

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: P832958

Luminaire Tested: **TTN-D0-830-U-DL-UPL2**

Issue Date: 5/15/2024

**Test Information**

Test Method: LM-79-08  
Report Number: P832958  
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-D0-830-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**

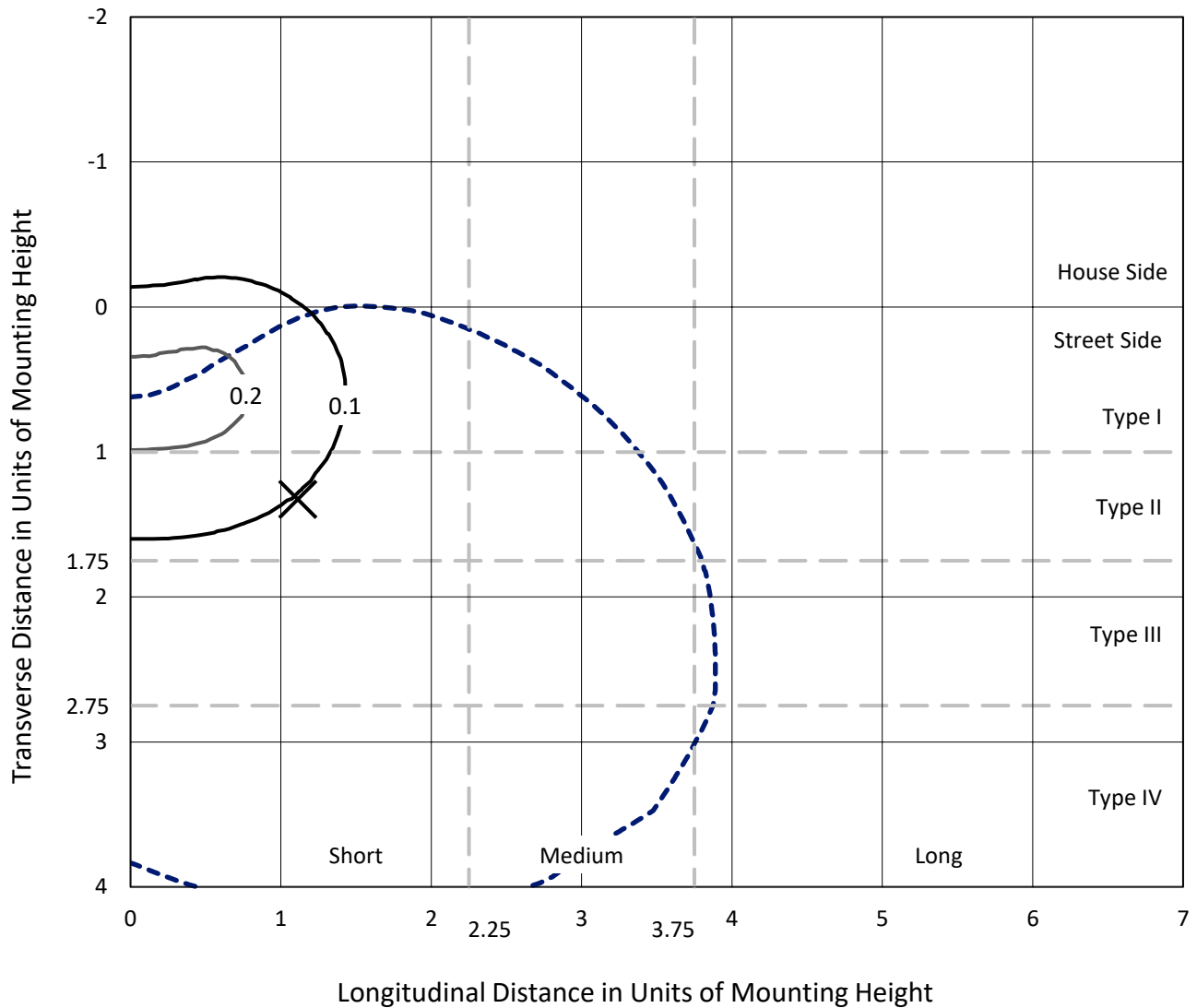
Lumens per Lamp: N/A  
Luminaire Lumens: 1566.8 lumens  
Efficiency: N/A  
Efficacy: 103.1 lumens/watt  
Luminous Opening: Vertical Cylinder (Dia: 0.71' x H: 0.1')  
IES Classification: Type IV - Short  
BUG Rating: B0 - U4 - G1  
  
Input Watts (W): 15.2  
Input Voltage (V): NR  
Input Current (Ain): 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

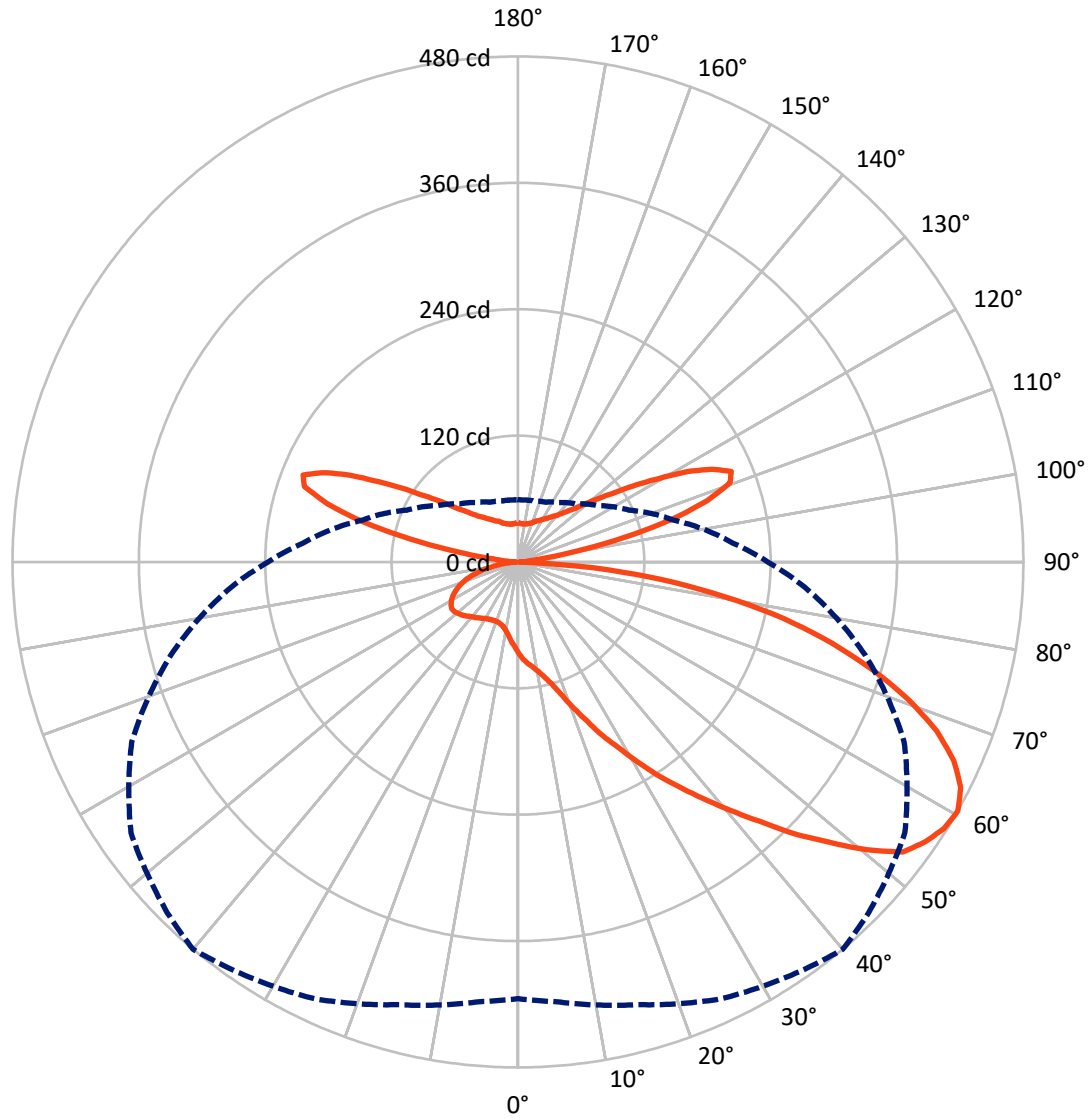
× Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 0.2 fc  
 Type IV - Short - N/A

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### Luminous Intensity Polar Plot



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

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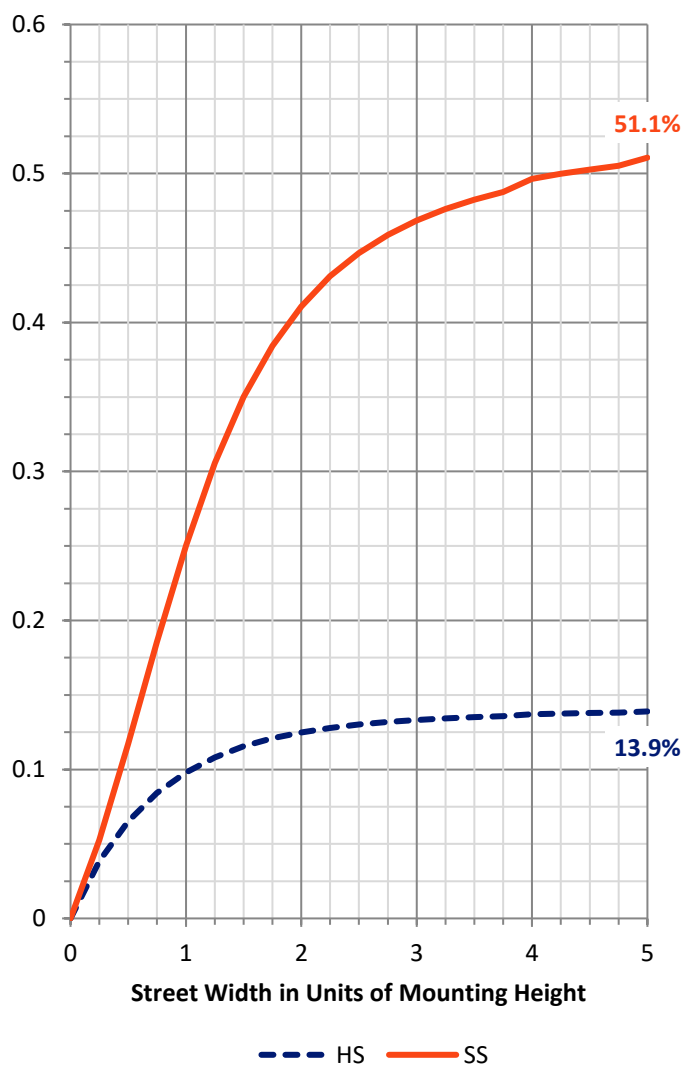
**FLUX DISTRIBUTION:**

		Downward	Upward	Total
<b>House Side</b>	Lumens	220.1	267.0	487.2
	% Fixture	14.1	17.0	31.1
<b>Street Side</b>	Lumens	812.6	267.0	1079.6
	% Fixture	51.9	17.0	68.9
<b>Total</b>	Lumens	1032.7	534.0	1566.8
	% Fixture	65.9	34.1	100.0

**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	8.2	0.5
10°-20°	26.2	1.7
20°-30°	55.3	3.5
30°-40°	101.0	6.4
40°-50°	164.1	10.5
50°-60°	228.1	14.6
60°-70°	236.5	15.1
70°-80°	169.5	10.8
80°-90°	43.9	2.8
90°-100°	11.9	0.8
100°-110°	121.1	7.7
110°-120°	177.1	11.3
120°-130°	102.8	6.6
130°-140°	54.4	3.5
140°-150°	32.3	2.1
150°-160°	19.9	1.3
160°-170°	10.9	0.7
170°-180°	3.5	0.2
0°-90°	1032.7	65.9
0°-180°	1566.8	100.0

**Coefficient of Utilization**



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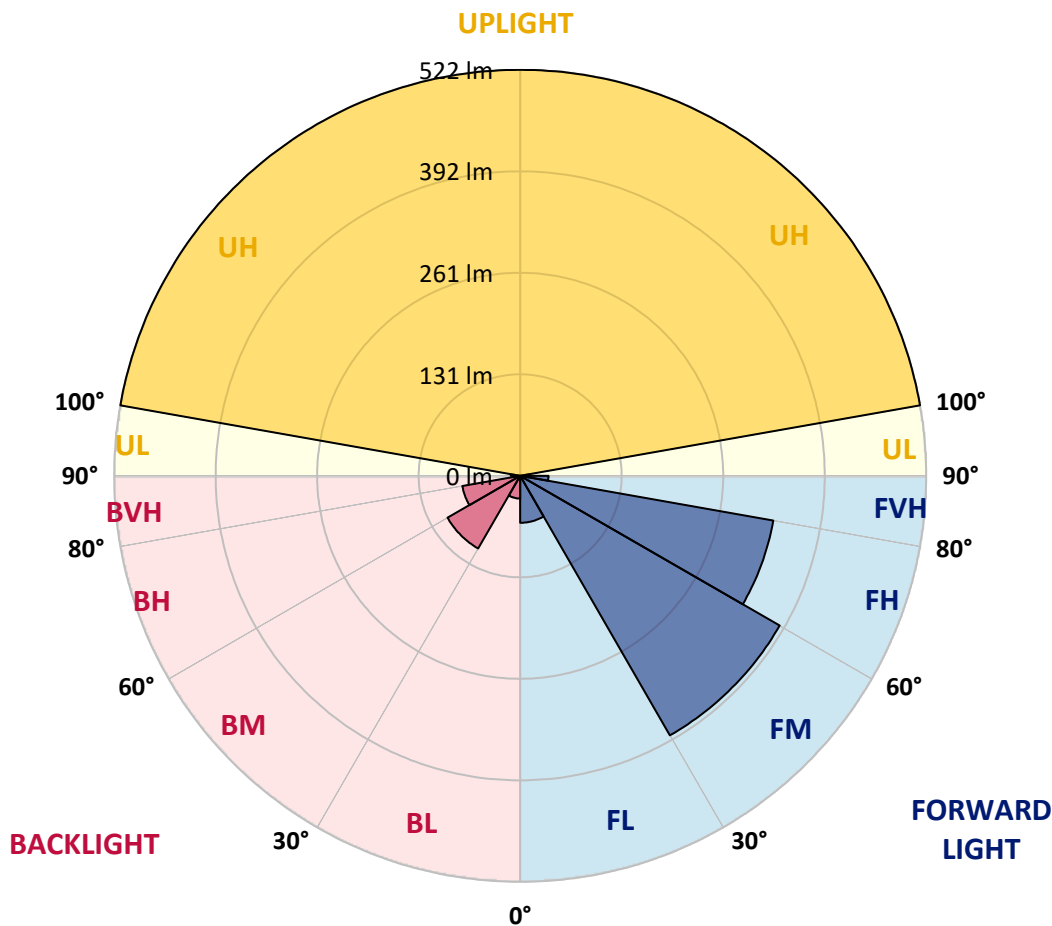
CATALOG NUMBER: TTN-D0-830-U-DL-UPL2

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

Zone	Lumens	% Fixture	Zone Rating/Lumen Limit		
			B	U	G
FL (0°-30°)	60.4	3.9			
FM (30°-60°)	385.3	24.6			
FH (60°-80°)	330.5	21.1			G0/660
FVH (80°-90°)	36.4	2.3			G1/100
BL (0°-30°)	29.2	1.9	B0/110		
BM (30°-60°)	107.9	6.9	B0/220		
BH (60°-80°)	75.4	4.8	B0/110		G0/110
BVH (80°-90°)	7.6	0.5			G0/10
UL (90°-100°)	11.9	0.8		U2/50	
UH (100°-180°)	522.1	33.3		U4/1000	

**BUG Rating: B0-U4-G1**

Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

	0°	5°	15°	25°	35°	40°	45°	55°	65°	75°	85°
0°	86.9	86.9	86.9	86.9	86.9	86.9	86.9	86.9	86.9	86.9	86.9
2.5°	93.2	93.2	93.2	93.2	92.3	92.3	91.4	90.5	89.6	88.7	86.9
5°	101.3	101.3	100.4	99.5	97.7	96.8	95.9	94.1	92.3	90.5	87.8
7.5°	104.8	104.8	104.8	103.9	101.3	100.4	98.6	95.9	93.2	90.5	86.9
10°	111.1	111.1	110.2	109.3	106.6	105.7	103.9	100.4	95.9	91.4	86.9
12.5°	119.2	118.3	117.4	116.5	113.8	112.0	109.3	105.7	100.4	95.0	89.6
15°	129.0	127.2	127.2	125.4	122.8	120.1	118.3	112.9	107.5	100.4	93.2
17.5°	139.8	138.9	138.0	136.2	133.5	131.7	129.0	122.8	115.6	106.6	98.6
20°	153.2	151.4	152.3	149.6	147.0	146.1	141.6	134.4	125.4	115.6	105.7
22.5°	169.4	167.6	167.6	164.9	163.1	161.3	156.8	148.7	137.1	126.3	113.8
25°	187.3	185.5	185.5	183.7	181.9	180.1	174.7	165.8	152.3	138.9	124.6
27.5°	207.0	205.2	205.2	204.3	199.8	197.1	192.7	182.8	169.4	152.3	135.3
30°	227.6	225.8	227.6	225.8	223.1	217.7	212.4	201.6	186.4	167.6	147.0
32.5°	243.7	243.7	244.6	246.4	244.6	240.1	233.9	224.9	204.3	181.0	157.7
35°	262.5	262.5	264.3	267.0	266.1	261.6	255.4	245.5	224.0	196.2	169.4
37.5°	283.2	283.2	284.9	289.4	287.6	284.9	280.5	267.9	243.7	211.5	181.9
40°	305.6	304.7	306.5	312.7	313.6	310.0	304.7	292.1	264.3	231.2	195.3
42.5°	328.0	327.1	330.6	336.9	337.8	336.9	331.5	317.2	285.8	250.9	208.8
45°	350.4	350.4	355.7	365.6	370.1	368.3	363.8	345.9	312.7	271.5	226.7
47.5°	373.7	373.7	380.8	393.4	398.7	397.8	396.1	374.6	338.7	293.0	241.9
50°	391.6	391.6	403.2	417.6	426.5	430.1	421.1	401.4	361.1	311.8	254.5
52.5°	409.5	409.5	421.1	443.5	452.5	457.9	446.2	425.6	386.2	328.9	266.1
55°	418.5	420.2	436.4	457.9	472.2	469.5	474.0	446.2	402.3	341.4	273.3
57.5°	419.4	422.0	440.0	462.4	478.5	477.6	478.5	453.4	408.6	344.1	274.2
60°	414.9	419.4	435.5	457.9	473.1	480.3	471.3	448.9	405.0	341.4	273.3
62.5°	404.1	413.1	430.1	447.1	469.5	472.2	465.1	446.2	395.2	338.7	268.8
65°	379.9	389.8	414.0	433.7	451.6	455.2	447.1	431.0	385.3	326.2	254.5
67.5°	355.7	362.0	382.6	413.1	425.6	429.2	426.5	407.7	368.3	301.1	237.5
70°	328.0	336.0	352.1	383.5	396.1	395.2	403.2	381.7	342.3	279.6	219.5
72.5°	290.3	302.0	318.1	344.1	359.3	353.9	366.5	348.6	308.2	252.7	195.3
75°	246.4	256.3	276.9	297.5	314.5	308.2	318.1	305.6	268.8	220.4	167.6
77.5°	197.1	208.8	227.6	246.4	258.1	258.1	262.5	251.8	223.1	181.0	137.1
80°	146.1	156.8	173.8	187.3	198.0	198.9	203.4	198.0	172.0	140.7	104.8
82.5°	96.8	102.2	117.4	128.1	138.9	138.0	145.2	141.6	120.1	96.8	69.9
85°	41.2	44.8	57.3	66.3	76.2	72.6	82.4	81.5	64.5	46.6	31.4
87.5°	1.8	2.7	2.7	1.8	2.7	0.9	2.7	3.6	2.7	1.8	1.8
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°	86.9	86.9	86.9	86.9	86.9	86.9	86.9	86.9	86.9	86.9	86.9
2.5°	86.9	86.0	84.2	83.3	82.4	80.6	80.6	79.7	79.7	79.7	78.9
5°	86.9	85.1	83.3	80.6	78.9	77.1	75.3	73.5	72.6	72.6	71.7
7.5°	85.1	83.3	80.6	78.0	75.3	71.7	69.9	66.3	65.4	64.5	64.5
10°	85.1	83.3	78.9	75.3	71.7	68.1	65.4	61.8	59.1	58.2	58.2
12.5°	86.0	83.3	78.9	74.4	69.9	65.4	61.8	58.2	55.6	53.8	53.8
15°	89.6	86.0	80.6	74.4	69.0	63.6	60.0	55.6	52.9	51.1	51.1
17.5°	94.1	90.5	82.4	75.3	69.0	62.7	58.2	53.8	51.1	49.3	48.4
20°	100.4	95.0	86.0	76.2	69.0	62.7	57.3	52.9	49.3	47.5	47.5
22.5°	107.5	101.3	89.6	78.0	69.9	62.7	57.3	52.0	48.4	46.6	46.6
25°	116.5	108.4	95.0	81.5	71.7	63.6	57.3	52.0	48.4	46.6	46.6
27.5°	126.3	117.4	100.4	85.1	73.5	64.5	57.3	52.0	48.4	46.6	46.6
30°	135.3	125.4	105.7	88.7	76.2	65.4	58.2	52.9	49.3	47.5	46.6
32.5°	145.2	132.6	111.1	92.3	78.0	67.2	59.1	53.8	49.3	47.5	47.5
35°	155.0	141.6	116.5	96.8	80.6	69.0	60.0	54.7	50.2	48.4	48.4
37.5°	165.8	151.4	122.8	100.4	83.3	70.8	61.8	55.6	51.1	49.3	49.3
40°	178.3	161.3	129.0	104.8	86.0	72.6	62.7	57.3	52.9	51.1	51.1
42.5°	190.0	170.3	135.3	108.4	88.7	74.4	64.5	58.2	54.7	52.9	52.9
45°	201.6	181.0	141.6	112.9	91.4	77.1	66.3	60.9	56.5	54.7	54.7
47.5°	215.1	190.9	148.7	116.5	94.1	78.9	68.1	62.7	58.2	57.3	56.5
50°	225.8	198.0	153.2	120.1	95.9	80.6	69.9	63.6	60.0	58.2	58.2
52.5°	235.7	205.2	156.8	121.9	96.8	81.5	71.7	65.4	61.8	60.0	60.0
55°	241.0	207.9	159.5	121.9	97.7	82.4	71.7	65.4	61.8	60.9	60.0
57.5°	241.0	207.9	157.7	120.1	95.9	80.6	70.8	64.5	61.8	60.0	60.0
60°	237.5	205.2	153.2	116.5	93.2	78.0	69.0	62.7	60.0	59.1	59.1
62.5°	232.1	200.7	149.6	112.0	89.6	74.4	66.3	60.0	58.2	58.2	57.3
65°	217.7	187.3	141.6	105.7	84.2	69.9	62.7	57.3	55.6	54.7	53.8
67.5°	202.5	174.7	129.0	98.6	77.1	65.4	58.2	53.8	51.1	51.1	50.2
70°	187.3	161.3	117.4	88.7	69.0	60.0	52.9	48.4	46.6	46.6	46.6
72.5°	166.7	144.3	103.9	78.0	60.9	52.9	47.5	43.0	42.1	42.1	41.2
75°	142.5	122.8	87.8	66.3	51.1	44.8	40.3	35.8	35.8	35.8	35.8
77.5°	116.5	99.5	69.9	52.9	40.3	35.8	33.2	29.6	29.6	29.6	29.6
80°	87.8	73.5	51.1	38.5	29.6	26.0	24.2	22.4	23.3	23.3	22.4
82.5°	57.3	48.4	32.3	24.2	18.8	17.0	17.0	15.2	16.1	16.1	16.1
85°	25.1	21.5	13.4	10.8	9.0	9.0	9.0	8.1	9.0	9.0	9.0
87.5°	1.8	1.8	1.8	1.8	1.8	1.8	1.8	0.0	0.9	1.8	0.9
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: P832958  
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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

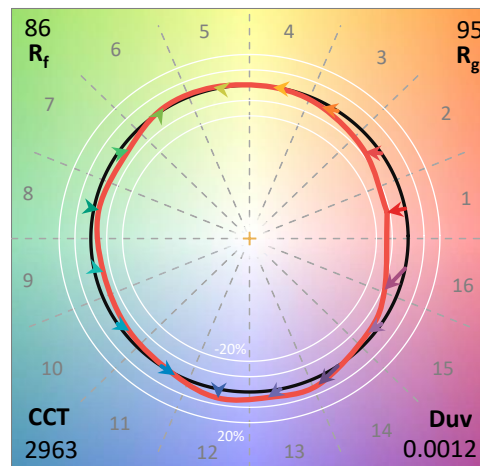
**Test Information**

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**

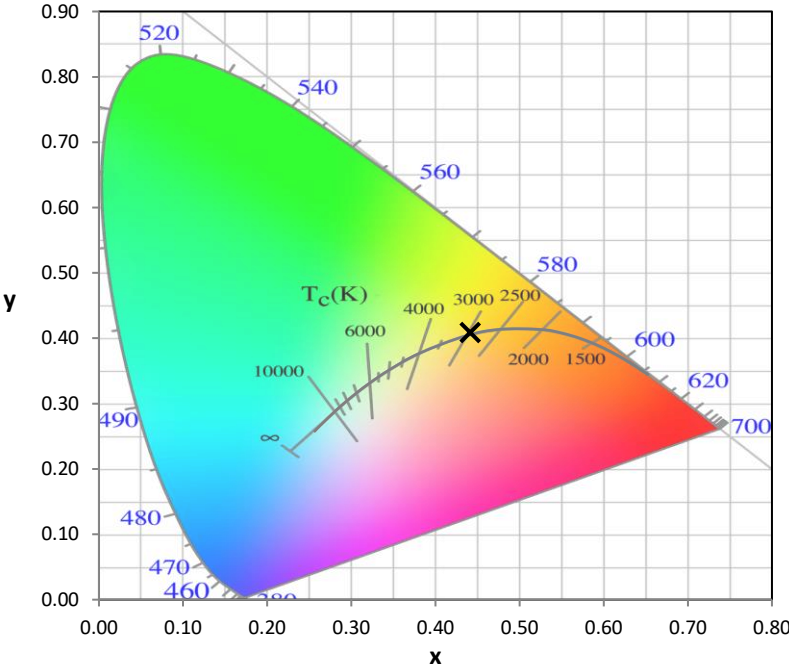
Stabilization Time: 37M  
 Operation Time: 1H 37M  
 Sphere Temperature (°C): 25.0

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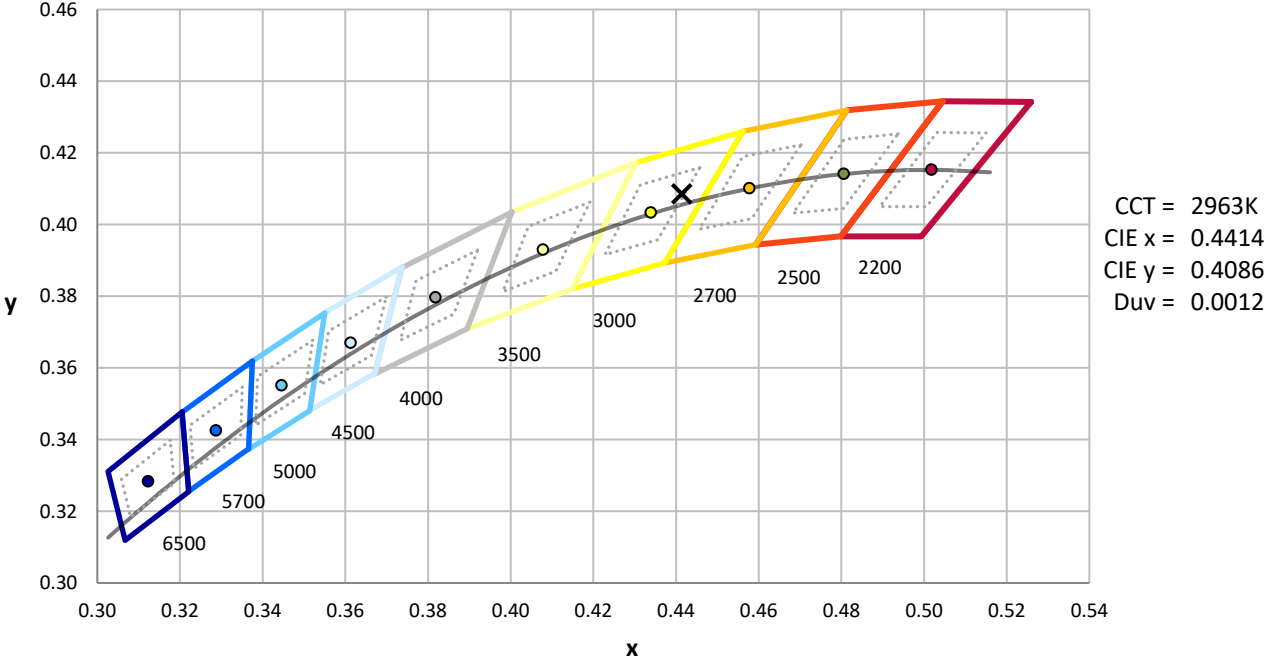
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	6/18/2024	12/18/2024
Power Meter	INXT2011004	2/8/2024	2/8/2025
AC Power Source	IN0063	10/22/2024	10/22/2025
DC Power Source	IN0208	10/22/2024	10/22/2025
Sphere Thermometer	IN0085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

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CIE 1931 Chromaticity Diagram



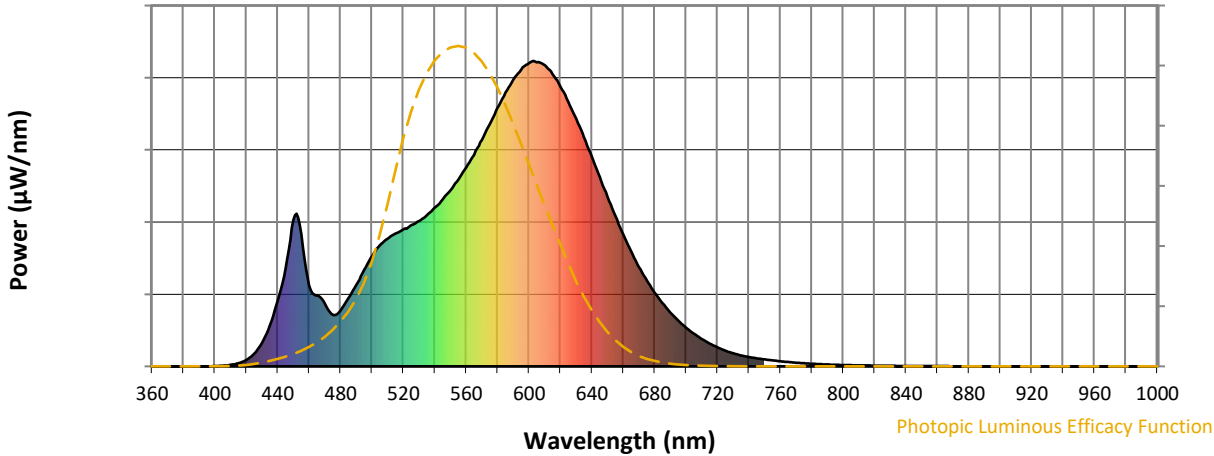
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 3000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**

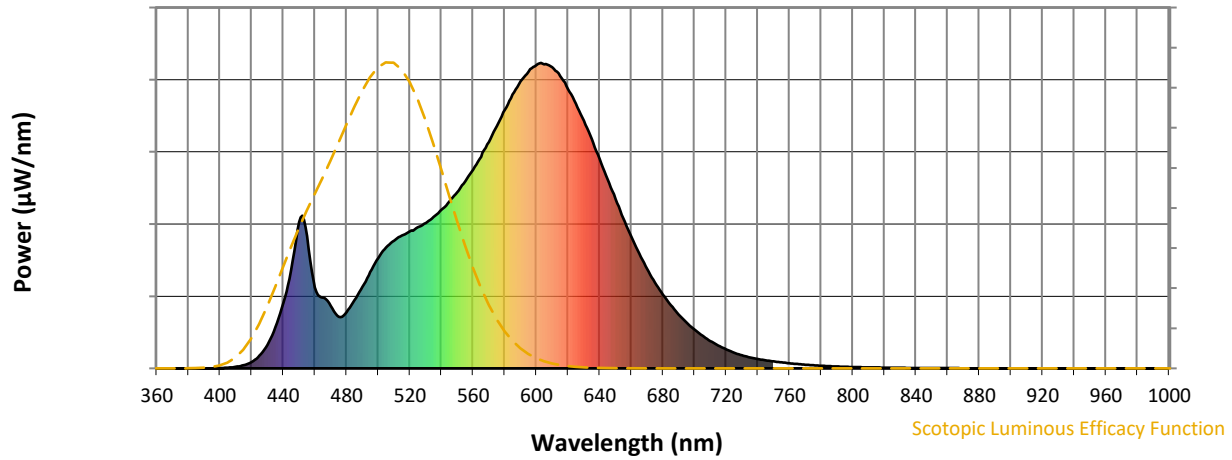


**Photopic Lumens: NR**

$\lambda$ (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**

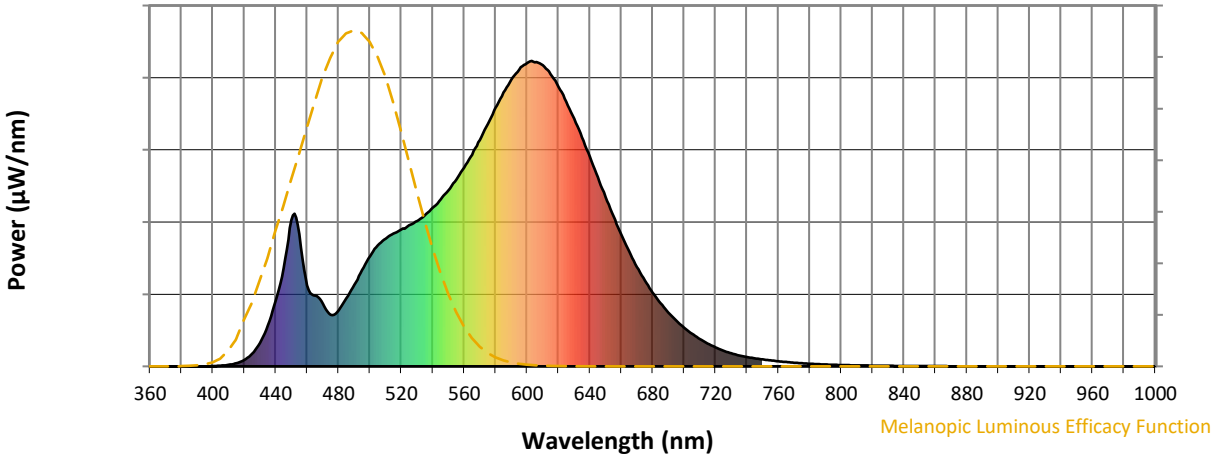
**S/P: 1.34**

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			



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Melanopic Flux vs. Wavelength



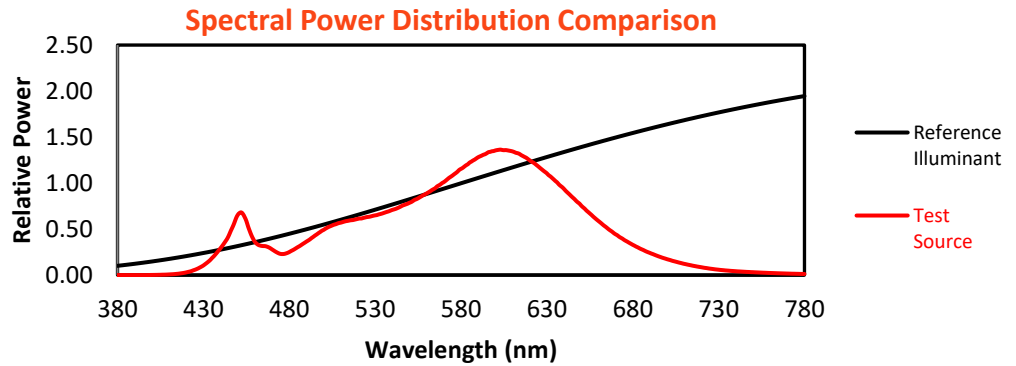
Melanopic Lumens: NR

M/P: 2.58

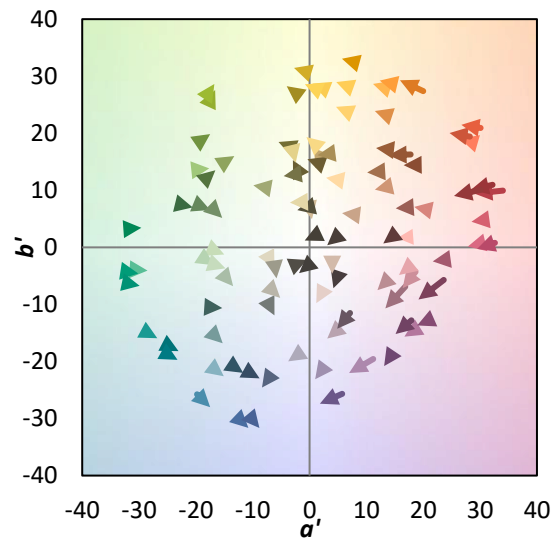
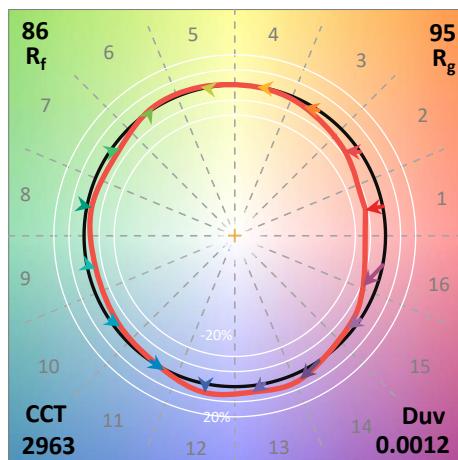
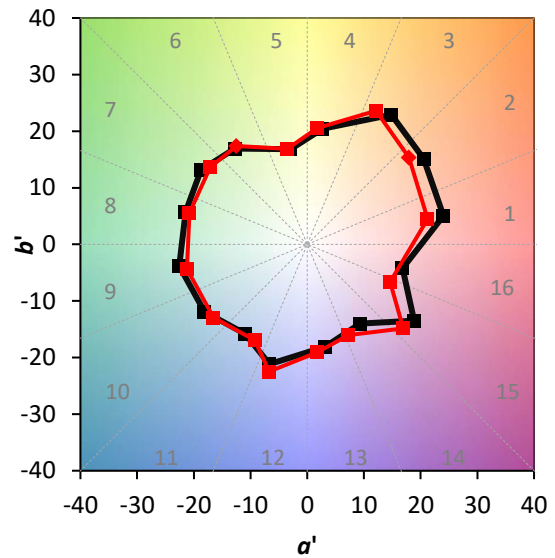
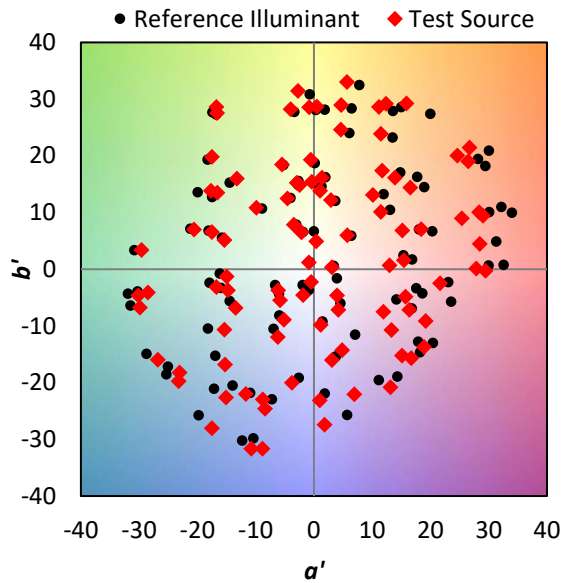
λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)
360	0	NR	490	267	NR	620	915	NR	750	23	NR	880	0	NR
365	0	NR	495	315	NR	625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

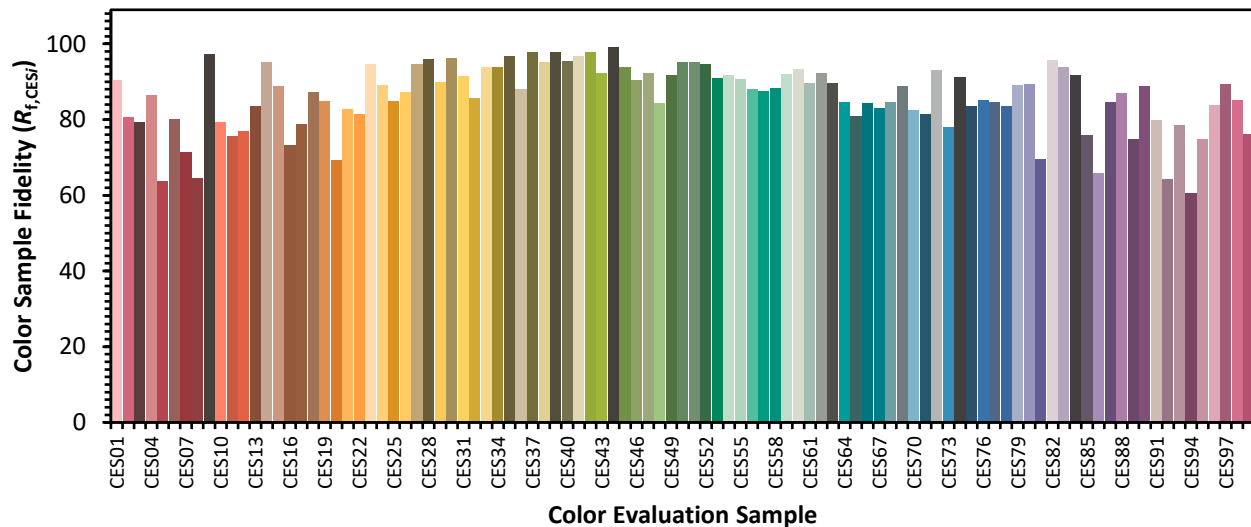


**Color Vector Graphics**

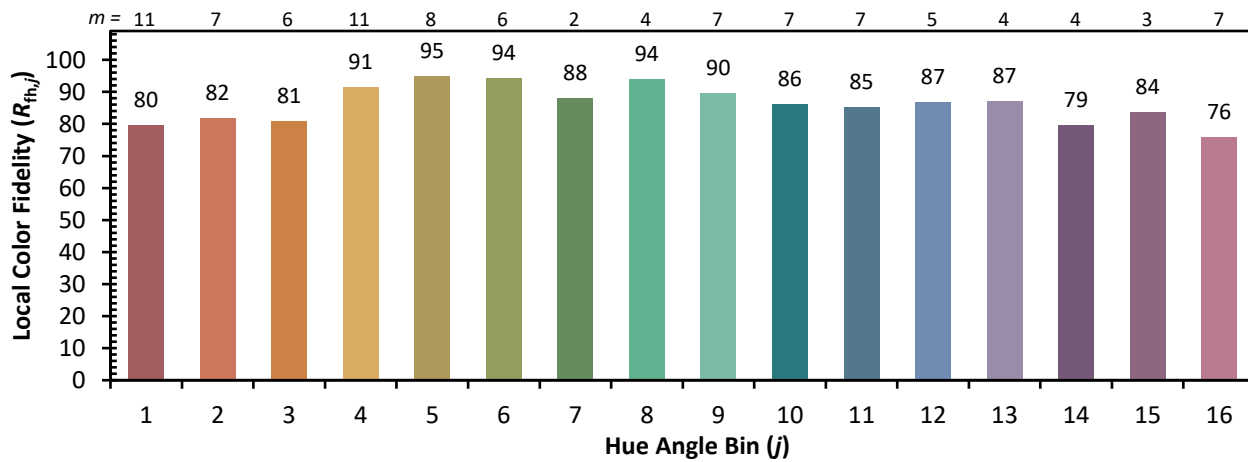
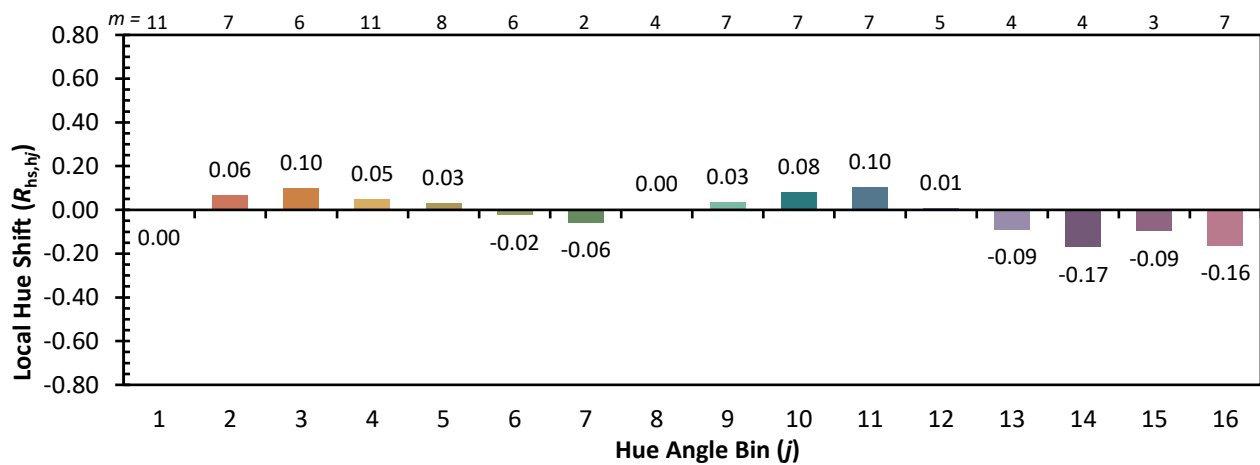
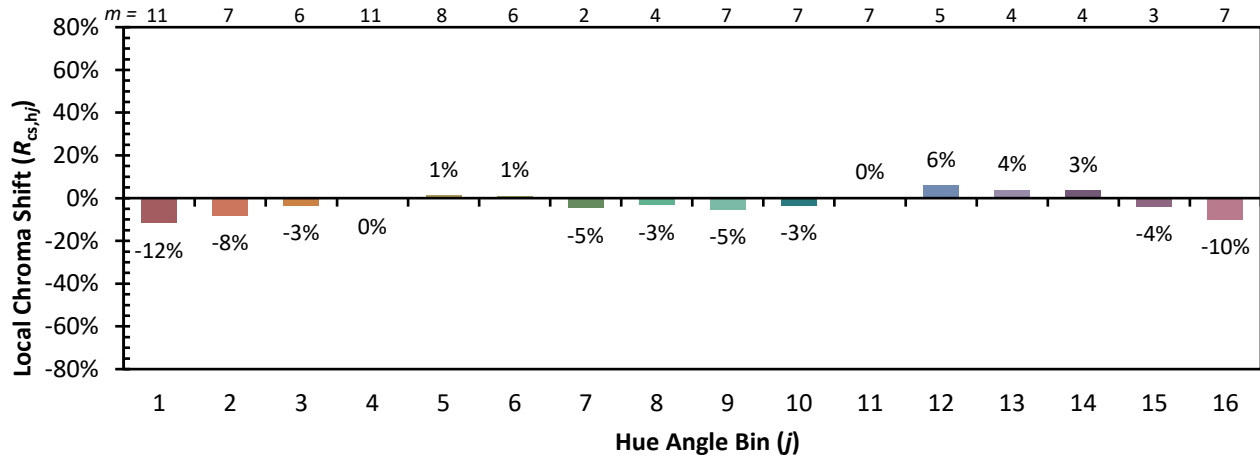


Individual Sample Fidelity Index ( $R_{f,i}$ )

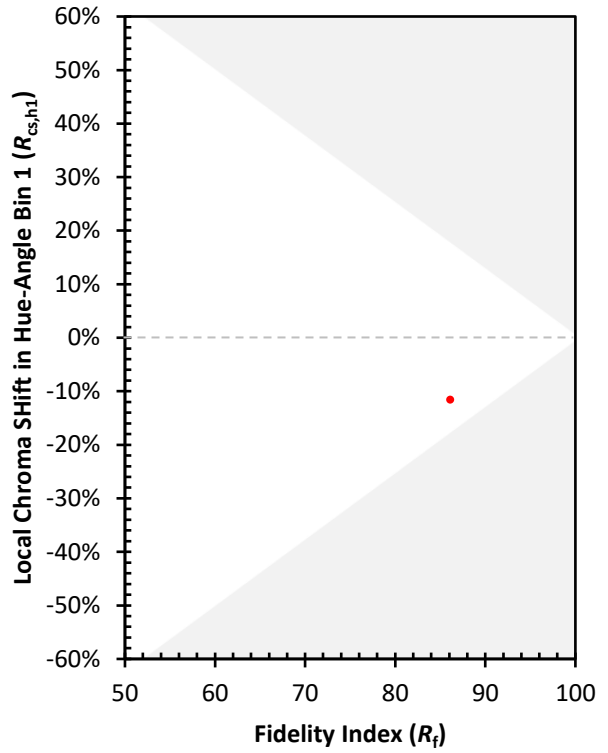
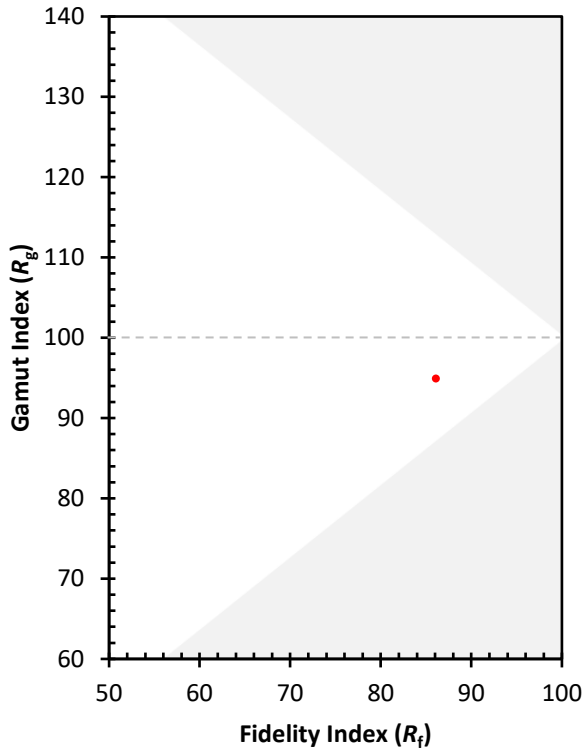
CES01 = 86	CES26 = 87	CES51 = 95	CES76 = 85
CES02 = 63	CES27 = 95	CES52 = 95	CES77 = 85
CES03 = 31	CES28 = 96	CES53 = 91	CES78 = 83
CES04 = 70	CES29 = 90	CES54 = 92	CES79 = 89
CES05 = 50	CES30 = 96	CES55 = 91	CES80 = 89
CES06 = 51	CES31 = 92	CES56 = 88	CES81 = 70
CES07 = 42	CES32 = 86	CES57 = 87	CES82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