

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: P832957

Luminaire Tested: **TTN-D0-830-U-DL-UPL1**

Issue Date: 5/15/2024

Test Information

Test Method: LM-79-08
Report Number: P832957
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-UPL1
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: 1327.9 lumens
Efficiency: N/A
Efficacy: 99.8 lumens/watt
Luminous Opening: Vertical Cylinder (Dia: 0.71' x H: 0.1')
IES Classification: Type IV - Short
BUG Rating: B0 - U3 - G1

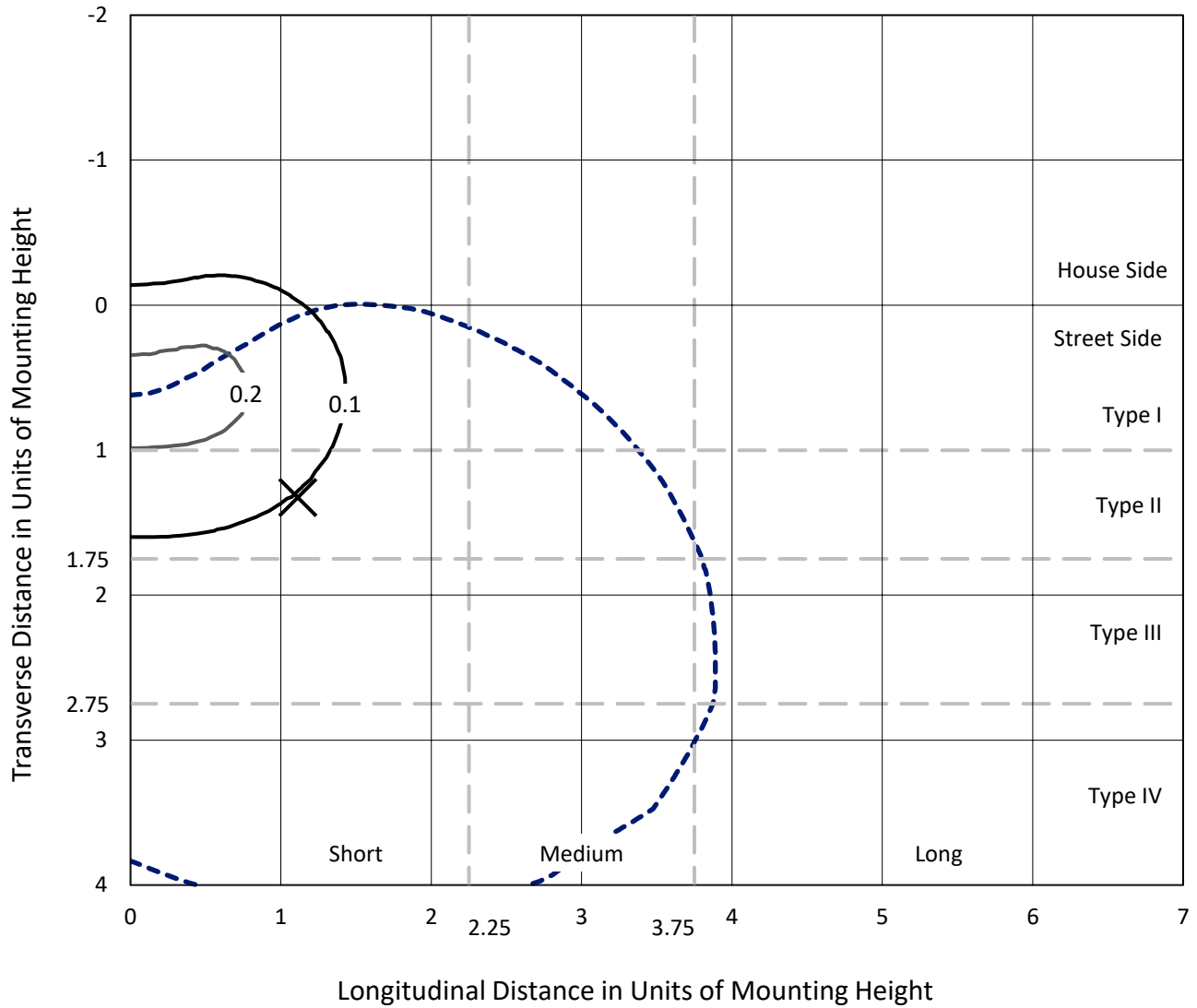
Input Watts (W): 13.3
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT



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Iso-Footcandle Lines of Horizontal Illumination

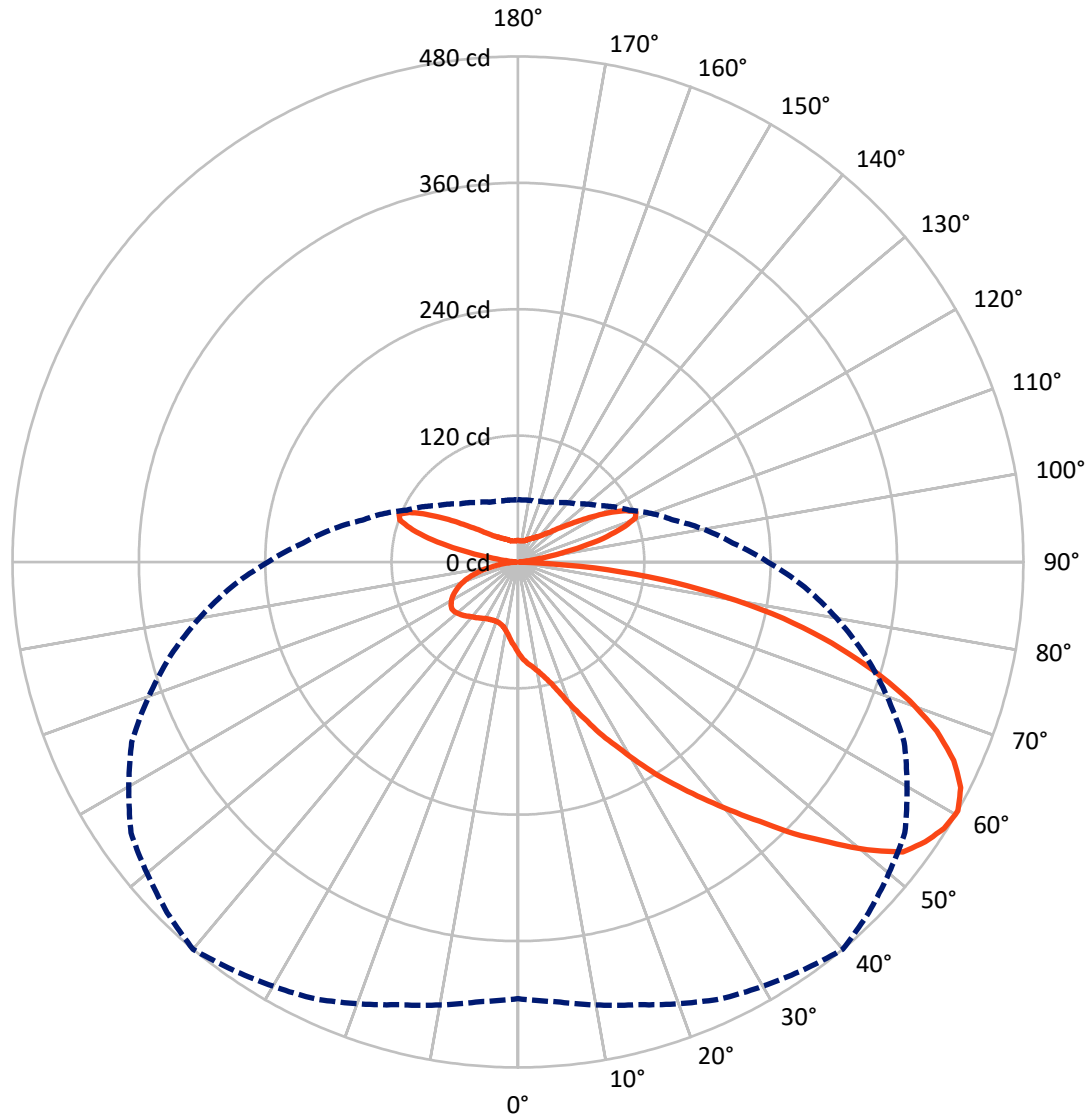
× Max cd
 - - - 1/2 Max cd



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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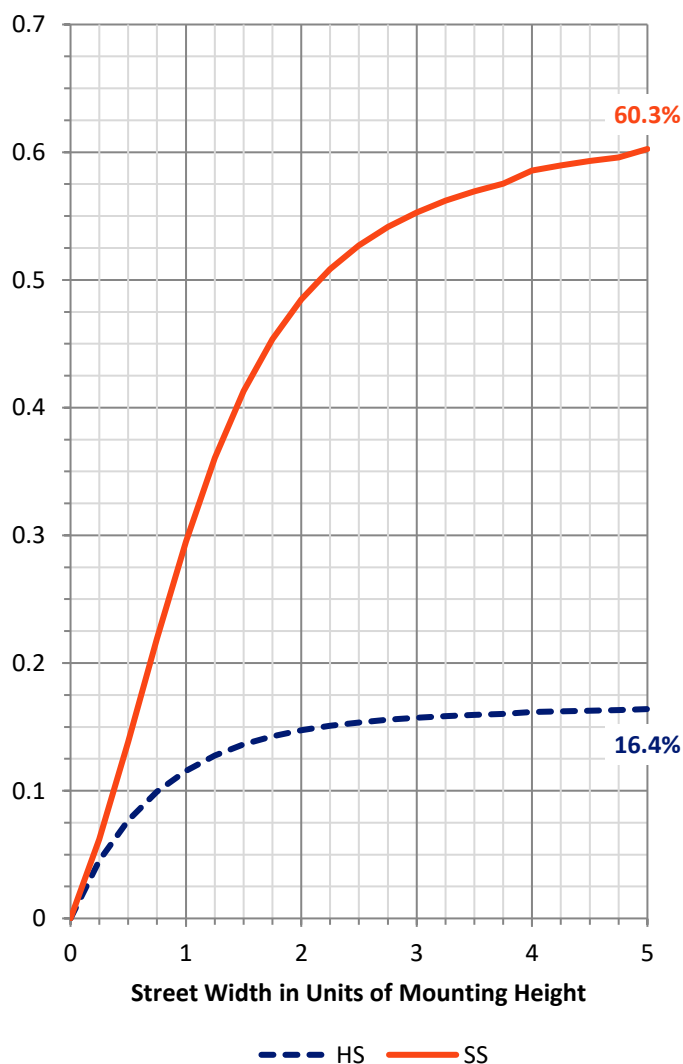
FLUX DISTRIBUTION:

		Downward	Upward	Total
House Side	Lumens	220.0	147.7	367.7
	% Fixture	16.6	11.1	27.7
Street Side	Lumens	812.4	147.7	960.2
	% Fixture	61.2	11.1	72.3
Total	Lumens	1032.4	295.5	1327.9
	% Fixture	77.7	22.3	100.0

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	8.2	0.6
10°-20°	26.2	2.0
20°-30°	55.3	4.2
30°-40°	101.0	7.6
40°-50°	164.1	12.4
50°-60°	228.1	17.2
60°-70°	236.5	17.8
70°-80°	169.5	12.8
80°-90°	43.6	3.3
90°-100°	6.6	0.5
100°-110°	67.0	5.0
110°-120°	98.0	7.4
120°-130°	56.9	4.3
130°-140°	30.1	2.3
140°-150°	17.9	1.3
150°-160°	11.0	0.8
160°-170°	6.0	0.5
170°-180°	2.0	0.1
0°-90°	1032.4	77.7
0°-180°	1327.9	100.0

Coefficient of Utilization

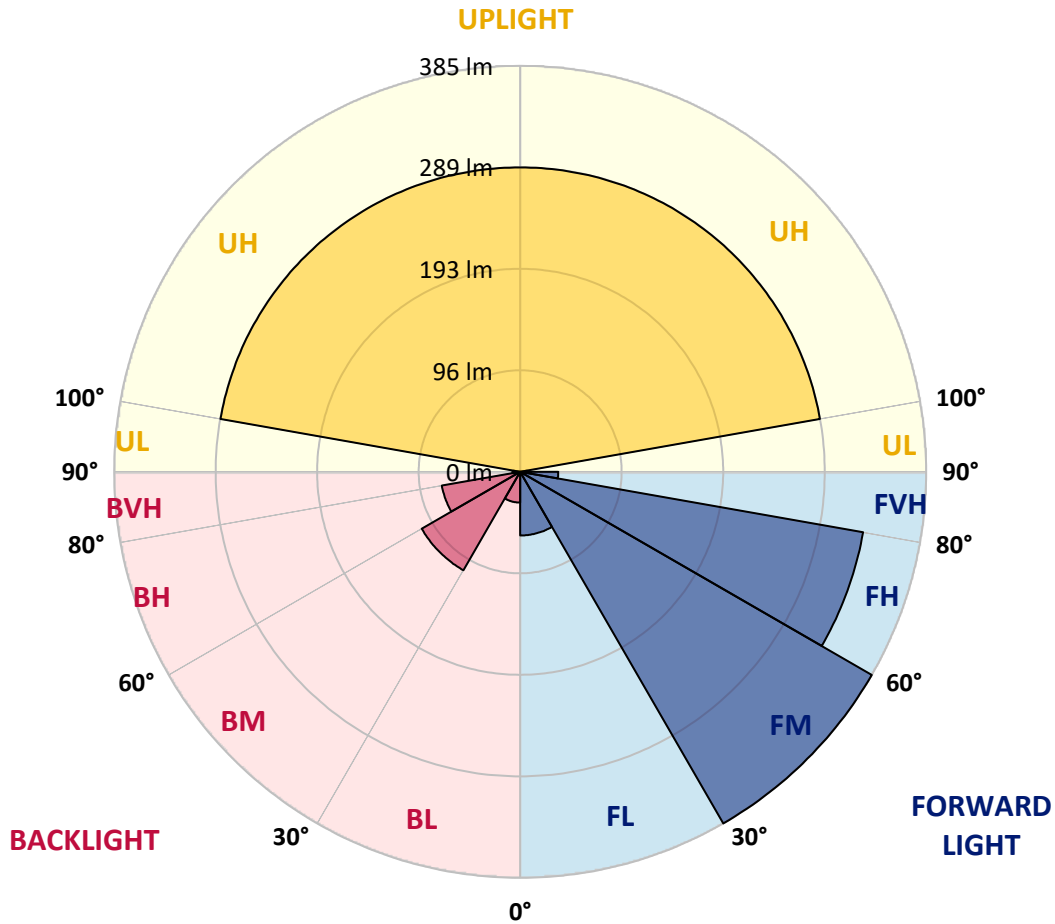


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LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

Zone	Lumens	% Fixture	Zone Rating/Lumen Limit		
			B	U	G
FL (0°-30°)	60.4	4.5			
FM (30°-60°)	385.3	29.0			
FH (60°-80°)	330.5	24.9			G0/660
FVH (80°-90°)	36.2	2.7			G1/100
BL (0°-30°)	29.2	2.2	B0/110		
BM (30°-60°)	107.9	8.1	B0/220		
BH (60°-80°)	75.4	5.7	B0/110		G0/110
BVH (80°-90°)	7.4	0.6			G0/10
UL (90°-100°)	6.6	0.5		U1/10	
UH (100°-180°)	288.9	21.8		U3/500	

BUG Rating: B0-U3-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°	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	4.0	3.8	3.5	4.0	3.0	3.0	2.5
95°	3.0	3.0	3.5	4.5	5.6	5.8	6.1	6.1	3.5	3.5	3.0
97.5°	4.0	4.5	4.5	5.6	9.1	12.9	16.7	10.1	5.1	5.1	4.5
100°	6.6	7.1	7.1	12.6	26.8	31.4	35.9	25.8	13.1	9.6	7.1
102.5°	21.2	22.2	27.3	40.9	60.7	57.9	55.1	46.5	44.0	30.3	24.3
105°	54.1	53.6	57.6	68.2	84.9	84.2	83.4	76.8	69.8	60.2	55.6
107.5°	71.3	71.3	74.8	83.9	96.6	104.6	112.7	114.2	90.5	79.4	74.3
110°	80.4	80.4	83.4	91.0	107.7	119.0	130.4	129.4	111.7	98.1	91.5



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CANDELA DISTRIBUTION (continued):

	0°	5°	15°	25°	35°	40°	45°	55°	65°	75°	85°
112.5°	82.4	82.9	86.9	98.6	116.8	121.8	126.9	122.3	115.3	109.2	104.1
115°	85.4	85.4	90.0	101.1	111.2	113.2	115.3	110.2	104.6	100.6	98.6
117.5°	84.4	85.9	86.9	93.0	99.6	101.1	102.6	100.1	92.5	89.5	88.5
120°	78.4	78.4	79.4	82.4	85.9	86.7	87.5	86.4	81.4	78.9	78.4
122.5°	69.8	70.3	69.8	71.3	73.8	74.6	75.3	74.3	70.3	69.3	69.3
125°	61.2	61.2	60.7	61.7	63.2	63.0	62.7	63.2	61.2	60.7	60.7
127.5°	55.1	54.6	53.6	54.1	54.6	54.6	54.6	55.1	53.1	53.6	54.1
130°	49.0	49.0	48.0	48.0	48.0	47.5	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	37.6	37.4	37.9	37.4	38.4	38.9
137.5°	35.4	35.4	34.4	34.4	34.4	34.2	33.9	34.4	34.4	34.9	35.9
140°	32.4	32.4	31.8	31.8	31.3	31.6	31.8	31.8	31.8	32.4	32.9
142.5°	30.8	30.3	29.8	29.3	29.8	29.8	29.8	29.8	29.3	29.8	30.8
145°	28.3	28.3	27.8	27.8	27.8	28.0	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	25.6	25.3	25.3	25.3	25.3	25.8
152.5°	24.8	24.8	24.3	24.8	24.3	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	21.7	21.7	21.7	21.7	22.2	22.2	22.2
162.5°	21.7	21.7	21.7	21.7	21.2	21.2	21.2	21.2	21.2	21.7	21.7
165°	21.7	21.2	21.2	21.2	20.7	20.7	20.7	20.7	20.7	21.2	21.7
167.5°	20.7	20.7	20.7	20.7	20.7	20.4	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	20.2	20.2	20.2	20.2	20.2	20.2	20.7
175°	20.7	20.7	20.7	20.7	20.2	20.2	20.2	20.2	20.7	20.7	20.7
177.5°	20.7	20.7	20.7	20.7	20.2	20.4	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°	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°	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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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

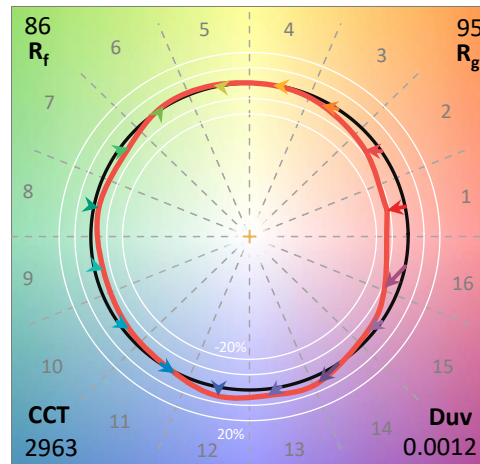
Test Information

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
 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

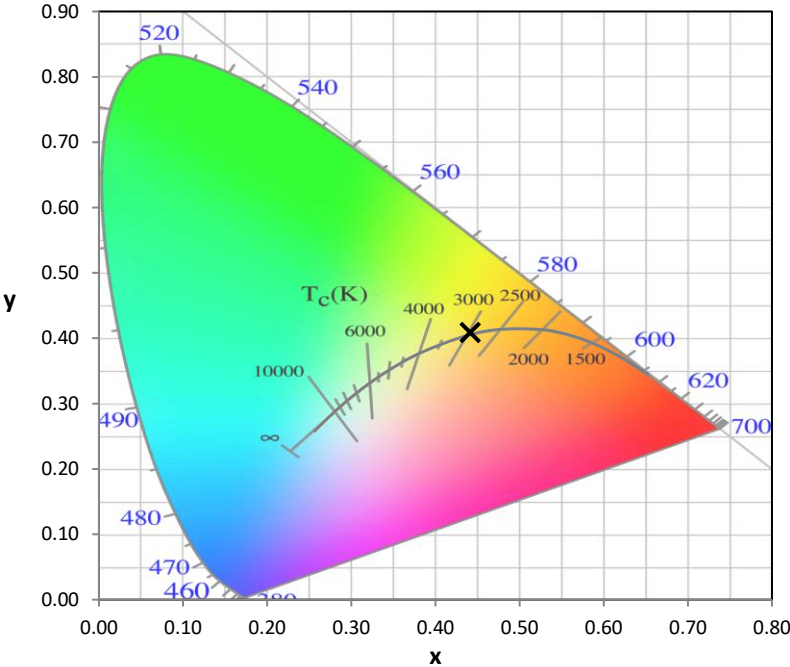
Stabilization Time: 37M
 Operation Time: 1H 37M
 Sphere Temperature (°C): 25.0

REPORT NUMBER: SP1-2411-284-4

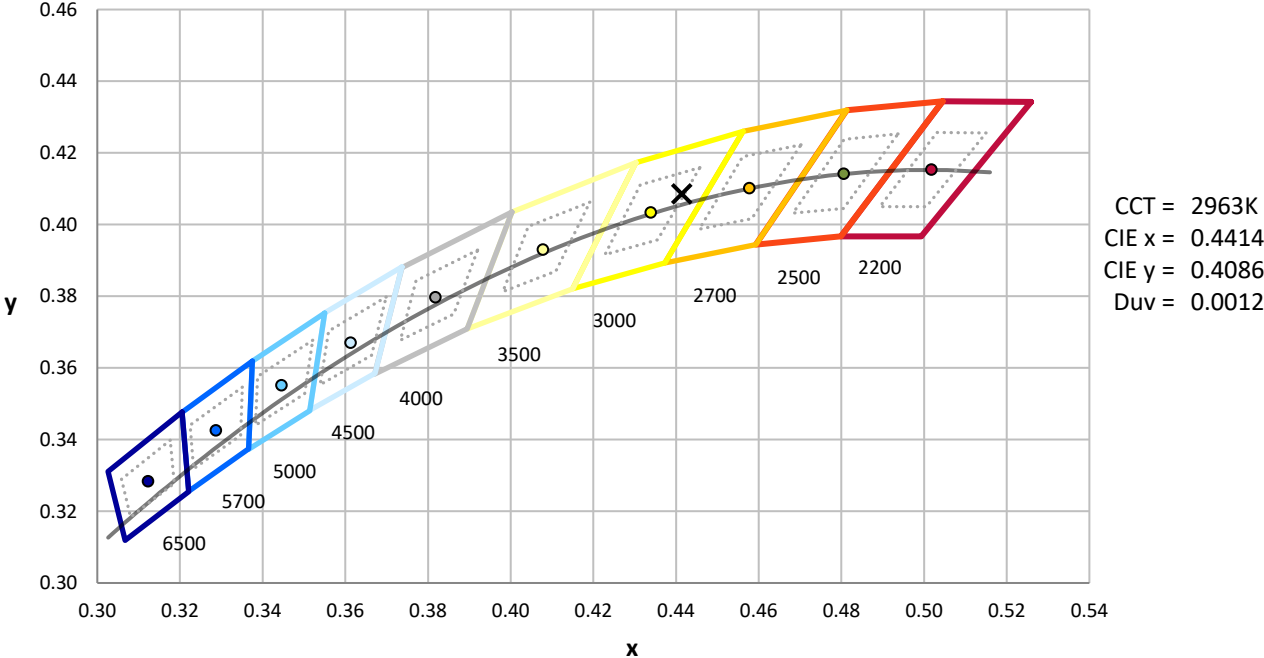
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	6/18/2024	12/18/2024
Power Meter	INXT2011004	2/8/2024	2/8/2025
AC Power Source	IN0063	10/22/2024	10/22/2025
DC Power Source	IN0208	10/22/2024	10/22/2025
Sphere Thermometer	IN0085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



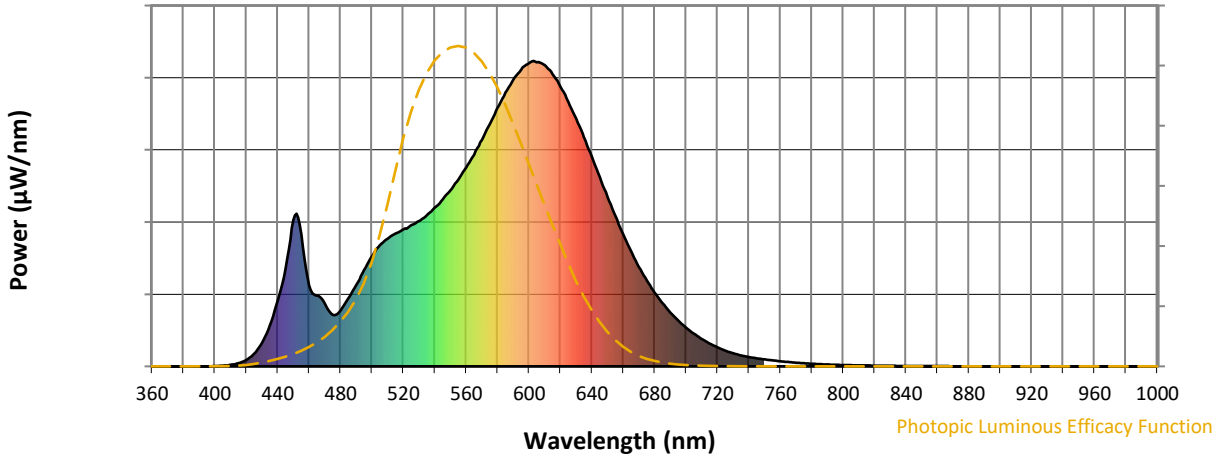
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-2411-284-4

Photopic Flux vs. Wavelength

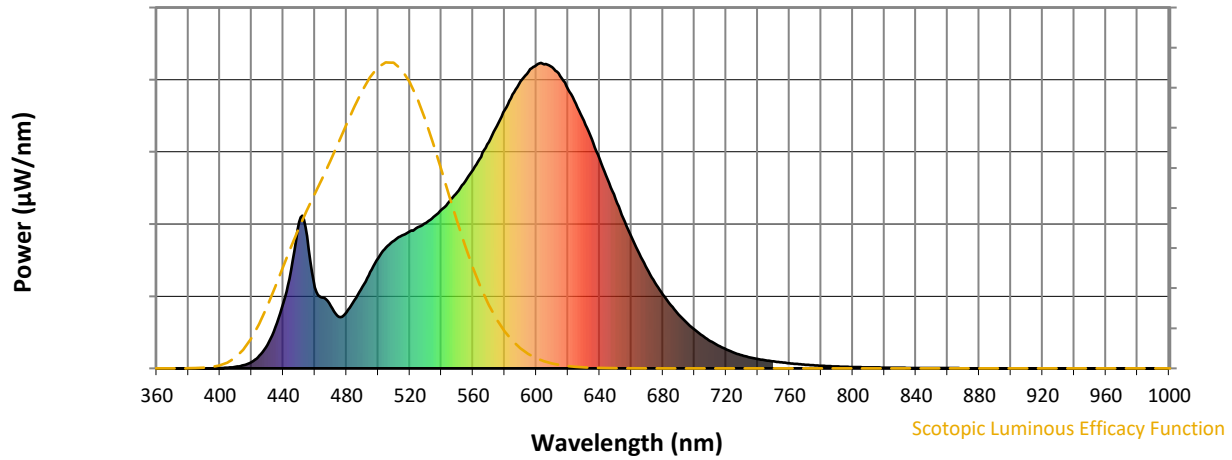


Photopic Lumens: NR

λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)
360	0	NR	490	267	NR	620	915	NR	750	23	NR	880	0	NR
365	0	NR	495	315	NR	625	866	NR	755	20	NR	885	0	NR
370	0	NR	500	360	NR	630	811	NR	760	17	NR	890	0	NR
375	0	NR	505	396	NR	635	750	NR	765	14	NR	895	0	NR
380	0	NR	510	418	NR	640	686	NR	770	12	NR	900	0	NR
385	0	NR	515	435	NR	645	619	NR	775	10	NR	905	0	NR
390	0	NR	520	448	NR	650	554	NR	780	9	NR	910	0	NR
395	0	NR	525	462	NR	655	491	NR	785	7	NR	915	0	NR
400	1	NR	530	476	NR	660	431	NR	790	6	NR	920	0	NR
405	2	NR	535	495	NR	665	376	NR	795	5	NR	925	0	NR
410	5	NR	540	520	NR	670	325	NR	800	4	NR	930	0	NR
415	10	NR	545	547	NR	675	280	NR	805	4	NR	935	0	NR
420	21	NR	550	576	NR	680	241	NR	810	3	NR	940	0	NR
425	42	NR	555	612	NR	685	207	NR	815	3	NR	945	0	NR
430	77	NR	560	651	NR	690	176	NR	820	2	NR	950	0	NR
435	135	NR	565	693	NR	695	149	NR	825	2	NR	955	0	NR
440	215	NR	570	741	NR	700	127	NR	830	2	NR	960	0	NR
445	321	NR	575	793	NR	705	107	NR	835	2	NR	965	0	NR
450	479	NR	580	847	NR	710	89	NR	840	1	NR	970	0	NR
455	432	NR	585	897	NR	715	75	NR	845	1	NR	975	0	NR
460	265	NR	590	940	NR	720	62	NR	850	1	NR	980	0	NR
465	231	NR	595	971	NR	725	51	NR	855	1	NR	985	0	NR
470	204	NR	600	993	NR	730	43	NR	860	1	NR	990	0	NR
475	168	NR	605	996	NR	735	36	NR	865	1	NR	995	0	NR
480	183	NR	610	986	NR	740	31	NR	870	1	NR	1000	0	NR
485	223	NR	615	957	NR	745	26	NR	875	0	NR			

REPORT NUMBER: SP1-2411-284-4

Scotopic Flux vs. Wavelength



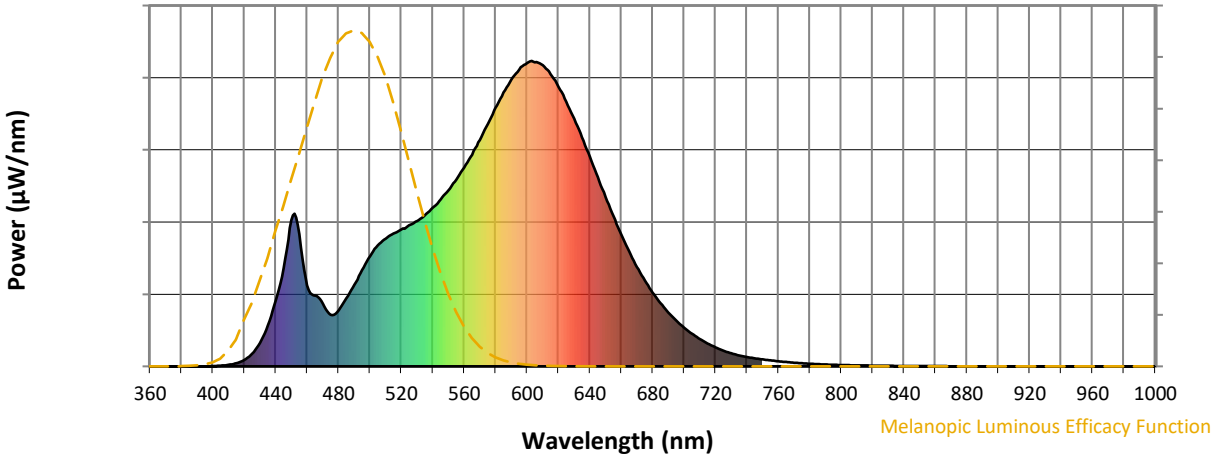
Scotopic Lumens: NR

S/P: 1.34

λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)
360	0	NR	490	267	NR	620	915	NR	750	23	NR	880	0	NR
365	0	NR	495	315	NR	625	866	NR	755	20	NR	885	0	NR
370	0	NR	500	360	NR	630	811	NR	760	17	NR	890	0	NR
375	0	NR	505	396	NR	635	750	NR	765	14	NR	895	0	NR
380	0	NR	510	418	NR	640	686	NR	770	12	NR	900	0	NR
385	0	NR	515	435	NR	645	619	NR	775	10	NR	905	0	NR
390	0	NR	520	448	NR	650	554	NR	780	9	NR	910	0	NR
395	0	NR	525	462	NR	655	491	NR	785	7	NR	915	0	NR
400	1	NR	530	476	NR	660	431	NR	790	6	NR	920	0	NR
405	2	NR	535	495	NR	665	376	NR	795	5	NR	925	0	NR
410	5	NR	540	520	NR	670	325	NR	800	4	NR	930	0	NR
415	10	NR	545	547	NR	675	280	NR	805	4	NR	935	0	NR
420	21	NR	550	576	NR	680	241	NR	810	3	NR	940	0	NR
425	42	NR	555	612	NR	685	207	NR	815	3	NR	945	0	NR
430	77	NR	560	651	NR	690	176	NR	820	2	NR	950	0	NR
435	135	NR	565	693	NR	695	149	NR	825	2	NR	955	0	NR
440	215	NR	570	741	NR	700	127	NR	830	2	NR	960	0	NR
445	321	NR	575	793	NR	705	107	NR	835	2	NR	965	0	NR
450	479	NR	580	847	NR	710	89	NR	840	1	NR	970	0	NR
455	432	NR	585	897	NR	715	75	NR	845	1	NR	975	0	NR
460	265	NR	590	940	NR	720	62	NR	850	1	NR	980	0	NR
465	231	NR	595	971	NR	725	51	NR	855	1	NR	985	0	NR
470	204	NR	600	993	NR	730	43	NR	860	1	NR	990	0	NR
475	168	NR	605	996	NR	735	36	NR	865	1	NR	995	0	NR
480	183	NR	610	986	NR	740	31	NR	870	1	NR	1000	0	NR
485	223	NR	615	957	NR	745	26	NR	875	0	NR			

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Melanopic Flux vs. Wavelength



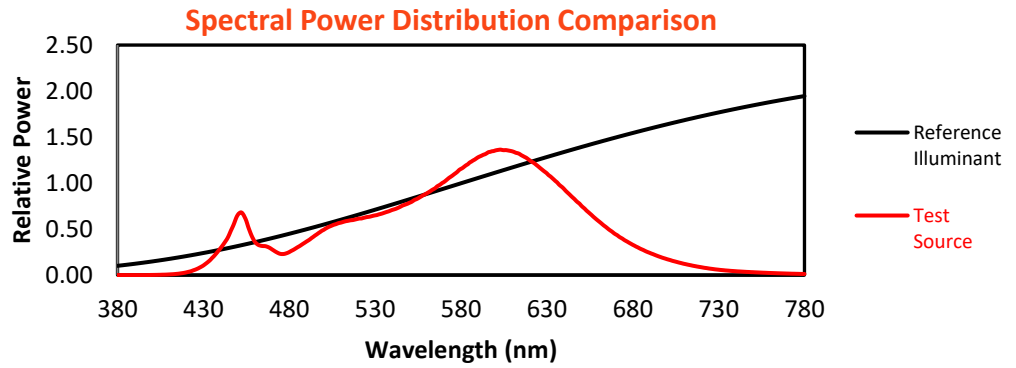
Melanopic Lumens: NR

M/P: 2.58

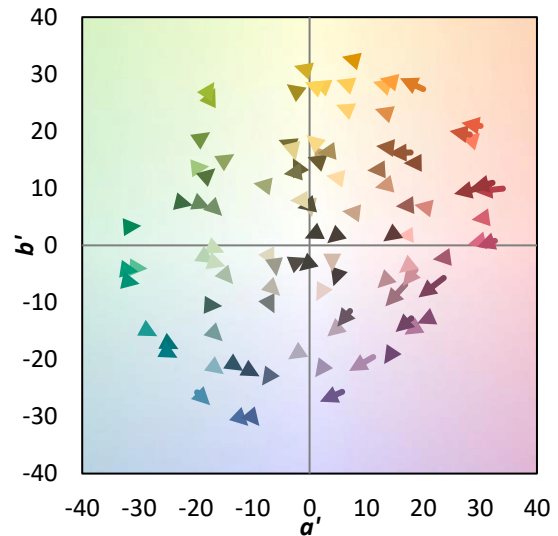
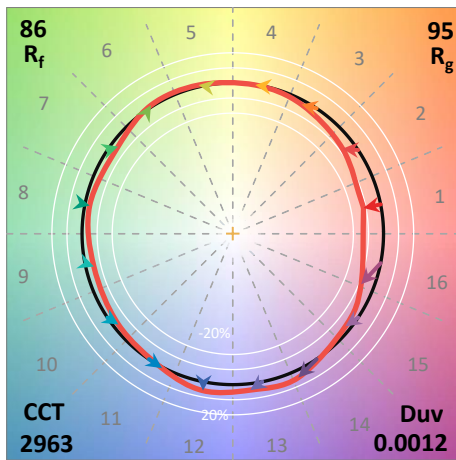
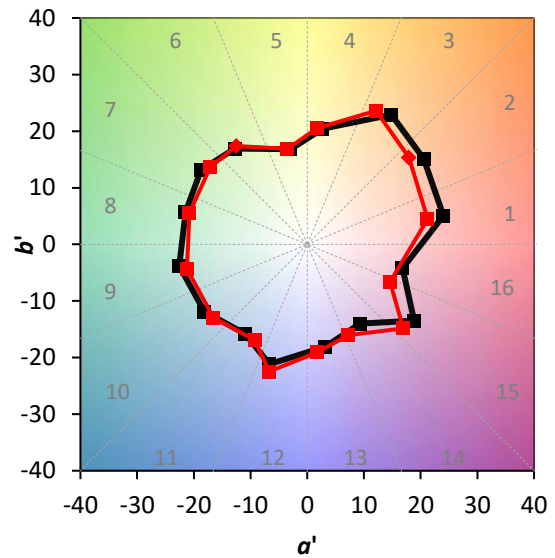
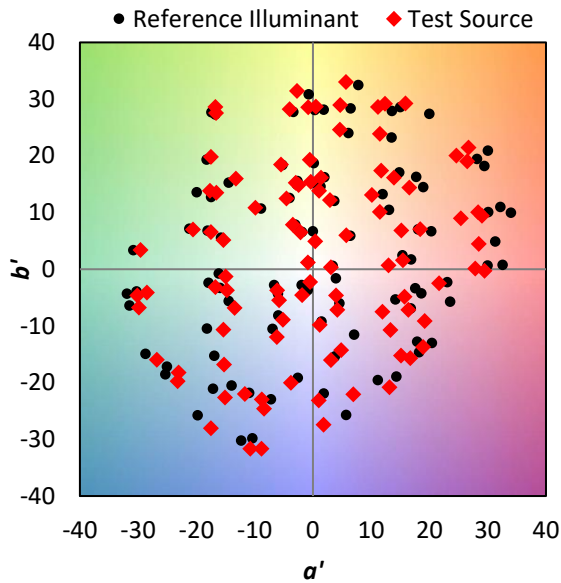
λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)
360	0	NR	490	267	NR	620	915	NR	750	23	NR	880	0	NR
365	0	NR	495	315	NR	625	866	NR	755	20	NR	885	0	NR
370	0	NR	500	360	NR	630	811	NR	760	17	NR	890	0	NR
375	0	NR	505	396	NR	635	750	NR	765	14	NR	895	0	NR
380	0	NR	510	418	NR	640	686	NR	770	12	NR	900	0	NR
385	0	NR	515	435	NR	645	619	NR	775	10	NR	905	0	NR
390	0	NR	520	448	NR	650	554	NR	780	9	NR	910	0	NR
395	0	NR	525	462	NR	655	491	NR	785	7	NR	915	0	NR
400	1	NR	530	476	NR	660	431	NR	790	6	NR	920	0	NR
405	2	NR	535	495	NR	665	376	NR	795	5	NR	925	0	NR
410	5	NR	540	520	NR	670	325	NR	800	4	NR	930	0	NR
415	10	NR	545	547	NR	675	280	NR	805	4	NR	935	0	NR
420	21	NR	550	576	NR	680	241	NR	810	3	NR	940	0	NR
425	42	NR	555	612	NR	685	207	NR	815	3	NR	945	0	NR
430	77	NR	560	651	NR	690	176	NR	820	2	NR	950	0	NR
435	135	NR	565	693	NR	695	149	NR	825	2	NR	955	0	NR
440	215	NR	570	741	NR	700	127	NR	830	2	NR	960	0	NR
445	321	NR	575	793	NR	705	107	NR	835	2	NR	965	0	NR
450	479	NR	580	847	NR	710	89	NR	840	1	NR	970	0	NR
455	432	NR	585	897	NR	715	75	NR	845	1	NR	975	0	NR
460	265	NR	590	940	NR	720	62	NR	850	1	NR	980	0	NR
465	231	NR	595	971	NR	725	51	NR	855	1	NR	985	0	NR
470	204	NR	600	993	NR	730	43	NR	860	1	NR	990	0	NR
475	168	NR	605	996	NR	735	36	NR	865	1	NR	995	0	NR
480	183	NR	610	986	NR	740	31	NR	870	1	NR	1000	0	NR
485	223	NR	615	957	NR	745	26	NR	875	0	NR			

Summary

$R_f = 86.1$
 $R_g = 94.9$
 CIE $R_a = 82.9$
 $R_9 = 3.9$

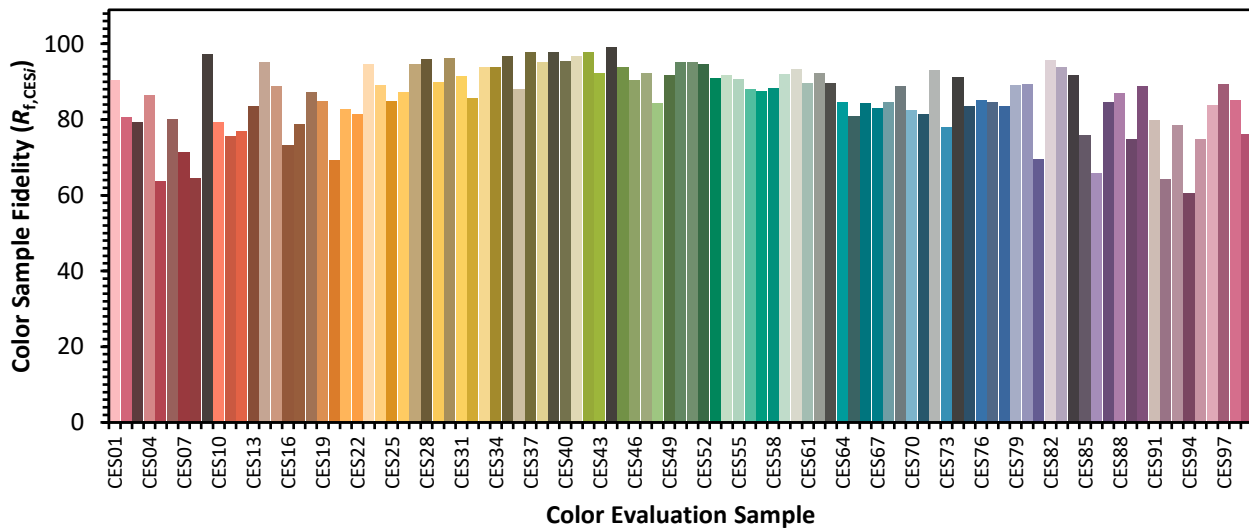


Color Vector Graphics

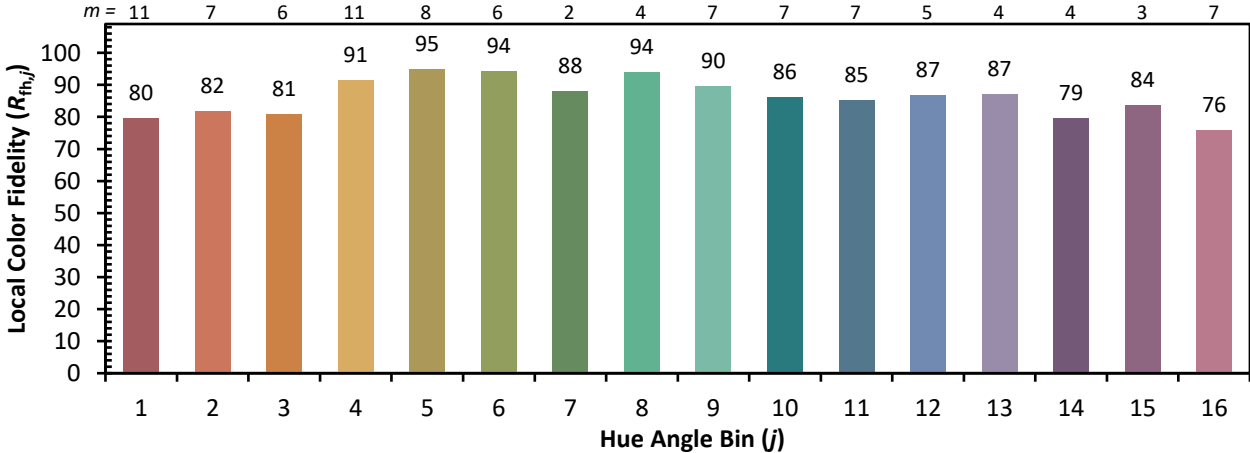
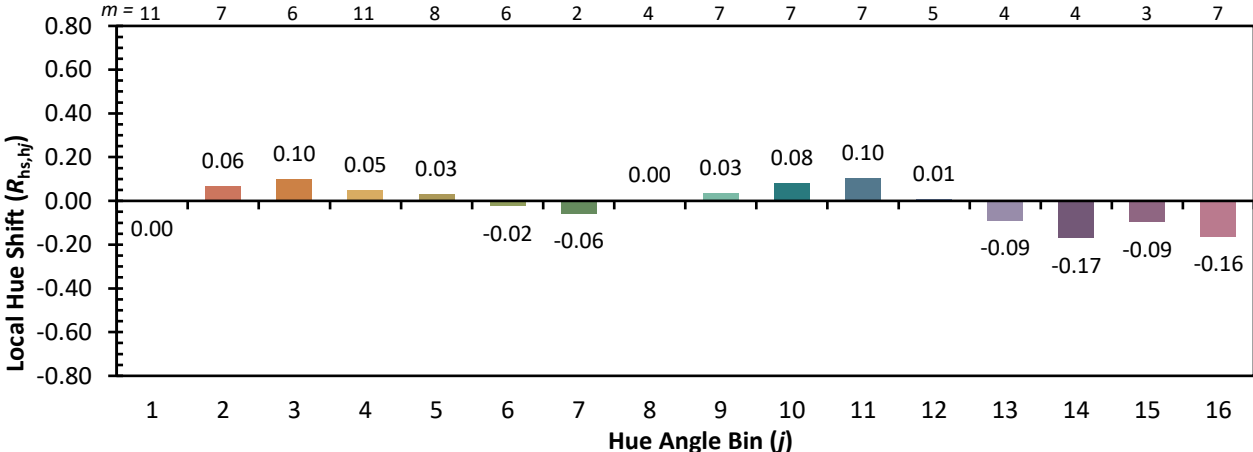
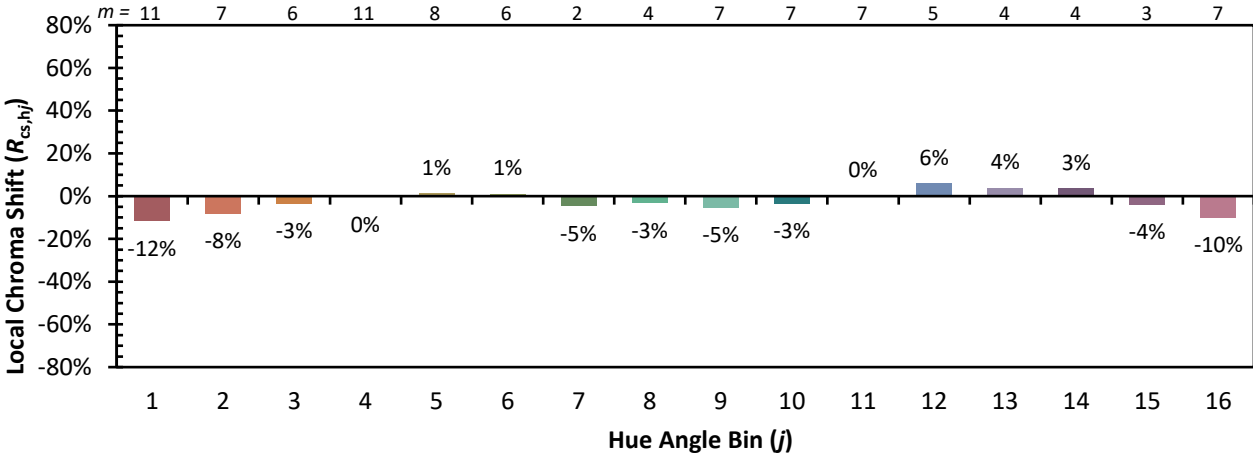


Individual Sample Fidelity Index ($R_{f,i}$)

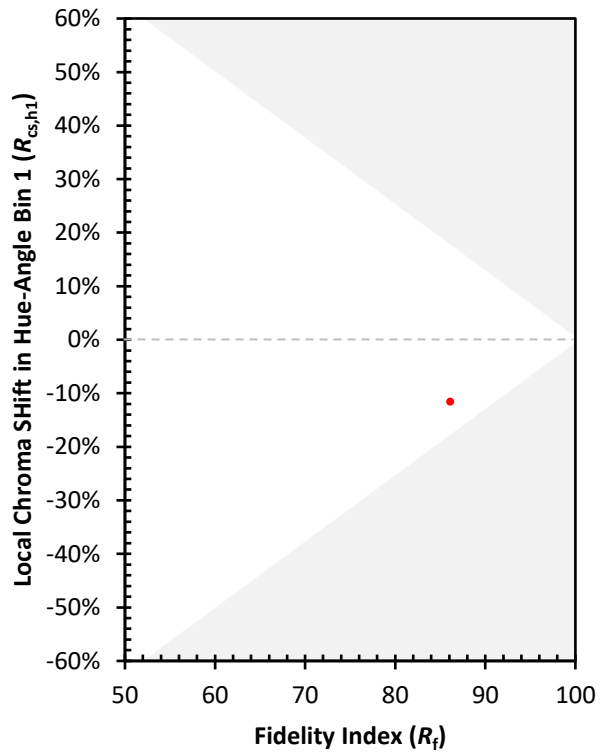
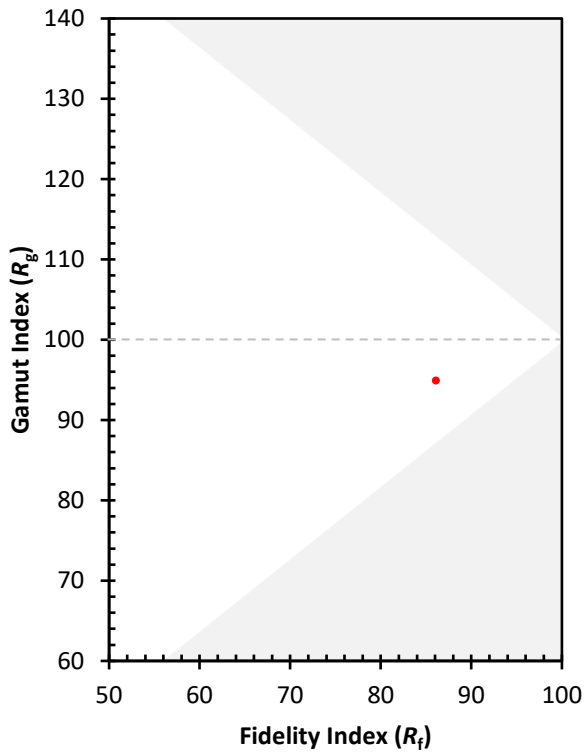
CES01 = 86	CES26 = 87	CES51 = 95	CES76 = 85
CES02 = 63	CES27 = 95	CES52 = 95	CES77 = 85
CES03 = 31	CES28 = 96	CES53 = 91	CES78 = 83
CES04 = 70	CES29 = 90	CES54 = 92	CES79 = 89
CES05 = 50	CES30 = 96	CES55 = 91	CES80 = 89
CES06 = 51	CES31 = 92	CES56 = 88	CES81 = 70
CES07 = 42	CES32 = 86	CES57 = 87	CES82 = 96
CES08 = 41	CES33 = 94	CES58 = 88	CES83 = 94
CES09 = 29	CES34 = 94	CES59 = 92	CES84 = 92
CES10 = 76	CES35 = 97	CES60 = 93	CES85 = 76
CES11 = 59	CES36 = 88	CES61 = 90	CES86 = 66
CES12 = 65	CES37 = 98	CES62 = 92	CES87 = 85
CES13 = 44	CES38 = 95	CES63 = 90	CES88 = 87
CES14 = 74	CES39 = 98	CES64 = 85	CES89 = 75
CES15 = 72	CES40 = 96	CES65 = 81	CES90 = 89
CES16 = 48	CES41 = 97	CES66 = 84	CES91 = 80
CES17 = 50	CES42 = 98	CES67 = 83	CES92 = 64
CES18 = 57	CES43 = 92	CES68 = 85	CES93 = 79
CES19 = 72	CES44 = 99	CES69 = 89	CES94 = 61
CES20 = 67	CES45 = 94	CES70 = 83	CES95 = 75
CES21 = 87	CES46 = 91	CES71 = 81	CES96 = 84
CES22 = 79	CES47 = 92	CES72 = 93	CES97 = 89
CES23 = 92	CES48 = 84	CES73 = 78	CES98 = 85
CES24 = 91	CES49 = 92	CES74 = 91	CES99 = 76
CES25 = 72	CES50 = 95	CES75 = 84	



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)