

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: P833318

Luminaire Tested: **TTN-D1-830-U-DL-UPL2**

Issue Date: 5/15/2024

**Test Information**

Test Method: LM-79-08  
Report Number: P833318  
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-UPL2  
Description: TOPTIER NANO LED PARKING GARAGE LUMINAIRE WITH UPLIGHT  
3000K, 80 CRI LEDS AND DRIVE LANE DISTRIBUTION  
Light Source: -  
Ballast/Driver: -

**Summary**

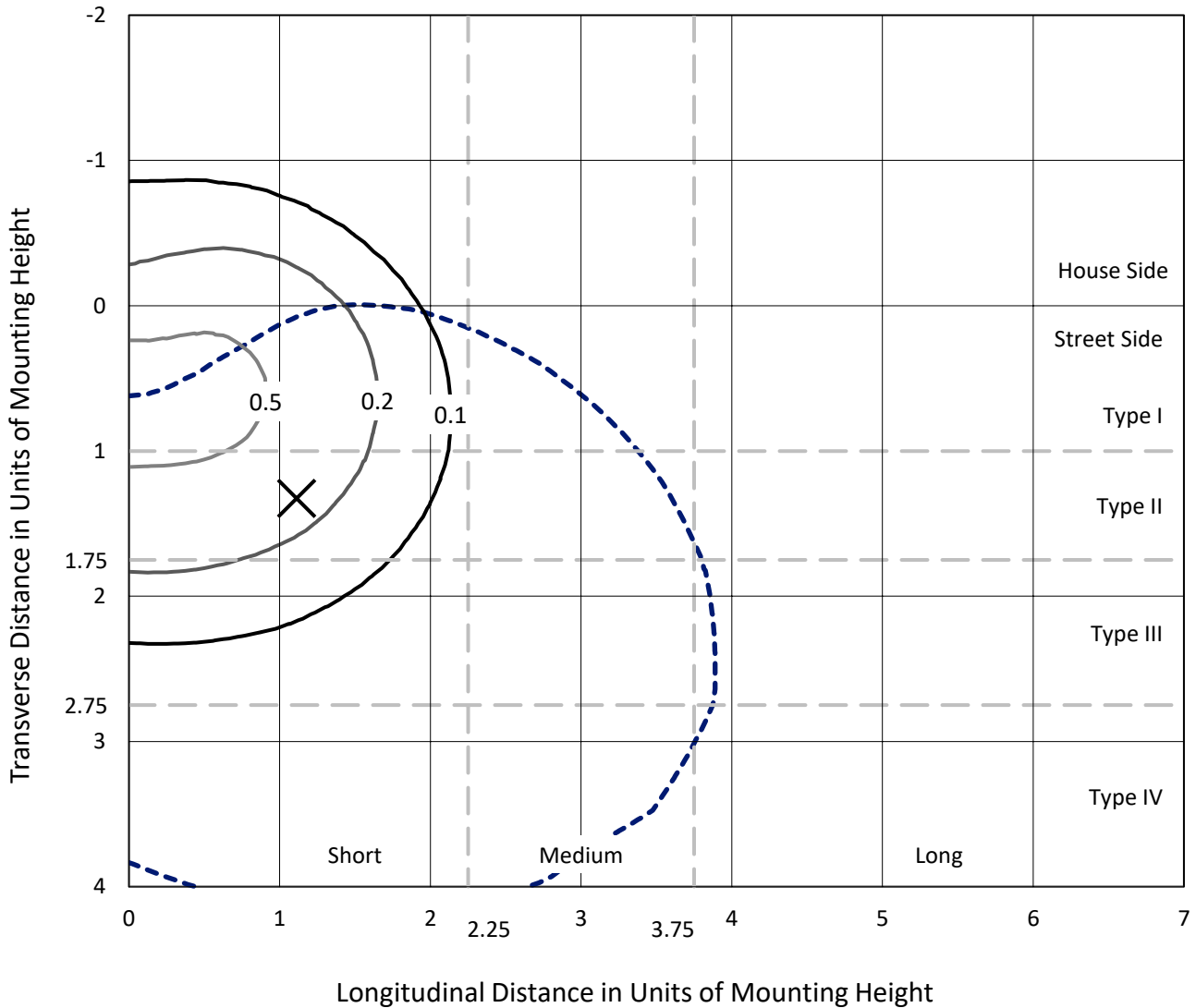
Lumens per Lamp: N/A  
Luminaire Lumens: 3389.8 lumens  
Efficiency: N/A  
Efficacy: 109.7 lumens/watt  
Luminous Opening: Vertical Cylinder (Dia: 0.71' x H: 0.1')  
IES Classification: Type IV - Short  
BUG Rating: B1 - U4 - G1  
  
Input Watts (W): 30.9  
Input Voltage (V): NR  
Input Current (Ain): 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

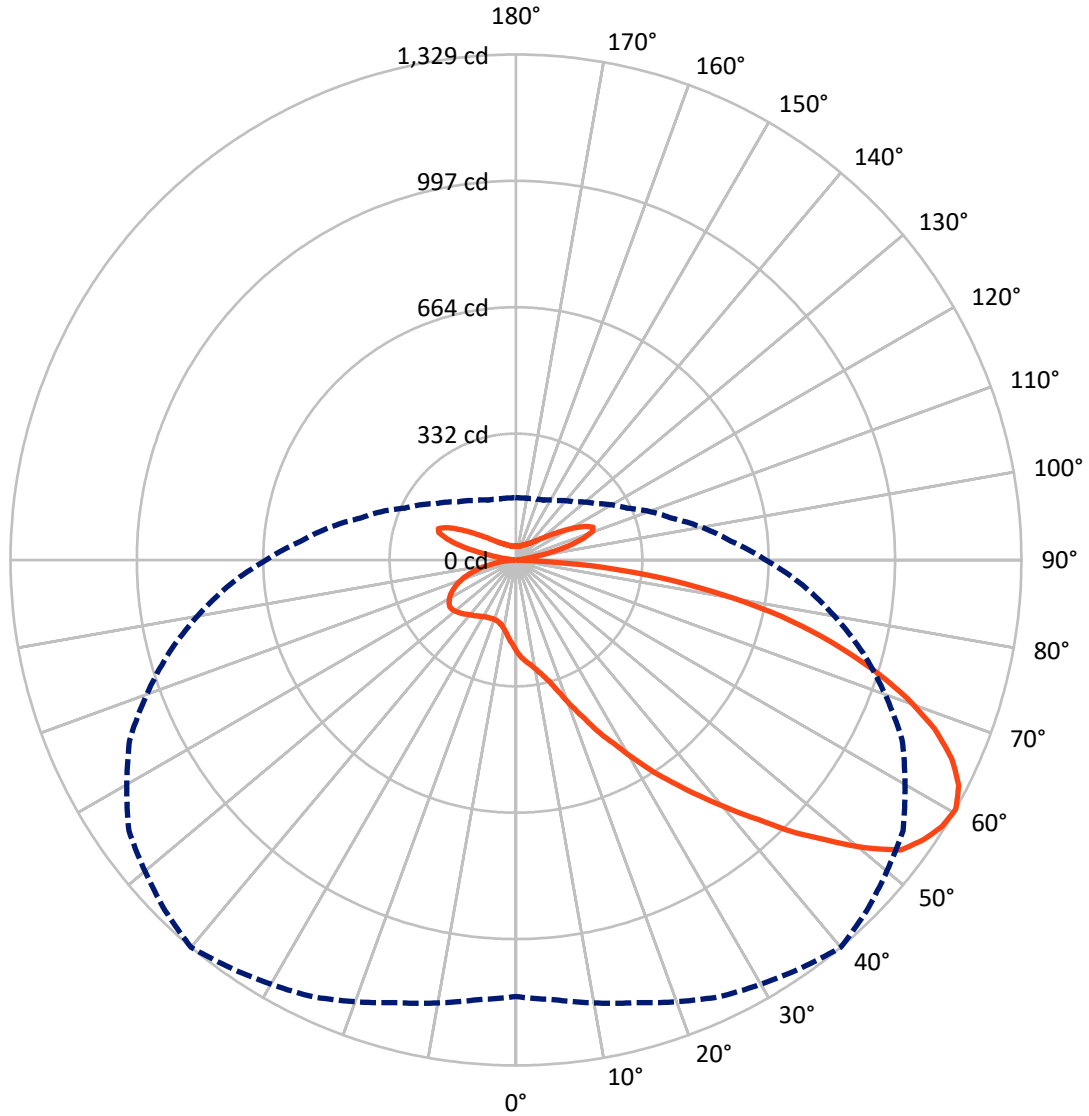
× Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 0.7 fc  
 Type IV - Short - N/A

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CATALOG NUMBER: TTN-D1-830-U-DL-UPL2

### Luminous Intensity Polar Plot



— Vertical Plane Through 40-Deg Lateral      - - - Horizontal Cone Through 60-Deg Vertical

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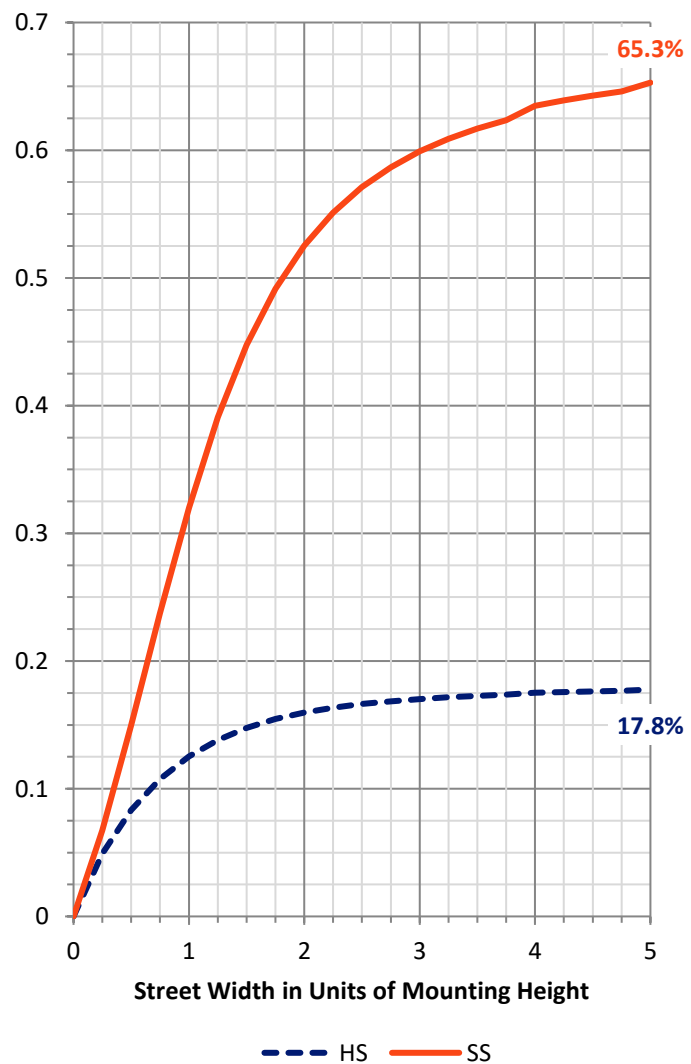
**FLUX DISTRIBUTION:**

		Downward	Upward	Total
<b>House Side</b>	Lumens	608.4	267.0	875.4
	% Fixture	17.9	7.9	25.8
<b>Street Side</b>	Lumens	2247.4	267.0	2514.4
	% Fixture	66.3	7.9	74.2
<b>Total</b>	Lumens	2855.7	534.0	3389.8
	% Fixture	84.2	15.8	100.0

**Coefficient of Utilization**

**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	22.7	0.7
10°-20°	72.4	2.1
20°-30°	152.9	4.5
30°-40°	279.4	8.2
40°-50°	454.0	13.4
50°-60°	631.1	18.6
60°-70°	654.2	19.3
70°-80°	468.8	13.8
80°-90°	120.3	3.5
90°-100°	11.9	0.4
100°-110°	121.1	3.6
110°-120°	177.1	5.2
120°-130°	102.8	3.0
130°-140°	54.4	1.6
140°-150°	32.3	1.0
150°-160°	19.9	0.6
160°-170°	10.9	0.3
170°-180°	3.5	0.1
0°-90°	2855.7	84.2
0°-180°	3389.8	100.0



REPORT NUMBER: P833318

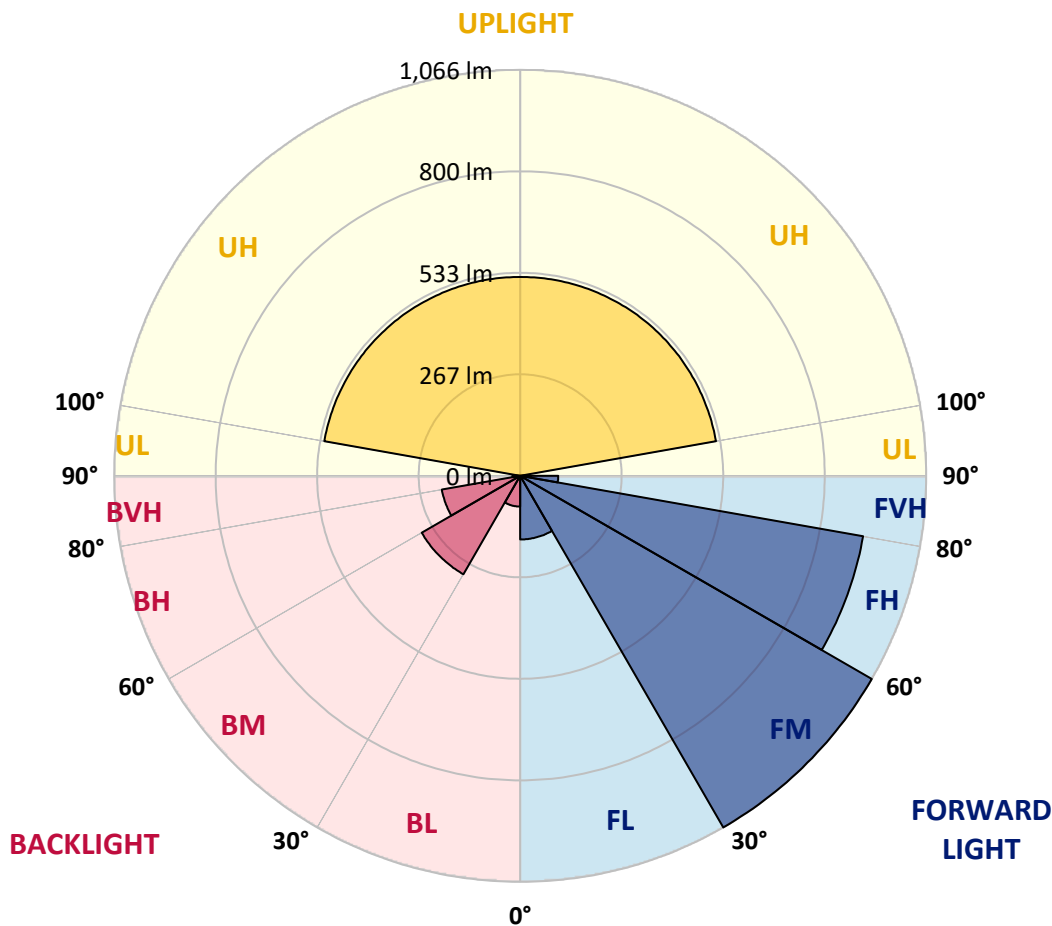
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

Zone	Lumens	% Fixture	Zone Rating/Lumen Limit		
			B	U	G
FL (0°-30°)	167.1	4.9			
FM (30°-60°)	1066.1	31.4			
FH (60°-80°)	914.3	27.0			G1/1800
FVH (80°-90°)	99.9	2.9			G1/100
BL (0°-30°)	80.9	2.4	B0/110		
BM (30°-60°)	298.5	8.8	B1/1000		
BH (60°-80°)	208.7	6.2	B1/500		G1/500
BVH (80°-90°)	20.3	0.6			G1/100
UL (90°-100°)	11.9	0.4		U2/50	
UH (100°-180°)	522.1	15.4		U4/1000	

**BUG Rating: B1-U4-G1**

Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

	0°	5°	15°	25°	35°	40°	45°	55°	65°	75°	85°
0°	240.5	240.5	240.5	240.5	240.5	240.5	240.5	240.5	240.5	240.5	240.5
2.5°	257.8	257.8	257.8	257.8	255.3	255.3	252.8	250.4	247.9	245.4	240.5
5°	280.1	280.1	277.6	275.2	270.2	267.7	265.2	260.3	255.3	250.4	242.9
7.5°	290.0	290.0	290.0	287.6	280.1	277.6	272.7	265.2	257.8	250.4	240.5
10°	307.4	307.4	304.9	302.4	295.0	292.5	287.6	277.6	265.2	252.8	240.5
12.5°	329.7	327.2	324.7	322.3	314.8	309.9	302.4	292.5	277.6	262.8	247.9
15°	357.0	352.0	352.0	347.0	339.6	332.2	327.2	312.3	297.5	277.6	257.8
17.5°	386.7	384.2	381.8	376.8	369.4	364.4	357.0	339.6	319.8	295.0	272.7
20°	423.9	418.9	421.4	414.0	406.5	404.1	391.7	371.8	347.0	319.8	292.5
22.5°	468.5	463.6	463.6	456.1	451.2	446.2	433.8	411.5	379.3	349.5	314.8
25°	518.1	513.1	513.1	508.2	503.2	498.3	483.4	458.6	421.4	384.2	344.6
27.5°	572.6	567.7	567.7	565.2	552.8	545.4	533.0	505.7	468.5	421.4	374.3
30°	629.6	624.7	629.6	624.7	617.2	602.4	587.5	557.8	515.6	463.6	406.5
32.5°	674.3	674.3	676.7	681.7	676.7	664.3	647.0	622.2	565.2	500.7	436.3
35°	726.3	726.3	731.3	738.7	736.2	723.8	706.5	679.2	619.7	542.9	468.5
37.5°	783.3	783.3	788.3	800.7	795.7	788.3	775.9	741.2	674.3	585.0	503.2
40°	845.3	842.8	847.8	865.1	867.6	857.7	842.8	808.1	731.3	639.6	540.4
42.5°	907.3	904.8	914.7	932.1	934.5	932.1	917.2	877.5	790.8	694.1	577.6
45°	969.3	969.3	984.1	1011.4	1023.8	1018.8	1006.4	956.9	865.1	751.1	627.2
47.5°	1033.7	1033.7	1053.5	1088.2	1103.1	1100.6	1095.7	1036.2	937.0	810.6	669.3
50°	1083.3	1083.3	1115.5	1155.2	1180.0	1189.9	1165.1	1110.6	999.0	862.7	704.0
52.5°	1132.9	1132.9	1165.1	1227.1	1251.8	1266.7	1234.5	1177.5	1068.4	909.8	736.2
55°	1157.6	1162.6	1207.2	1266.7	1306.4	1298.9	1311.3	1234.5	1113.0	944.5	756.1
57.5°	1160.1	1167.6	1217.1	1279.1	1323.7	1321.3	1323.7	1254.3	1130.4	951.9	758.5
60°	1147.7	1160.1	1204.7	1266.7	1308.9	1328.7	1303.9	1241.9	1120.5	944.5	756.1
62.5°	1118.0	1142.8	1189.9	1237.0	1298.9	1306.4	1286.6	1234.5	1093.2	937.0	743.7
65°	1051.1	1078.3	1145.3	1199.8	1249.4	1259.3	1237.0	1192.4	1065.9	902.3	704.0
67.5°	984.1	1001.5	1058.5	1142.8	1177.5	1187.4	1180.0	1127.9	1018.8	832.9	656.9
70°	907.3	929.6	974.2	1061.0	1095.7	1093.2	1115.5	1056.0	946.9	773.4	607.3
72.5°	803.2	835.4	880.0	951.9	994.0	979.2	1013.9	964.3	852.7	699.1	540.4
75°	681.7	709.0	766.0	823.0	870.1	852.7	880.0	845.3	743.7	609.8	463.6
77.5°	545.4	577.6	629.6	681.7	713.9	713.9	726.3	696.6	617.2	500.7	379.3
80°	404.1	433.8	480.9	518.1	547.8	550.3	562.7	547.8	476.0	389.2	290.0
82.5°	267.7	282.6	324.7	354.5	384.2	381.8	401.6	391.7	332.2	267.7	193.4
85°	114.0	123.9	158.7	183.4	210.7	200.8	228.1	225.6	178.5	128.9	86.8
87.5°	5.0	7.4	7.4	5.0	7.4	2.5	7.4	9.9	7.4	5.0	5.0
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	7.3	6.8	6.4	7.3	5.5	5.5	4.6
95°	5.5	5.5	6.4	8.2	10.1	10.6	11.0	11.0	6.4	6.4	5.5
97.5°	7.3	8.2	8.2	10.1	16.4	23.3	30.2	18.3	9.1	9.1	8.2
100°	11.9	12.8	12.8	22.8	48.4	56.6	64.9	46.6	23.8	17.4	12.8
102.5°	38.4	40.2	49.3	74.0	109.6	104.6	99.6	84.1	79.5	54.8	43.9
105°	97.8	96.8	104.2	123.3	153.5	152.2	150.8	138.9	126.1	108.7	100.5
107.5°	128.8	128.8	135.2	151.7	174.5	189.1	203.7	206.5	163.5	143.4	134.3
110°	145.3	145.3	150.8	164.5	194.6	215.2	235.7	233.9	201.9	177.3	165.4



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**CANDELA DISTRIBUTION (continued):**

	0°	5°	15°	25°	35°	40°	45°	55°	65°	75°	85°
112.5°	148.9	149.8	157.1	178.2	211.1	220.2	229.3	221.1	208.3	197.4	188.2
115°	154.4	154.4	162.6	182.7	201.0	204.6	208.3	199.2	189.1	181.8	178.2
117.5°	152.6	155.3	157.1	168.1	180.0	182.8	185.5	180.9	167.2	161.7	159.9
120°	141.6	141.6	143.4	148.9	155.3	156.7	158.1	156.2	147.1	142.5	141.6
122.5°	126.1	127.0	126.1	128.8	133.4	134.8	136.1	134.3	127.0	125.2	125.2
125°	110.6	110.6	109.6	111.5	114.2	113.8	113.3	114.2	110.6	109.6	109.6
127.5°	99.6	98.7	96.8	97.8	98.7	98.7	98.7	99.6	95.9	96.8	97.8
130°	88.6	88.6	86.8	86.8	86.8	85.9	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	68.0	67.6	68.5	67.6	69.4	70.4
137.5°	64.0	64.0	62.1	62.1	62.1	61.6	61.2	62.1	62.1	63.0	64.9
140°	58.5	58.5	57.6	57.6	56.6	57.1	57.6	57.6	57.6	58.5	59.4
142.5°	55.7	54.8	53.9	53.0	53.9	53.9	53.9	53.9	53.0	53.9	55.7
145°	51.2	51.2	50.3	50.3	50.3	50.8	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	46.2	45.7	45.7	45.7	45.7	46.6
152.5°	44.8	44.8	43.9	44.8	43.9	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	39.3	39.3	39.3	39.3	40.2	40.2	40.2
162.5°	39.3	39.3	39.3	39.3	38.4	38.4	38.4	38.4	38.4	39.3	39.3
165°	39.3	38.4	38.4	38.4	37.5	37.5	37.5	37.5	37.5	38.4	39.3
167.5°	37.5	37.5	37.5	37.5	37.5	37.0	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	36.5	36.5	36.5	36.5	36.5	36.5	37.5
175°	37.5	37.5	37.5	37.5	36.5	36.5	36.5	36.5	37.5	37.5	37.5
177.5°	37.5	37.5	37.5	37.5	36.5	37.0	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°	240.5	240.5	240.5	240.5	240.5	240.5	240.5	240.5	240.5	240.5	240.5
2.5°	240.5	238.0	233.0	230.5	228.1	223.1	223.1	220.6	220.6	220.6	218.1
5°	240.5	235.5	230.5	223.1	218.1	213.2	208.2	203.3	200.8	200.8	198.3
7.5°	235.5	230.5	223.1	215.7	208.2	198.3	193.4	183.4	181.0	178.5	178.5
10°	235.5	230.5	218.1	208.2	198.3	188.4	181.0	171.0	163.6	161.1	161.1
12.5°	238.0	230.5	218.1	205.7	193.4	181.0	171.0	161.1	153.7	148.7	148.7
15°	247.9	238.0	223.1	205.7	190.9	176.0	166.1	153.7	146.3	141.3	141.3
17.5°	260.3	250.4	228.1	208.2	190.9	173.5	161.1	148.7	141.3	136.3	133.9
20°	277.6	262.8	238.0	210.7	190.9	173.5	158.7	146.3	136.3	131.4	131.4
22.5°	297.5	280.1	247.9	215.7	193.4	173.5	158.7	143.8	133.9	128.9	128.9
25°	322.3	299.9	262.8	225.6	198.3	176.0	158.7	143.8	133.9	128.9	128.9
27.5°	349.5	324.7	277.6	235.5	203.3	178.5	158.7	143.8	133.9	128.9	128.9
30°	374.3	347.0	292.5	245.4	210.7	181.0	161.1	146.3	136.3	131.4	128.9
32.5°	401.6	366.9	307.4	255.3	215.7	185.9	163.6	148.7	136.3	131.4	131.4
35°	428.9	391.7	322.3	267.7	223.1	190.9	166.1	151.2	138.8	133.9	133.9
37.5°	458.6	418.9	339.6	277.6	230.5	195.8	171.0	153.7	141.3	136.3	136.3
40°	493.3	446.2	357.0	290.0	238.0	200.8	173.5	158.7	146.3	141.3	141.3
42.5°	525.5	471.0	374.3	299.9	245.4	205.7	178.5	161.1	151.2	146.3	146.3
45°	557.8	500.7	391.7	312.3	252.8	213.2	183.4	168.6	156.2	151.2	151.2
47.5°	594.9	528.0	411.5	322.3	260.3	218.1	188.4	173.5	161.1	158.7	156.2
50°	624.7	547.8	423.9	332.2	265.2	223.1	193.4	176.0	166.1	161.1	161.1
52.5°	652.0	567.7	433.8	337.1	267.7	225.6	198.3	181.0	171.0	166.1	166.1
55°	666.8	575.1	441.2	337.1	270.2	228.1	198.3	181.0	171.0	168.6	166.1
57.5°	666.8	575.1	436.3	332.2	265.2	223.1	195.8	178.5	171.0	166.1	166.1
60°	656.9	567.7	423.9	322.3	257.8	215.7	190.9	173.5	166.1	163.6	163.6
62.5°	642.0	555.3	414.0	309.9	247.9	205.7	183.4	166.1	161.1	161.1	158.7
65°	602.4	518.1	391.7	292.5	233.0	193.4	173.5	158.7	153.7	151.2	148.7
67.5°	560.2	483.4	357.0	272.7	213.2	181.0	161.1	148.7	141.3	141.3	138.8
70°	518.1	446.2	324.7	245.4	190.9	166.1	146.3	133.9	128.9	128.9	128.9
72.5°	461.1	399.1	287.6	215.7	168.6	146.3	131.4	119.0	116.5	116.5	114.0
75°	394.1	339.6	242.9	183.4	141.3	123.9	111.6	99.2	99.2	99.2	99.2
77.5°	322.3	275.2	193.4	146.3	111.6	99.2	91.7	81.8	81.8	81.8	81.8
80°	242.9	203.3	141.3	106.6	81.8	71.9	66.9	62.0	64.5	64.5	62.0
82.5°	158.7	133.9	89.2	66.9	52.1	47.1	47.1	42.1	44.6	44.6	44.6
85°	69.4	59.5	37.2	29.7	24.8	24.8	24.8	22.3	24.8	24.8	24.8
87.5°	5.0	5.0	5.0	5.0	5.0	5.0	5.0	0.0	2.5	5.0	2.5
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



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**CANDELA DISTRIBUTION (continued):**

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

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



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

Report Prepared for

Cooper Lighting Solutions

MCGRAW EDISON

Report Number: SP1-2411-284-4

Test Date: 11/22/2024

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

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

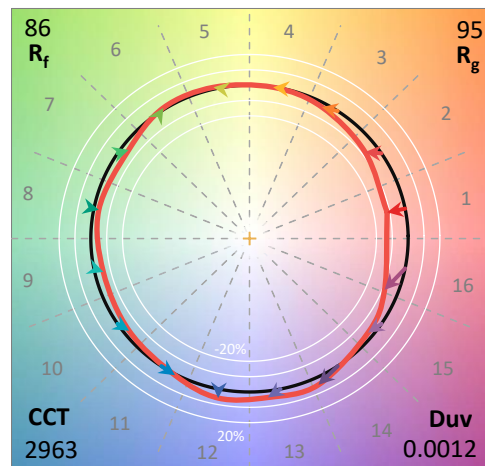
**Test Information**

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

**Spectral Parameters**

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

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



**Test Conditions**

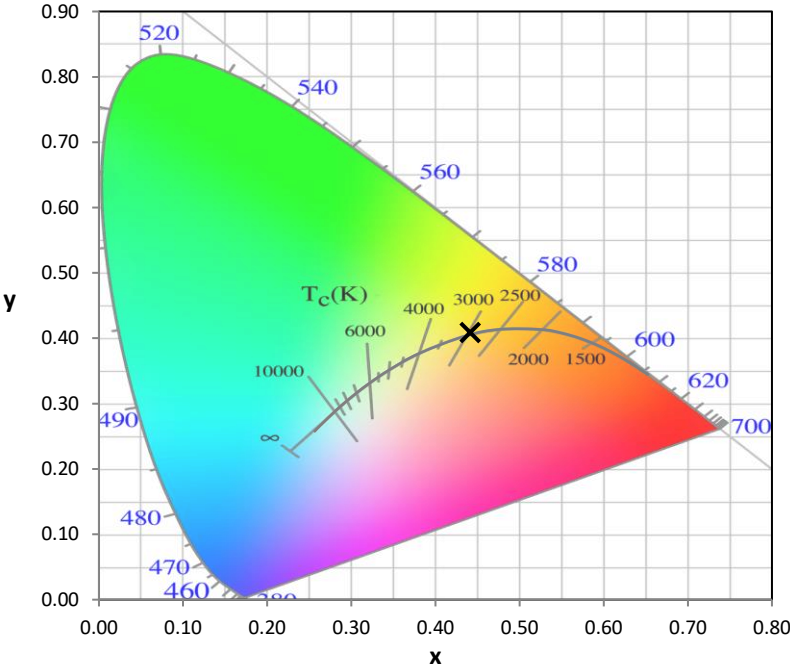
Stabilization Time: 37M  
 Operation Time: 1H 37M  
 Sphere Temperature (°C): 25.0

REPORT NUMBER: SP1-2411-284-4

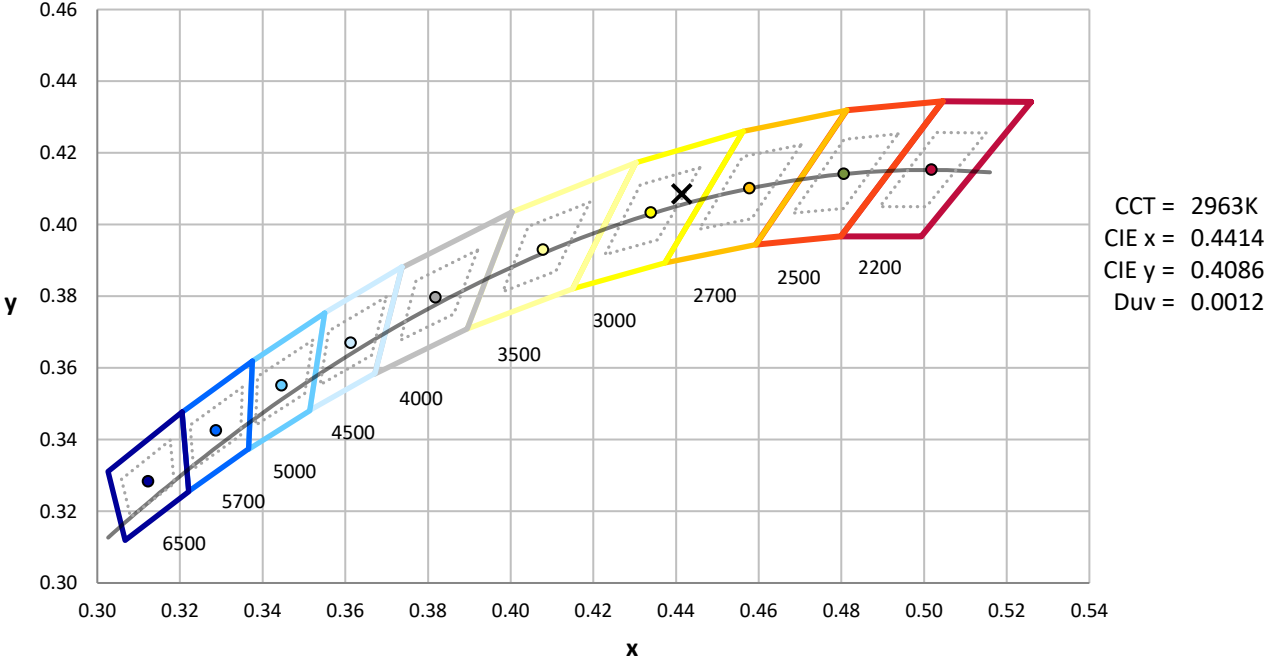
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	6/18/2024	12/18/2024
Power Meter	INXT2011004	2/8/2024	2/8/2025
AC Power Source	IN0063	10/22/2024	10/22/2025
DC Power Source	IN0208	10/22/2024	10/22/2025
Sphere Thermometer	IN0085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

REPORT NUMBER: SP1-2411-284-4

CIE 1931 Chromaticity Diagram



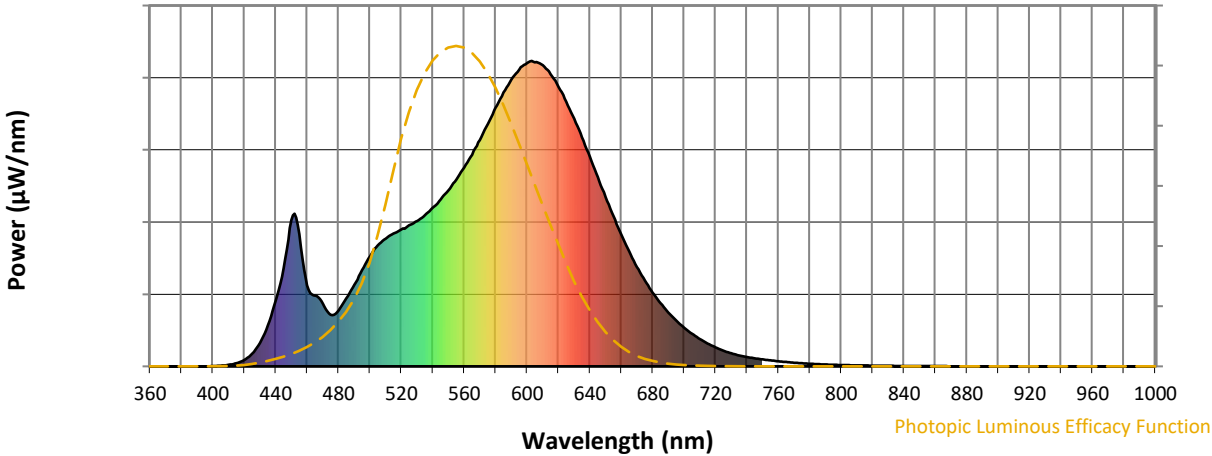
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-2411-284-4

**Photopic Flux vs. Wavelength**

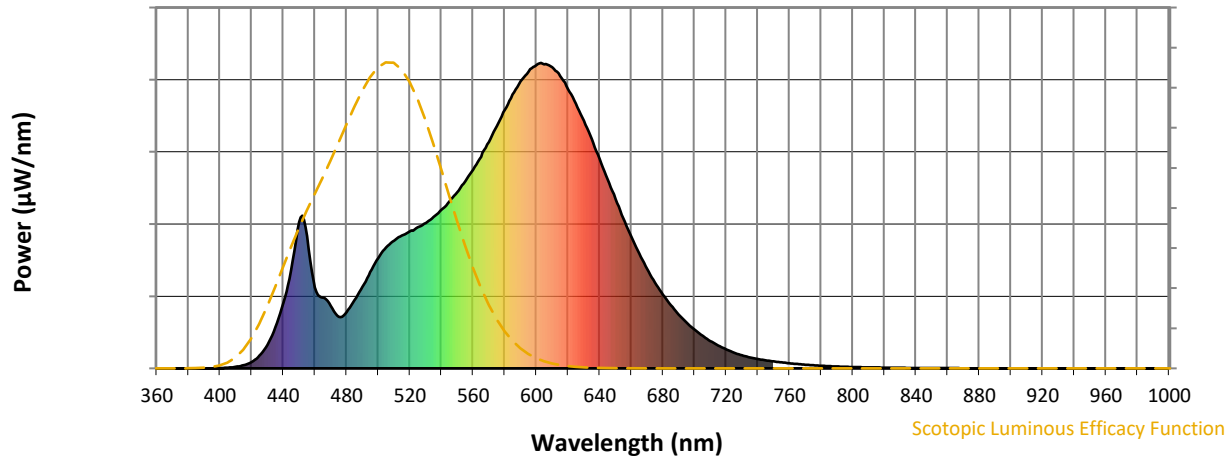


**Photopic Lumens: NR**

$\lambda$ (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**

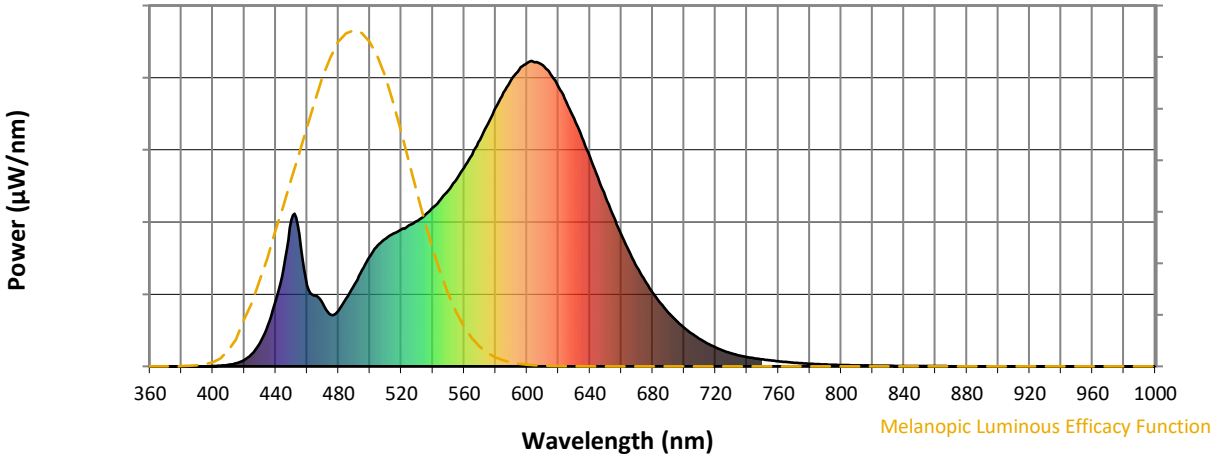
**S/P: 1.34**

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



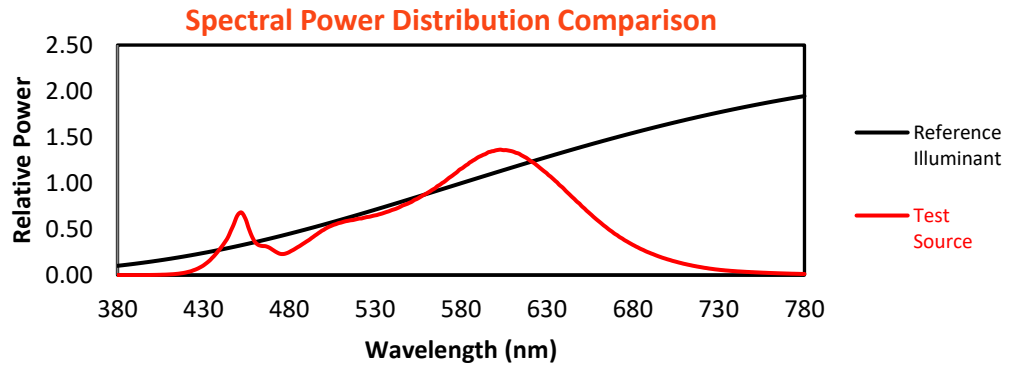
Melanopic Lumens: NR

M/P: 2.58

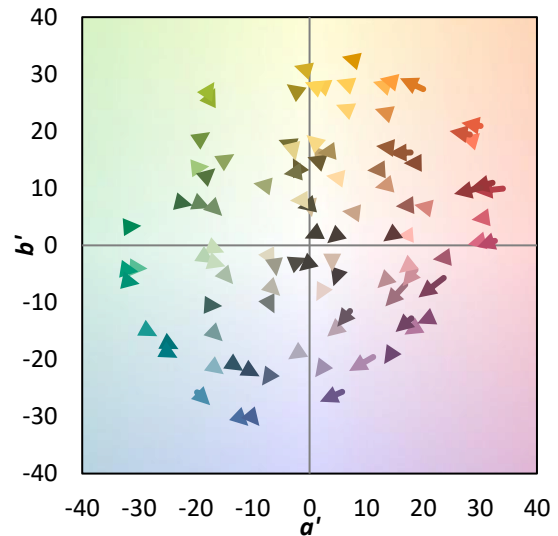
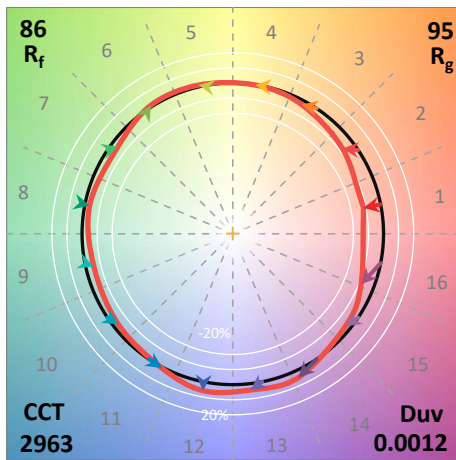
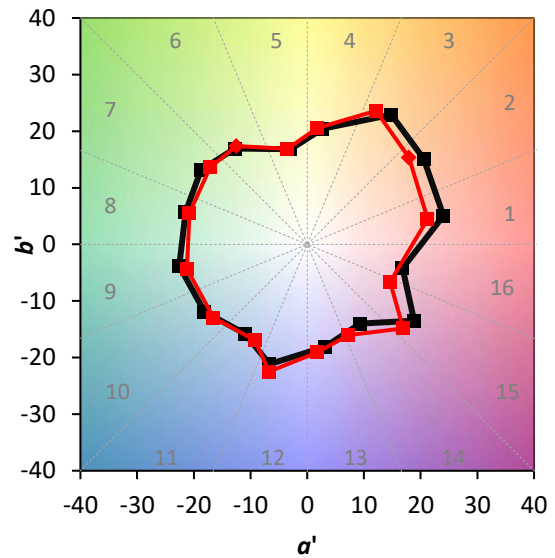
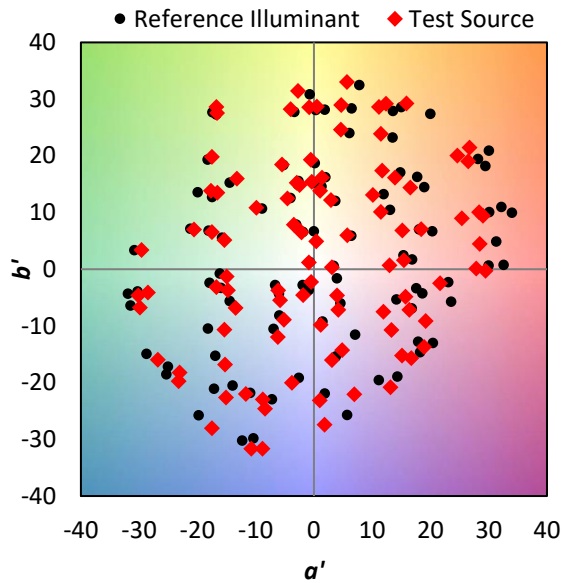
λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)
360	0	NR	490	267	NR	620	915	NR	750	23	NR	880	0	NR
365	0	NR	495	315	NR	625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

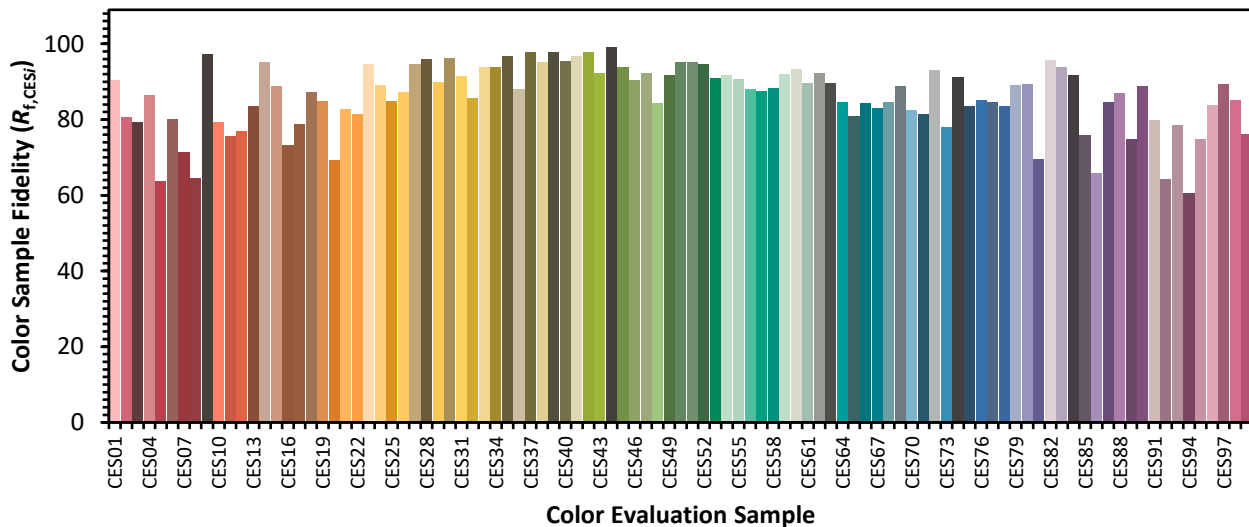


**Color Vector Graphics**

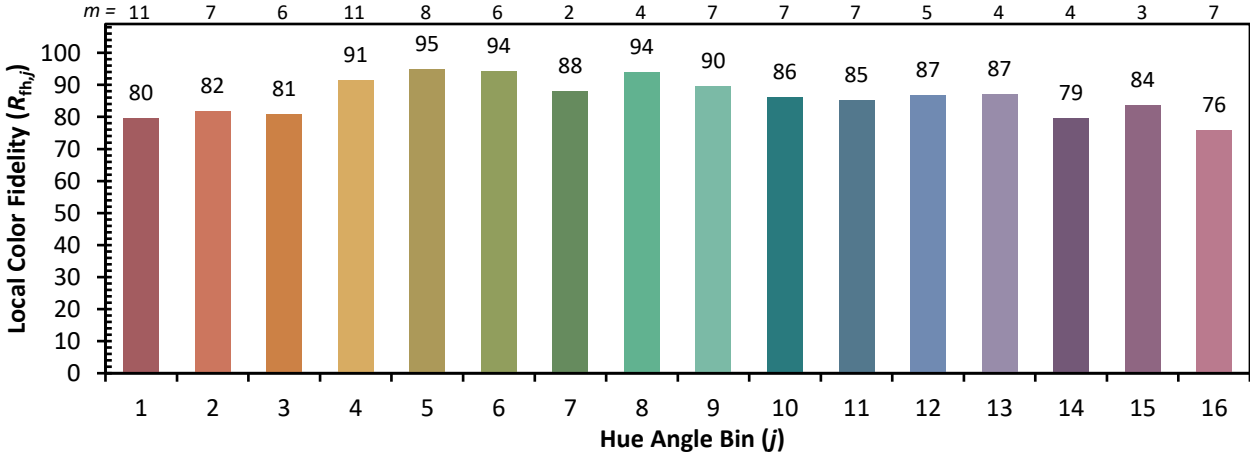
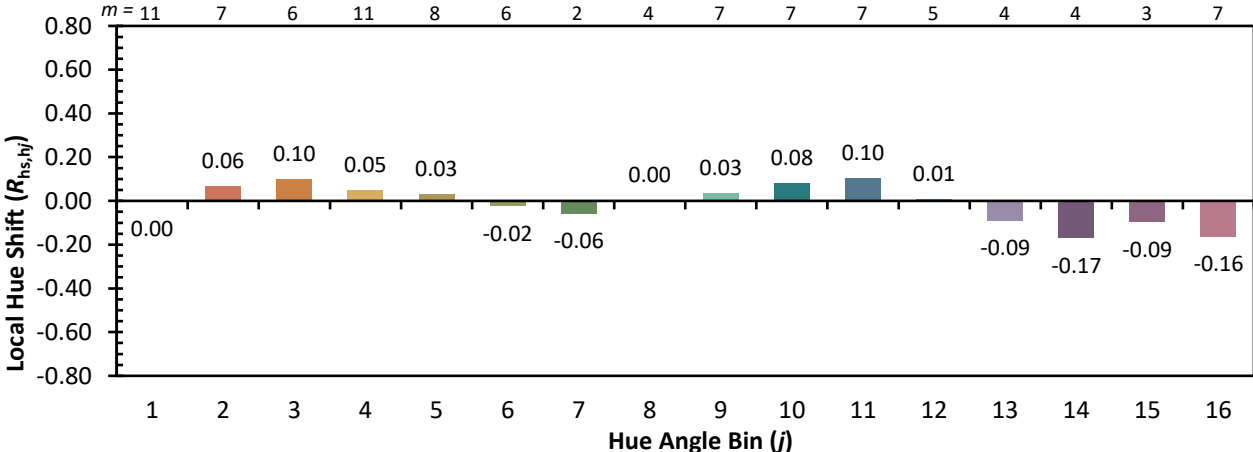
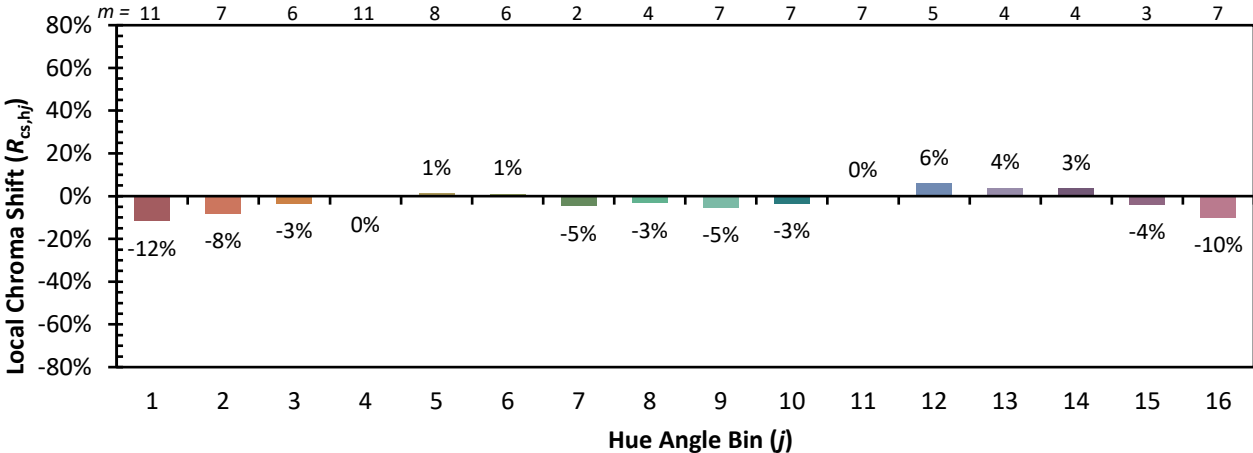


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

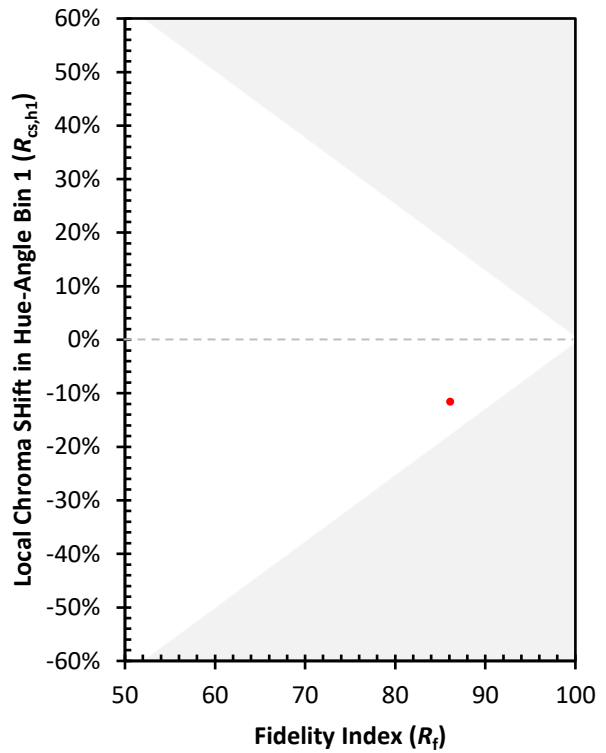
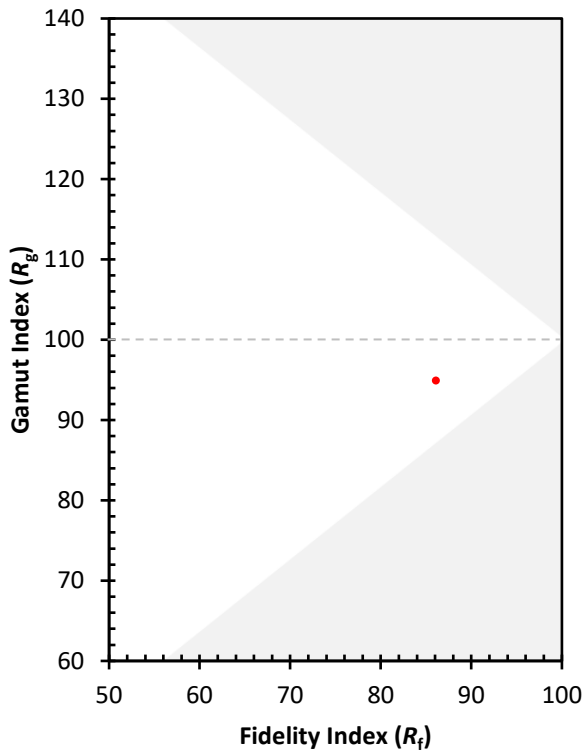
CES01 = 86	CES26 = 87	CES51 = 95	CES76 = 85
CES02 = 63	CES27 = 95	CES52 = 95	CES77 = 85
CES03 = 31	CES28 = 96	CES53 = 91	CES78 = 83
CES04 = 70	CES29 = 90	CES54 = 92	CES79 = 89
CES05 = 50	CES30 = 96	CES55 = 91	CES80 = 89
CES06 = 51	CES31 = 92	CES56 = 88	CES81 = 70
CES07 = 42	CES32 = 86	CES57 = 87	CES82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