

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: P833317

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

Issue Date: 5/15/2024

Test Information

Test Method: LM-79-08
Report Number: P833317
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-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: 3150.9 lumens
Efficiency: N/A
Efficacy: 108.7 lumens/watt
Luminous Opening: Vertical Cylinder (Dia: 0.71' x H: 0.1')
IES Classification: Type IV - Short
BUG Rating: B1 - U3 - G1

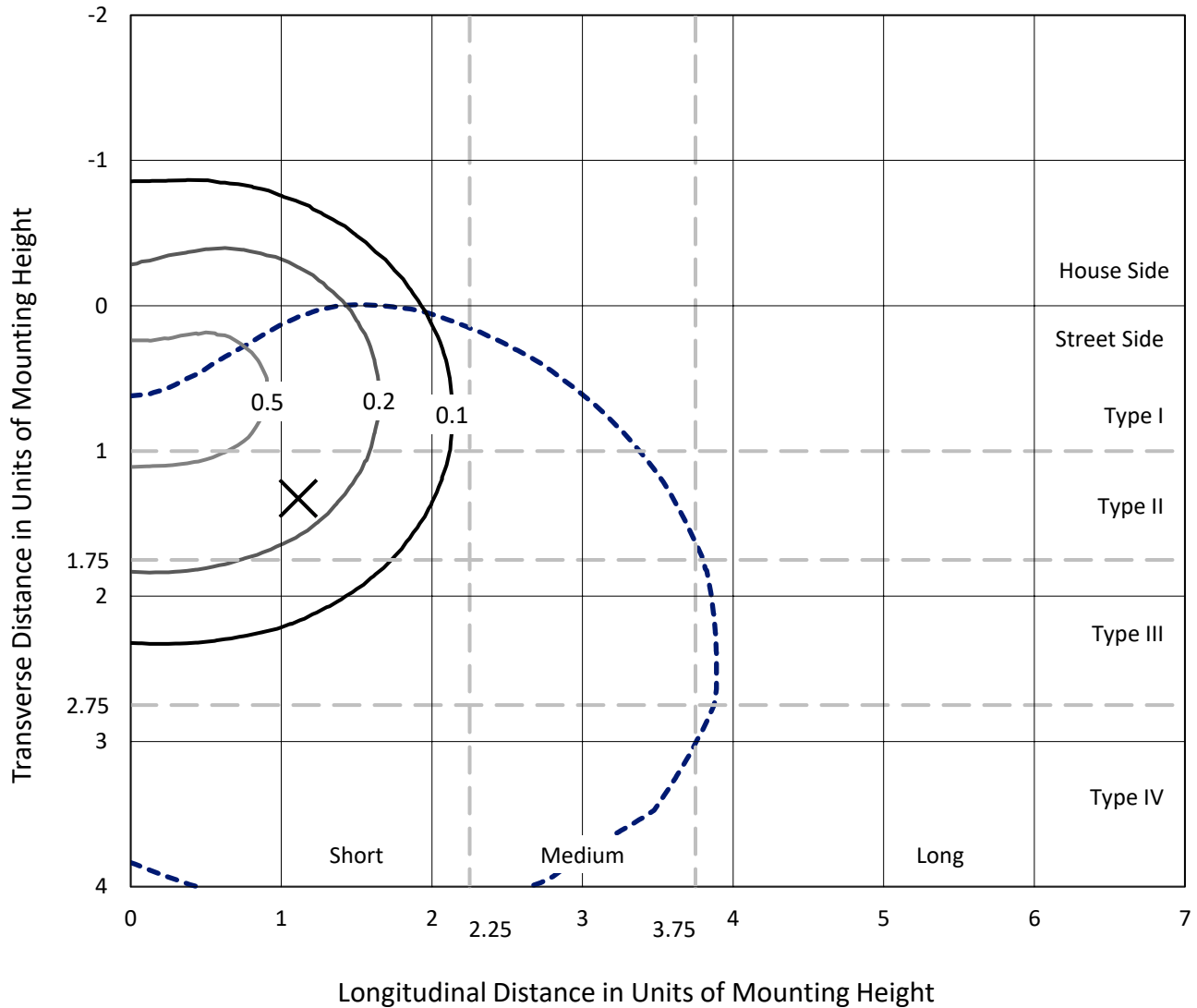
Input Watts (W): 29
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT



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Iso-Footcandle Lines of Horizontal Illumination

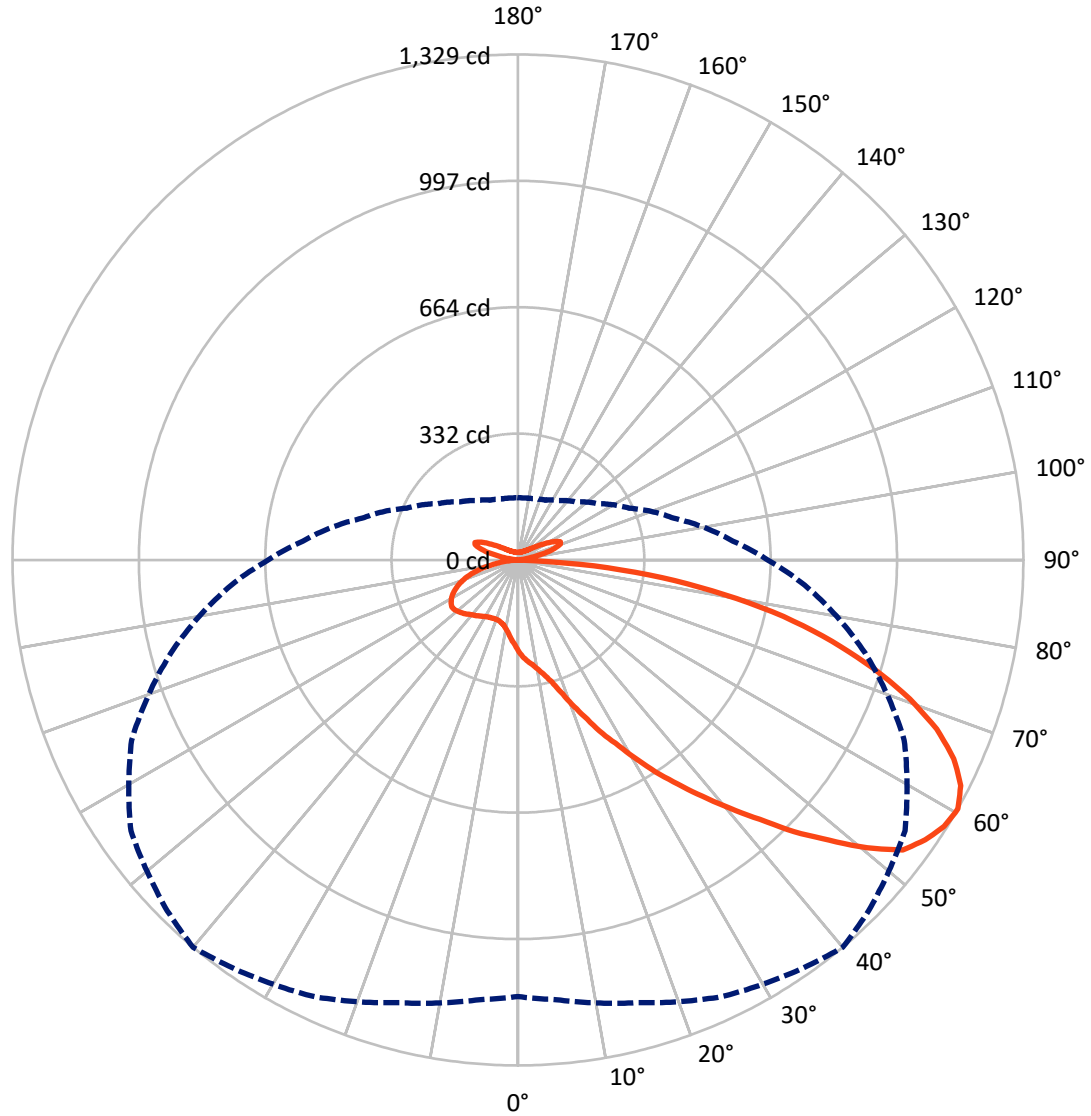
× Max cd
 - - - 1/2 Max cd



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

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Luminous Intensity Polar Plot



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

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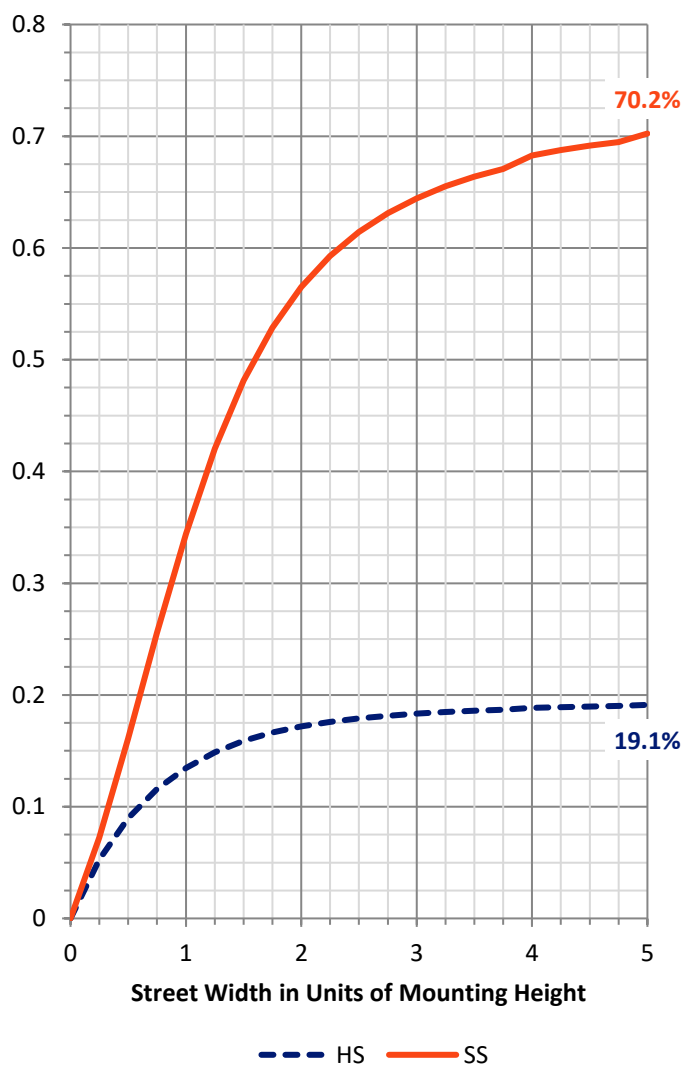
FLUX DISTRIBUTION:

		Downward	Upward	Total
House Side	Lumens	608.2	147.7	755.9
	% Fixture	19.3	4.7	24.0
Street Side	Lumens	2247.2	147.7	2395.0
	% Fixture	71.3	4.7	76.0
Total	Lumens	2855.4	295.5	3150.9
	% Fixture	90.6	9.4	100.0

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	22.7	0.7
10°-20°	72.4	2.3
20°-30°	152.9	4.9
30°-40°	279.4	8.9
40°-50°	454.0	14.4
50°-60°	631.1	20.0
60°-70°	654.2	20.8
70°-80°	468.8	14.9
80°-90°	119.9	3.8
90°-100°	6.6	0.2
100°-110°	67.0	2.1
110°-120°	98.0	3.1
120°-130°	56.9	1.8
130°-140°	30.1	1.0
140°-150°	17.9	0.6
150°-160°	11.0	0.3
160°-170°	6.0	0.2
170°-180°	2.0	0.1
0°-90°	2855.4	90.6
0°-180°	3150.9	100.0

Coefficient of Utilization

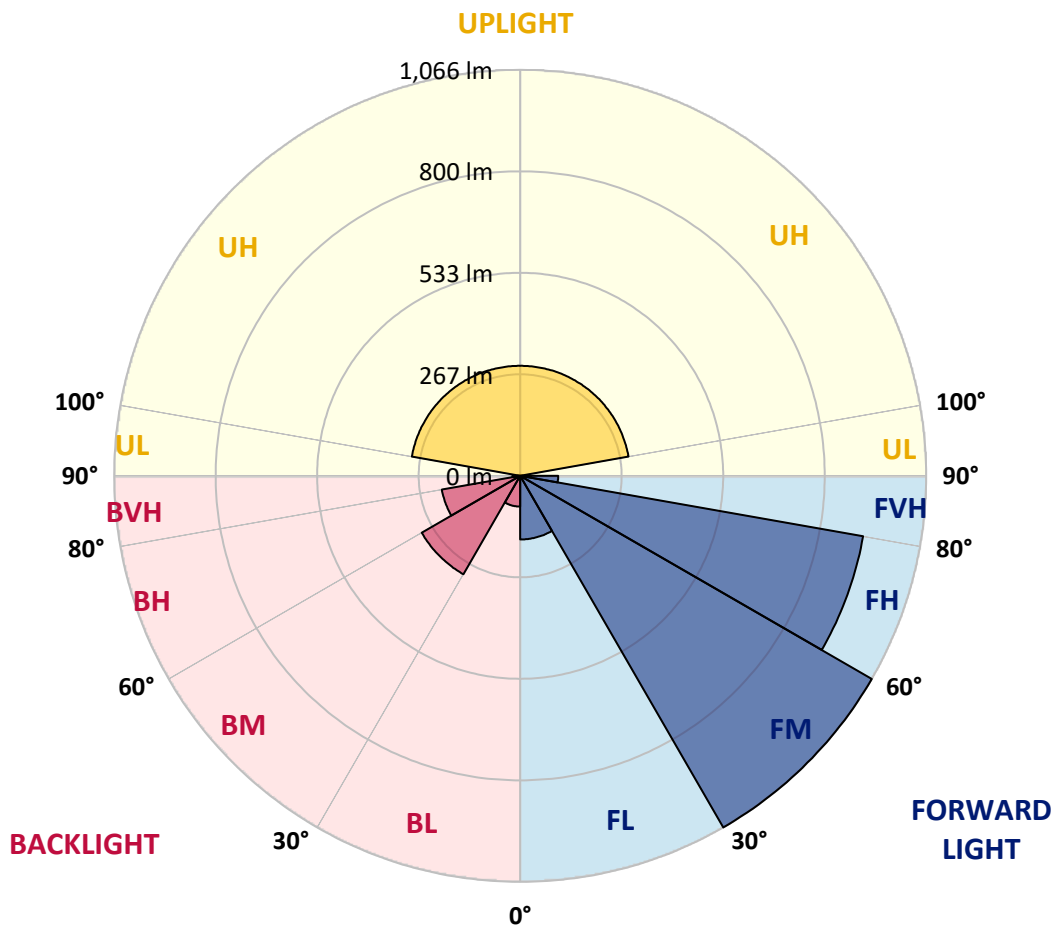


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LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

Zone	Lumens	% Fixture	Zone Rating/Lumen Limit		
			B	U	G
FL (0°-30°)	167.1	5.3			
FM (30°-60°)	1066.1	33.8			
FH (60°-80°)	914.3	29.0			G1/1800
FVH (80°-90°)	99.8	3.2			G1/100
BL (0°-30°)	80.9	2.6	B0/110		
BM (30°-60°)	298.5	9.5	B1/1000		
BH (60°-80°)	208.7	6.6	B1/500		G1/500
BVH (80°-90°)	20.2	0.6			G1/100
UL (90°-100°)	6.6	0.2		U1/10	
UH (100°-180°)	288.9	9.2		U3/500	

BUG Rating: B1-U3-G1
 Type IV Short





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CANDELA DISTRIBUTION (FULL):

	0°	5°	15°	25°	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°	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°	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°	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



REPORT NUMBER: P833317
 CATALOG NUMBER: TTN-D1-830-U-DL-UPL1

CANDELA DISTRIBUTION (continued):

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

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



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

Report Prepared for

Cooper Lighting Solutions

MCGRAW EDISON

Report Number: SP1-2411-284-4

Test Date: 11/22/2024

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

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

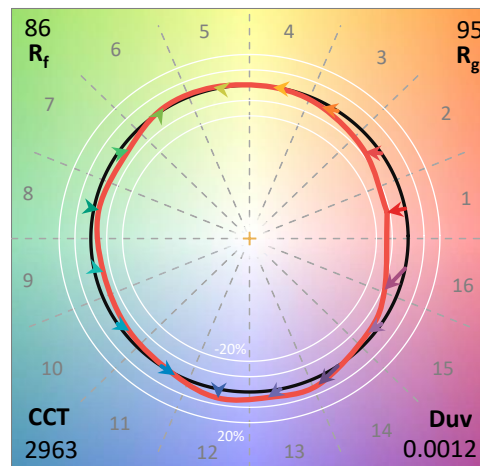
Test Information

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

Spectral Parameters

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

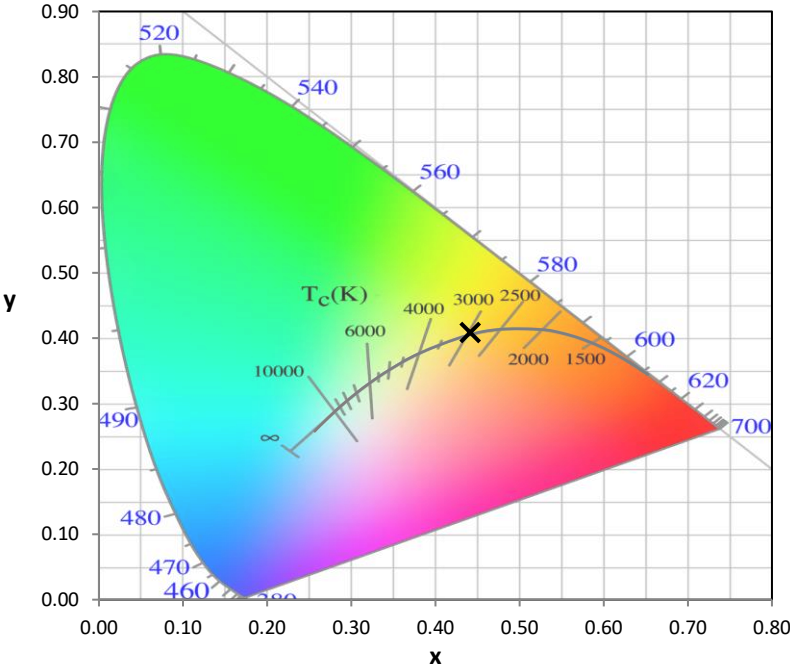
Stabilization Time: 37M
 Operation Time: 1H 37M
 Sphere Temperature (°C): 25.0

REPORT NUMBER: SP1-2411-284-4

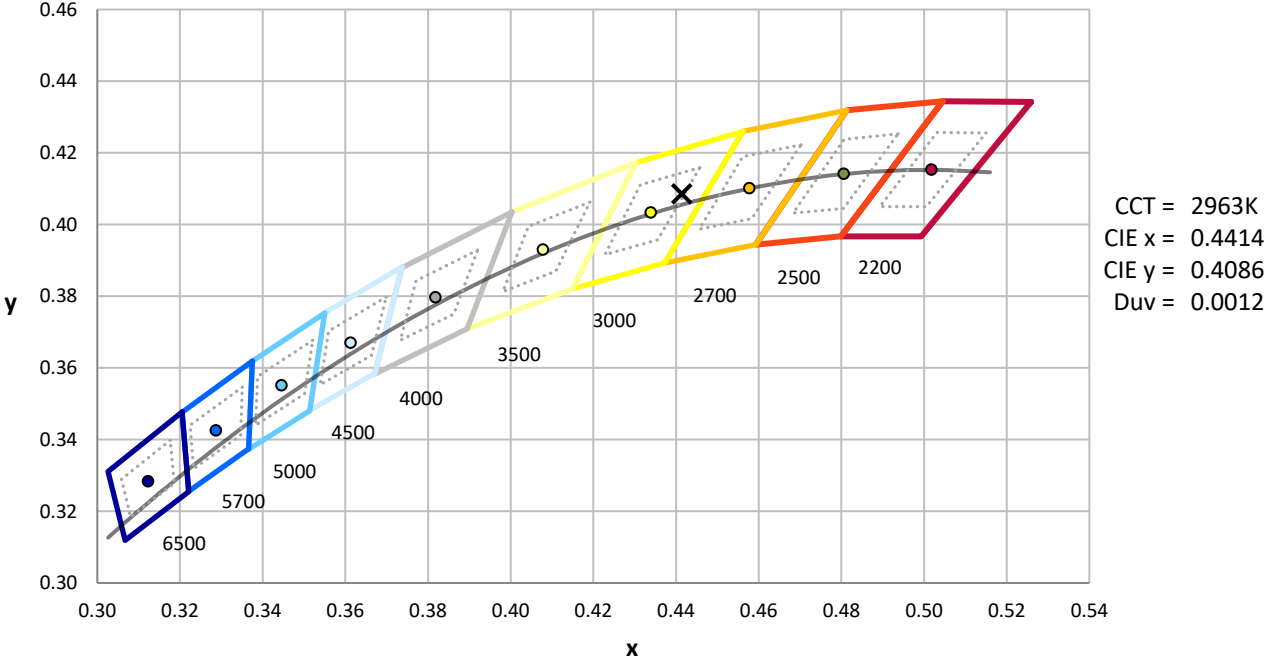
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	6/18/2024	12/18/2024
Power Meter	INXT2011004	2/8/2024	2/8/2025
AC Power Source	IN0063	10/22/2024	10/22/2025
DC Power Source	IN0208	10/22/2024	10/22/2025
Sphere Thermometer	IN0085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

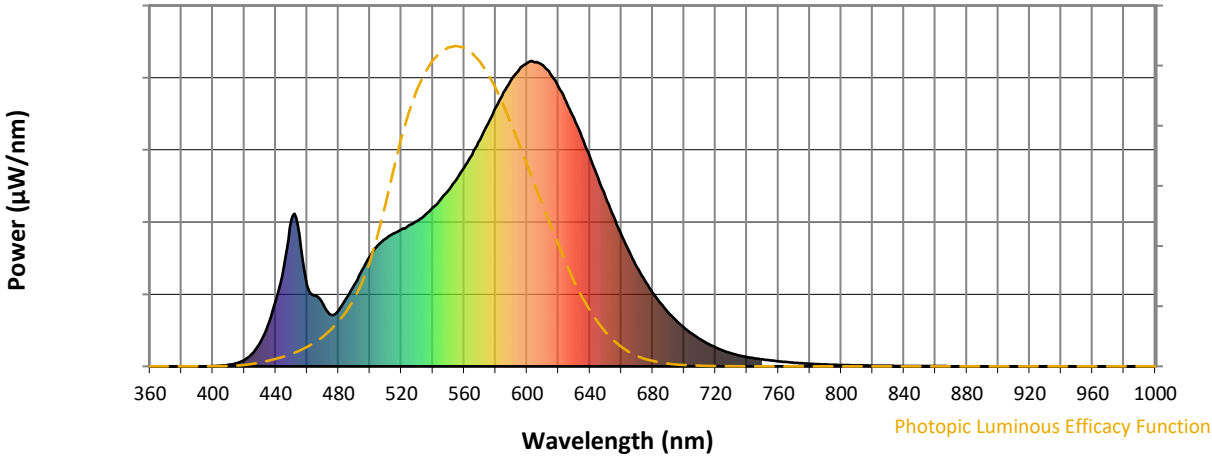


CCT = 2963K
 CIE x = 0.4414
 CIE y = 0.4086
 Duv = 0.0012

Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-2411-284-4

Photopic Flux vs. Wavelength

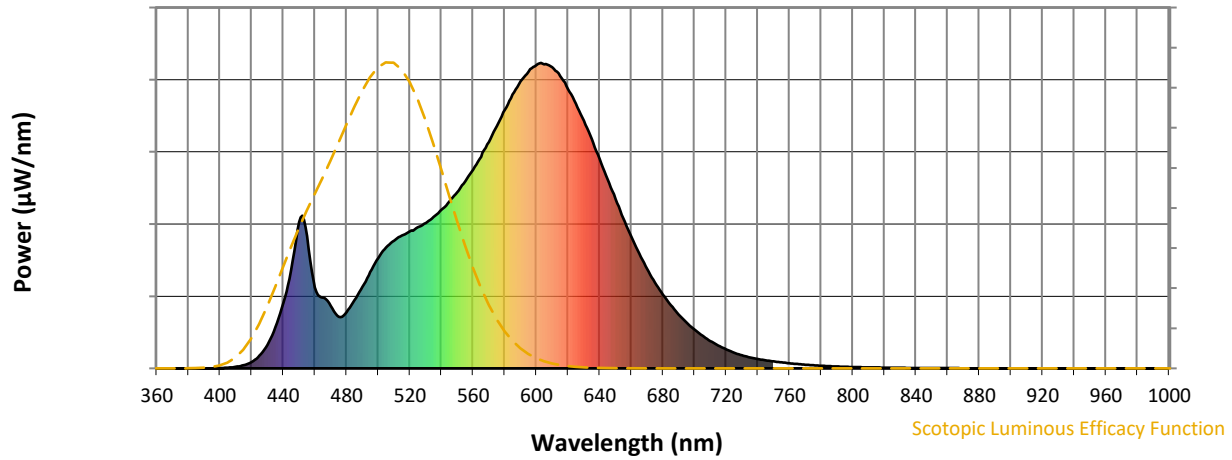


Photopic Lumens: NR

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



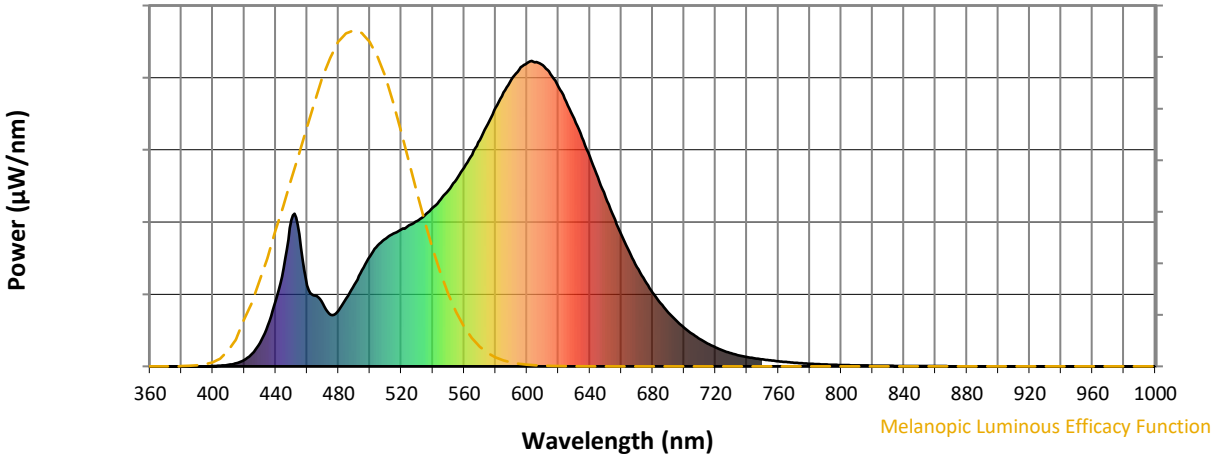
Scotopic Lumens: NR

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			

REPORT NUMBER: SP1-2411-284-4

Melanopic Flux vs. Wavelength



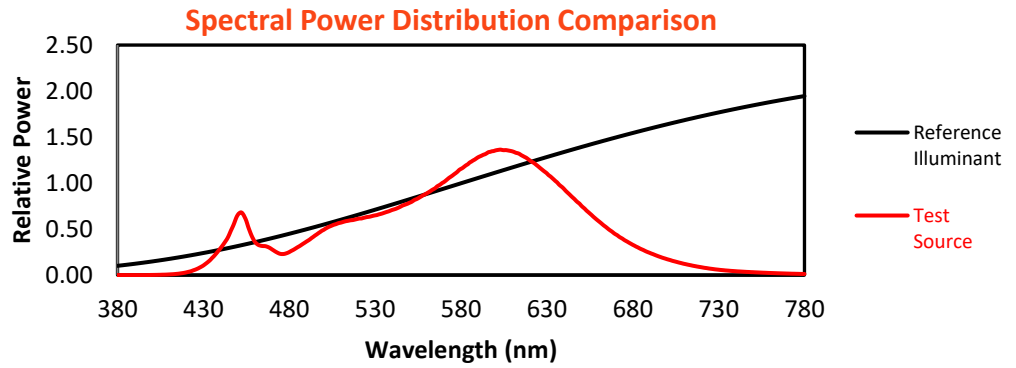
Melanopic Lumens: NR

M/P: 2.58

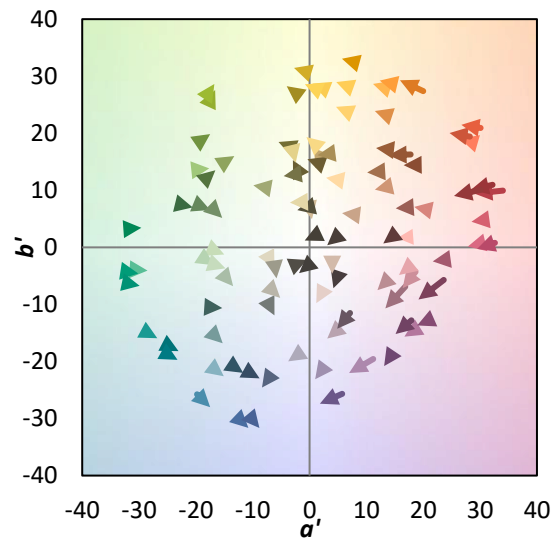
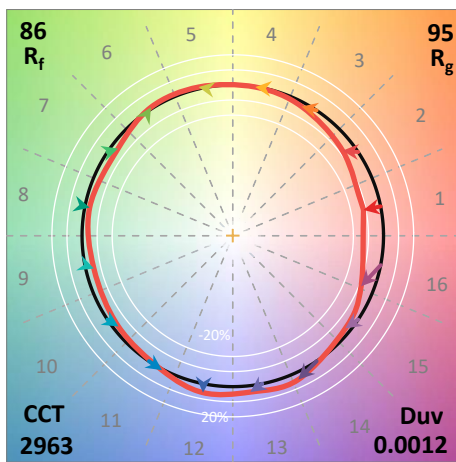
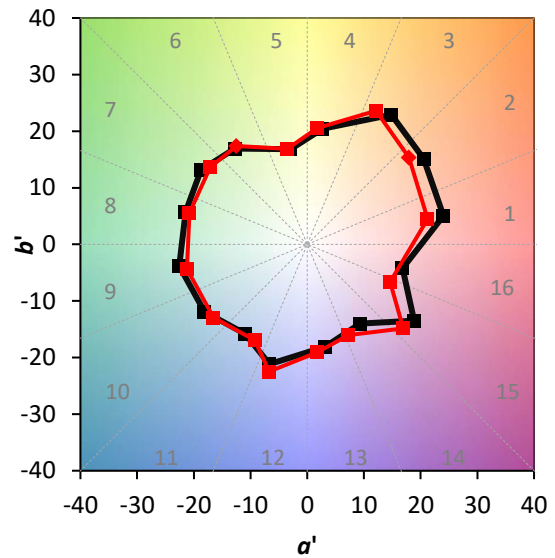
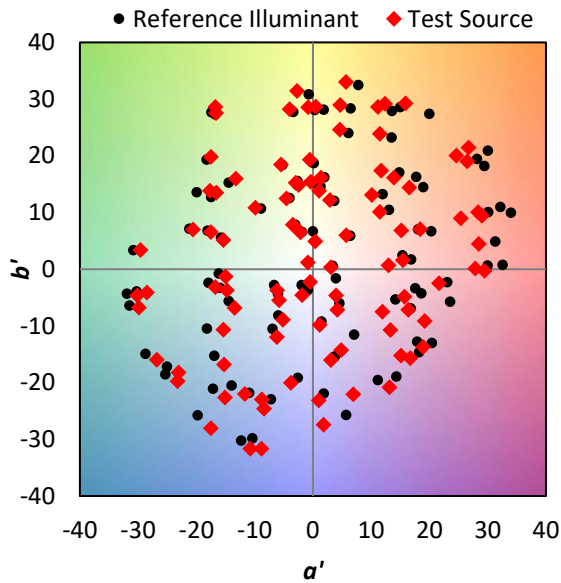
λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)
360	0	NR	490	267	NR	620	915	NR	750	23	NR	880	0	NR
365	0	NR	495	315	NR	625	866	NR	755	20	NR	885	0	NR
370	0	NR	500	360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

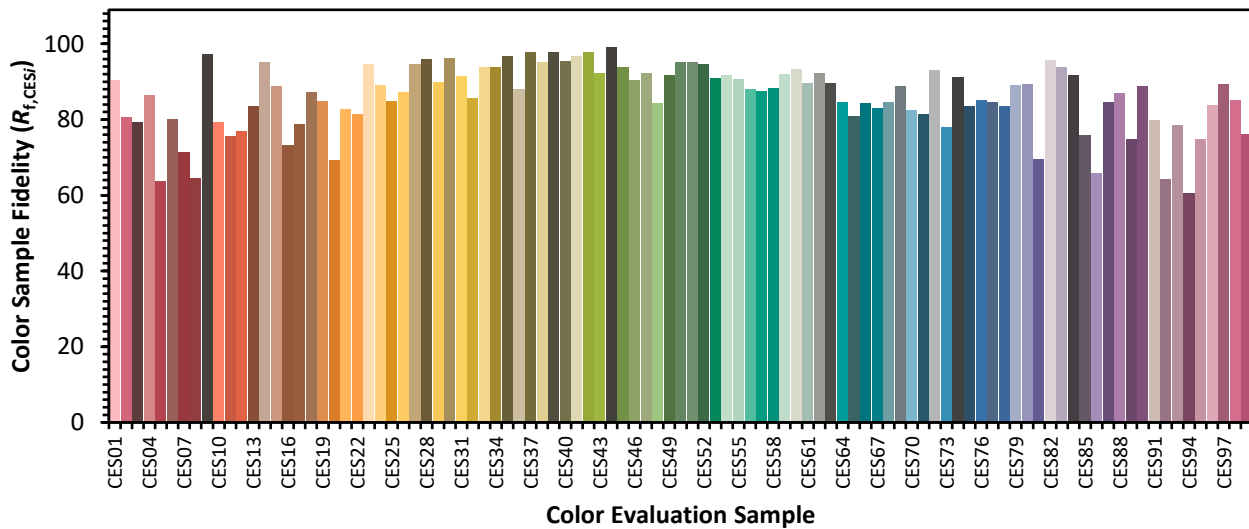


Color Vector Graphics

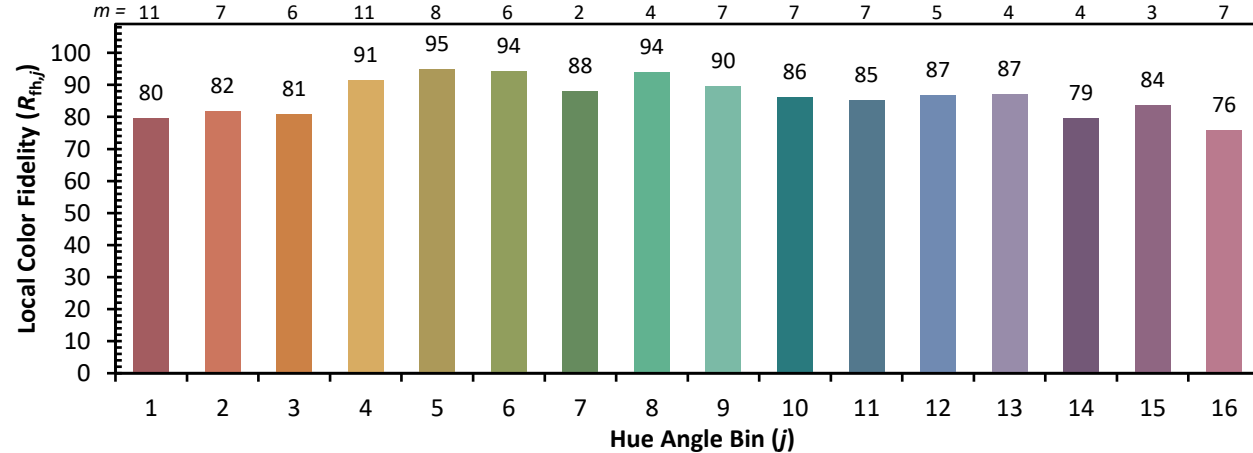
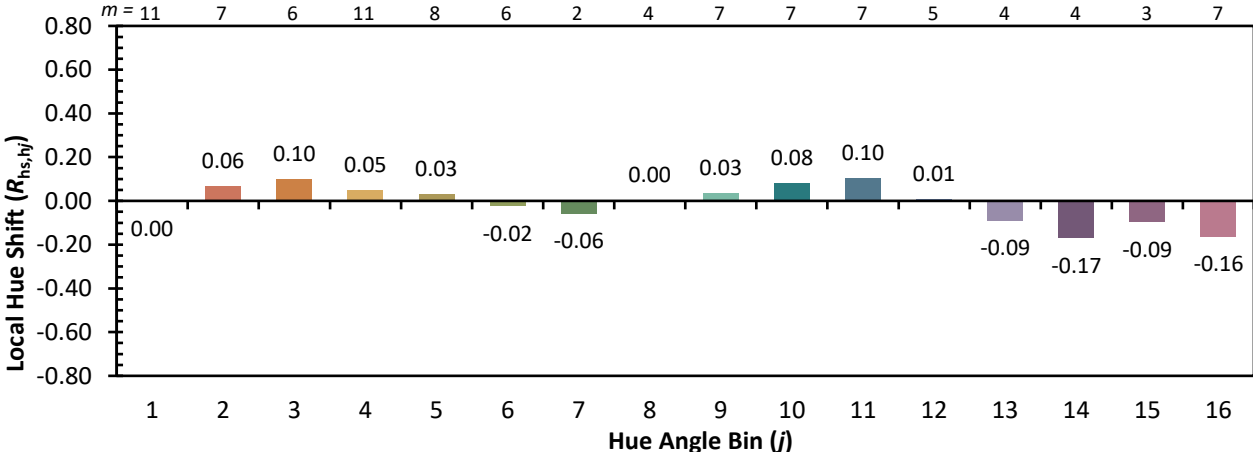
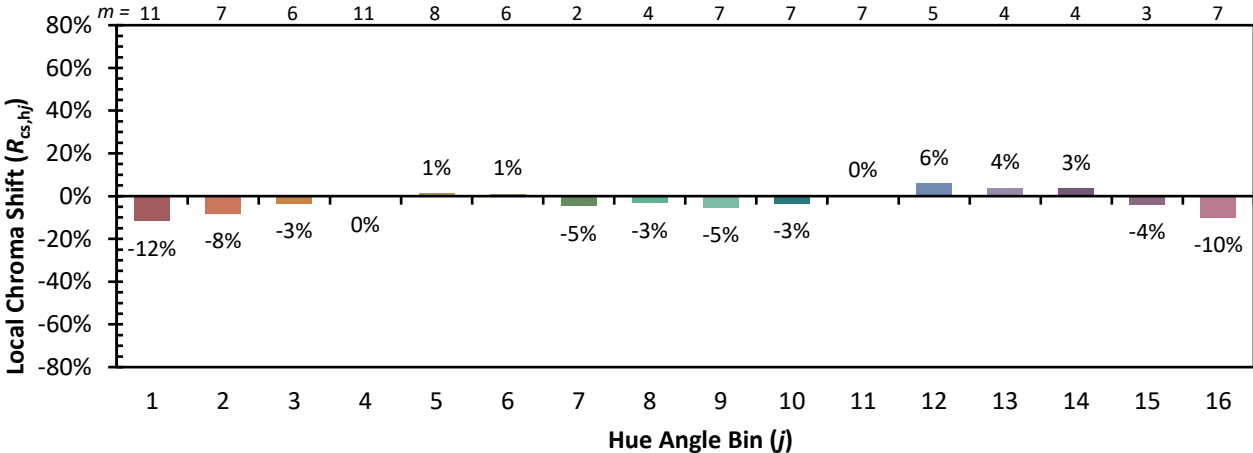


Individual Sample Fidelity Index ($R_{f,i}$)

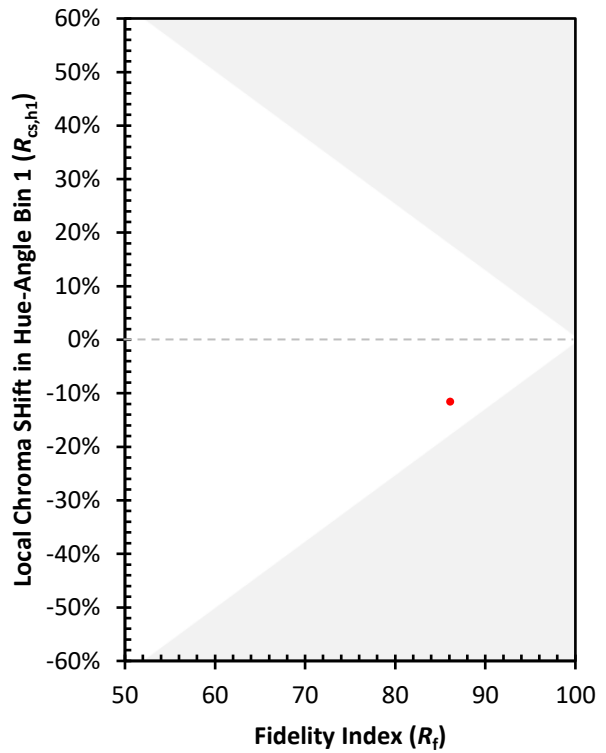
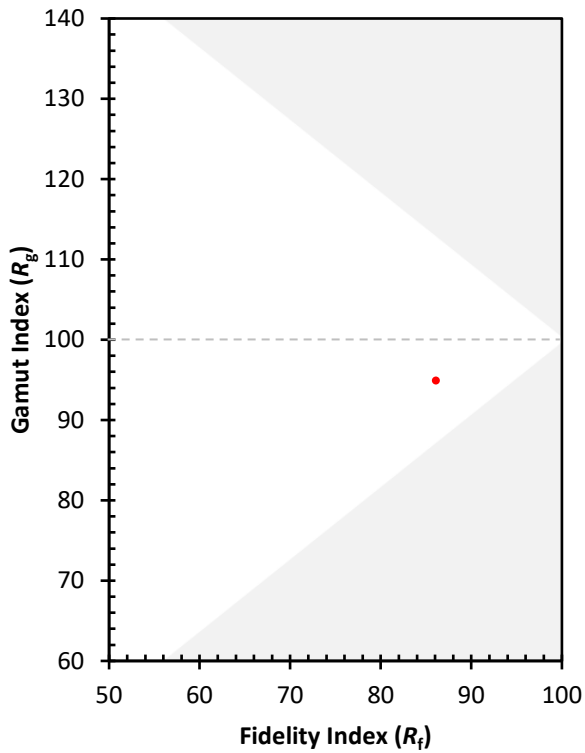
CES01 = 86	CES26 = 87	CES51 = 95	CES76 = 85
CES02 = 63	CES27 = 95	CES52 = 95	CES77 = 85
CES03 = 31	CES28 = 96	CES53 = 91	CES78 = 83
CES04 = 70	CES29 = 90	CES54 = 92	CES79 = 89
CES05 = 50	CES30 = 96	CES55 = 91	CES80 = 89
CES06 = 51	CES31 = 92	CES56 = 88	CES81 = 70
CES07 = 42	CES32 = 86	CES57 = 87	CES82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