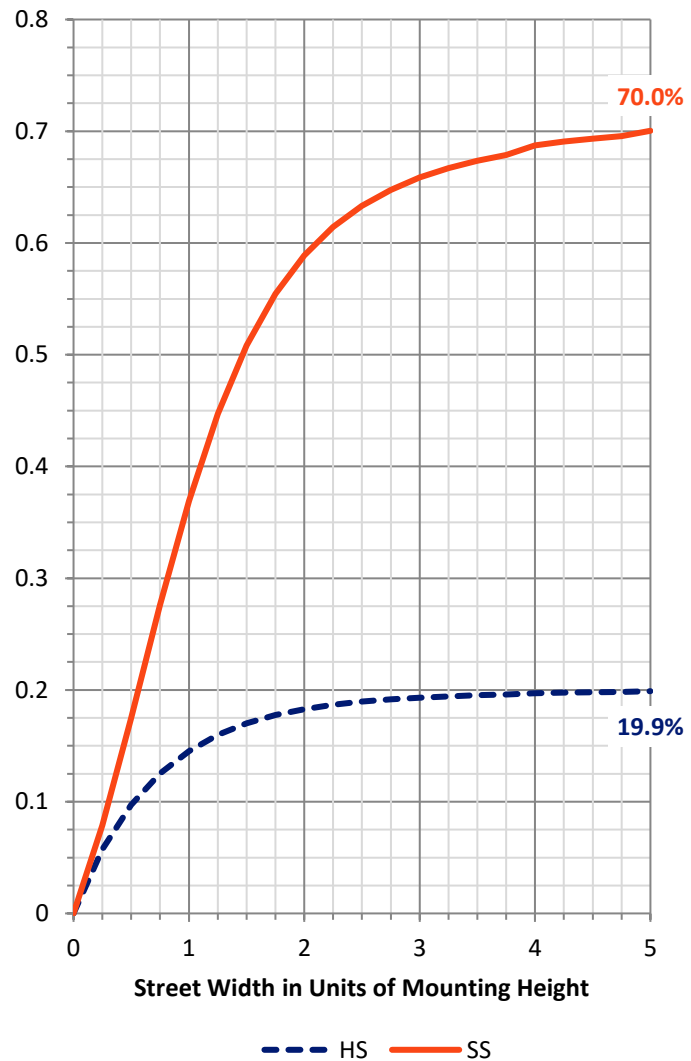
**FLUX DISTRIBUTION:**

		Downward	Upward	Total
<b>House Side</b>	Lumens	624.9	147.7	772.6
	% Fixture	20.0	4.7	24.7
<b>Street Side</b>	Lumens	2206.5	147.7	2354.2
	% Fixture	70.6	4.7	75.3
<b>Total</b>	Lumens	2831.4	295.5	3126.9
	% Fixture	90.6	9.4	100.0

**Coefficient of Utilization**

**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	25.4	0.8
10°-20°	82.3	2.6
20°-30°	173.6	5.6
30°-40°	315.3	10.1
40°-50°	498.2	15.9
50°-60°	661.6	21.2
60°-70°	636.8	20.4
70°-80°	373.8	12.0
80°-90°	64.6	2.1
90°-100°	6.6	0.2
100°-110°	67.0	2.1
110°-120°	98.0	3.1
120°-130°	56.9	1.8
130°-140°	30.1	1.0
140°-150°	17.9	0.6
150°-160°	11.0	0.4
160°-170°	6.0	0.2
170°-180°	2.0	0.1
0°-90°	2831.4	90.6
0°-180°	3126.9	100.0

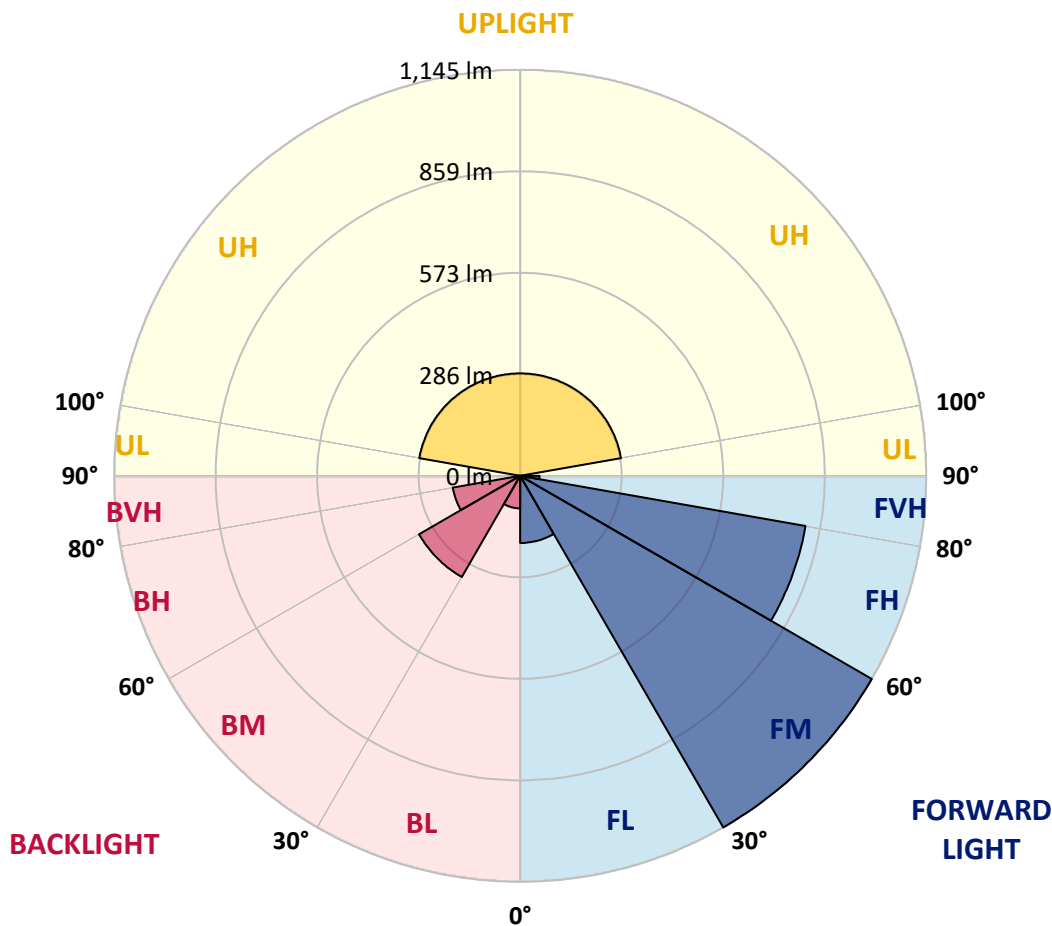


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

Zone	Lumens	% Fixture	Zone Rating/Lumen Limit		
			B	U	G
FL (0°-30°)	189.4	6.1			
FM (30°-60°)	1145.3	36.6			
FH (60°-80°)	817.4	26.1			G1/1800
FVH (80°-90°)	54.4	1.7			G1/100
BL (0°-30°)	91.9	2.9	B0/110		
BM (30°-60°)	329.6	10.5	B1/1000		
BH (60°-80°)	193.2	6.2	B1/500		G1/500
BVH (80°-90°)	10.2	0.3			G1/100
UL (90°-100°)	6.6	0.2		U1/10	
UH (100°-180°)	288.9	9.2		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°	265.3	265.3	265.3	265.3	265.3	265.3	265.3	265.3	265.3	265.3	265.3
2.5°	282.7	285.2	282.7	282.7	280.2	280.2	277.7	275.3	272.8	270.3	265.3
5°	314.9	314.9	312.4	307.5	305.0	302.5	297.6	290.1	285.2	277.7	270.3
7.5°	329.8	329.8	327.3	322.4	317.4	314.9	307.5	297.6	290.1	280.2	270.3
10°	349.6	352.1	347.2	342.2	337.2	334.8	324.8	312.4	300.0	287.7	272.8
12.5°	372.0	374.4	372.0	364.5	357.1	354.6	344.7	329.8	314.9	297.6	280.2
15°	401.7	406.7	399.2	394.3	386.8	384.4	372.0	354.6	337.2	314.9	292.6
17.5°	436.4	438.9	434.0	426.5	421.6	419.1	406.7	386.8	362.0	337.2	310.0
20°	476.1	478.6	476.1	466.2	461.2	458.8	446.4	424.0	394.3	367.0	332.3
22.5°	523.2	528.2	520.7	513.3	508.3	508.3	493.5	468.7	434.0	399.2	359.6
25°	577.8	585.2	575.3	570.3	565.4	562.9	550.5	520.7	481.1	438.9	389.3
27.5°	644.7	649.7	642.3	639.8	629.9	629.9	610.0	575.3	533.1	483.6	426.5
30°	704.2	709.2	704.2	704.2	696.8	694.3	674.5	639.8	587.7	528.2	458.8
32.5°	761.3	766.2	763.8	766.2	763.8	761.3	736.5	699.3	647.2	570.3	491.0
35°	818.3	825.8	823.3	830.7	828.2	825.8	805.9	761.3	699.3	622.4	525.7
37.5°	877.8	885.3	885.3	892.7	895.2	895.2	872.9	825.8	756.3	669.5	565.4
40°	942.3	949.7	949.7	962.1	967.1	967.1	942.3	895.2	818.3	721.6	607.5
42.5°	1004.3	1011.7	1014.2	1026.6	1034.1	1036.5	1016.7	962.1	872.9	773.7	647.2
45°	1063.8	1071.3	1078.7	1103.5	1115.9	1113.4	1098.5	1041.5	942.3	828.2	689.4
47.5°	1120.8	1130.8	1143.2	1175.4	1192.8	1190.3	1180.4	1115.9	1006.8	880.3	726.6
50°	1165.5	1172.9	1197.7	1232.4	1254.8	1257.2	1242.4	1180.4	1061.3	920.0	753.8
52.5°	1200.2	1210.1	1239.9	1289.5	1306.8	1314.3	1296.9	1234.9	1115.9	954.7	776.2
55°	1225.0	1225.0	1269.6	1326.7	1351.5	1356.4	1356.4	1279.6	1148.1	977.0	788.6
57.5°	1212.6	1212.6	1262.2	1324.2	1363.9	1361.4	1356.4	1282.0	1153.1	972.1	781.1
60°	1177.9	1185.3	1232.4	1294.4	1334.1	1331.6	1316.7	1249.8	1128.3	952.2	766.2
62.5°	1130.8	1143.2	1192.8	1239.9	1284.5	1291.9	1272.1	1212.6	1086.1	922.5	739.0
65°	1041.5	1058.9	1120.8	1172.9	1207.6	1222.5	1197.7	1143.2	1029.1	865.4	681.9
67.5°	942.3	954.7	1006.8	1081.2	1101.0	1115.9	1103.5	1046.5	949.7	773.7	617.5
70°	828.2	848.1	882.8	957.2	979.5	994.4	994.4	937.3	845.6	679.5	540.6
72.5°	694.3	716.6	758.8	813.4	843.1	853.0	850.6	803.4	721.6	575.3	456.3
75°	548.0	565.4	615.0	654.7	686.9	694.3	691.9	652.2	577.8	463.7	362.0
77.5°	404.2	421.6	458.8	488.5	518.3	513.3	513.3	483.6	436.4	344.7	275.3
80°	265.3	280.2	312.4	322.4	354.6	352.1	352.1	329.8	297.6	230.6	183.5
82.5°	146.3	158.7	181.0	190.9	210.8	205.8	208.3	193.4	173.6	128.9	104.1
85°	52.1	62.0	74.4	81.8	91.8	91.8	91.8	79.4	74.4	49.6	42.2
87.5°	2.5	5.0	9.9	9.9	14.9	14.9	14.9	9.9	9.9	2.5	2.5
90°	2.5	2.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.5
92.5°	2.5	2.5	2.5	3.5	3.9	4.0	3.5	4.0	3.0	3.0	2.5
95°	3.0	3.0	3.5	4.5	5.4	5.6	6.1	6.1	3.5	3.5	3.0
97.5°	4.0	4.5	4.5	5.6	8.4	9.1	16.7	10.1	5.1	5.1	4.5
100°	6.6	7.1	7.1	12.6	24.0	26.8	35.9	25.8	13.1	9.6	7.1
102.5°	21.2	22.2	27.3	40.9	56.7	60.7	55.1	46.5	44.0	30.3	24.3
105°	54.1	53.6	57.6	68.2	81.6	84.9	83.4	76.8	69.8	60.2	55.6
107.5°	71.3	71.3	74.8	83.9	94.1	96.6	112.7	114.2	90.5	79.4	74.3
110°	80.4	80.4	83.4	91.0	104.4	107.7	130.4	129.4	111.7	98.1	91.5



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**CANDELA DISTRIBUTION (continued):**

	0°	5°	15°	25°	33°	35°	45°	55°	65°	75°	85°
112.5°	82.4	82.9	86.9	98.6	113.2	116.8	126.9	122.3	115.3	109.2	104.1
115°	85.4	85.4	90.0	101.1	109.2	111.2	115.3	110.2	104.6	100.6	98.6
117.5°	84.4	85.9	86.9	93.0	98.3	99.6	102.6	100.1	92.5	89.5	88.5
120°	78.4	78.4	79.4	82.4	85.2	85.9	87.5	86.4	81.4	78.9	78.4
122.5°	69.8	70.3	69.8	71.3	73.3	73.8	75.3	74.3	70.3	69.3	69.3
125°	61.2	61.2	60.7	61.7	62.9	63.2	62.7	63.2	61.2	60.7	60.7
127.5°	55.1	54.6	53.6	54.1	54.5	54.6	54.6	55.1	53.1	53.6	54.1
130°	49.0	49.0	48.0	48.0	48.0	48.0	47.0	48.0	47.0	47.5	48.0
132.5°	43.5	43.5	42.0	41.5	41.5	41.5	41.5	42.0	41.5	42.5	43.5
135°	38.9	38.9	37.4	37.9	37.9	37.9	37.4	37.9	37.4	38.4	38.9
137.5°	35.4	35.4	34.4	34.4	34.4	34.4	33.9	34.4	34.4	34.9	35.9
140°	32.4	32.4	31.8	31.8	31.4	31.3	31.8	31.8	31.8	32.4	32.9
142.5°	30.8	30.3	29.8	29.3	29.7	29.8	29.8	29.8	29.3	29.8	30.8
145°	28.3	28.3	27.8	27.8	27.8	27.8	28.3	27.8	27.8	28.3	28.3
147.5°	26.8	26.8	26.3	26.8	26.8	26.8	26.8	26.8	26.3	26.8	26.8
150°	26.3	25.8	25.3	25.8	25.8	25.8	25.3	25.3	25.3	25.3	25.8
152.5°	24.8	24.8	24.3	24.8	24.4	24.3	24.3	24.3	24.3	24.3	24.8
155°	23.8	23.8	23.3	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8
157.5°	22.7	23.3	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	23.3
160°	22.2	22.2	22.2	22.2	21.8	21.7	21.7	21.7	22.2	22.2	22.2
162.5°	21.7	21.7	21.7	21.7	21.3	21.2	21.2	21.2	21.2	21.7	21.7
165°	21.7	21.2	21.2	21.2	20.8	20.7	20.7	20.7	20.7	21.2	21.7
167.5°	20.7	20.7	20.7	20.7	20.7	20.7	20.2	20.2	20.7	20.7	20.7
170°	20.7	20.7	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2
172.5°	20.7	20.7	20.7	20.7	20.3	20.2	20.2	20.2	20.2	20.2	20.7
175°	20.7	20.7	20.7	20.7	20.3	20.2	20.2	20.2	20.7	20.7	20.7
177.5°	20.7	20.7	20.7	20.7	20.3	20.2	20.7	20.7	20.7	20.7	20.7
180°	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7





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**CANDELA DISTRIBUTION (continued):**

	90°	95°	105°	115°	125°	135°	145°	155°	165°	175°	180°
0°	265.3	265.3	265.3	265.3	265.3	265.3	265.3	265.3	265.3	265.3	265.3
2.5°	262.9	260.4	257.9	252.9	250.5	248.0	245.5	243.0	243.0	243.0	243.0
5°	265.3	262.9	255.4	248.0	240.5	233.1	228.1	225.7	223.2	220.7	220.7
7.5°	265.3	260.4	250.5	240.5	233.1	223.2	215.7	208.3	203.3	200.9	200.9
10°	267.8	260.4	248.0	238.1	225.7	213.3	203.3	193.4	188.5	183.5	183.5
12.5°	272.8	265.3	248.0	235.6	220.7	205.8	193.4	183.5	176.1	171.1	171.1
15°	282.7	272.8	252.9	235.6	218.2	200.9	188.5	176.1	168.6	163.7	163.7
17.5°	297.6	285.2	260.4	235.6	215.7	198.4	183.5	171.1	161.2	156.2	156.2
20°	314.9	300.0	270.3	240.5	215.7	195.9	181.0	166.1	156.2	151.3	151.3
22.5°	339.7	317.4	282.7	248.0	220.7	198.4	178.5	163.7	153.7	148.8	148.8
25°	367.0	342.2	297.6	257.9	225.7	198.4	178.5	163.7	153.7	148.8	146.3
27.5°	396.8	369.5	314.9	267.8	230.6	203.3	181.0	163.7	153.7	148.8	148.8
30°	424.0	391.8	332.3	280.2	238.1	205.8	183.5	166.1	153.7	148.8	148.8
32.5°	453.8	416.6	349.6	292.6	245.5	210.8	186.0	168.6	156.2	151.3	148.8
35°	483.6	441.4	367.0	302.5	252.9	215.7	188.5	171.1	158.7	153.7	153.7
37.5°	515.8	468.7	384.4	314.9	260.4	220.7	193.4	173.6	161.2	156.2	156.2
40°	550.5	496.0	401.7	324.8	267.8	225.7	198.4	178.5	166.1	161.2	161.2
42.5°	585.2	525.7	421.6	337.2	275.3	230.6	200.9	183.5	171.1	166.1	166.1
45°	619.9	550.5	438.9	349.6	282.7	238.1	208.3	188.5	176.1	171.1	171.1
47.5°	652.2	577.8	453.8	357.1	290.1	243.0	210.8	193.4	181.0	178.5	176.1
50°	674.5	595.1	463.7	364.5	292.6	245.5	215.7	195.9	186.0	181.0	181.0
52.5°	691.9	612.5	471.2	369.5	295.1	248.0	218.2	200.9	190.9	186.0	183.5
55°	701.8	615.0	471.2	364.5	292.6	248.0	218.2	200.9	190.9	186.0	186.0
57.5°	691.9	602.6	461.2	354.6	285.2	240.5	210.8	195.9	186.0	183.5	181.0
60°	672.0	582.7	441.4	339.7	272.8	228.1	200.9	188.5	181.0	178.5	176.1
62.5°	644.7	557.9	421.6	319.9	255.4	213.3	193.4	178.5	173.6	171.1	168.6
65°	590.2	510.8	389.3	295.1	233.1	195.9	176.1	166.1	161.2	156.2	153.7
67.5°	530.7	458.8	344.7	265.3	205.8	176.1	158.7	148.8	141.3	141.3	138.9
70°	466.2	404.2	297.6	225.7	178.5	153.7	136.4	128.9	124.0	124.0	121.5
72.5°	389.3	339.7	248.0	183.5	146.3	126.5	114.1	106.6	104.1	104.1	101.7
75°	312.4	267.8	195.9	143.8	114.1	99.2	89.3	84.3	81.8	81.8	79.4
77.5°	230.6	195.9	141.3	104.1	81.8	71.9	64.5	62.0	59.5	59.5	57.0
80°	153.7	128.9	91.8	67.0	49.6	44.6	39.7	39.7	37.2	39.7	37.2
82.5°	84.3	69.4	49.6	34.7	24.8	22.3	19.8	19.8	22.3	22.3	19.8
85°	32.2	24.8	17.4	9.9	7.4	7.4	7.4	7.4	7.4	7.4	5.0
87.5°	2.5	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90°	2.5	2.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.5	2.5
92.5°	2.5	2.5	3.0	3.0	4.0	3.5	4.0	3.5	2.5	2.5	2.5
95°	3.0	3.0	3.5	3.5	6.1	6.1	5.6	4.5	3.5	3.0	3.0
97.5°	4.0	4.5	5.1	5.1	10.1	16.7	9.1	5.6	4.5	4.5	4.0
100°	7.1	7.1	9.6	13.1	25.8	35.9	26.8	12.6	7.1	7.1	6.6
102.5°	23.3	24.3	30.3	44.0	46.5	55.1	60.7	40.9	27.3	22.2	21.2
105°	55.6	55.6	60.2	69.8	76.8	83.4	84.9	68.2	57.6	53.6	54.1
107.5°	73.8	74.3	79.4	90.5	114.2	112.7	96.6	83.9	74.8	71.3	71.3
110°	90.5	91.5	98.1	111.7	129.4	130.4	107.7	91.0	83.4	80.4	80.4



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 CATALOG NUMBER: TTN-D1-830-U-DL-CG-UPL1

**CANDELA DISTRIBUTION (continued):**

	90°	95°	105°	115°	125°	135°	145°	155°	165°	175°	180°
112.5°	103.1	104.1	109.2	115.3	122.3	126.9	116.8	98.6	86.9	82.9	82.4
115°	99.6	98.6	100.6	104.6	110.2	115.3	111.2	101.1	90.0	85.4	85.4
117.5°	86.9	88.5	89.5	92.5	100.1	102.6	99.6	93.0	86.9	85.9	84.4
120°	77.3	78.4	78.9	81.4	86.4	87.5	85.9	82.4	79.4	78.4	78.4
122.5°	68.2	69.3	69.3	70.3	74.3	75.3	73.8	71.3	69.8	70.3	69.8
125°	60.2	60.7	60.7	61.2	63.2	62.7	63.2	61.7	60.7	61.2	61.2
127.5°	53.6	54.1	53.6	53.1	55.1	54.6	54.6	54.1	53.6	54.6	55.1
130°	48.5	48.0	47.5	47.0	48.0	47.0	48.0	48.0	48.0	49.0	49.0
132.5°	43.5	43.5	42.5	41.5	42.0	41.5	41.5	41.5	42.0	43.5	43.5
135°	38.9	38.9	38.4	37.4	37.9	37.4	37.9	37.9	37.4	38.9	38.9
137.5°	36.4	35.9	34.9	34.4	34.4	33.9	34.4	34.4	34.4	35.4	35.4
140°	32.9	32.9	32.4	31.8	31.8	31.8	31.3	31.8	31.8	32.4	32.4
142.5°	30.8	30.8	29.8	29.3	29.8	29.8	29.8	29.3	29.8	30.3	30.8
145°	28.8	28.3	28.3	27.8	27.8	28.3	27.8	27.8	27.8	28.3	28.3
147.5°	27.3	26.8	26.8	26.3	26.8	26.8	26.8	26.8	26.3	26.8	26.8
150°	25.8	25.8	25.3	25.3	25.3	25.3	25.8	25.8	25.3	25.8	26.3
152.5°	25.3	24.8	24.3	24.3	24.3	24.3	24.3	24.8	24.3	24.8	24.8
155°	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.3	23.8	23.8
157.5°	23.3	23.3	22.7	22.7	22.7	22.7	22.7	22.7	22.7	23.3	22.7
160°	22.7	22.2	22.2	22.2	21.7	21.7	21.7	22.2	22.2	22.2	22.2
162.5°	22.2	21.7	21.7	21.2	21.2	21.2	21.2	21.7	21.7	21.7	21.7
165°	21.2	21.7	21.2	20.7	20.7	20.7	20.7	21.2	21.2	21.2	21.7
167.5°	21.2	20.7	20.7	20.7	20.2	20.2	20.7	20.7	20.7	20.7	20.7
170°	20.7	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.7	20.7
172.5°	20.7	20.7	20.2	20.2	20.2	20.2	20.2	20.7	20.7	20.7	20.7
175°	20.2	20.7	20.7	20.7	20.2	20.2	20.2	20.7	20.7	20.7	20.7
177.5°	20.7	20.7	20.7	20.7	20.7	20.7	20.2	20.7	20.7	20.7	20.7
180°	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7

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: SP1-2411-284-4

Test Date: 11/22/2024

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

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

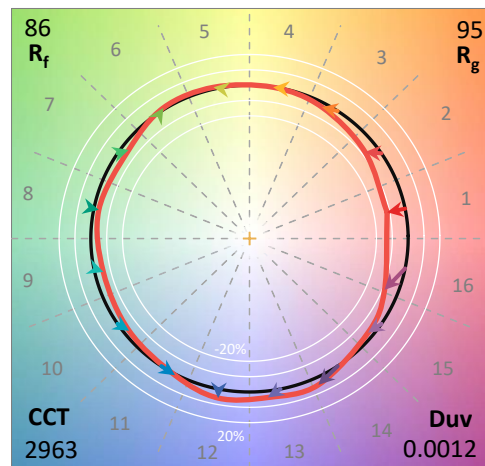
**Test Information**

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<sub>f</sub>: 86.1  
 R<sub>g</sub>: 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**

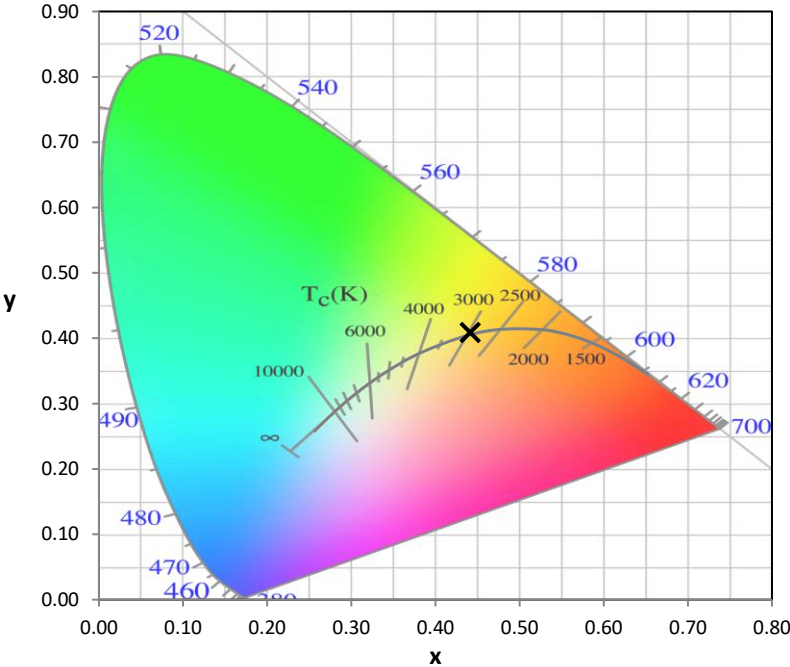
Stabilization Time: 37M  
 Operation Time: 1H 37M  
 Sphere Temperature (°C): 25.0

REPORT NUMBER: SP1-2411-284-4

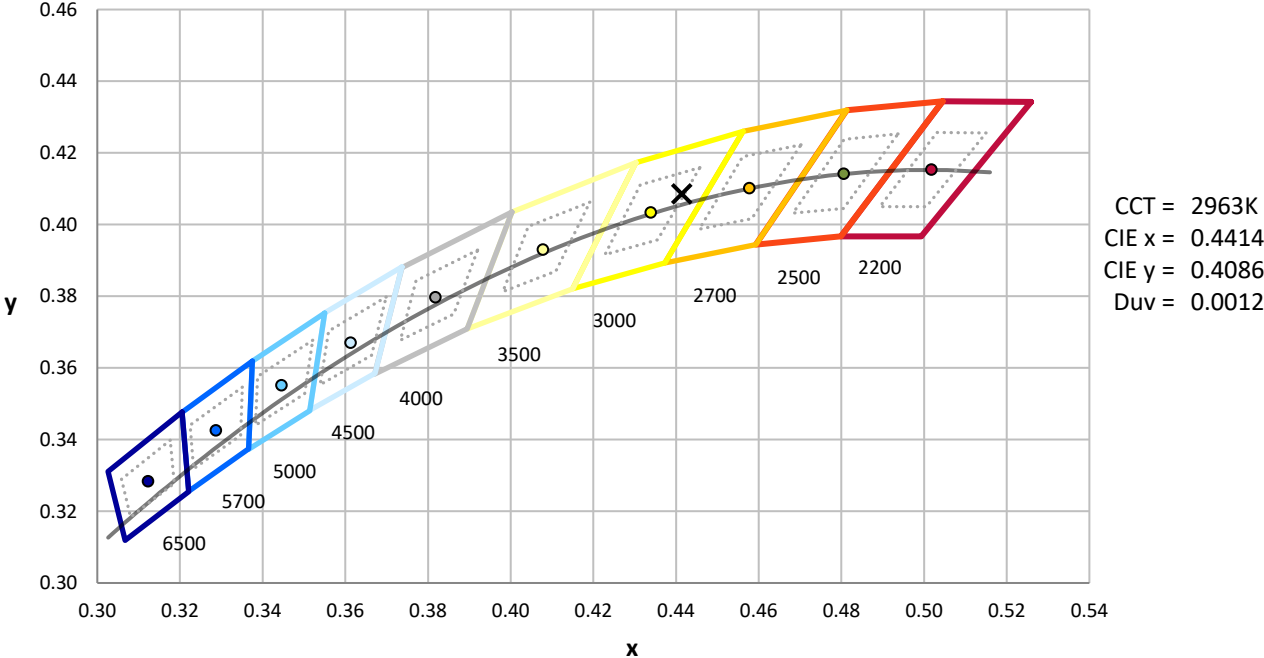
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	6/18/2024	12/18/2024
Power Meter	INXT2011004	2/8/2024	2/8/2025
AC Power Source	IN0063	10/22/2024	10/22/2025
DC Power Source	IN0208	10/22/2024	10/22/2025
Sphere Thermometer	IN0085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

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CIE 1931 Chromaticity Diagram



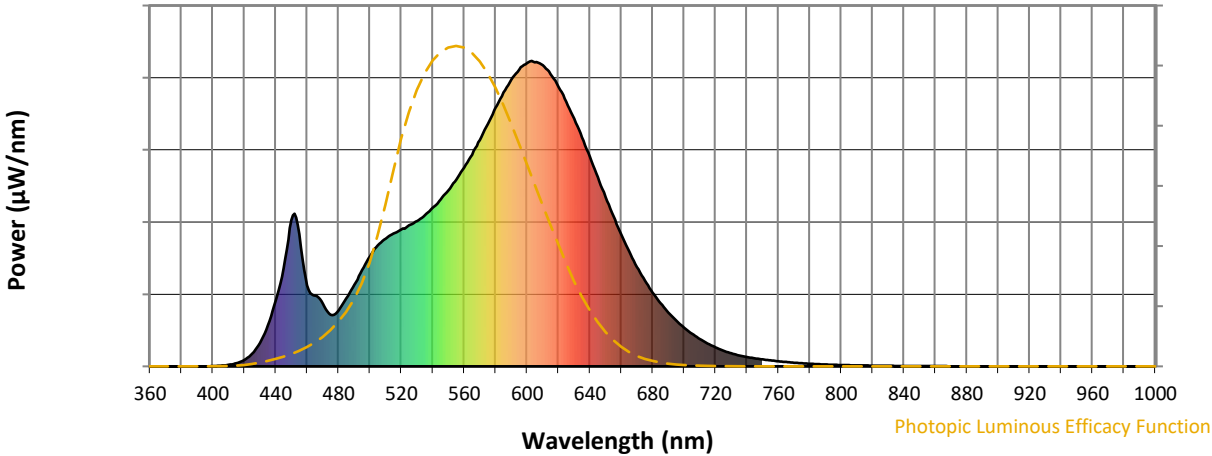
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 3000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**

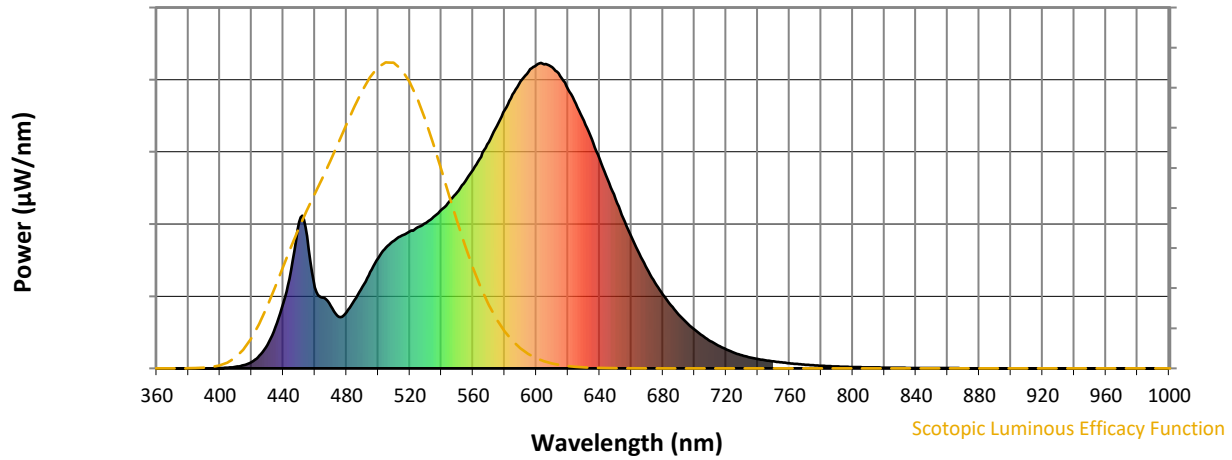


**Photopic Lumens: NR**

$\lambda$ (nm)	Power W <sup>^</sup> /nm	Lumens ( $\phi$ /nm)	$\lambda$ (nm)	Power W <sup>^</sup> /nm	Lumens ( $\phi$ /nm)	$\lambda$ (nm)	Power W <sup>^</sup> /nm	Lumens ( $\phi$ /nm)	$\lambda$ (nm)	Power W <sup>^</sup> /nm	Lumens ( $\phi$ /nm)	$\lambda$ (nm)	Power W <sup>^</sup> /nm	Lumens ( $\phi$ /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**

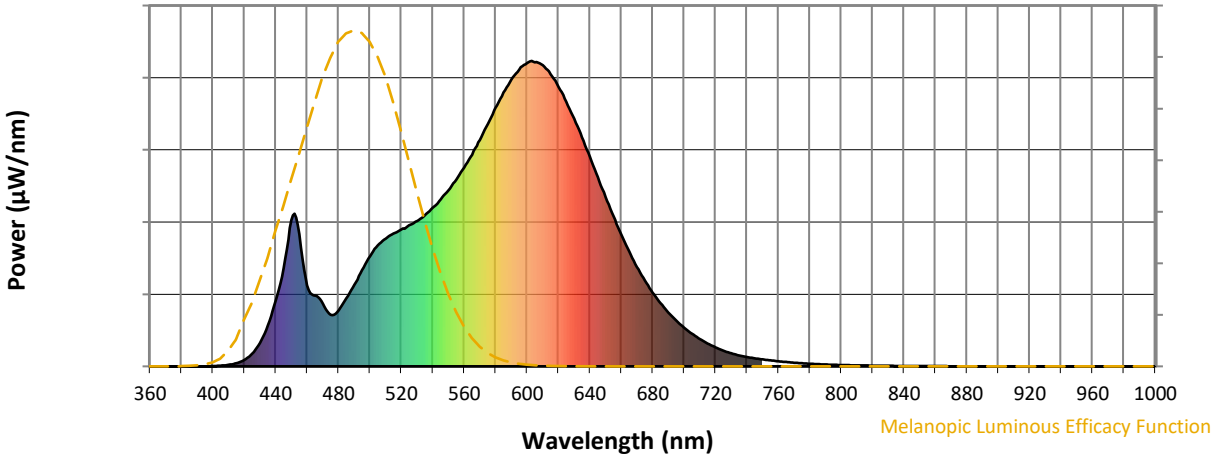
**S/P: 1.34**

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



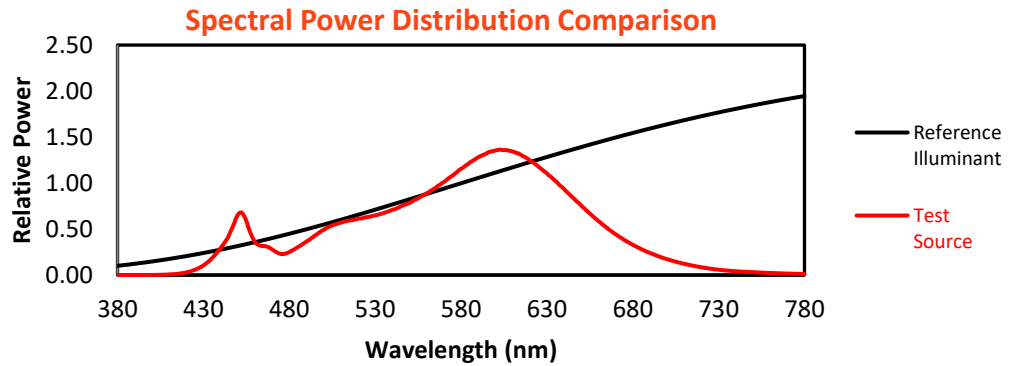
Melanopic Lumens: NR

M/P: 2.58

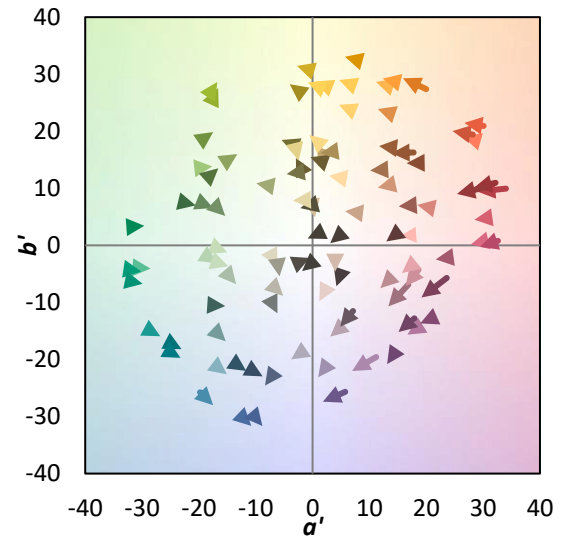
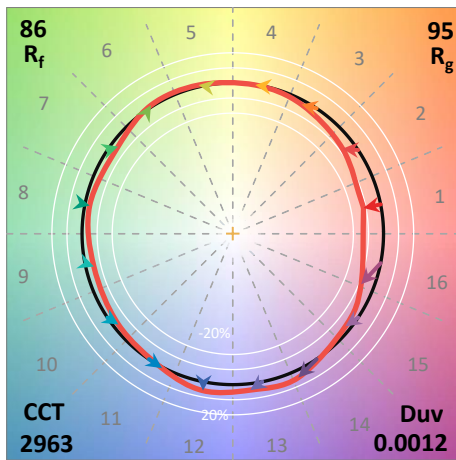
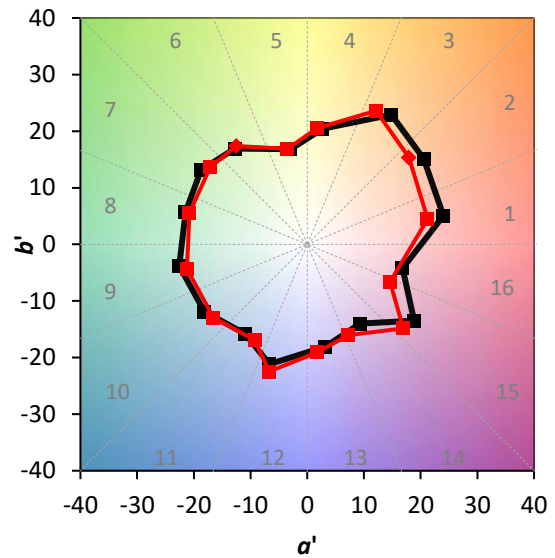
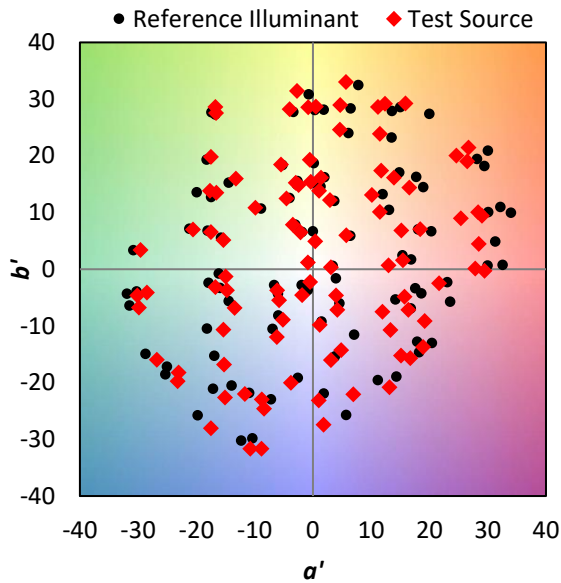
λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)
360	0	NR	490	267	NR	620	915	NR	750	23	NR	880	0	NR
365	0	NR	495	315	NR	625	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  $R_a = 82.9$   
 $R_9 = 3.9$

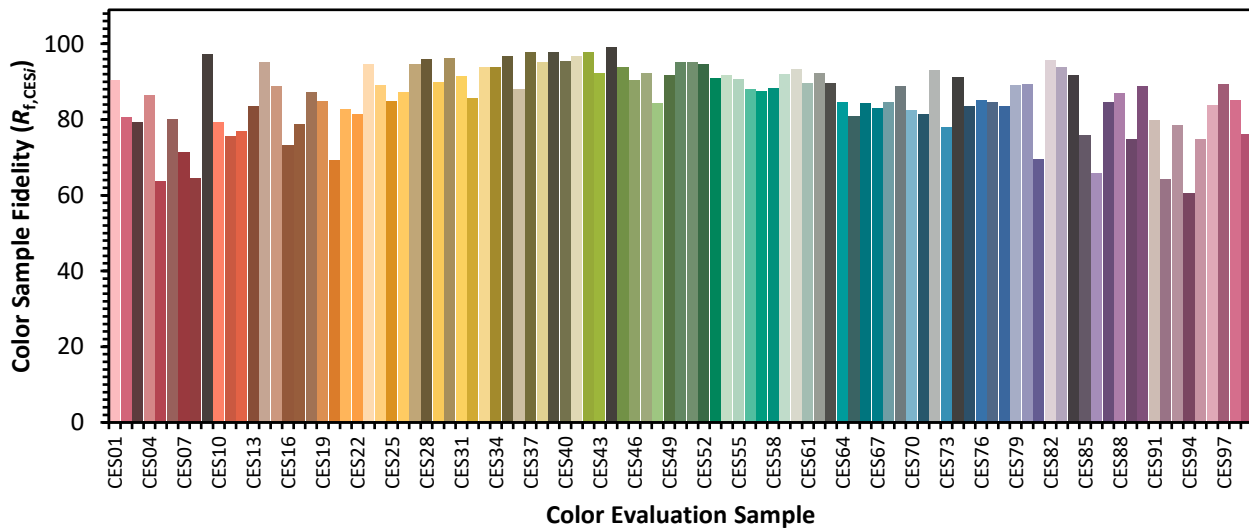


**Color Vector Graphics**

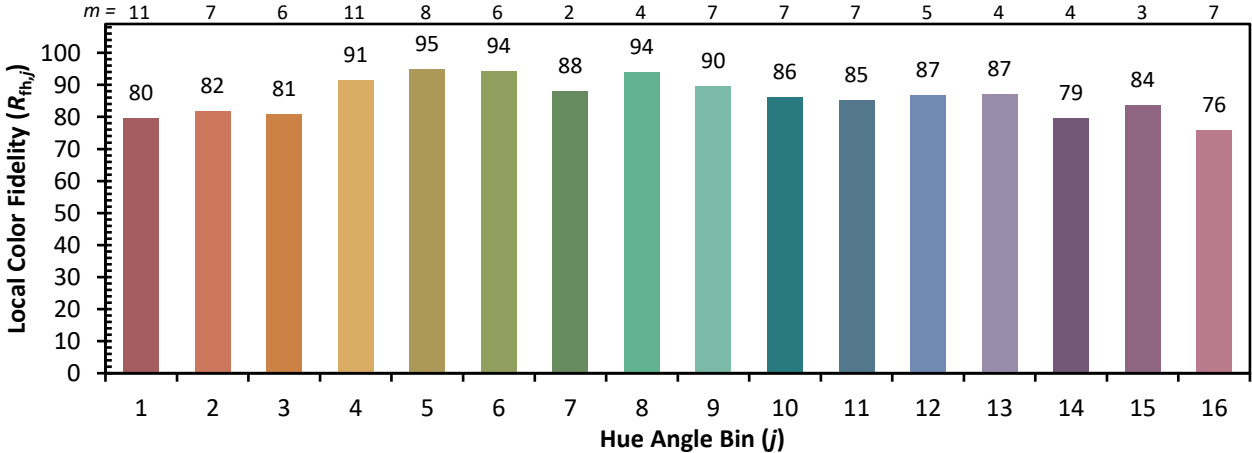
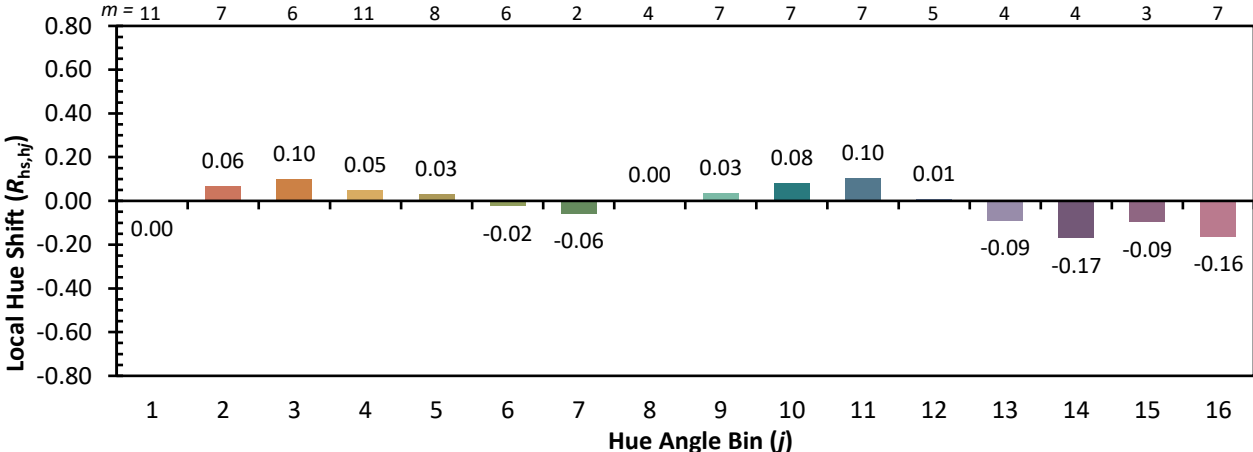
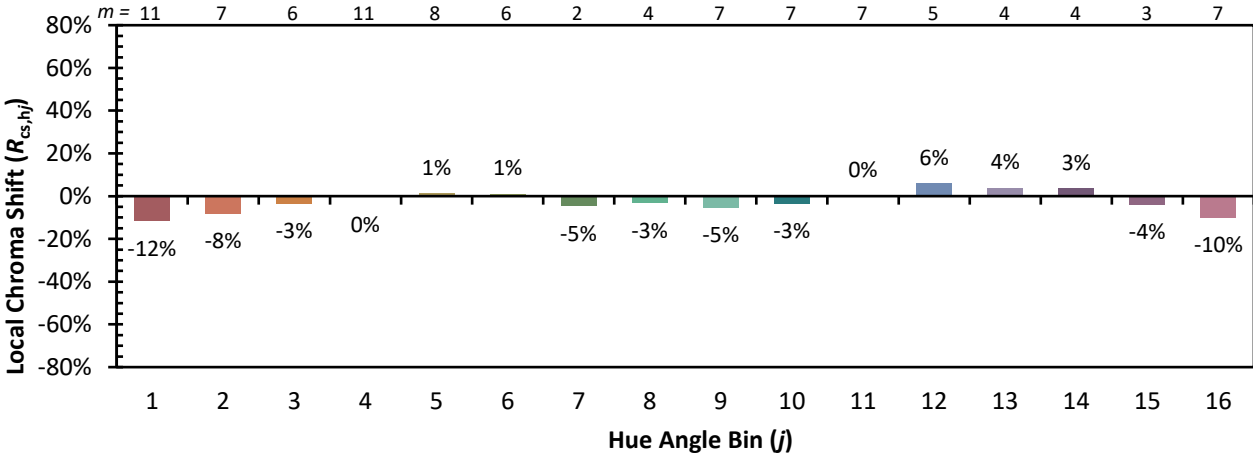


Individual Sample Fidelity Index ( $R_{f,i}$ )

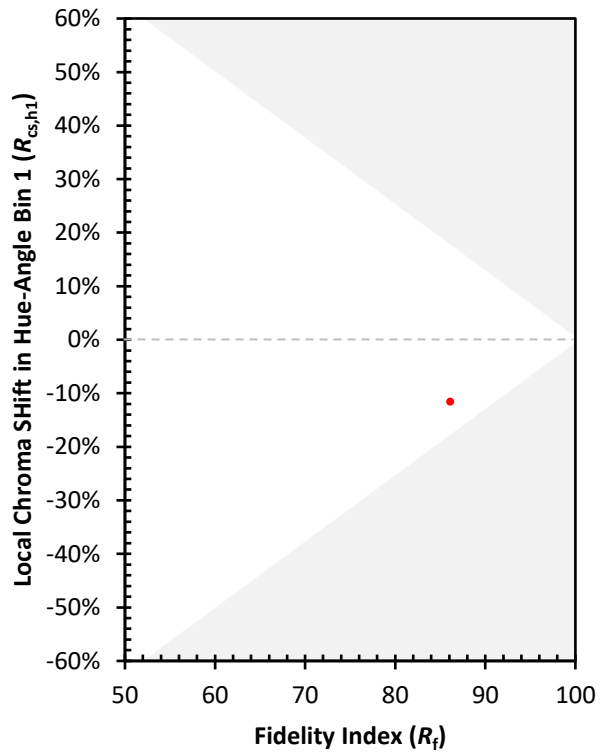
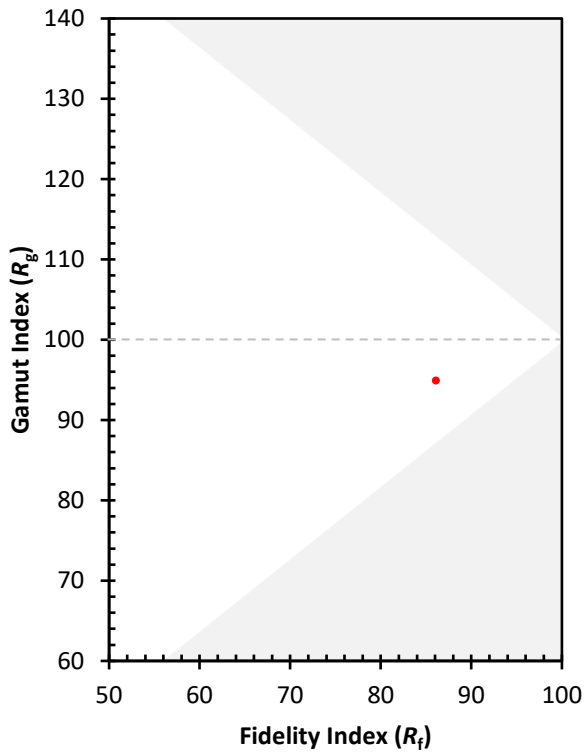
CES01 = 86	CES26 = 87	CES51 = 95	CES76 = 85
CES02 = 63	CES27 = 95	CES52 = 95	CES77 = 85
CES03 = 31	CES28 = 96	CES53 = 91	CES78 = 83
CES04 = 70	CES29 = 90	CES54 = 92	CES79 = 89
CES05 = 50	CES30 = 96	CES55 = 91	CES80 = 89
CES06 = 51	CES31 = 92	CES56 = 88	CES81 = 70
CES07 = 42	CES32 = 86	CES57 = 87	CES82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