

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: P833169

Luminaire Tested: **TTN-D1-735-U-DL-UPL3**

Issue Date: 5/15/2024

**Test Information**

Test Method: LM-79-08  
Report Number: P833169  
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-D1-735-U-DL-UPL3  
Description: TOPTIER NANO LED PARKING GARAGE LUMINAIRE WITH UPLIGHT  
3500K, 70 CRI LEDS AND DRIVE LANE DISTRIBUTION  
Light Source: -  
Ballast/Driver: -

**Summary**

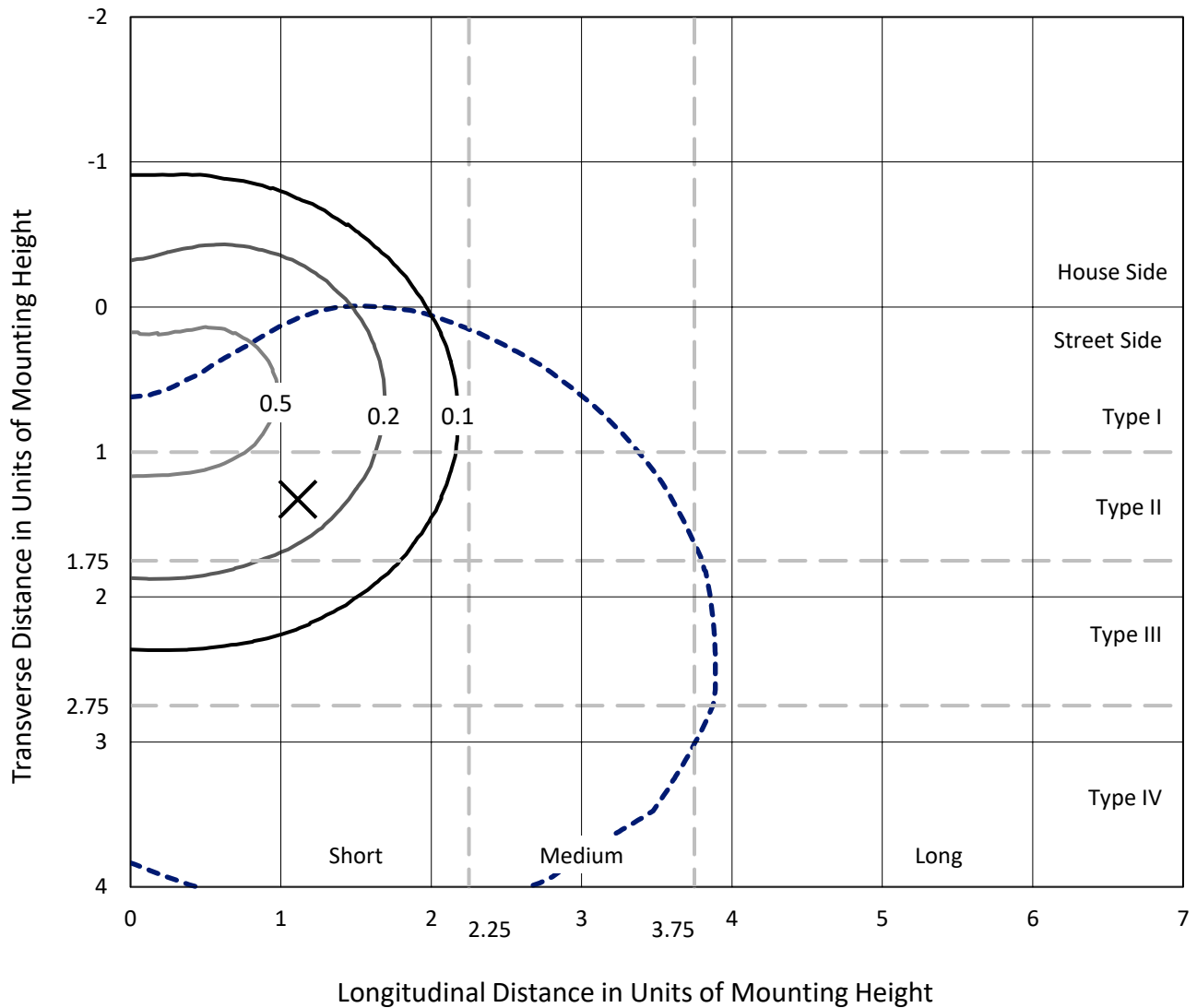
Lumens per Lamp: N/A  
Luminaire Lumens: 3774.7 lumens  
Efficiency: N/A  
Efficacy: 113.0 lumens/watt  
Luminous Opening: Vertical Cylinder (Dia: 0.71' x H: 0.1')  
IES Classification: Type IV - Short  
BUG Rating: B1 - U4 - G2  
  
Input Watts (W): 33.4  
Input Voltage (V): NR  
Input Current (Ain): 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

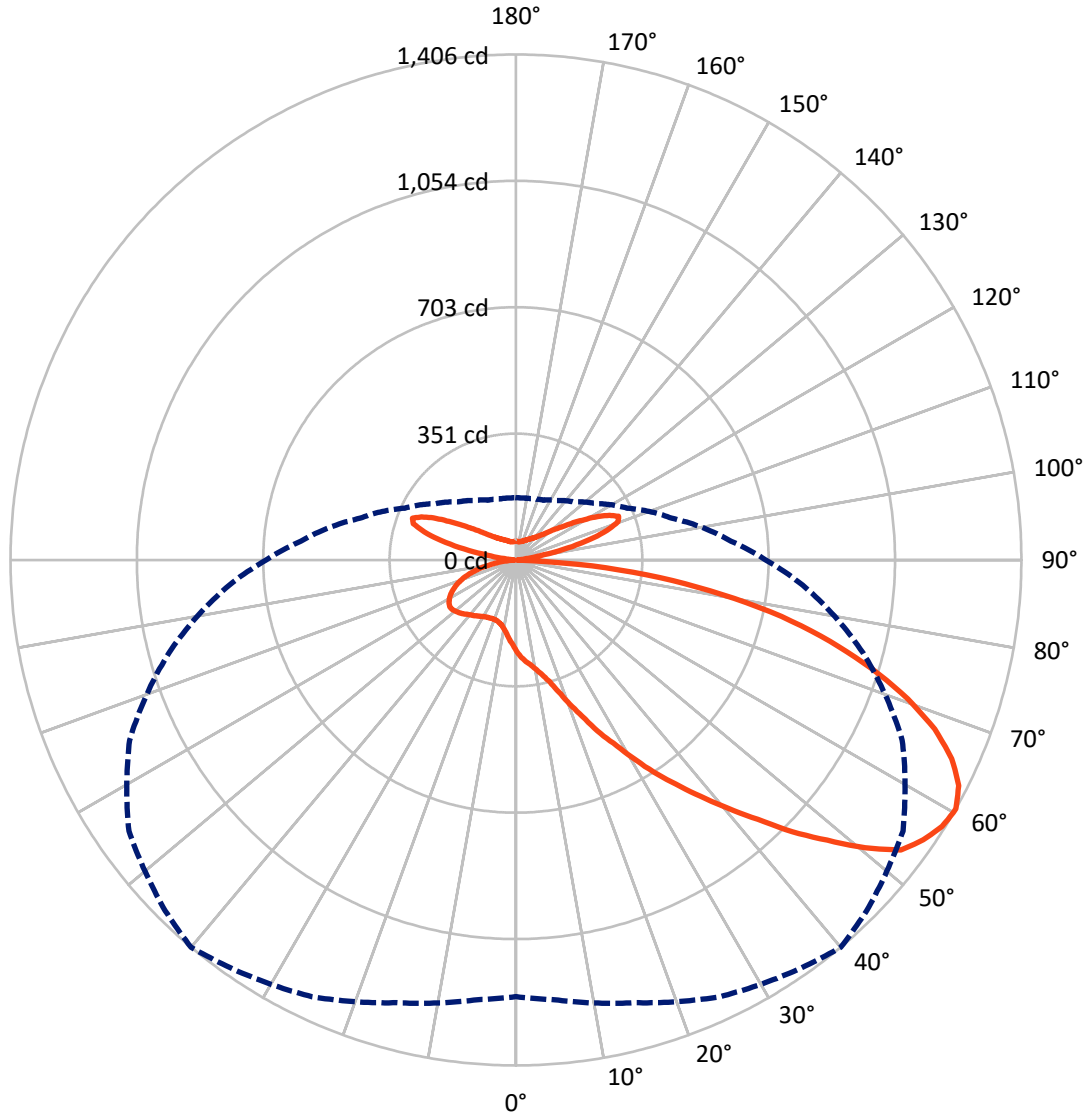
✕ Max cd  
 - - - 1/2 Max cd



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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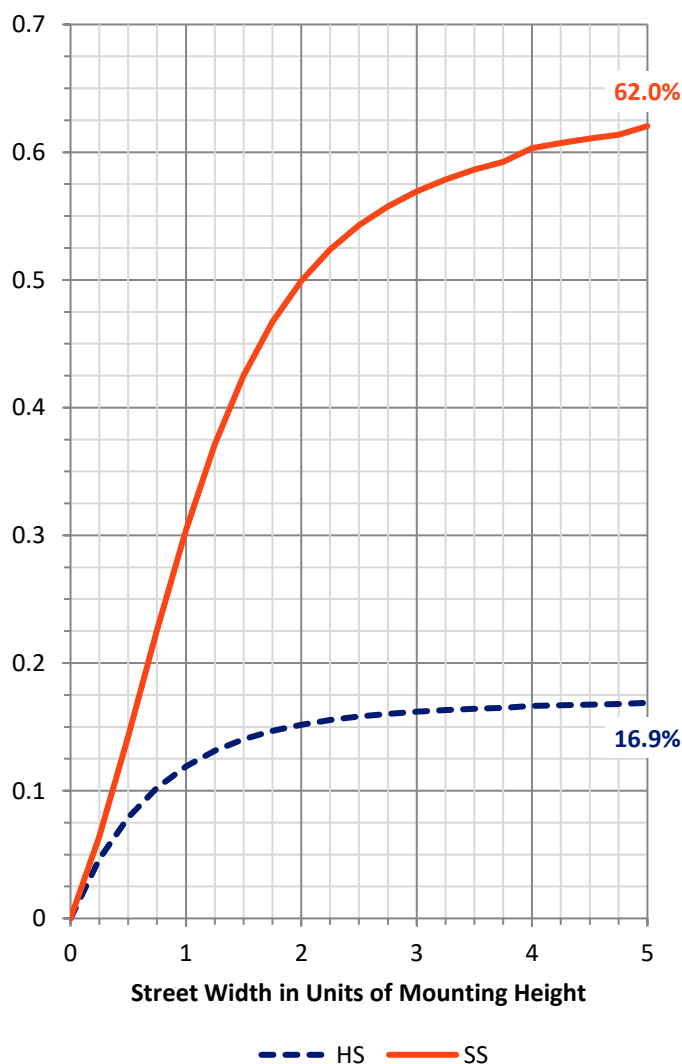
**FLUX DISTRIBUTION:**

		Downward	Upward	Total
<b>House Side</b>	Lumens	643.8	376.3	1020.2
	% Fixture	17.1	10.0	27.0
<b>Street Side</b>	Lumens	2378.2	376.3	2754.5
	% Fixture	63.0	10.0	73.0
<b>Total</b>	Lumens	3022.0	752.7	3774.7
	% Fixture	80.1	19.9	100.0

**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	24.0	0.6
10°-20°	76.6	2.0
20°-30°	161.8	4.3
30°-40°	295.7	7.8
40°-50°	480.4	12.7
50°-60°	667.8	17.7
60°-70°	692.3	18.3
70°-80°	496.0	13.1
80°-90°	127.5	3.4
90°-100°	16.8	0.4
100°-110°	170.7	4.5
110°-120°	249.6	6.6
120°-130°	144.9	3.8
130°-140°	76.7	2.0
140°-150°	45.6	1.2
150°-160°	28.1	0.7
160°-170°	15.3	0.4
170°-180°	5.0	0.1
0°-90°	3022.0	80.1
0°-180°	3774.7	100.0

**Coefficient of Utilization**

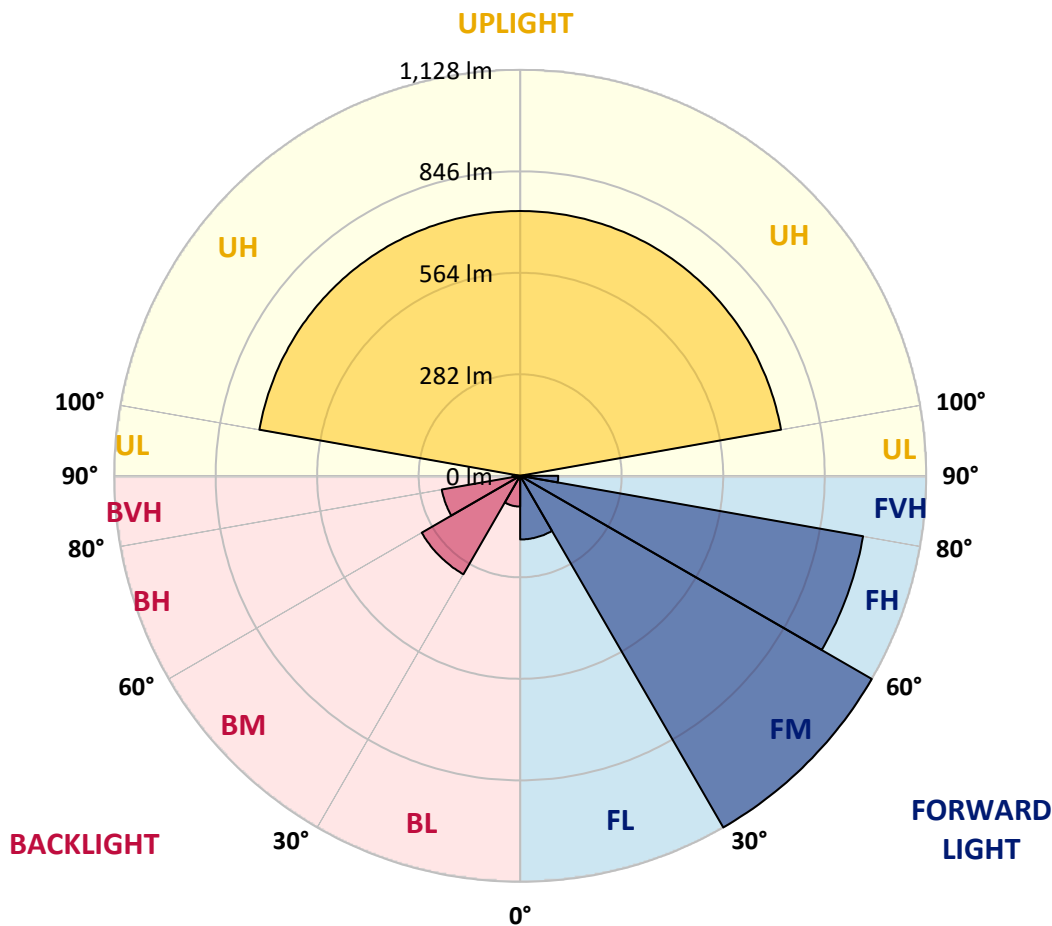


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

Zone	Lumens	% Fixture	Zone Rating/Lumen Limit		
			B	U	G
FL (0°-30°)	176.8	4.7			
FM (30°-60°)	1128.0	29.9			
FH (60°-80°)	967.5	25.6			G1/1800
FVH (80°-90°)	105.9	2.8			G2/225
BL (0°-30°)	85.6	2.3	B0/110		
BM (30°-60°)	315.8	8.4	B1/1000		
BH (60°-80°)	220.8	5.9	B1/500		G1/500
BVH (80°-90°)	21.6	0.6			G1/100
UL (90°-100°)	16.8	0.4		U2/50	
UH (100°-180°)	735.8	19.5		U4/1000	

**BUG Rating: B1-U4-G2**  
 Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

	0°	5°	15°	25°	35°	40°	45°	55°	65°	75°	85°
0°	254.4	254.4	254.4	254.4	254.4	254.4	254.4	254.4	254.4	254.4	254.4
2.5°	272.8	272.8	272.8	272.8	270.2	270.2	267.6	264.9	262.3	259.7	254.4
5°	296.4	296.4	293.8	291.2	285.9	283.3	280.7	275.4	270.2	264.9	257.1
7.5°	306.9	306.9	306.9	304.3	296.4	293.8	288.5	280.7	272.8	264.9	254.4
10°	325.3	325.3	322.6	320.0	312.1	309.5	304.3	293.8	280.7	267.6	254.4
12.5°	348.9	346.2	343.6	341.0	333.1	327.9	320.0	309.5	293.8	278.0	262.3
15°	377.7	372.5	372.5	367.2	359.4	351.5	346.2	330.5	314.8	293.8	272.8
17.5°	409.2	406.6	403.9	398.7	390.8	385.6	377.7	359.4	338.4	312.1	288.5
20°	448.5	443.3	445.9	438.0	430.2	427.6	414.4	393.5	367.2	338.4	309.5
22.5°	495.8	490.5	490.5	482.6	477.4	472.1	459.0	435.4	401.3	369.8	333.1
25°	548.2	543.0	543.0	537.7	532.5	527.2	511.5	485.3	445.9	406.6	364.6
27.5°	605.9	600.7	600.7	598.1	584.9	577.1	564.0	535.1	495.8	445.9	396.1
30°	666.3	661.0	666.3	661.0	653.1	637.4	621.7	590.2	545.6	490.5	430.2
32.5°	713.5	713.5	716.1	721.3	716.1	703.0	684.6	658.4	598.1	529.9	461.7
35°	768.6	768.6	773.8	781.7	779.0	765.9	747.6	718.7	655.8	574.4	495.8
37.5°	828.9	828.9	834.1	847.2	842.0	834.1	821.0	784.3	713.5	619.0	532.5
40°	894.5	891.8	897.1	915.4	918.1	907.6	891.8	855.1	773.8	676.7	571.8
42.5°	960.0	957.4	967.9	986.3	988.9	986.3	970.5	928.6	836.7	734.5	611.2
45°	1025.6	1025.6	1041.3	1070.2	1083.3	1078.1	1065.0	1012.5	915.4	794.8	663.6
47.5°	1093.8	1093.8	1114.8	1151.5	1167.3	1164.6	1159.4	1096.4	991.5	857.7	708.2
50°	1146.3	1146.3	1180.4	1222.3	1248.6	1259.1	1232.8	1175.1	1057.1	912.8	744.9
52.5°	1198.7	1198.7	1232.8	1298.4	1324.6	1340.4	1306.3	1245.9	1130.5	962.7	779.0
55°	1225.0	1230.2	1277.4	1340.4	1382.3	1374.5	1387.6	1306.3	1177.7	999.4	800.0
57.5°	1227.6	1235.5	1287.9	1353.5	1400.7	1398.1	1400.7	1327.3	1196.1	1007.2	802.7
60°	1214.5	1227.6	1274.8	1340.4	1385.0	1405.9	1379.7	1314.1	1185.6	999.4	800.0
62.5°	1183.0	1209.2	1259.1	1308.9	1374.5	1382.3	1361.4	1306.3	1156.8	991.5	786.9
65°	1112.2	1141.0	1211.8	1269.6	1322.0	1332.5	1308.9	1261.7	1127.9	954.8	744.9
67.5°	1041.3	1059.7	1120.0	1209.2	1245.9	1256.4	1248.6	1193.5	1078.1	881.3	695.1
70°	960.0	983.6	1030.9	1122.7	1159.4	1156.8	1180.4	1117.4	1002.0	818.4	642.6
72.5°	849.9	884.0	931.2	1007.2	1051.8	1036.1	1072.8	1020.4	902.3	739.7	571.8
75°	721.3	750.2	810.5	870.8	920.7	902.3	931.2	894.5	786.9	645.3	490.5
77.5°	577.1	611.2	666.3	721.3	755.4	755.4	768.6	737.1	653.1	529.9	401.3
80°	427.6	459.0	508.9	548.2	579.7	582.3	595.4	579.7	503.6	411.8	306.9
82.5°	283.3	299.0	343.6	375.1	406.6	403.9	424.9	414.4	351.5	283.3	204.6
85°	120.7	131.2	167.9	194.1	223.0	212.5	241.3	238.7	188.9	136.4	91.8
87.5°	5.2	7.9	7.9	5.2	7.9	2.6	7.9	10.5	7.9	5.2	5.2
90°	6.4	6.4	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	6.4
92.5°	6.4	6.4	6.4	9.0	10.3	9.6	9.0	10.3	7.7	7.7	6.4
95°	7.7	7.7	9.0	11.6	14.2	14.8	15.5	15.5	9.0	9.0	7.7
97.5°	10.3	11.6	11.6	14.2	23.2	32.8	42.5	25.8	12.9	12.9	11.6
100°	16.7	18.0	18.0	32.2	68.2	79.8	91.4	65.7	33.5	24.5	18.0
102.5°	54.1	56.7	69.5	104.3	154.5	147.4	140.4	118.5	112.0	77.3	61.8
105°	137.8	136.5	146.8	173.8	216.3	214.4	212.5	195.7	177.7	153.2	141.6
107.5°	181.6	181.6	190.6	213.8	245.9	266.5	287.1	291.0	230.5	202.2	189.3
110°	204.7	204.7	212.5	231.8	274.3	303.2	332.2	329.6	284.6	249.8	233.1



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**CANDELA DISTRIBUTION (continued):**

	0°	5°	15°	25°	35°	40°	45°	55°	65°	75°	85°
112.5°	209.9	211.2	221.5	251.1	297.5	310.4	323.2	311.6	293.6	278.1	265.3
115°	217.6	217.6	229.2	257.5	283.3	288.5	293.6	280.7	266.5	256.2	251.1
117.5°	215.0	218.9	221.5	236.9	253.7	257.5	261.4	255.0	235.6	227.9	225.3
120°	199.6	199.6	202.2	209.9	218.9	220.8	222.8	220.2	207.3	200.9	199.6
122.5°	177.7	179.0	177.7	181.6	188.0	190.0	191.9	189.3	179.0	176.4	176.4
125°	155.8	155.8	154.5	157.1	161.0	160.4	159.7	161.0	155.8	154.5	154.5
127.5°	140.4	139.1	136.5	137.8	139.1	139.1	139.1	140.4	135.2	136.5	137.8
130°	124.9	124.9	122.3	122.3	122.3	121.0	119.8	122.3	119.8	121.0	122.3
132.5°	110.7	110.7	106.9	105.6	105.6	105.6	105.6	106.9	105.6	108.2	110.7
135°	99.2	99.2	95.3	96.6	96.6	95.9	95.3	96.6	95.3	97.9	99.2
137.5°	90.1	90.1	87.6	87.6	87.6	86.9	86.3	87.6	87.6	88.8	91.4
140°	82.4	82.4	81.1	81.1	79.8	80.4	81.1	81.1	81.1	82.4	83.7
142.5°	78.5	77.3	76.0	74.7	76.0	76.0	76.0	76.0	74.7	76.0	78.5
145°	72.1	72.1	70.8	70.8	70.8	71.4	72.1	70.8	70.8	72.1	72.1
147.5°	68.2	68.2	67.0	68.2	68.2	68.2	68.2	68.2	67.0	68.2	68.2
150°	67.0	65.7	64.4	65.7	65.7	65.1	64.4	64.4	64.4	64.4	65.7
152.5°	63.1	63.1	61.8	63.1	61.8	61.8	61.8	61.8	61.8	61.8	63.1
155°	60.5	60.5	59.2	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5
157.5°	57.9	59.2	57.9	57.9	57.9	57.9	57.9	57.9	57.9	57.9	59.2
160°	56.7	56.7	56.7	56.7	55.4	55.4	55.4	55.4	56.7	56.7	56.7
162.5°	55.4	55.4	55.4	55.4	54.1	54.1	54.1	54.1	54.1	55.4	55.4
165°	55.4	54.1	54.1	54.1	52.8	52.8	52.8	52.8	52.8	54.1	55.4
167.5°	52.8	52.8	52.8	52.8	52.8	52.2	51.5	51.5	52.8	52.8	52.8
170°	52.8	52.8	51.5	51.5	51.5	51.5	51.5	51.5	51.5	51.5	51.5
172.5°	52.8	52.8	52.8	52.8	51.5	51.5	51.5	51.5	51.5	51.5	52.8
175°	52.8	52.8	52.8	52.8	51.5	51.5	51.5	51.5	52.8	52.8	52.8
177.5°	52.8	52.8	52.8	52.8	51.5	52.2	52.8	52.8	52.8	52.8	52.8
180°	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8





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**CANDELA DISTRIBUTION (continued):**

	90°	95°	105°	115°	125°	135°	145°	155°	165°	175°	180°
0°	254.4	254.4	254.4	254.4	254.4	254.4	254.4	254.4	254.4	254.4	254.4
2.5°	254.4	251.8	246.6	243.9	241.3	236.1	236.1	233.5	233.5	233.5	230.8
5°	254.4	249.2	243.9	236.1	230.8	225.6	220.3	215.1	212.5	212.5	209.8
7.5°	249.2	243.9	236.1	228.2	220.3	209.8	204.6	194.1	191.5	188.9	188.9
10°	249.2	243.9	230.8	220.3	209.8	199.4	191.5	181.0	173.1	170.5	170.5
12.5°	251.8	243.9	230.8	217.7	204.6	191.5	181.0	170.5	162.6	157.4	157.4
15°	262.3	251.8	236.1	217.7	202.0	186.2	175.7	162.6	154.8	149.5	149.5
17.5°	275.4	264.9	241.3	220.3	202.0	183.6	170.5	157.4	149.5	144.3	141.6
20°	293.8	278.0	251.8	223.0	202.0	183.6	167.9	154.8	144.3	139.0	139.0
22.5°	314.8	296.4	262.3	228.2	204.6	183.6	167.9	152.1	141.6	136.4	136.4
25°	341.0	317.4	278.0	238.7	209.8	186.2	167.9	152.1	141.6	136.4	136.4
27.5°	369.8	343.6	293.8	249.2	215.1	188.9	167.9	152.1	141.6	136.4	136.4
30°	396.1	367.2	309.5	259.7	223.0	191.5	170.5	154.8	144.3	139.0	136.4
32.5°	424.9	388.2	325.3	270.2	228.2	196.7	173.1	157.4	144.3	139.0	139.0
35°	453.8	414.4	341.0	283.3	236.1	202.0	175.7	160.0	146.9	141.6	141.6
37.5°	485.3	443.3	359.4	293.8	243.9	207.2	181.0	162.6	149.5	144.3	144.3
40°	522.0	472.1	377.7	306.9	251.8	212.5	183.6	167.9	154.8	149.5	149.5
42.5°	556.1	498.4	396.1	317.4	259.7	217.7	188.9	170.5	160.0	154.8	154.8
45°	590.2	529.9	414.4	330.5	267.6	225.6	194.1	178.4	165.3	160.0	160.0
47.5°	629.5	558.7	435.4	341.0	275.4	230.8	199.4	183.6	170.5	167.9	165.3
50°	661.0	579.7	448.5	351.5	280.7	236.1	204.6	186.2	175.7	170.5	170.5
52.5°	689.9	600.7	459.0	356.7	283.3	238.7	209.8	191.5	181.0	175.7	175.7
55°	705.6	608.5	466.9	356.7	285.9	241.3	209.8	191.5	181.0	178.4	175.7
57.5°	705.6	608.5	461.7	351.5	280.7	236.1	207.2	188.9	181.0	175.7	175.7
60°	695.1	600.7	448.5	341.0	272.8	228.2	202.0	183.6	175.7	173.1	173.1
62.5°	679.4	587.6	438.0	327.9	262.3	217.7	194.1	175.7	170.5	170.5	167.9
65°	637.4	548.2	414.4	309.5	246.6	204.6	183.6	167.9	162.6	160.0	157.4
67.5°	592.8	511.5	377.7	288.5	225.6	191.5	170.5	157.4	149.5	149.5	146.9
70°	548.2	472.1	343.6	259.7	202.0	175.7	154.8	141.6	136.4	136.4	136.4
72.5°	487.9	422.3	304.3	228.2	178.4	154.8	139.0	125.9	123.3	123.3	120.7
75°	417.1	359.4	257.1	194.1	149.5	131.2	118.0	104.9	104.9	104.9	104.9
77.5°	341.0	291.2	204.6	154.8	118.0	104.9	97.1	86.6	86.6	86.6	86.6
80°	257.1	215.1	149.5	112.8	86.6	76.1	70.8	65.6	68.2	68.2	65.6
82.5°	167.9	141.6	94.4	70.8	55.1	49.8	49.8	44.6	47.2	47.2	47.2
85°	73.4	63.0	39.3	31.5	26.2	26.2	26.2	23.6	26.2	26.2	26.2
87.5°	5.2	5.2	5.2	5.2	5.2	5.2	5.2	0.0	2.6	5.2	2.6
90°	6.4	6.4	7.7	7.7	7.7	7.7	7.7	7.7	7.7	6.4	6.4
92.5°	6.4	6.4	7.7	7.7	10.3	9.0	10.3	9.0	6.4	6.4	6.4
95°	7.7	7.7	9.0	9.0	15.5	15.5	14.2	11.6	9.0	7.7	7.7
97.5°	10.3	11.6	12.9	12.9	25.8	42.5	23.2	14.2	11.6	11.6	10.3
100°	18.0	18.0	24.5	33.5	65.7	91.4	68.2	32.2	18.0	18.0	16.7
102.5°	59.2	61.8	77.3	112.0	118.5	140.4	154.5	104.3	69.5	56.7	54.1
105°	141.6	141.6	153.2	177.7	195.7	212.5	216.3	173.8	146.8	136.5	137.8
107.5°	188.0	189.3	202.2	230.5	291.0	287.1	245.9	213.8	190.6	181.6	181.6
110°	230.5	233.1	249.8	284.6	329.6	332.2	274.3	231.8	212.5	204.7	204.7



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**CANDELA DISTRIBUTION (continued):**

	90°	95°	105°	115°	125°	135°	145°	155°	165°	175°	180°
112.5°	262.7	265.3	278.1	293.6	311.6	323.2	297.5	251.1	221.5	211.2	209.9
115°	253.7	251.1	256.2	266.5	280.7	293.6	283.3	257.5	229.2	217.6	217.6
117.5°	221.5	225.3	227.9	235.6	255.0	261.4	253.7	236.9	221.5	218.9	215.0
120°	197.0	199.6	200.9	207.3	220.2	222.8	218.9	209.9	202.2	199.6	199.6
122.5°	173.8	176.4	176.4	179.0	189.3	191.9	188.0	181.6	177.7	179.0	177.7
125°	153.2	154.5	154.5	155.8	161.0	159.7	161.0	157.1	154.5	155.8	155.8
127.5°	136.5	137.8	136.5	135.2	140.4	139.1	139.1	137.8	136.5	139.1	140.4
130°	123.6	122.3	121.0	119.8	122.3	119.8	122.3	122.3	122.3	124.9	124.9
132.5°	110.7	110.7	108.2	105.6	106.9	105.6	105.6	105.6	106.9	110.7	110.7
135°	99.2	99.2	97.9	95.3	96.6	95.3	96.6	96.6	95.3	99.2	99.2
137.5°	92.7	91.4	88.8	87.6	87.6	86.3	87.6	87.6	87.6	90.1	90.1
140°	83.7	83.7	82.4	81.1	81.1	81.1	79.8	81.1	81.1	82.4	82.4
142.5°	78.5	78.5	76.0	74.7	76.0	76.0	76.0	74.7	76.0	77.3	78.5
145°	73.4	72.1	72.1	70.8	70.8	72.1	70.8	70.8	70.8	72.1	72.1
147.5°	69.5	68.2	68.2	67.0	68.2	68.2	68.2	68.2	67.0	68.2	68.2
150°	65.7	65.7	64.4	64.4	64.4	64.4	65.7	65.7	64.4	65.7	67.0
152.5°	64.4	63.1	61.8	61.8	61.8	61.8	61.8	63.1	61.8	63.1	63.1
155°	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	59.2	60.5	60.5
157.5°	59.2	59.2	57.9	57.9	57.9	57.9	57.9	57.9	57.9	59.2	57.9
160°	57.9	56.7	56.7	56.7	55.4	55.4	55.4	56.7	56.7	56.7	56.7
162.5°	56.7	55.4	55.4	54.1	54.1	54.1	54.1	55.4	55.4	55.4	55.4
165°	54.1	55.4	54.1	52.8	52.8	52.8	52.8	54.1	54.1	54.1	55.4
167.5°	54.1	52.8	52.8	52.8	51.5	51.5	52.8	52.8	52.8	52.8	52.8
170°	52.8	51.5	51.5	51.5	51.5	51.5	51.5	51.5	51.5	52.8	52.8
172.5°	52.8	52.8	51.5	51.5	51.5	51.5	51.5	52.8	52.8	52.8	52.8
175°	51.5	52.8	52.8	52.8	51.5	51.5	51.5	52.8	52.8	52.8	52.8
177.5°	52.8	52.8	52.8	52.8	52.8	52.8	51.5	52.8	52.8	52.8	52.8
180°	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8

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: SP1-2411-284-1

Test Date: 11/15/2024

Luminaire Tested: TTN-D0-735-U-WQ

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

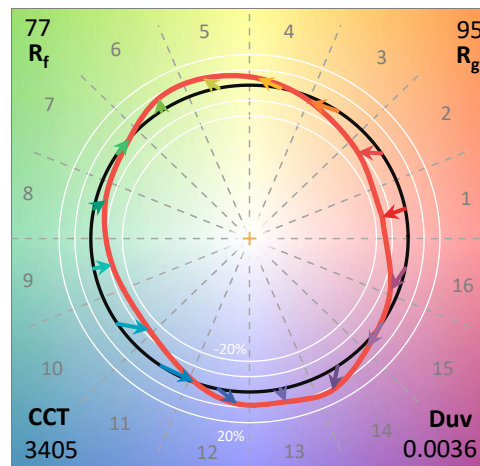
**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2411-284-1  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 11/15/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW EDISON  
 Catalog Number: **TTN-D0-735-U-WQ**  
 Description: TOPTIER NANO LED PARKING GARAGE LUMINAIRE. 3500K, 70 CRI LEDS AND WIDE DISTRIBUTION

**Spectral Parameters**

CCT (K): 3405  
 CIE u': 0.2365  
 CIE v': 0.5180  
 Duv: 0.0036  
 CIE x: 0.4148  
 CIE y: 0.4038  
 CIE z: 0.1814  
 Peak Wavelength (nm): 596  
 Dominant Wavelength (nm): 579  
 Purity: 45.70672  
 Rf: 76.6  
 Rg: 95.4

CRI (Ra):	73.9		
R1:	71.3	R9:	-18.0
R2:	80.3	R10:	53.1
R3:	87.8	R11:	68.6
R4:	73.2	R12:	42.6
R5:	69.8	R13:	72.5
R6:	71.8	R14:	92.7
R7:	82.8	R15:	64.3
R8:	54.1		



**Test Conditions**

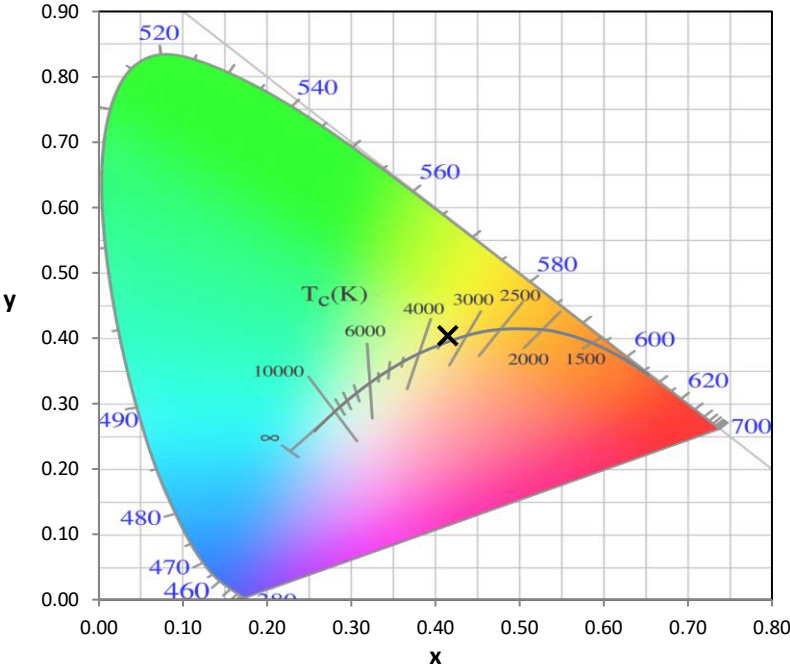
Stabilization Time: 38M  
 Operation Time: 1H 38M  
 Sphere Temperature (°C): 24.9

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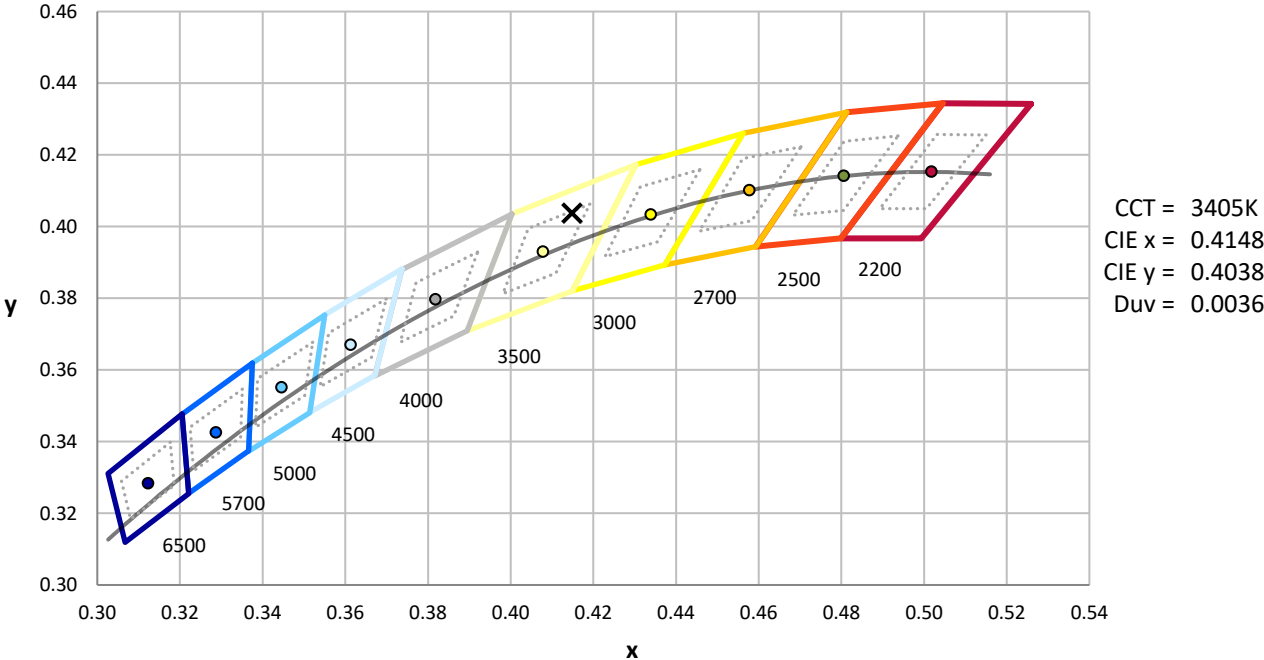
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	6/18/2024	12/18/2024
Power Meter	INXT2011004	2/8/2024	2/8/2025
AC Power Source	IN0063	10/22/2024	10/22/2025
DC Power Source	IN0208	10/22/2024	10/22/2025
Sphere Thermometer	IN0085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

REPORT NUMBER: SP1-2411-284-1

CIE 1931 Chromaticity Diagram



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

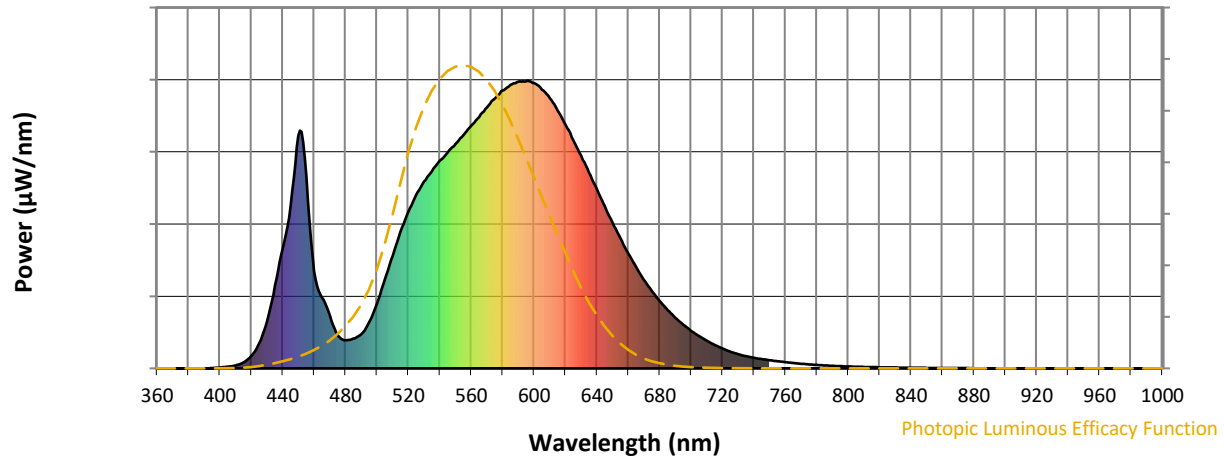


CCT = 3405K  
 CIE x = 0.4148  
 CIE y = 0.4038  
 Duv = 0.0036

Point lies inside the ANSI 3500K 4-step quadrangle

REPORT NUMBER: SP1-2411-284-1

**Photopic Flux vs. Wavelength**

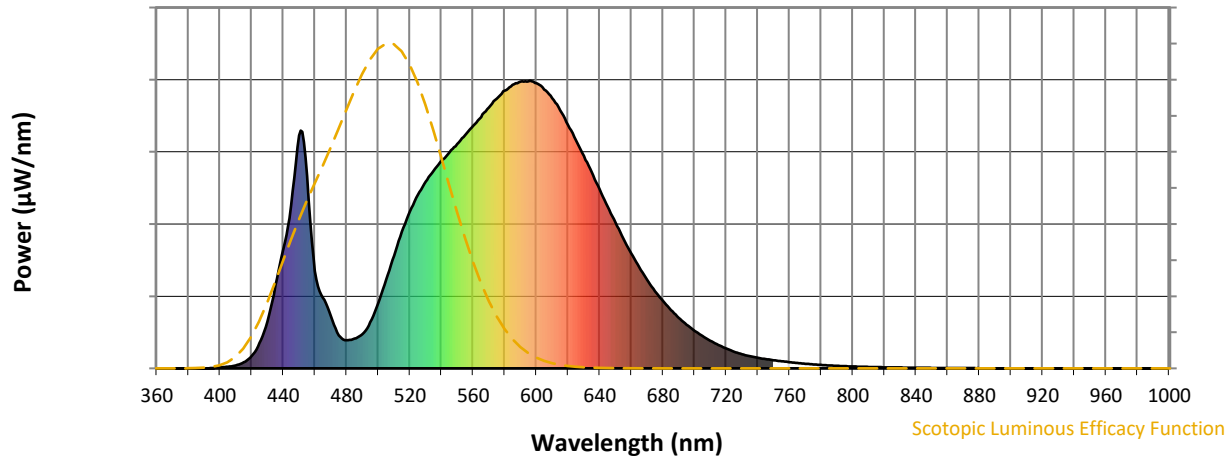


**Photopic Lumens: NR**

$\lambda$ (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	119	NR	620	846	NR	750	28	NR	880	1	NR
365	0	NR	495	160	NR	625	793	NR	755	25	NR	885	0	NR
370	0	NR	500	225	NR	630	739	NR	760	22	NR	890	0	NR
375	0	NR	505	308	NR	635	681	NR	765	19	NR	895	0	NR
380	0	NR	510	392	NR	640	623	NR	770	16	NR	900	0	NR
385	0	NR	515	474	NR	645	563	NR	775	14	NR	905	0	NR
390	0	NR	520	545	NR	650	506	NR	780	12	NR	910	0	NR
395	1	NR	525	603	NR	655	451	NR	785	10	NR	915	0	NR
400	3	NR	530	649	NR	660	399	NR	790	9	NR	920	0	NR
405	5	NR	535	687	NR	665	352	NR	795	8	NR	925	0	NR
410	11	NR	540	721	NR	670	307	NR	800	6	NR	930	0	NR
415	21	NR	545	751	NR	675	268	NR	805	6	NR	935	0	NR
420	43	NR	550	779	NR	680	234	NR	810	5	NR	940	0	NR
425	88	NR	555	811	NR	685	203	NR	815	4	NR	945	0	NR
430	163	NR	560	843	NR	690	176	NR	820	4	NR	950	0	NR
435	288	NR	565	873	NR	695	152	NR	825	3	NR	955	0	NR
440	416	NR	570	907	NR	700	131	NR	830	3	NR	960	0	NR
445	566	NR	575	938	NR	705	112	NR	835	3	NR	965	0	NR
450	810	NR	580	965	NR	710	96	NR	840	2	NR	970	0	NR
455	669	NR	585	986	NR	715	81	NR	845	2	NR	975	0	NR
460	338	NR	590	997	NR	720	69	NR	850	2	NR	980	0	NR
465	246	NR	595	997	NR	725	58	NR	855	1	NR	985	0	NR
470	182	NR	600	991	NR	730	49	NR	860	1	NR	990	0	NR
475	115	NR	605	968	NR	735	42	NR	865	1	NR	995	0	NR
480	97	NR	610	939	NR	740	37	NR	870	1	NR	1000	0	NR
485	103	NR	615	896	NR	745	32	NR	875	1	NR			

REPORT NUMBER: SP1-2411-284-1

**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

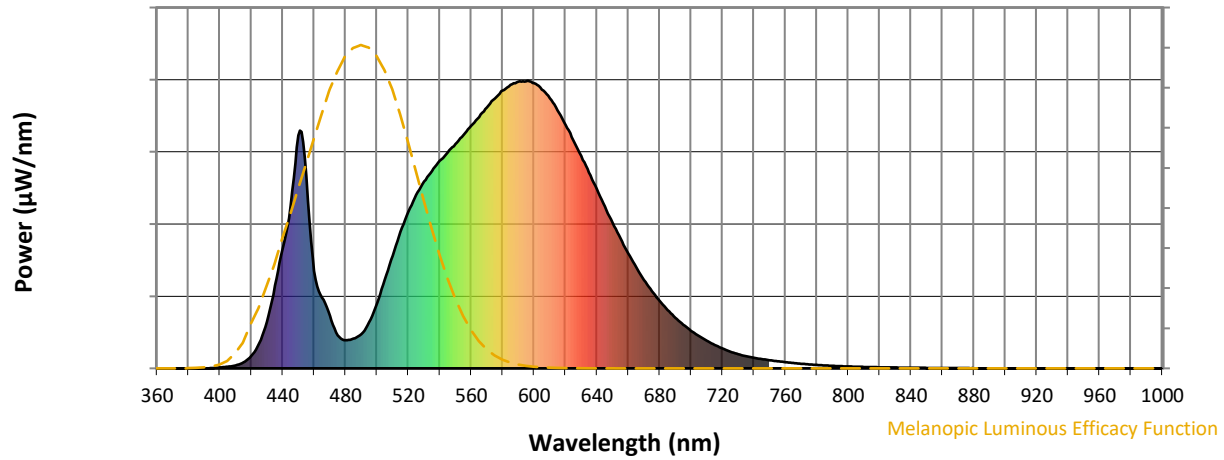
**S/P: 1.33**

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	119	NR	620	846	NR	750	28	NR	880	1	NR
365	0	NR	495	160	NR	625	793	NR	755	25	NR	885	0	NR
370	0	NR	500	225	NR	630	739	NR	760	22	NR	890	0	NR
375	0	NR	505	308	NR	635	681	NR	765	19	NR	895	0	NR
380	0	NR	510	392	NR	640	623	NR	770	16	NR	900	0	NR
385	0	NR	515	474	NR	645	563	NR	775	14	NR	905	0	NR
390	0	NR	520	545	NR	650	506	NR	780	12	NR	910	0	NR
395	1	NR	525	603	NR	655	451	NR	785	10	NR	915	0	NR
400	3	NR	530	649	NR	660	399	NR	790	9	NR	920	0	NR
405	5	NR	535	687	NR	665	352	NR	795	8	NR	925	0	NR
410	11	NR	540	721	NR	670	307	NR	800	6	NR	930	0	NR
415	21	NR	545	751	NR	675	268	NR	805	6	NR	935	0	NR
420	43	NR	550	779	NR	680	234	NR	810	5	NR	940	0	NR
425	88	NR	555	811	NR	685	203	NR	815	4	NR	945	0	NR
430	163	NR	560	843	NR	690	176	NR	820	4	NR	950	0	NR
435	288	NR	565	873	NR	695	152	NR	825	3	NR	955	0	NR
440	416	NR	570	907	NR	700	131	NR	830	3	NR	960	0	NR
445	566	NR	575	938	NR	705	112	NR	835	3	NR	965	0	NR
450	810	NR	580	965	NR	710	96	NR	840	2	NR	970	0	NR
455	669	NR	585	986	NR	715	81	NR	845	2	NR	975	0	NR
460	338	NR	590	997	NR	720	69	NR	850	2	NR	980	0	NR
465	246	NR	595	997	NR	725	58	NR	855	1	NR	985	0	NR
470	182	NR	600	991	NR	730	49	NR	860	1	NR	990	0	NR
475	115	NR	605	968	NR	735	42	NR	865	1	NR	995	0	NR
480	97	NR	610	939	NR	740	37	NR	870	1	NR	1000	0	NR
485	103	NR	615	896	NR	745	32	NR	875	1	NR			



REPORT NUMBER: SP1-2411-284-1

Melanopic Flux vs. Wavelength



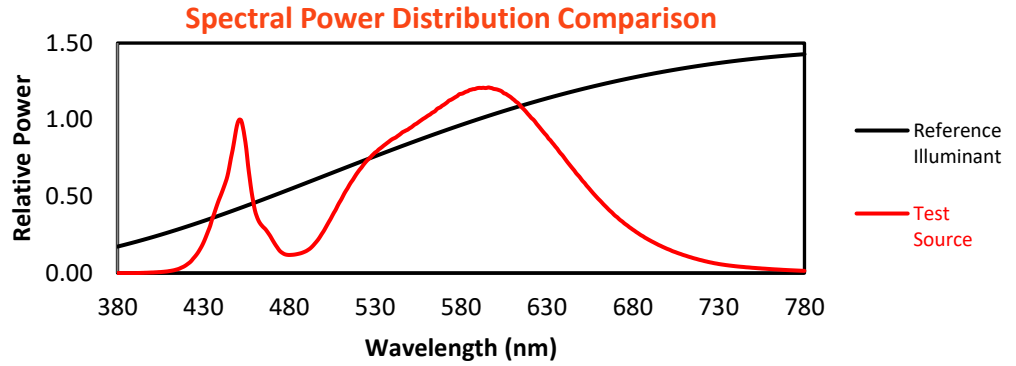
Melanopic Lumens: NR

M/P: 2.47

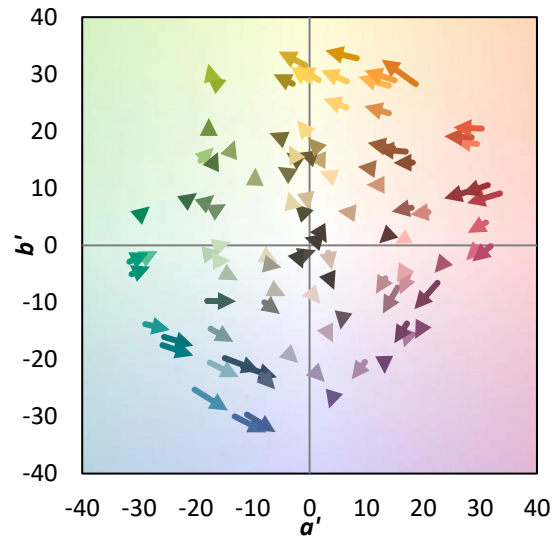
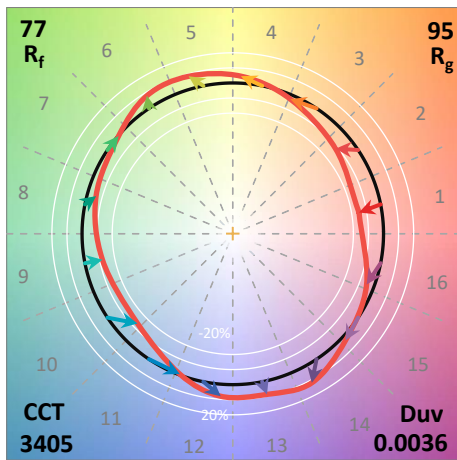
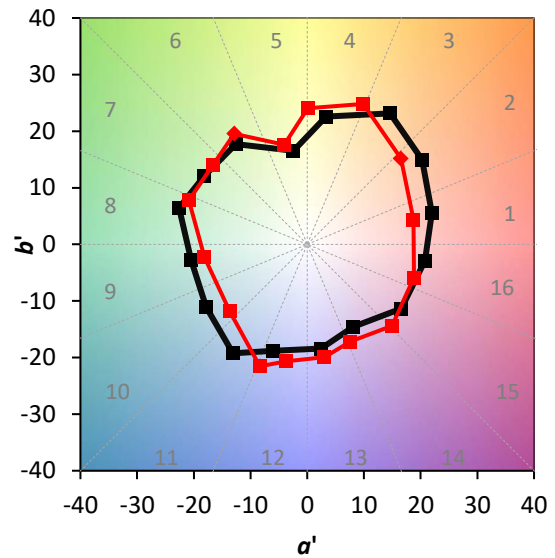
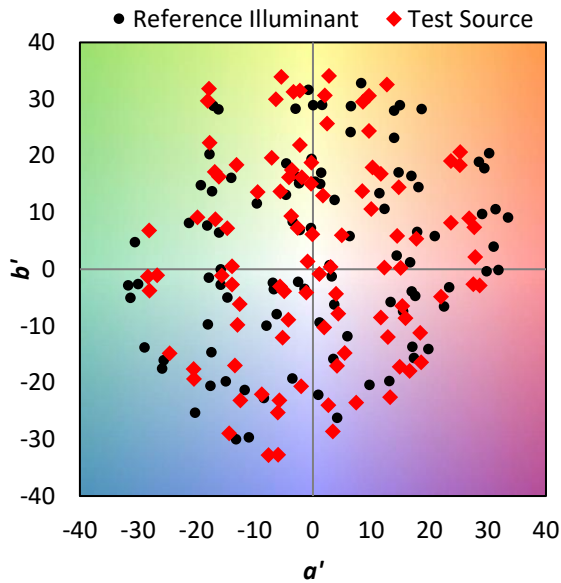
$\lambda$ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	$\lambda$ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	$\lambda$ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	$\lambda$ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	$\lambda$ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)
360	0	NR	490	119	NR	620	846	NR	750	28	NR	880	1	NR
365	0	NR	495	160	NR	625	793	NR	755	25	NR	885	0	NR
370	0	NR	500	225	NR	630	739	NR	760	22	NR	890	0	NR
375	0	NR	505	308	NR	635	681	NR	765	19	NR	895	0	NR
380	0	NR	510	392	NR	640	623	NR	770	16	NR	900	0	NR
385	0	NR	515	474	NR	645	563	NR	775	14	NR	905	0	NR
390	0	NR	520	545	NR	650	506	NR	780	12	NR	910	0	NR
395	1	NR	525	603	NR	655	451	NR	785	10	NR	915	0	NR
400	3	NR	530	649	NR	660	399	NR	790	9	NR	920	0	NR
405	5	NR	535	687	NR	665	352	NR	795	8	NR	925	0	NR
410	11	NR	540	721	NR	670	307	NR	800	6	NR	930	0	NR
415	21	NR	545	751	NR	675	268	NR	805	6	NR	935	0	NR
420	43	NR	550	779	NR	680	234	NR	810	5	NR	940	0	NR
425	88	NR	555	811	NR	685	203	NR	815	4	NR	945	0	NR
430	163	NR	560	843	NR	690	176	NR	820	4	NR	950	0	NR
435	288	NR	565	873	NR	695	152	NR	825	3	NR	955	0	NR
440	416	NR	570	907	NR	700	131	NR	830	3	NR	960	0	NR
445	566	NR	575	938	NR	705	112	NR	835	3	NR	965	0	NR
450	810	NR	580	965	NR	710	96	NR	840	2	NR	970	0	NR
455	669	NR	585	986	NR	715	81	NR	845	2	NR	975	0	NR
460	338	NR	590	997	NR	720	69	NR	850	2	NR	980	0	NR
465	246	NR	595	997	NR	725	58	NR	855	1	NR	985	0	NR
470	182	NR	600	991	NR	730	49	NR	860	1	NR	990	0	NR
475	115	NR	605	968	NR	735	42	NR	865	1	NR	995	0	NR
480	97	NR	610	939	NR	740	37	NR	870	1	NR	1000	0	NR
485	103	NR	615	896	NR	745	32	NR	875	1	NR			

**Summary**

$R_f = 76.6$   
 $R_g = 95.4$   
 $CIE R_a = 73.9$   
 $R_g = -18.0$

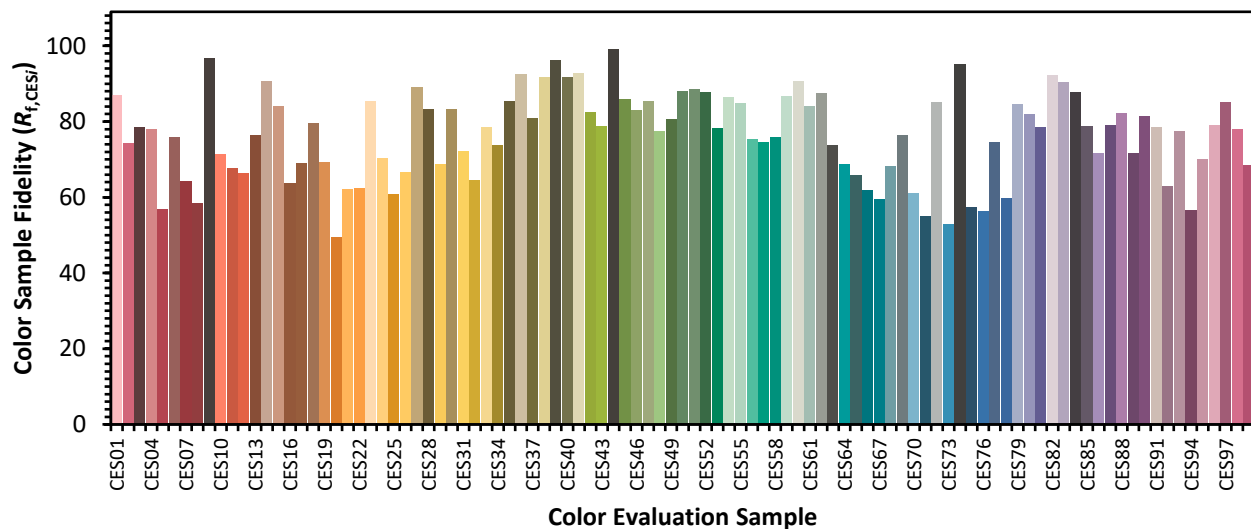


**Color Vector Graphics**

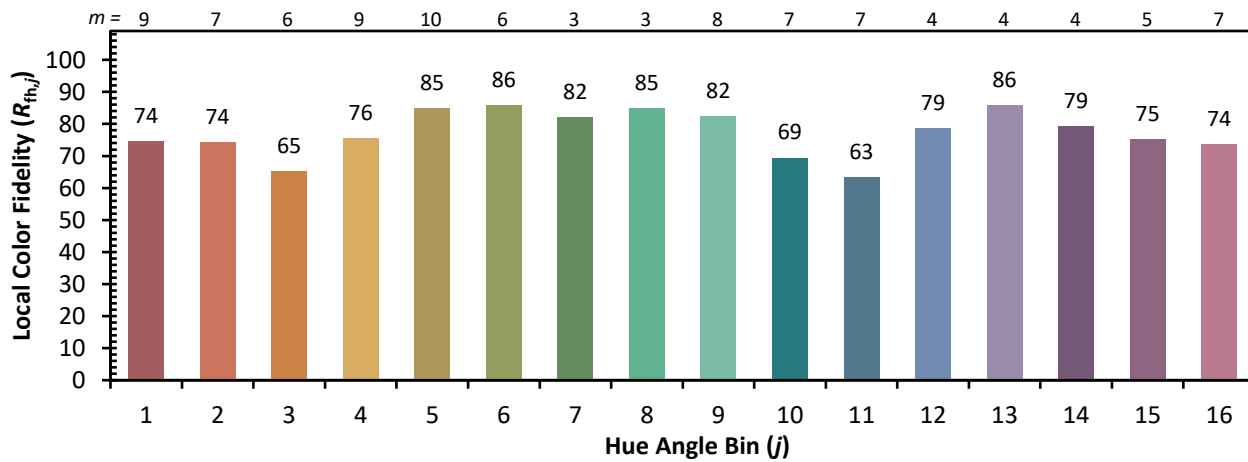
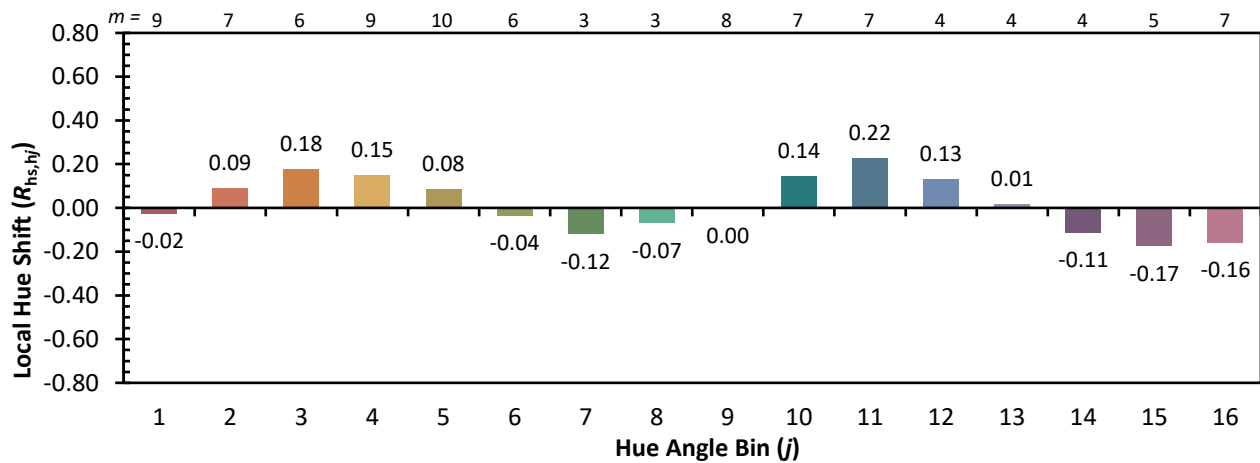
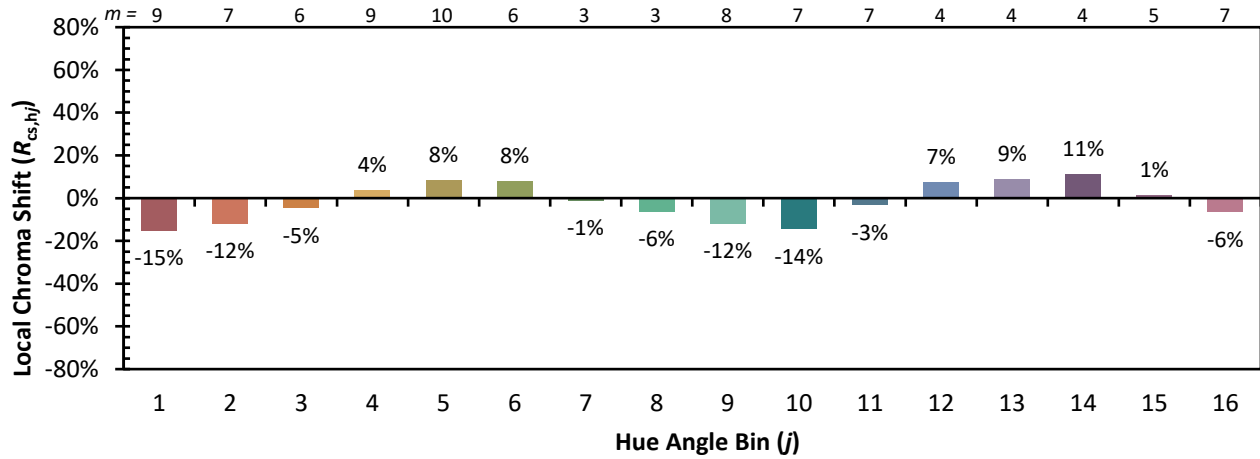


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

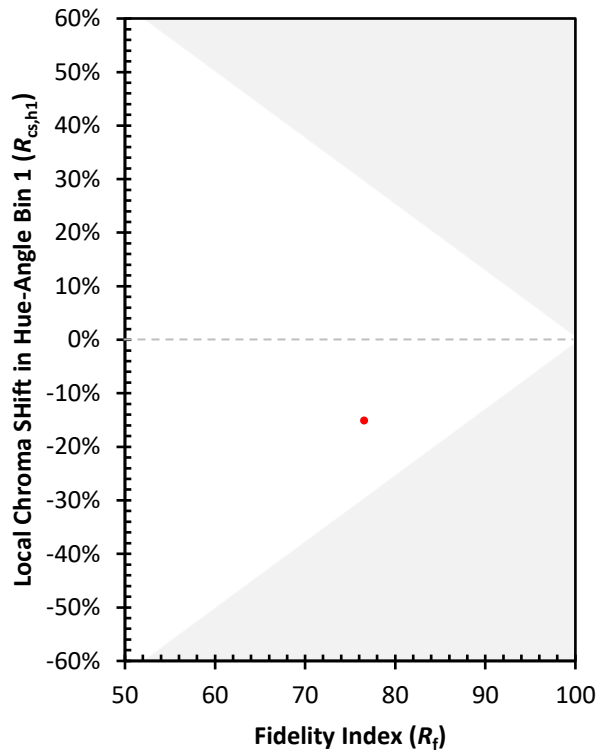
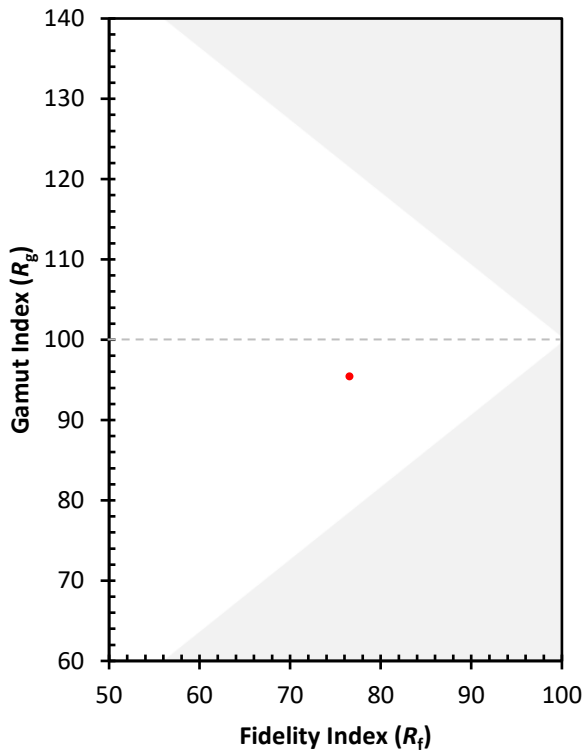
CES01 = 86	CES26 = 67	CES51 = 88	CES76 = 56
CES02 = 62	CES27 = 89	CES52 = 88	CES77 = 75
CES03 = 31	CES28 = 83	CES53 = 78	CES78 = 60
CES04 = 70	CES29 = 69	CES54 = 86	CES79 = 85
CES05 = 48	CES30 = 83	CES55 = 85	CES80 = 82
CES06 = 51	CES31 = 72	CES56 = 75	CES81 = 78
CES07 = 41	CES32 = 65	CES57 = 75	CES82 = 92
CES08 = 40	CES33 = 78	CES58 = 76	CES83 = 90
CES09 = 29	CES34 = 74	CES59 = 87	CES84 = 88
CES10 = 75	CES35 = 86	CES60 = 91	CES85 = 79
CES11 = 58	CES36 = 93	CES61 = 84	CES86 = 72
CES12 = 64	CES37 = 81	CES62 = 88	CES87 = 79
CES13 = 43	CES38 = 92	CES63 = 74	CES88 = 82
CES14 = 74	CES39 = 96	CES64 = 69	CES89 = 72
CES15 = 71	CES40 = 92	CES65 = 66	CES90 = 82
CES16 = 47	CES41 = 93	CES66 = 62	CES91 = 79
CES17 = 50	CES42 = 83	CES67 = 60	CES92 = 63
CES18 = 56	CES43 = 79	CES68 = 68	CES93 = 77
CES19 = 72	CES44 = 99	CES69 = 76	CES94 = 56
CES20 = 65	CES45 = 86	CES70 = 61	CES95 = 70
CES21 = 86	CES46 = 83	CES71 = 55	CES96 = 79
CES22 = 79	CES47 = 85	CES72 = 85	CES97 = 85
CES23 = 92	CES48 = 78	CES73 = 53	CES98 = 78
CES24 = 91	CES49 = 81	CES74 = 95	CES99 = 68
CES25 = 72	CES50 = 88	CES75 = 57	



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)