

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: P832954

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

Issue Date: 5/15/2024

Test Information

Test Method: LM-79-08
Report Number: P832954
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-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: 1318.9 lumens
Efficiency: N/A
Efficacy: 99.2 lumens/watt
Luminous Opening: Vertical Cylinder (Dia: 0.71' x H: 0.1')
IES Classification: Type IV - Short
BUG Rating: B0 - U3 - G1

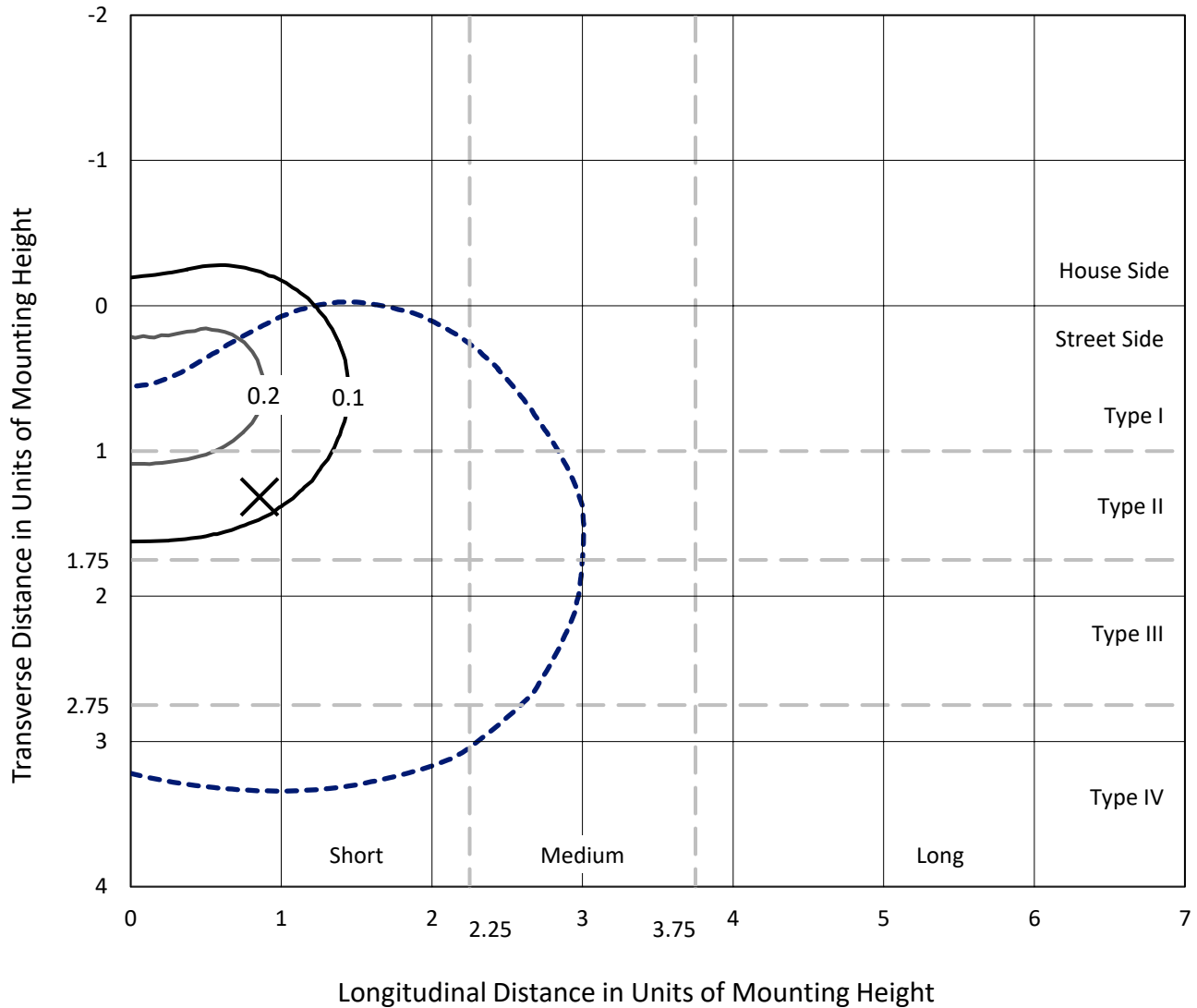
Input Watts (W): 13.3
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT



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Iso-Footcandle Lines of Horizontal Illumination

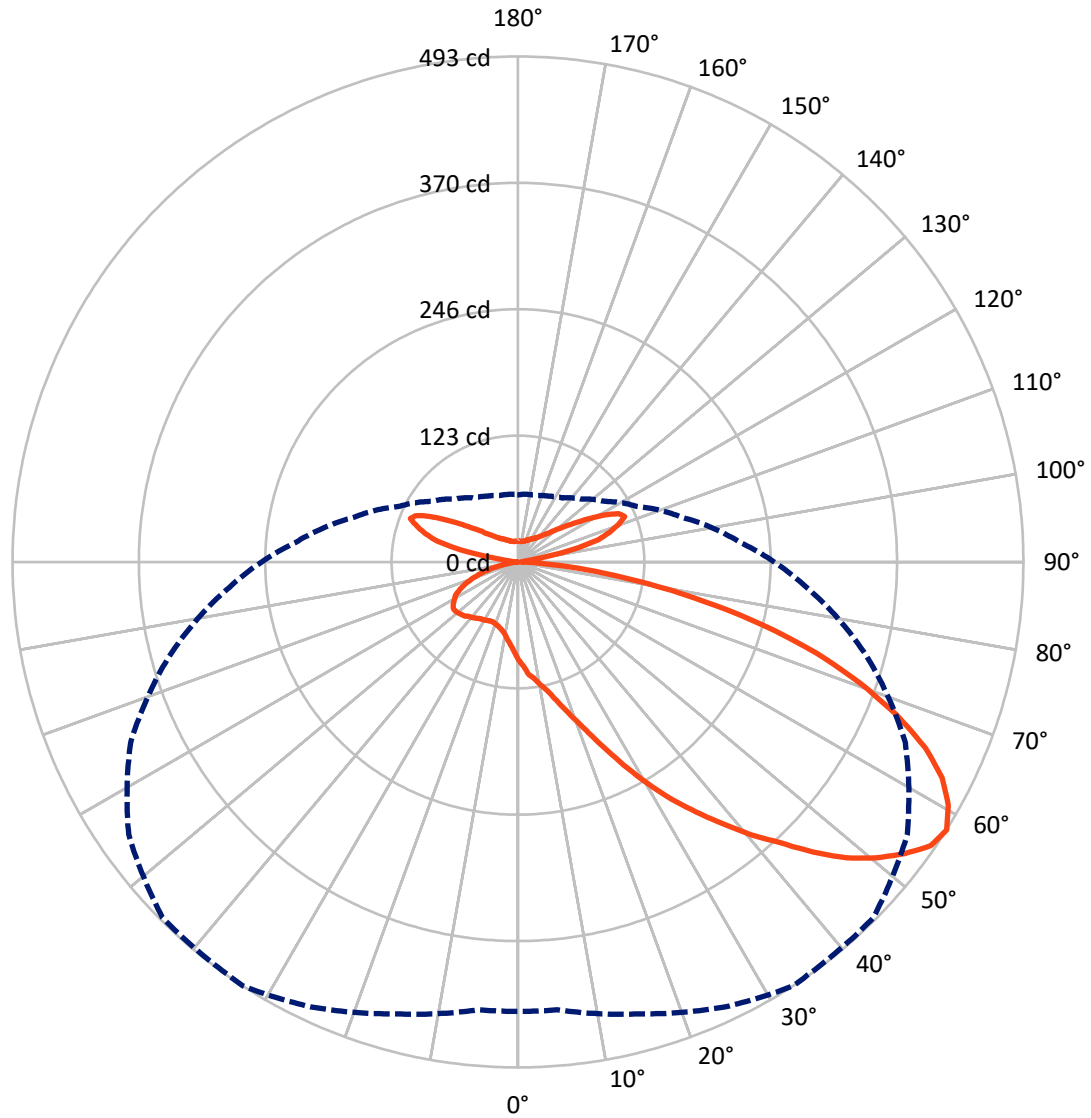
× Max cd
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 0.3 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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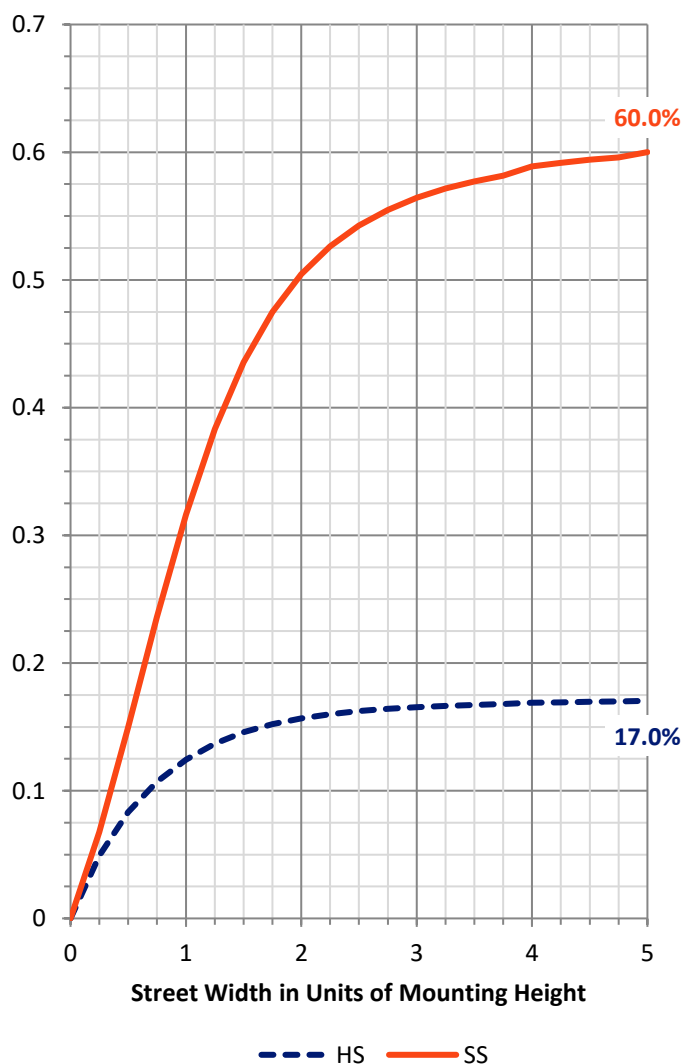
FLUX DISTRIBUTION:

		Downward	Upward	Total
House Side	Lumens	225.9	147.7	373.7
	% Fixture	17.1	11.2	28.3
Street Side	Lumens	797.5	147.7	945.2
	% Fixture	60.5	11.2	71.7
Total	Lumens	1023.4	295.5	1318.9
	% Fixture	77.6	22.4	100.0

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	9.2	0.7
10°-20°	29.7	2.3
20°-30°	62.7	4.8
30°-40°	113.9	8.6
40°-50°	180.0	13.6
50°-60°	239.1	18.1
60°-70°	230.1	17.4
70°-80°	135.1	10.2
80°-90°	23.6	1.8
90°-100°	6.6	0.5
100°-110°	67.0	5.1
110°-120°	98.0	7.4
120°-130°	56.9	4.3
130°-140°	30.1	2.3
140°-150°	17.9	1.4
150°-160°	11.0	0.8
160°-170°	6.0	0.5
170°-180°	2.0	0.1
0°-90°	1023.4	77.6
0°-180°	1318.9	100.0

Coefficient of Utilization



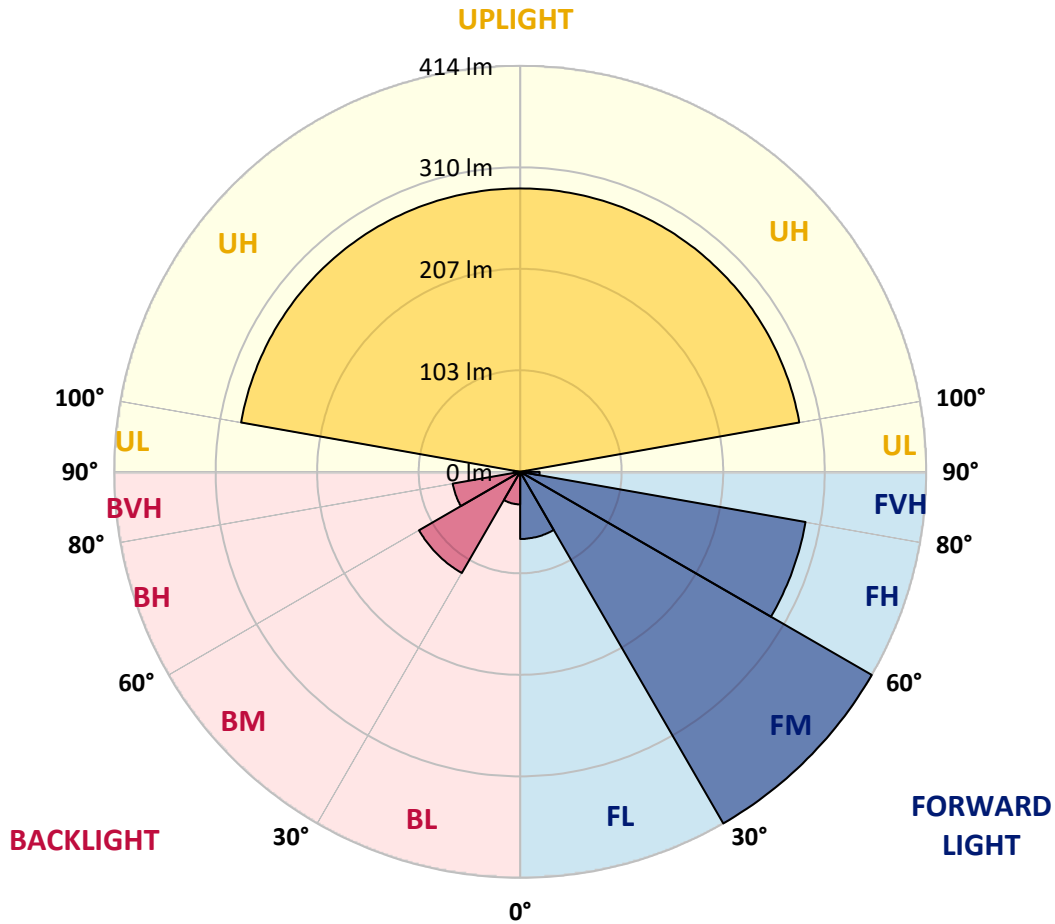
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LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

Zone	Lumens	% Fixture	Zone Rating/Lumen Limit		
			B	U	G
FL (0°-30°)	68.4	5.2			
FM (30°-60°)	413.9	31.4			
FH (60°-80°)	295.4	22.4			G0/660
FVH (80°-90°)	19.8	1.5			G1/100
BL (0°-30°)	33.2	2.5	B0/110		
BM (30°-60°)	119.1	9.0	B0/220		
BH (60°-80°)	69.8	5.3	B0/110		G0/110
BVH (80°-90°)	3.8	0.3			G0/10
UL (90°-100°)	6.6	0.5		U1/10	
UH (100°-180°)	288.9	21.9		U3/500	

BUG Rating: B0-U3-G1

Type IV Short





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CANDELA DISTRIBUTION (FULL):

	0°	5°	15°	25°	33°	35°	45°	55°	65°	75°	85°
0°	95.9	95.9	95.9	95.9	95.9	95.9	95.9	95.9	95.9	95.9	95.9
2.5°	102.2	103.0	102.2	102.2	101.3	101.3	100.4	99.5	98.6	97.7	95.9
5°	113.8	113.8	112.9	111.1	110.2	109.3	107.5	104.8	103.0	100.4	97.7
7.5°	119.2	119.2	118.3	116.5	114.7	113.8	111.1	107.5	104.8	101.3	97.7
10°	126.3	127.2	125.5	123.7	121.9	121.0	117.4	112.9	108.4	103.9	98.6
12.5°	134.4	135.3	134.4	131.7	129.0	128.1	124.6	119.2	113.8	107.5	101.3
15°	145.2	147.0	144.3	142.5	139.8	138.9	134.4	128.1	121.9	113.8	105.7
17.5°	157.7	158.6	156.8	154.1	152.3	151.4	147.0	139.8	130.8	121.9	112.0
20°	172.0	172.9	172.0	168.5	166.7	165.8	161.3	153.2	142.5	132.6	120.1
22.5°	189.1	190.9	188.2	185.5	183.7	183.7	178.3	169.4	156.8	144.3	129.9
25°	208.8	211.5	207.9	206.1	204.3	203.4	198.9	188.2	173.8	158.6	140.7
27.5°	233.0	234.8	232.1	231.2	227.6	227.6	220.4	207.9	192.7	174.7	154.1
30°	254.5	256.3	254.5	254.5	251.8	250.9	243.7	231.2	212.4	190.9	165.8
32.5°	275.1	276.9	276.0	276.9	276.0	275.1	266.1	252.7	233.9	206.1	177.4
35°	295.7	298.4	297.5	300.2	299.3	298.4	291.2	275.1	252.7	224.9	190.0
37.5°	317.2	319.9	319.9	322.6	323.5	323.5	315.4	298.4	273.3	241.9	204.3
40°	340.5	343.2	343.2	347.7	349.5	349.5	340.5	323.5	295.7	260.8	219.5
42.5°	362.9	365.6	366.5	371.0	373.7	374.6	367.4	347.7	315.4	279.6	233.9
45°	384.4	387.1	389.8	398.8	403.2	402.3	397.0	376.4	340.5	299.3	249.1
47.5°	405.0	408.6	413.1	424.7	431.0	430.1	426.5	403.2	363.8	318.1	262.5
50°	421.2	423.8	432.8	445.3	453.4	454.3	448.9	426.5	383.5	332.4	272.4
52.5°	433.7	437.3	448.0	466.0	472.2	474.9	468.6	446.2	403.2	345.0	280.5
55°	442.7	442.7	458.8	479.4	488.4	490.2	490.2	462.4	414.9	353.1	285.0
57.5°	438.2	438.2	456.1	478.5	492.8	491.9	490.2	463.3	416.7	351.3	282.3
60°	425.6	428.3	445.3	467.8	482.1	481.2	475.8	451.6	407.7	344.1	276.9
62.5°	408.6	413.1	431.0	448.0	464.2	466.9	459.7	438.2	392.5	333.3	267.0
65°	376.4	382.6	405.0	423.8	436.4	441.8	432.8	413.1	371.9	312.7	246.4
67.5°	340.5	345.0	363.8	390.7	397.9	403.2	398.8	378.1	343.2	279.6	223.1
70°	299.3	306.5	319.0	345.9	353.9	359.3	359.3	338.7	305.6	245.5	195.3
72.5°	250.9	259.0	274.2	293.9	304.7	308.2	307.4	290.3	260.8	207.9	164.9
75°	198.0	204.3	222.2	236.6	248.2	250.9	250.0	235.7	208.8	167.6	130.8
77.5°	146.1	152.3	165.8	176.5	187.3	185.5	185.5	174.7	157.7	124.6	99.5
80°	95.9	101.3	112.9	116.5	128.1	127.2	127.2	119.2	107.5	83.3	66.3
82.5°	52.9	57.3	65.4	69.0	76.2	74.4	75.3	69.9	62.7	46.6	37.6
85°	18.8	22.4	26.9	29.6	33.2	33.2	33.2	28.7	26.9	17.9	15.2
87.5°	0.9	1.8	3.6	3.6	5.4	5.4	5.4	3.6	3.6	0.9	0.9
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°	95.9	95.9	95.9	95.9	95.9	95.9	95.9	95.9	95.9	95.9	95.9
2.5°	95.0	94.1	93.2	91.4	90.5	89.6	88.7	87.8	87.8	87.8	87.8
5°	95.9	95.0	92.3	89.6	86.9	84.2	82.4	81.5	80.6	79.8	79.8
7.5°	95.9	94.1	90.5	86.9	84.2	80.6	78.0	75.3	73.5	72.6	72.6
10°	96.8	94.1	89.6	86.0	81.5	77.1	73.5	69.9	68.1	66.3	66.3
12.5°	98.6	95.9	89.6	85.1	79.8	74.4	69.9	66.3	63.6	61.8	61.8
15°	102.2	98.6	91.4	85.1	78.9	72.6	68.1	63.6	60.9	59.1	59.1
17.5°	107.5	103.0	94.1	85.1	78.0	71.7	66.3	61.8	58.2	56.5	56.5
20°	113.8	108.4	97.7	86.9	78.0	70.8	65.4	60.0	56.5	54.7	54.7
22.5°	122.8	114.7	102.2	89.6	79.8	71.7	64.5	59.1	55.6	53.8	53.8
25°	132.6	123.7	107.5	93.2	81.5	71.7	64.5	59.1	55.6	53.8	52.9
27.5°	143.4	133.5	113.8	96.8	83.3	73.5	65.4	59.1	55.6	53.8	53.8
30°	153.2	141.6	120.1	101.3	86.0	74.4	66.3	60.0	55.6	53.8	53.8
32.5°	164.0	150.5	126.3	105.7	88.7	76.2	67.2	60.9	56.5	54.7	53.8
35°	174.7	159.5	132.6	109.3	91.4	78.0	68.1	61.8	57.3	55.6	55.6
37.5°	186.4	169.4	138.9	113.8	94.1	79.8	69.9	62.7	58.2	56.5	56.5
40°	198.9	179.2	145.2	117.4	96.8	81.5	71.7	64.5	60.0	58.2	58.2
42.5°	211.5	190.0	152.3	121.9	99.5	83.3	72.6	66.3	61.8	60.0	60.0
45°	224.0	198.9	158.6	126.3	102.2	86.0	75.3	68.1	63.6	61.8	61.8
47.5°	235.7	208.8	164.0	129.0	104.8	87.8	76.2	69.9	65.4	64.5	63.6
50°	243.7	215.1	167.6	131.7	105.7	88.7	78.0	70.8	67.2	65.4	65.4
52.5°	250.0	221.3	170.3	133.5	106.6	89.6	78.9	72.6	69.0	67.2	66.3
55°	253.6	222.2	170.3	131.7	105.7	89.6	78.9	72.6	69.0	67.2	67.2
57.5°	250.0	217.7	166.7	128.1	103.0	86.9	76.2	70.8	67.2	66.3	65.4
60°	242.8	210.6	159.5	122.8	98.6	82.4	72.6	68.1	65.4	64.5	63.6
62.5°	233.0	201.6	152.3	115.6	92.3	77.1	69.9	64.5	62.7	61.8	60.9
65°	213.3	184.6	140.7	106.6	84.2	70.8	63.6	60.0	58.2	56.5	55.6
67.5°	191.8	165.8	124.6	95.9	74.4	63.6	57.3	53.8	51.1	51.1	50.2
70°	168.5	146.1	107.5	81.5	64.5	55.6	49.3	46.6	44.8	44.8	43.9
72.5°	140.7	122.8	89.6	66.3	52.9	45.7	41.2	38.5	37.6	37.6	36.7
75°	112.9	96.8	70.8	52.0	41.2	35.8	32.3	30.5	29.6	29.6	28.7
77.5°	83.3	70.8	51.1	37.6	29.6	26.0	23.3	22.4	21.5	21.5	20.6
80°	55.6	46.6	33.2	24.2	17.9	16.1	14.3	14.3	13.4	14.3	13.4
82.5°	30.5	25.1	17.9	12.5	9.0	8.1	7.2	7.2	8.1	8.1	7.2
85°	11.6	9.0	6.3	3.6	2.7	2.7	2.7	2.7	2.7	2.7	1.8
87.5°	0.9	0.9	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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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

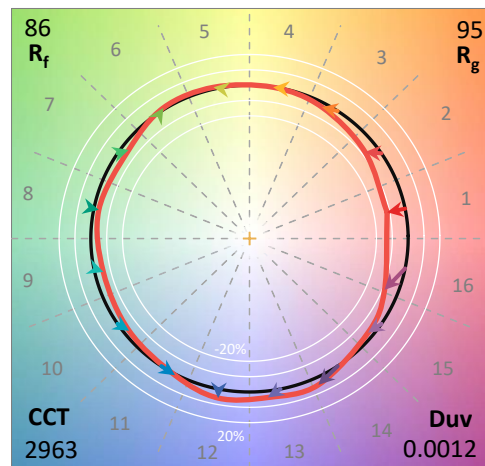
Test Information

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_f: 86.1
 R_g: 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

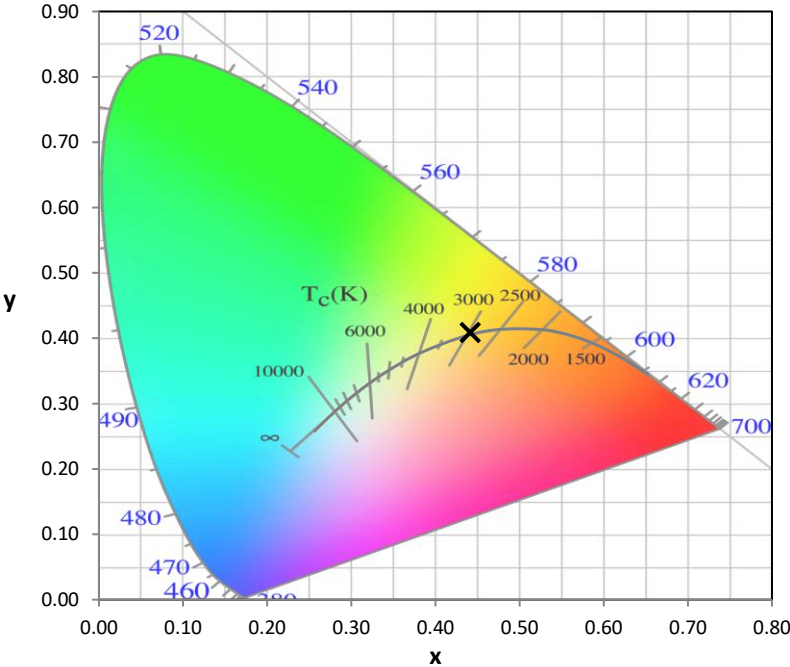
Stabilization Time: 37M
 Operation Time: 1H 37M
 Sphere Temperature (°C): 25.0

REPORT NUMBER: SP1-2411-284-4

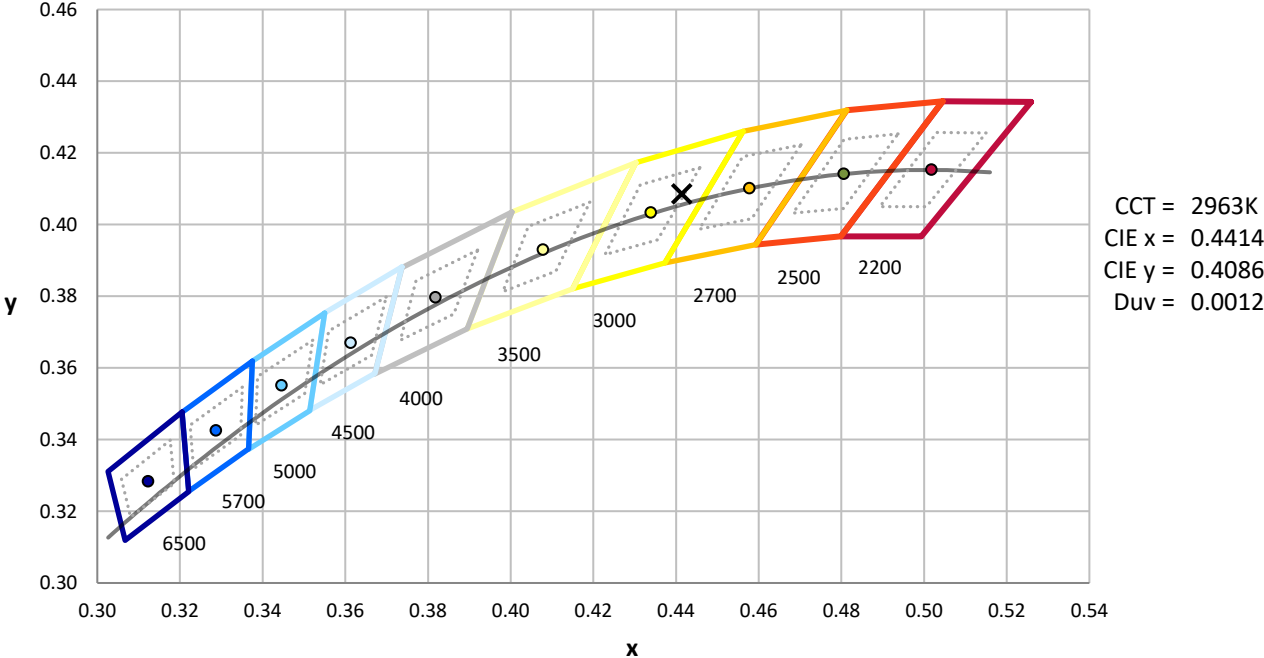
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	6/18/2024	12/18/2024
Power Meter	INXT2011004	2/8/2024	2/8/2025
AC Power Source	IN0063	10/22/2024	10/22/2025
DC Power Source	IN0208	10/22/2024	10/22/2025
Sphere Thermometer	IN0085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



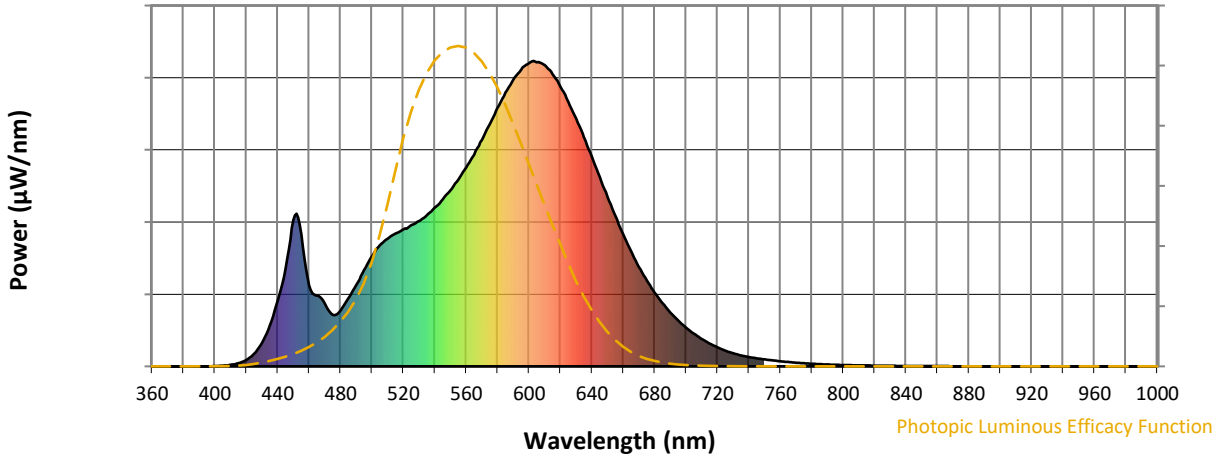
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-2411-284-4

Photopic Flux vs. Wavelength

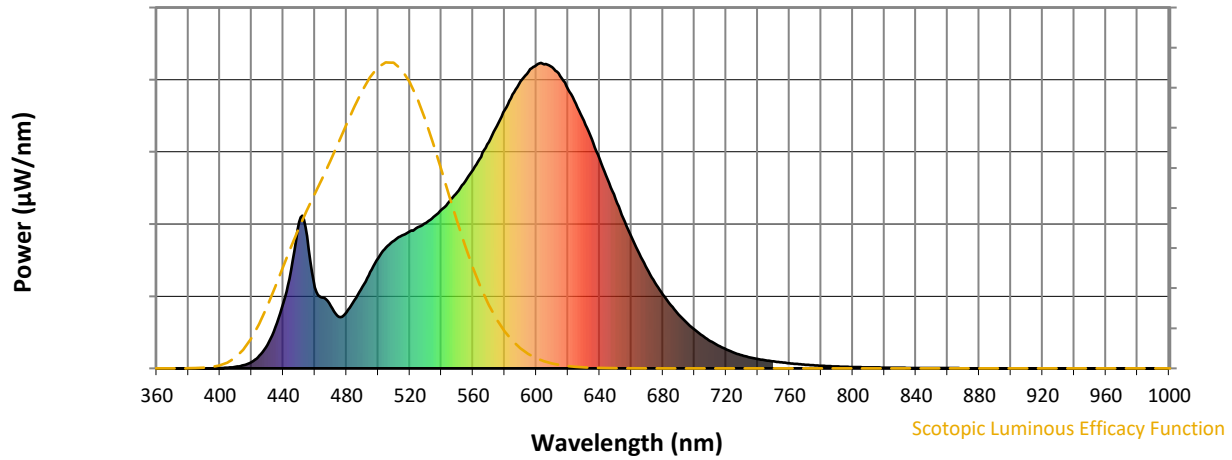


Photopic Lumens: NR

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			

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Scotopic Flux vs. Wavelength



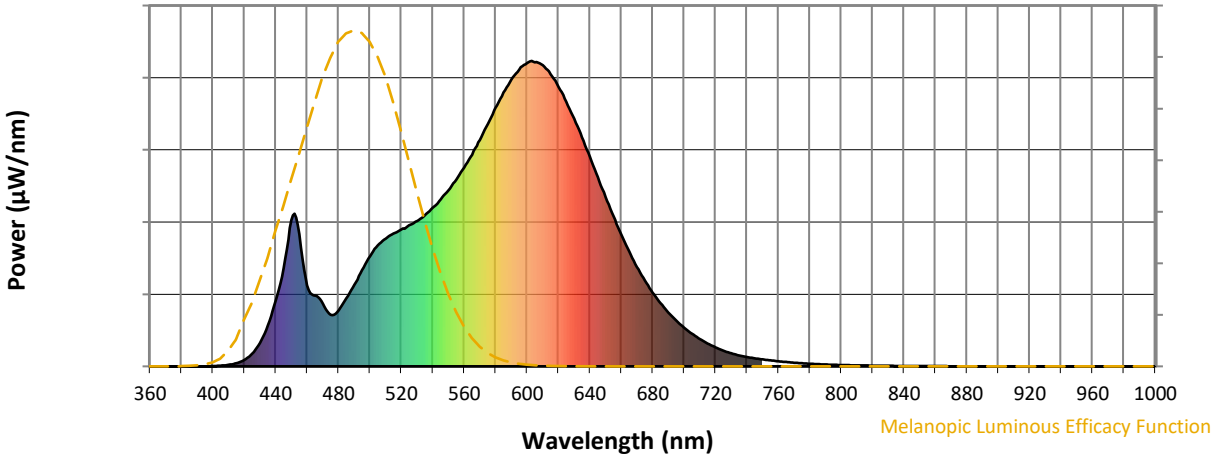
Scotopic Lumens: NR

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			

REPORT NUMBER: SP1-2411-284-4

Melanopic Flux vs. Wavelength



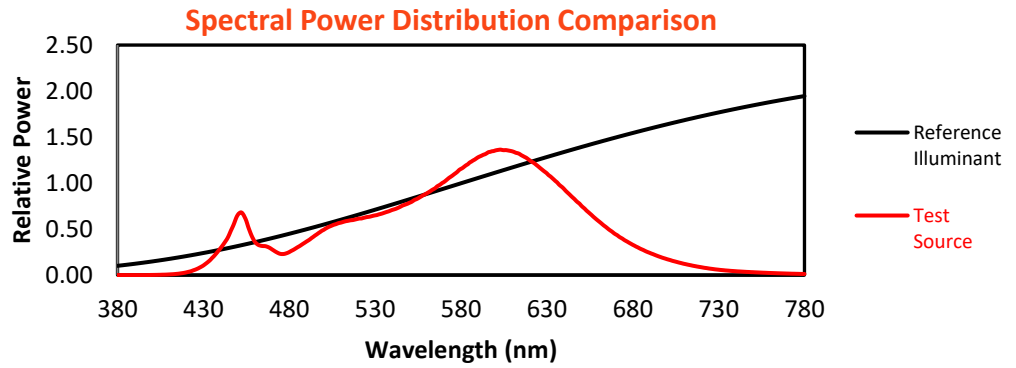
Melanopic Lumens: NR

M/P: 2.58

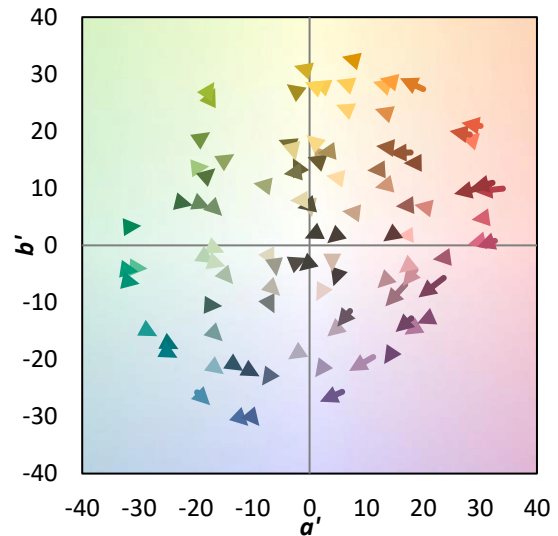
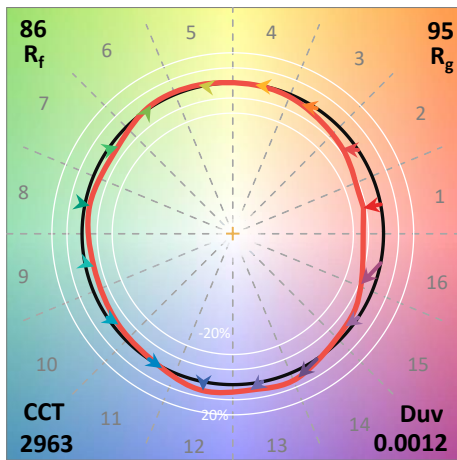
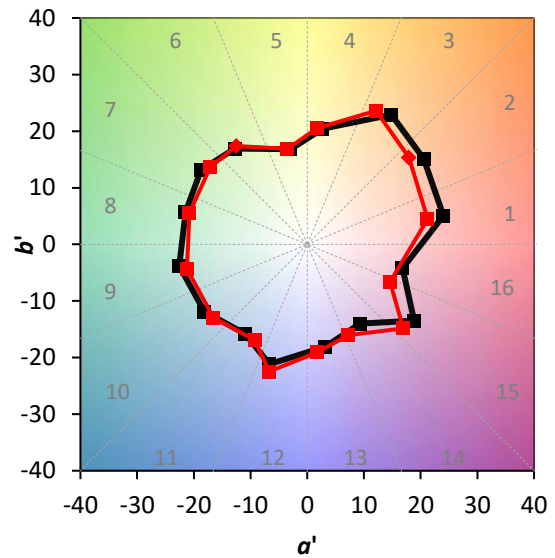
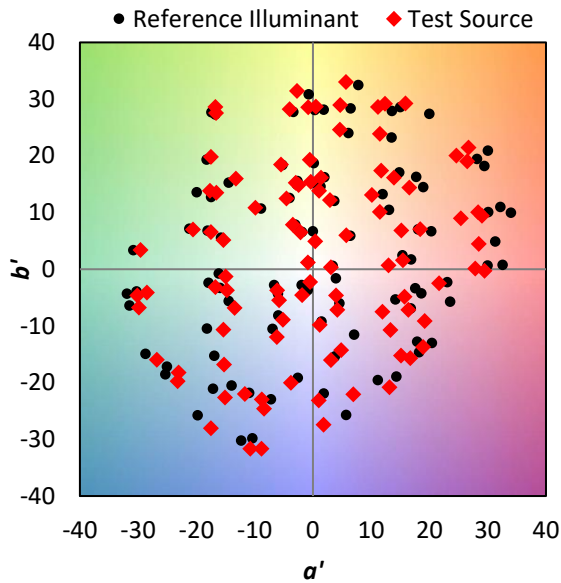
λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)
360	0	NR	490	267	NR	620	915	NR	750	23	NR	880	0	NR
365	0	NR	495	315	NR	625	866	NR	755	20	NR	885	0	NR
370	0	NR	500	360	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 $R_a = 82.9$
 $R_9 = 3.9$

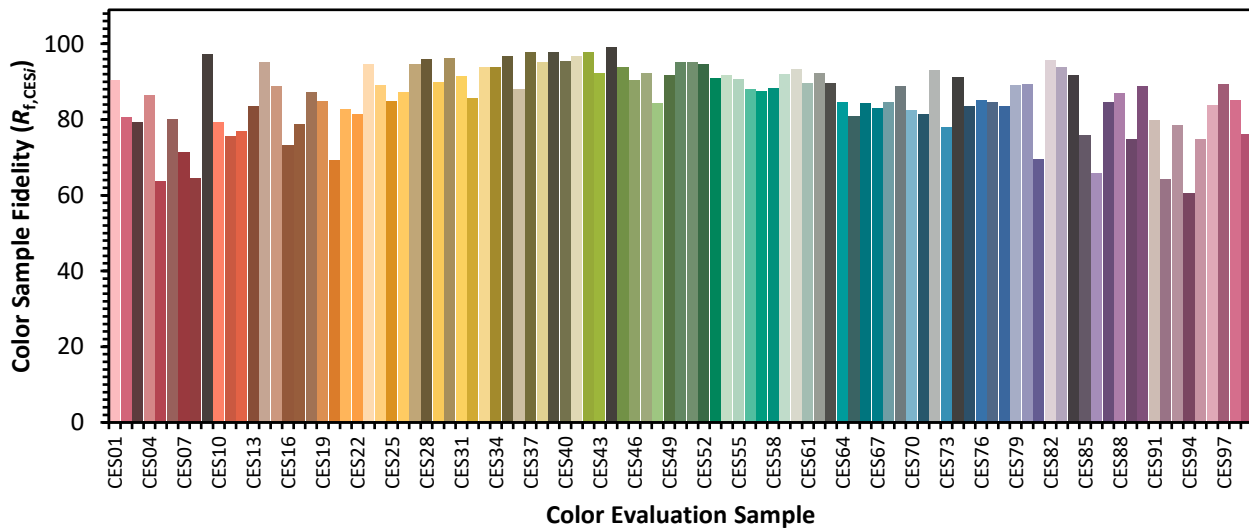


Color Vector Graphics

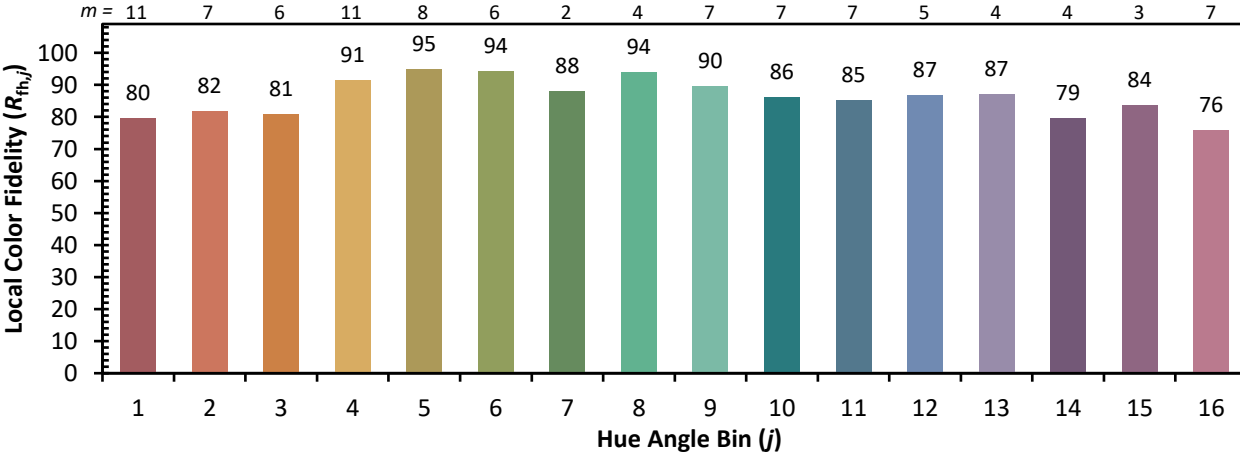
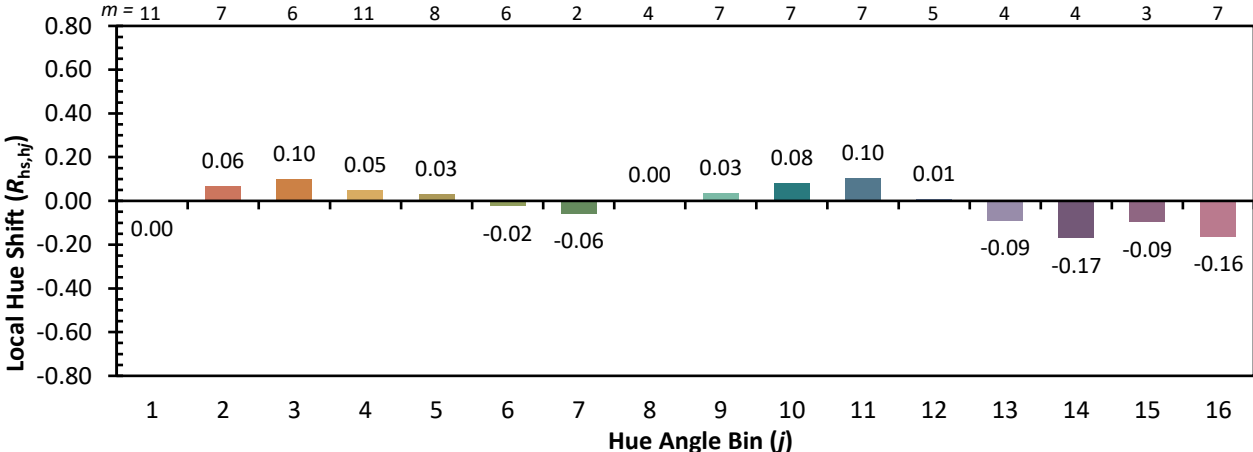
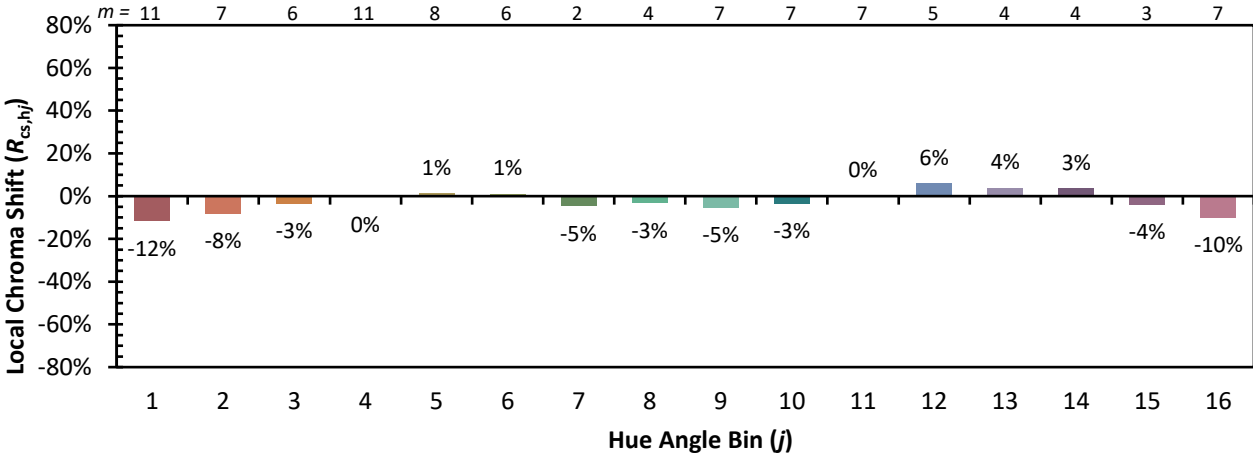


Individual Sample Fidelity Index ($R_{f,i}$)

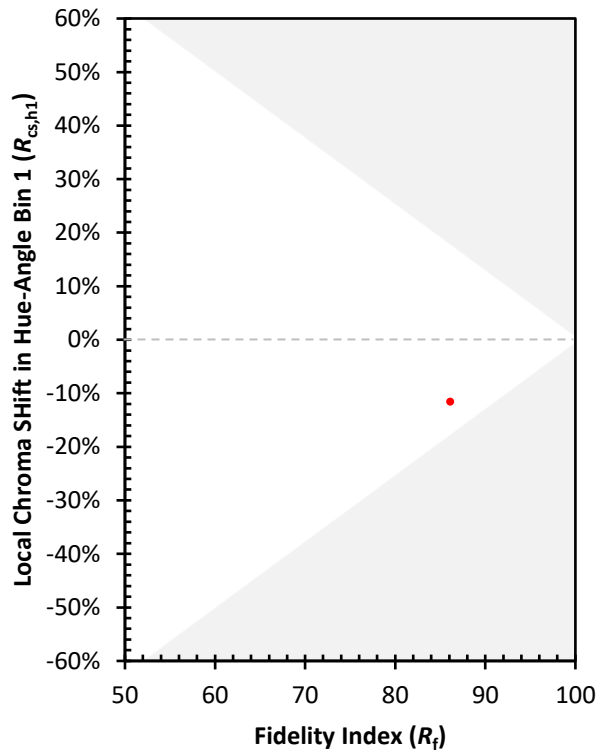
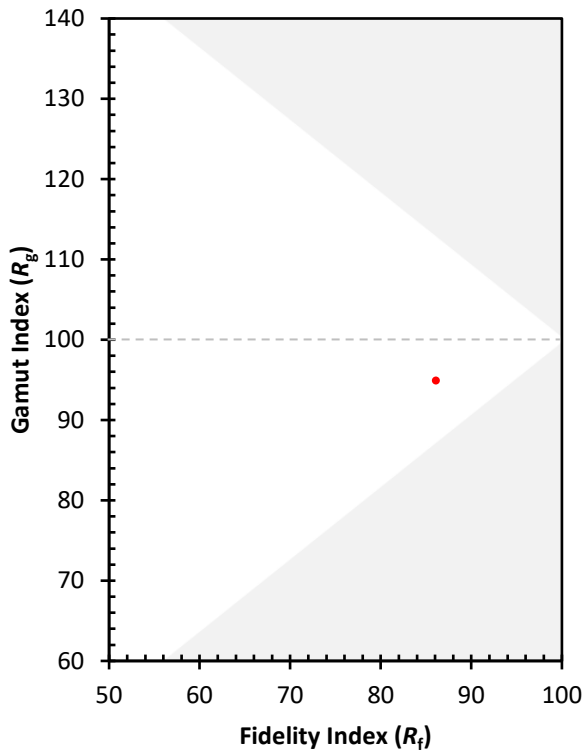
CES01 = 86	CES26 = 87	CES51 = 95	CES76 = 85
CES02 = 63	CES27 = 95	CES52 = 95	CES77 = 85
CES03 = 31	CES28 = 96	CES53 = 91	CES78 = 83
CES04 = 70	CES29 = 90	CES54 = 92	CES79 = 89
CES05 = 50	CES30 = 96	CES55 = 91	CES80 = 89
CES06 = 51	CES31 = 92	CES56 = 88	CES81 = 70
CES07 = 42	CES32 = 86	CES57 = 87	CES82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