

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: P833588

Luminaire Tested: **TTN-D2-750-U-DL-UPL2**

Issue Date: 5/15/2024

**Test Information**

Test Method: LM-79-08  
Report Number: P833588  
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-D2-750-U-DL-UPL2  
Description: TOPTIER NANO LED PARKING GARAGE LUMINAIRE WITH UPLIGHT  
5000K, 70 CRI LEDS AND DRIVE LANE DISTRIBUTION  
Light Source: -  
Ballast/Driver: -

**Summary**

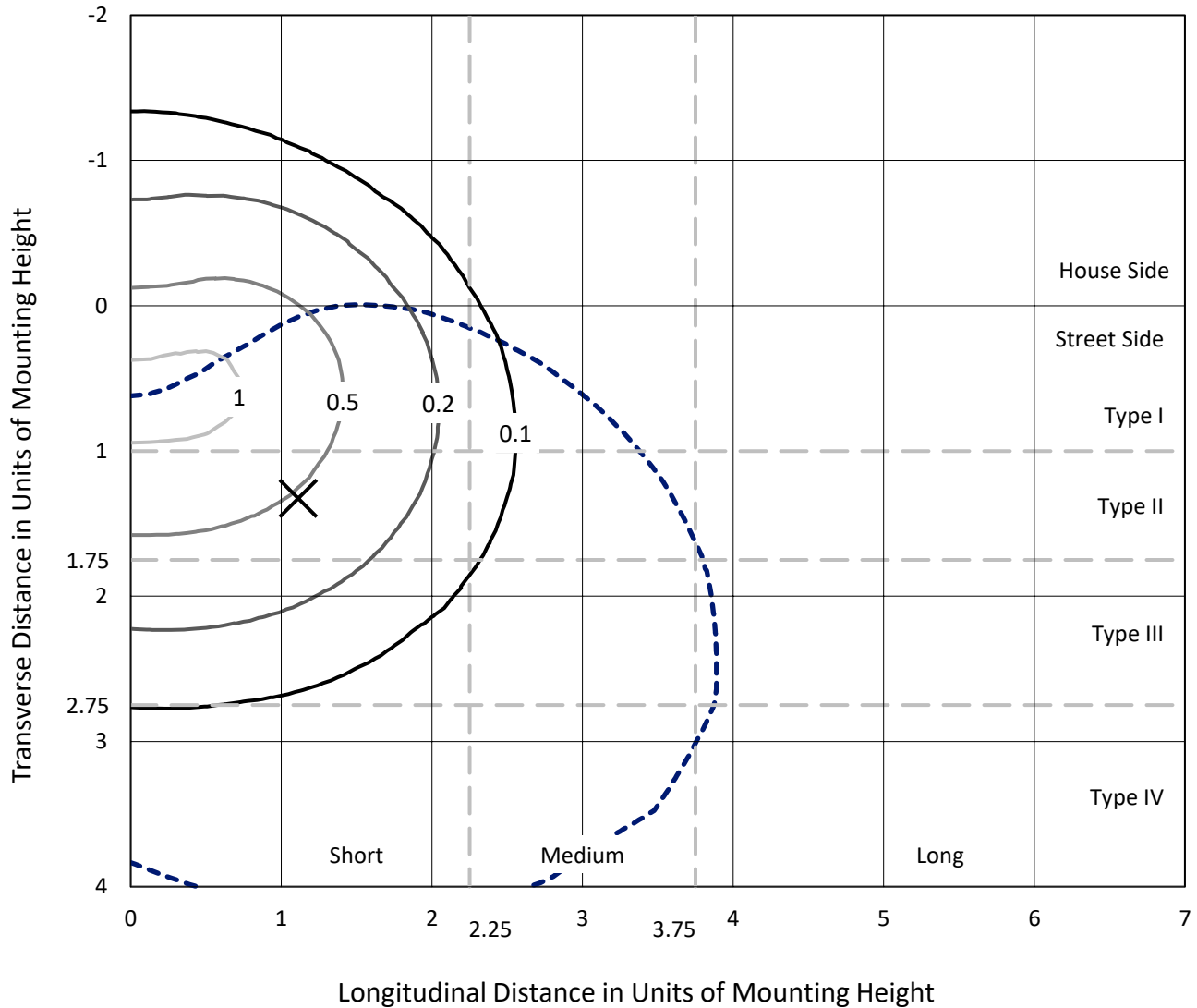
Lumens per Lamp: N/A  
Luminaire Lumens: 5597.7 lumens  
Efficiency: N/A  
Efficacy: 119.1 lumens/watt  
Luminous Opening: Vertical Cylinder (Dia: 0.71' x H: 0.1')  
IES Classification: Type IV - Short  
BUG Rating: B1 - U4 - G2  
  
Input Watts (W): 47  
Input Voltage (V): NR  
Input Current (Ain): 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

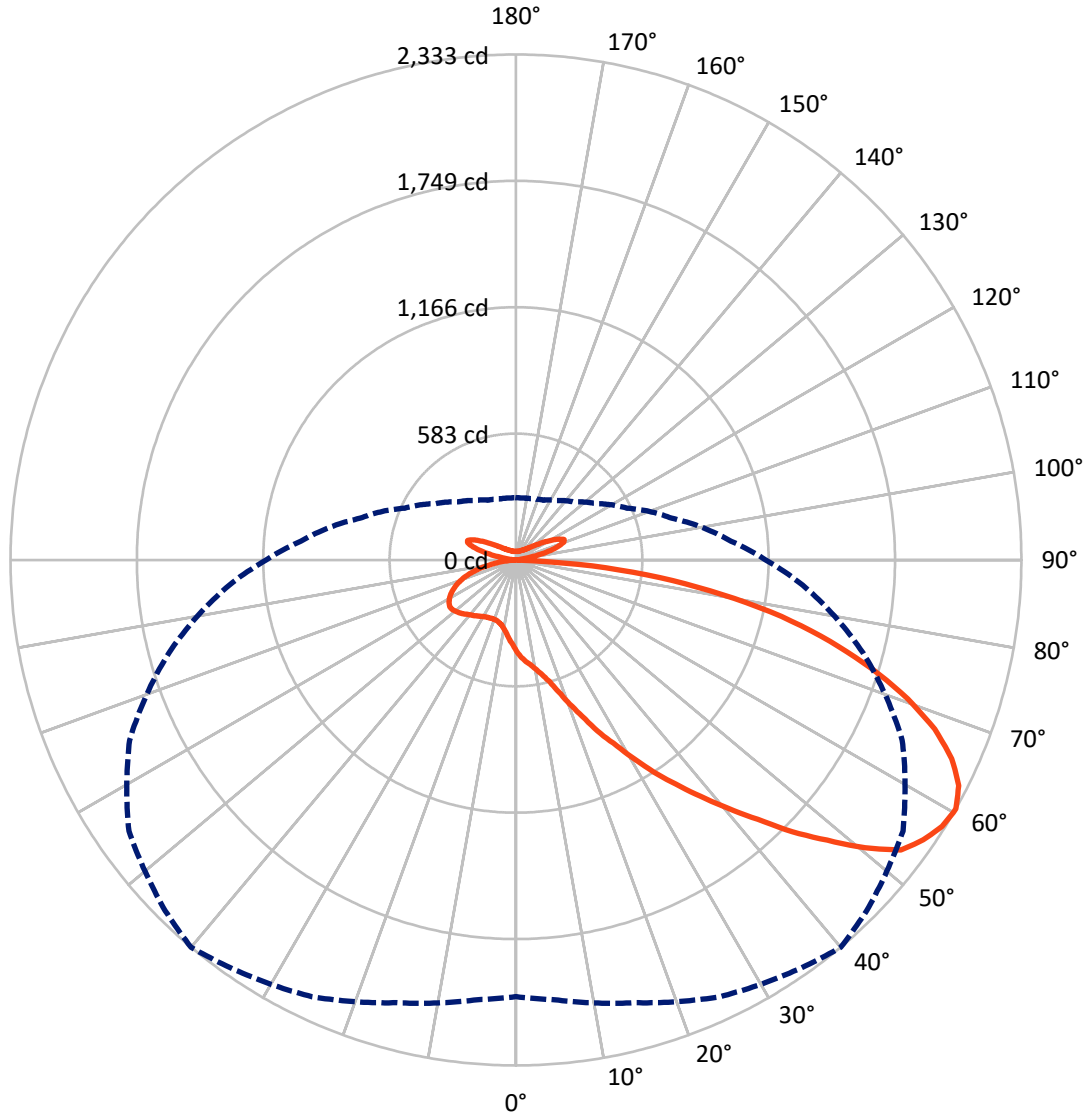
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 1.1 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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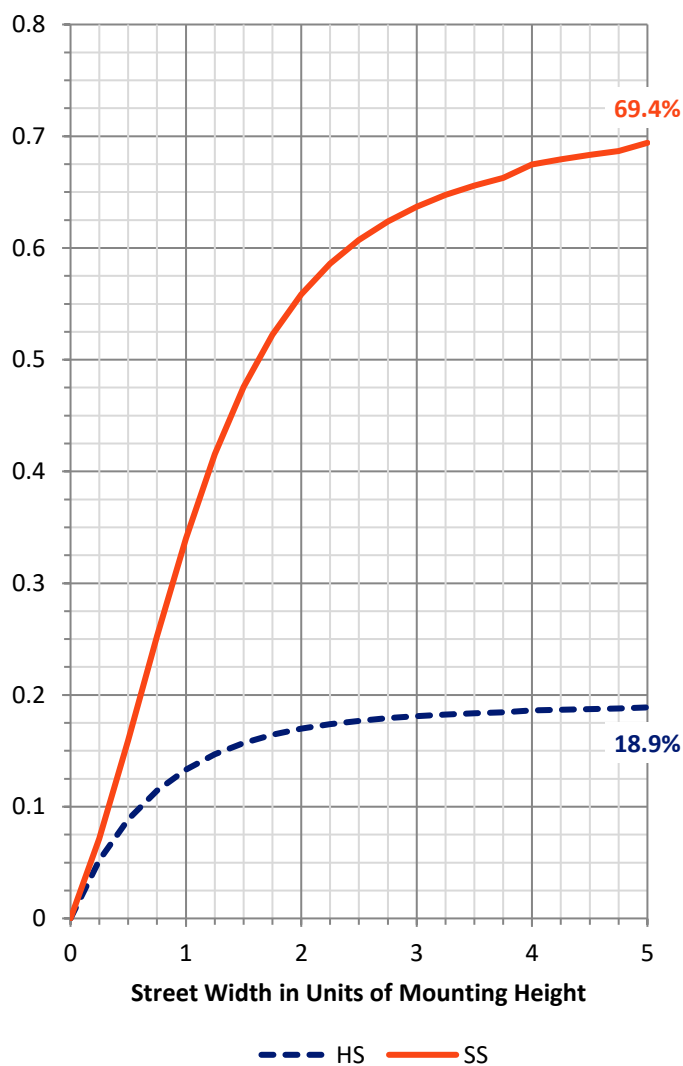
**FLUX DISTRIBUTION:**

		Downward	Upward	Total
<b>House Side</b>	Lumens	1067.7	292.5	1360.2
	% Fixture	19.1	5.2	24.3
<b>Street Side</b>	Lumens	3945.1	292.4	4237.5
	% Fixture	70.5	5.2	75.7
<b>Total</b>	Lumens	5012.8	584.9	5597.7
	% Fixture	89.6	10.4	100.0

**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	39.8	0.7
10°-20°	127.0	2.3
20°-30°	268.4	4.8
30°-40°	490.5	8.8
40°-50°	797.1	14.2
50°-60°	1107.9	19.8
60°-70°	1148.5	20.5
70°-80°	823.0	14.7
80°-90°	210.6	3.8
90°-100°	13.1	0.2
100°-110°	132.7	2.4
110°-120°	194.0	3.5
120°-130°	112.6	2.0
130°-140°	59.7	1.1
140°-150°	35.4	0.6
150°-160°	21.8	0.4
160°-170°	11.9	0.2
170°-180°	3.9	0.1
0°-90°	5012.8	89.6
0°-180°	5597.7	100.0

**Coefficient of Utilization**



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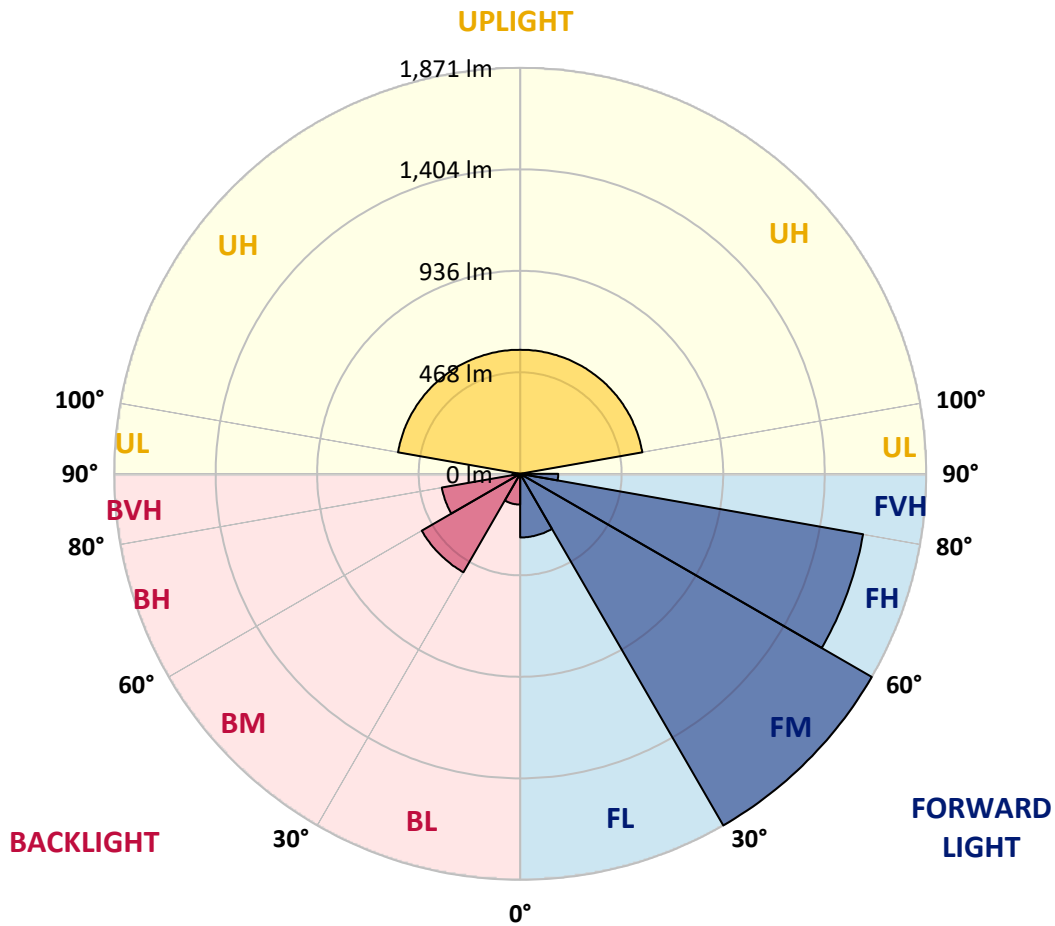
CATALOG NUMBER: TTN-D2-750-U-DL-UPL2

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

Zone	Lumens	% Fixture	Zone Rating/Lumen Limit		
			B	U	G
FL (0°-30°)	293.3	5.2			
FM (30°-60°)	1871.5	33.4			
FH (60°-80°)	1605.1	28.7			G1/1800
FVH (80°-90°)	175.2	3.1			G2/225
BL (0°-30°)	141.9	2.5	B1/500		
BM (30°-60°)	524.0	9.4	B1/1000		
BH (60°-80°)	366.4	6.5	B1/500		G1/500
BVH (80°-90°)	35.4	0.6			G1/100
UL (90°-100°)	13.1	0.2		U2/50	
UH (100°-180°)	571.8	10.2		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°	422.1	422.1	422.1	422.1	422.1	422.1	422.1	422.1	422.1	422.1	422.1
2.5°	452.6	452.6	452.6	452.6	448.2	448.2	443.9	439.5	435.2	430.8	422.1
5°	491.7	491.7	487.4	483.0	474.3	470.0	465.6	456.9	448.2	439.5	426.5
7.5°	509.2	509.2	509.2	504.8	491.7	487.4	478.7	465.6	452.6	439.5	422.1
10°	539.6	539.6	535.3	530.9	517.9	513.5	504.8	487.4	465.6	443.9	422.1
12.5°	578.8	574.4	570.1	565.7	552.7	544.0	530.9	513.5	487.4	461.3	435.2
15°	626.7	618.0	618.0	609.2	596.2	583.1	574.4	548.3	522.2	487.4	452.6
17.5°	678.9	674.5	670.2	661.5	648.4	639.7	626.7	596.2	561.4	517.9	478.7
20°	744.2	735.4	739.8	726.7	713.7	709.3	687.6	652.8	609.2	561.4	513.5
22.5°	822.5	813.8	813.8	800.7	792.0	783.3	761.6	722.4	665.8	613.6	552.7
25°	909.5	900.8	900.8	892.1	883.4	874.7	848.6	805.1	739.8	674.5	604.9
27.5°	1005.3	996.6	996.6	992.2	970.4	957.4	935.6	887.8	822.5	739.8	657.1
30°	1105.3	1096.6	1105.3	1096.6	1083.6	1057.5	1031.4	979.1	905.2	813.8	713.7
32.5°	1183.7	1183.7	1188.0	1196.7	1188.0	1166.3	1135.8	1092.3	992.2	879.1	765.9
35°	1275.1	1275.1	1283.8	1296.8	1292.5	1270.7	1240.3	1192.4	1087.9	953.0	822.5
37.5°	1375.2	1375.2	1383.9	1405.6	1396.9	1383.9	1362.1	1301.2	1183.7	1027.0	883.4
40°	1484.0	1479.6	1488.3	1518.8	1523.1	1505.7	1479.6	1418.7	1283.8	1122.8	948.7
42.5°	1592.7	1588.4	1605.8	1636.3	1640.6	1636.3	1610.2	1540.5	1388.2	1218.5	1014.0
45°	1701.5	1701.5	1727.6	1775.5	1797.3	1788.6	1766.8	1679.8	1518.8	1318.6	1101.0
47.5°	1814.7	1814.7	1849.5	1910.4	1936.5	1932.2	1923.5	1819.0	1645.0	1423.0	1175.0
50°	1901.7	1901.7	1958.3	2027.9	2071.4	2088.8	2045.3	1949.6	1753.8	1514.4	1235.9
52.5°	1988.8	1988.8	2045.3	2154.1	2197.6	2223.8	2167.2	2067.1	1875.6	1597.1	1292.5
55°	2032.3	2041.0	2119.3	2223.8	2293.4	2280.3	2302.1	2167.2	1953.9	1658.0	1327.3
57.5°	2036.6	2049.7	2136.7	2245.5	2323.8	2319.5	2323.8	2202.0	1984.4	1671.1	1331.6
60°	2014.9	2036.6	2115.0	2223.8	2297.7	2332.5	2289.0	2180.2	1967.0	1658.0	1327.3
62.5°	1962.6	2006.2	2088.8	2171.5	2280.3	2293.4	2258.6	2167.2	1919.1	1645.0	1305.5
65°	1845.1	1893.0	2010.5	2106.3	2193.3	2210.7	2171.5	2093.2	1871.3	1584.0	1235.9
67.5°	1727.6	1758.1	1858.2	2006.2	2067.1	2084.5	2071.4	1980.1	1788.6	1462.2	1153.2
70°	1592.7	1631.9	1710.2	1862.6	1923.5	1919.1	1958.3	1853.9	1662.4	1357.7	1066.2
72.5°	1410.0	1466.5	1544.9	1671.1	1745.1	1718.9	1779.9	1692.8	1497.0	1227.2	948.7
75°	1196.7	1244.6	1344.7	1444.8	1527.5	1497.0	1544.9	1484.0	1305.5	1070.5	813.8
77.5°	957.4	1014.0	1105.3	1196.7	1253.3	1253.3	1275.1	1222.8	1083.6	879.1	665.8
80°	709.3	761.6	844.2	909.5	961.7	966.1	987.8	961.7	835.5	683.2	509.2
82.5°	470.0	496.1	570.1	622.3	674.5	670.2	705.0	687.6	583.1	470.0	339.4
85°	200.2	217.6	278.5	322.0	369.9	352.5	400.4	396.0	313.3	226.3	152.3
87.5°	8.7	13.1	13.1	8.7	13.1	4.4	13.1	17.4	13.1	8.7	8.7
90°	5.0	5.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.0
92.5°	5.0	5.0	5.0	7.0	8.0	7.5	7.0	8.0	6.0	6.0	5.0
95°	6.0	6.0	7.0	9.0	11.0	11.5	12.0	12.0	7.0	7.0	6.0
97.5°	8.0	9.0	9.0	11.0	18.0	25.5	33.0	20.0	10.0	10.0	9.0
100°	13.0	14.0	14.0	25.0	53.0	62.0	71.1	51.0	26.0	19.0	14.0
102.5°	42.0	44.0	54.0	81.1	120.1	114.6	109.1	92.1	87.1	60.0	48.0
105°	107.1	106.1	114.1	135.1	168.1	166.6	165.1	152.1	138.1	119.1	110.1
107.5°	141.1	141.1	148.1	166.1	191.1	207.2	223.2	226.2	179.1	157.1	147.1
110°	159.1	159.1	165.1	180.1	213.2	235.7	258.2	256.2	221.2	194.1	181.1



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**CANDELA DISTRIBUTION (continued):**

	0°	5°	15°	25°	35°	40°	45°	55°	65°	75°	85°
112.5°	163.1	164.1	172.1	195.1	231.2	241.2	251.2	242.2	228.2	216.2	206.2
115°	169.1	169.1	178.1	200.2	220.2	224.2	228.2	218.2	207.2	199.2	195.1
117.5°	167.1	170.1	172.1	184.1	197.1	200.1	203.2	198.1	183.1	177.1	175.1
120°	155.1	155.1	157.1	163.1	170.1	171.6	173.1	171.1	161.1	156.1	155.1
122.5°	138.1	139.1	138.1	141.1	146.1	147.6	149.1	147.1	139.1	137.1	137.1
125°	121.1	121.1	120.1	122.1	125.1	124.6	124.1	125.1	121.1	120.1	120.1
127.5°	109.1	108.1	106.1	107.1	108.1	108.1	108.1	109.1	105.1	106.1	107.1
130°	97.1	97.1	95.1	95.1	95.1	94.1	93.1	95.1	93.1	94.1	95.1
132.5°	86.1	86.1	83.1	82.1	82.1	82.1	82.1	83.1	82.1	84.1	86.1
135°	77.1	77.1	74.1	75.1	75.1	74.6	74.1	75.1	74.1	76.1	77.1
137.5°	70.1	70.1	68.1	68.1	68.1	67.6	67.1	68.1	68.1	69.1	71.1
140°	64.0	64.0	63.0	63.0	62.0	62.5	63.0	63.0	63.0	64.0	65.0
142.5°	61.0	60.0	59.0	58.0	59.0	59.0	59.0	59.0	58.0	59.0	61.0
145°	56.0	56.0	55.0	55.0	55.0	55.5	56.0	55.0	55.0	56.0	56.0
147.5°	53.0	53.0	52.0	53.0	53.0	53.0	53.0	53.0	52.0	53.0	53.0
150°	52.0	51.0	50.0	51.0	51.0	50.5	50.0	50.0	50.0	50.0	51.0
152.5°	49.0	49.0	48.0	49.0	48.0	48.0	48.0	48.0	48.0	48.0	49.0
155°	47.0	47.0	46.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0
157.5°	45.0	46.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	46.0
160°	44.0	44.0	44.0	44.0	43.0	43.0	43.0	43.0	44.0	44.0	44.0
162.5°	43.0	43.0	43.0	43.0	42.0	42.0	42.0	42.0	42.0	43.0	43.0
165°	43.0	42.0	42.0	42.0	41.0	41.0	41.0	41.0	41.0	42.0	43.0
167.5°	41.0	41.0	41.0	41.0	41.0	40.5	40.0	40.0	41.0	41.0	41.0
170°	41.0	41.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
172.5°	41.0	41.0	41.0	41.0	40.0	40.0	40.0	40.0	40.0	40.0	41.0
175°	41.0	41.0	41.0	41.0	40.0	40.0	40.0	40.0	41.0	41.0	41.0
177.5°	41.0	41.0	41.0	41.0	40.0	40.5	41.0	41.0	41.0	41.0	41.0
180°	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0





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**CANDELA DISTRIBUTION (continued):**

	90°	95°	105°	115°	125°	135°	145°	155°	165°	175°	180°
0°	422.1	422.1	422.1	422.1	422.1	422.1	422.1	422.1	422.1	422.1	422.1
2.5°	422.1	417.8	409.1	404.7	400.4	391.7	391.7	387.3	387.3	387.3	383.0
5°	422.1	413.4	404.7	391.7	383.0	374.3	365.5	356.8	352.5	352.5	348.1
7.5°	413.4	404.7	391.7	378.6	365.5	348.1	339.4	322.0	317.7	313.3	313.3
10°	413.4	404.7	383.0	365.5	348.1	330.7	317.7	300.3	287.2	282.9	282.9
12.5°	417.8	404.7	383.0	361.2	339.4	317.7	300.3	282.9	269.8	261.1	261.1
15°	435.2	417.8	391.7	361.2	335.1	309.0	291.6	269.8	256.8	248.1	248.1
17.5°	456.9	439.5	400.4	365.5	335.1	304.6	282.9	261.1	248.1	239.3	235.0
20°	487.4	461.3	417.8	369.9	335.1	304.6	278.5	256.8	239.3	230.6	230.6
22.5°	522.2	491.7	435.2	378.6	339.4	304.6	278.5	252.4	235.0	226.3	226.3
25°	565.7	526.6	461.3	396.0	348.1	309.0	278.5	252.4	235.0	226.3	226.3
27.5°	613.6	570.1	487.4	413.4	356.8	313.3	278.5	252.4	235.0	226.3	226.3
30°	657.1	609.2	513.5	430.8	369.9	317.7	282.9	256.8	239.3	230.6	226.3
32.5°	705.0	644.1	539.6	448.2	378.6	326.4	287.2	261.1	239.3	230.6	230.6
35°	752.9	687.6	565.7	470.0	391.7	335.1	291.6	265.5	243.7	235.0	235.0
37.5°	805.1	735.4	596.2	487.4	404.7	343.8	300.3	269.8	248.1	239.3	239.3
40°	866.0	783.3	626.7	509.2	417.8	352.5	304.6	278.5	256.8	248.1	248.1
42.5°	922.6	826.8	657.1	526.6	430.8	361.2	313.3	282.9	265.5	256.8	256.8
45°	979.1	879.1	687.6	548.3	443.9	374.3	322.0	295.9	274.2	265.5	265.5
47.5°	1044.4	926.9	722.4	565.7	456.9	383.0	330.7	304.6	282.9	278.5	274.2
50°	1096.6	961.7	744.2	583.1	465.6	391.7	339.4	309.0	291.6	282.9	282.9
52.5°	1144.5	996.6	761.6	591.8	470.0	396.0	348.1	317.7	300.3	291.6	291.6
55°	1170.6	1009.6	774.6	591.8	474.3	400.4	348.1	317.7	300.3	295.9	291.6
57.5°	1170.6	1009.6	765.9	583.1	465.6	391.7	343.8	313.3	300.3	291.6	291.6
60°	1153.2	996.6	744.2	565.7	452.6	378.6	335.1	304.6	291.6	287.2	287.2
62.5°	1127.1	974.8	726.7	544.0	435.2	361.2	322.0	291.6	282.9	282.9	278.5
65°	1057.5	909.5	687.6	513.5	409.1	339.4	304.6	278.5	269.8	265.5	261.1
67.5°	983.5	848.6	626.7	478.7	374.3	317.7	282.9	261.1	248.1	248.1	243.7
70°	909.5	783.3	570.1	430.8	335.1	291.6	256.8	235.0	226.3	226.3	226.3
72.5°	809.4	700.6	504.8	378.6	295.9	256.8	230.6	208.9	204.5	204.5	200.2
75°	691.9	596.2	426.5	322.0	248.1	217.6	195.8	174.1	174.1	174.1	174.1
77.5°	565.7	483.0	339.4	256.8	195.8	174.1	161.0	143.6	143.6	143.6	143.6
80°	426.5	356.8	248.1	187.1	143.6	126.2	117.5	108.8	113.1	113.1	108.8
82.5°	278.5	235.0	156.7	117.5	91.4	82.7	82.7	74.0	78.3	78.3	78.3
85°	121.8	104.4	65.3	52.2	43.5	43.5	43.5	39.2	43.5	43.5	43.5
87.5°	8.7	8.7	8.7	8.7	8.7	8.7	8.7	0.0	4.4	8.7	4.4
90°	5.0	5.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.0	5.0
92.5°	5.0	5.0	6.0	6.0	8.0	7.0	8.0	7.0	5.0	5.0	5.0
95°	6.0	6.0	7.0	7.0	12.0	12.0	11.0	9.0	7.0	6.0	6.0
97.5°	8.0	9.0	10.0	10.0	20.0	33.0	18.0	11.0	9.0	9.0	8.0
100°	14.0	14.0	19.0	26.0	51.0	71.1	53.0	25.0	14.0	14.0	13.0
102.5°	46.0	48.0	60.0	87.1	92.1	109.1	120.1	81.1	54.0	44.0	42.0
105°	110.1	110.1	119.1	138.1	152.1	165.1	168.1	135.1	114.1	106.1	107.1
107.5°	146.1	147.1	157.1	179.1	226.2	223.2	191.1	166.1	148.1	141.1	141.1
110°	179.1	181.1	194.1	221.2	256.2	258.2	213.2	180.1	165.1	159.1	159.1



REPORT NUMBER: P833588  
 CATALOG NUMBER: TTN-D2-750-U-DL-UPL2

**CANDELA DISTRIBUTION (continued):**

	90°	95°	105°	115°	125°	135°	145°	155°	165°	175°	180°
112.5°	204.2	206.2	216.2	228.2	242.2	251.2	231.2	195.1	172.1	164.1	163.1
115°	197.1	195.1	199.2	207.2	218.2	228.2	220.2	200.2	178.1	169.1	169.1
117.5°	172.1	175.1	177.1	183.1	198.1	203.2	197.1	184.1	172.1	170.1	167.1
120°	153.1	155.1	156.1	161.1	171.1	173.1	170.1	163.1	157.1	155.1	155.1
122.5°	135.1	137.1	137.1	139.1	147.1	149.1	146.1	141.1	138.1	139.1	138.1
125°	119.1	120.1	120.1	121.1	125.1	124.1	125.1	122.1	120.1	121.1	121.1
127.5°	106.1	107.1	106.1	105.1	109.1	108.1	108.1	107.1	106.1	108.1	109.1
130°	96.1	95.1	94.1	93.1	95.1	93.1	95.1	95.1	95.1	97.1	97.1
132.5°	86.1	86.1	84.1	82.1	83.1	82.1	82.1	82.1	83.1	86.1	86.1
135°	77.1	77.1	76.1	74.1	75.1	74.1	75.1	75.1	74.1	77.1	77.1
137.5°	72.1	71.1	69.1	68.1	68.1	67.1	68.1	68.1	68.1	70.1	70.1
140°	65.0	65.0	64.0	63.0	63.0	63.0	62.0	63.0	63.0	64.0	64.0
142.5°	61.0	61.0	59.0	58.0	59.0	59.0	59.0	58.0	59.0	60.0	61.0
145°	57.0	56.0	56.0	55.0	55.0	56.0	55.0	55.0	55.0	56.0	56.0
147.5°	54.0	53.0	53.0	52.0	53.0	53.0	53.0	53.0	52.0	53.0	53.0
150°	51.0	51.0	50.0	50.0	50.0	50.0	51.0	51.0	50.0	51.0	52.0
152.5°	50.0	49.0	48.0	48.0	48.0	48.0	48.0	49.0	48.0	49.0	49.0
155°	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	46.0	47.0	47.0
157.5°	46.0	46.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	46.0	45.0
160°	45.0	44.0	44.0	44.0	43.0	43.0	43.0	44.0	44.0	44.0	44.0
162.5°	44.0	43.0	43.0	42.0	42.0	42.0	42.0	43.0	43.0	43.0	43.0
165°	42.0	43.0	42.0	41.0	41.0	41.0	41.0	42.0	42.0	42.0	43.0
167.5°	42.0	41.0	41.0	41.0	40.0	40.0	41.0	41.0	41.0	41.0	41.0
170°	41.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	41.0	41.0
172.5°	41.0	41.0	40.0	40.0	40.0	40.0	40.0	41.0	41.0	41.0	41.0
175°	40.0	41.0	41.0	41.0	40.0	40.0	40.0	41.0	41.0	41.0	41.0
177.5°	41.0	41.0	41.0	41.0	41.0	41.0	40.0	41.0	41.0	41.0	41.0
180°	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0

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: SP1-2411-284-3

Test Date: 11/21/2024

Luminaire Tested: TTN-D0-750-U-WQ

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

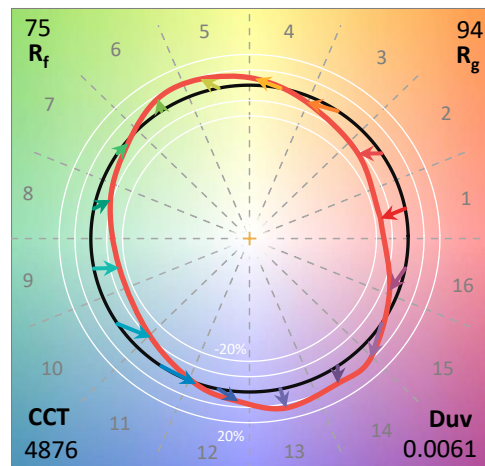
**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2411-284-3  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 11/21/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW EDISON  
 Catalog Number: **TTN-D0-750-U-WQ**  
 Description: TOPTIER NANO LED PARKING GARAGE LUMINAIRE. 5000K, 70 CRI LEDS AND WIDE DISTRIBUTION

**Spectral Parameters**

CCT (K): 4876  
 CIE u': 0.2086  
 CIE v': 0.4932  
 Duv: 0.0061  
 CIE x: 0.3502  
 CIE y: 0.3680  
 CIE z: 0.2818  
 Peak Wavelength (nm): 451  
 Dominant Wavelength (nm): 569  
 Purity: 15.51324  
 Rf: 74.6  
 Rg: 94.4

CRI (Ra):	72.6		
R1:	69.5	R9:	-24.6
R2:	77.0	R10:	44.8
R3:	82.2	R11:	68.2
R4:	72.6	R12:	36.1
R5:	69.3	R13:	70.5
R6:	67.6	R14:	89.9
R7:	83.7	R15:	63.1
R8:	58.6		



**Test Conditions**

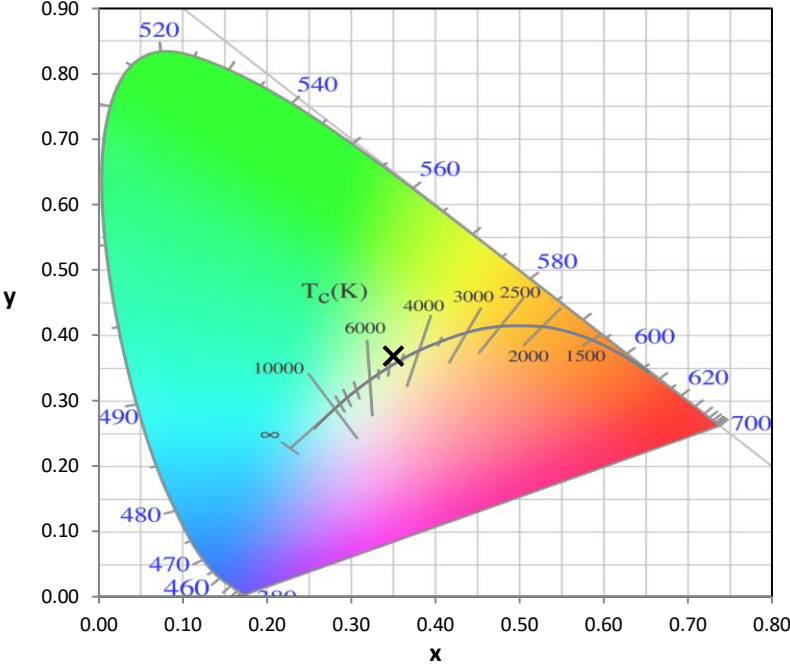
Stabilization Time: 51M  
 Operation Time: 1H 51M  
 Sphere Temperature (°C): 24.9

REPORT NUMBER: SP1-2411-284-3

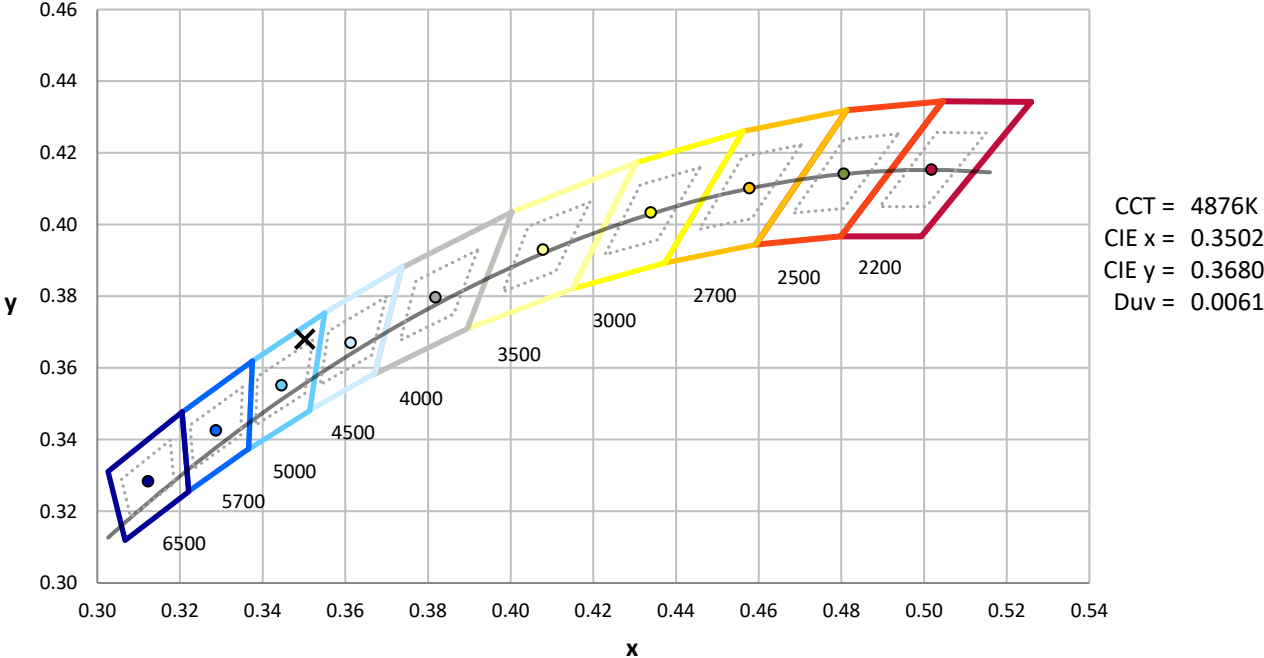
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	6/18/2024	12/18/2024
Power Meter	INXT2011004	2/8/2024	2/8/2025
AC Power Source	IN0063	10/22/2024	10/22/2025
DC Power Source	IN0208	10/22/2024	10/22/2025
Sphere Thermometer	IN0085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

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**CIE 1931 Chromaticity Diagram**



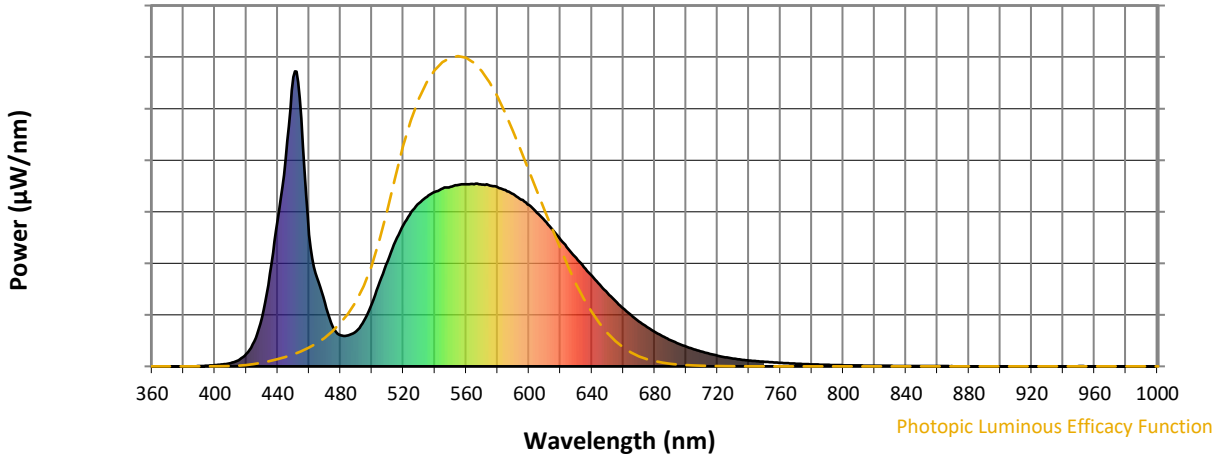
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 5000K 7-step quadrangle

REPORT NUMBER: SP1-2411-284-3

**Photopic Flux vs. Wavelength**

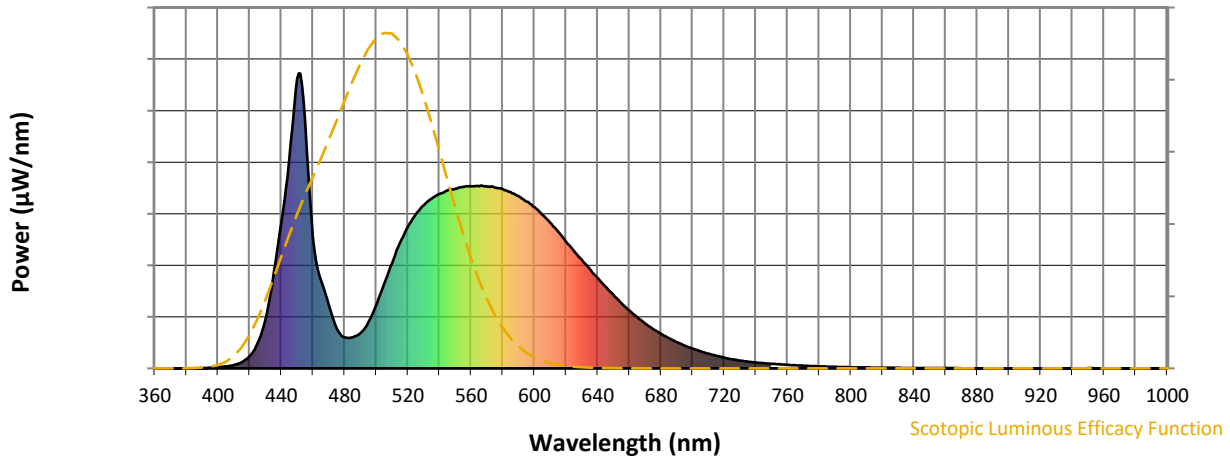


**Photopic Lumens: NR**

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	430	NR	750	16	NR	880	0	NR
365	0	NR	495	156	NR	625	398	NR	755	14	NR	885	0	NR
370	0	NR	500	214	NR	630	368	NR	760	12	NR	890	0	NR
375	0	NR	505	286	NR	635	336	NR	765	11	NR	895	0	NR
380	0	NR	510	357	NR	640	306	NR	770	9	NR	900	0	NR
385	0	NR	515	425	NR	645	276	NR	775	8	NR	905	0	NR
390	1	NR	520	480	NR	650	248	NR	780	7	NR	910	0	NR
395	2	NR	525	523	NR	655	221	NR	785	6	NR	915	0	NR
400	4	NR	530	554	NR	660	196	NR	790	5	NR	920	0	NR
405	7	NR	535	575	NR	665	173	NR	795	4	NR	925	0	NR
410	11	NR	540	592	NR	670	152	NR	800	4	NR	930	0	NR
415	21	NR	545	603	NR	675	133	NR	805	3	NR	935	0	NR
420	42	NR	550	609	NR	680	117	NR	810	3	NR	940	0	NR
425	85	NR	555	615	NR	685	102	NR	815	3	NR	945	0	NR
430	165	NR	560	617	NR	690	89	NR	820	2	NR	950	1	NR
435	316	NR	565	617	NR	695	77	NR	825	2	NR	955	0	NR
440	497	NR	570	616	NR	700	67	NR	830	2	NR	960	0	NR
445	702	NR	575	613	NR	705	58	NR	835	2	NR	965	0	NR
450	981	NR	580	607	NR	710	50	NR	840	1	NR	970	0	NR
455	840	NR	585	598	NR	715	43	NR	845	1	NR	975	0	NR
460	446	NR	590	583	NR	720	36	NR	850	1	NR	980	0	NR
465	300	NR	595	566	NR	725	31	NR	855	1	NR	985	0	NR
470	215	NR	600	546	NR	730	26	NR	860	1	NR	990	0	NR
475	135	NR	605	521	NR	735	23	NR	865	1	NR	995	0	NR
480	105	NR	610	494	NR	740	20	NR	870	1	NR	1000	0	NR
485	106	NR	615	463	NR	745	18	NR	875	0	NR			

REPORT NUMBER: SP1-2411-284-3

**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

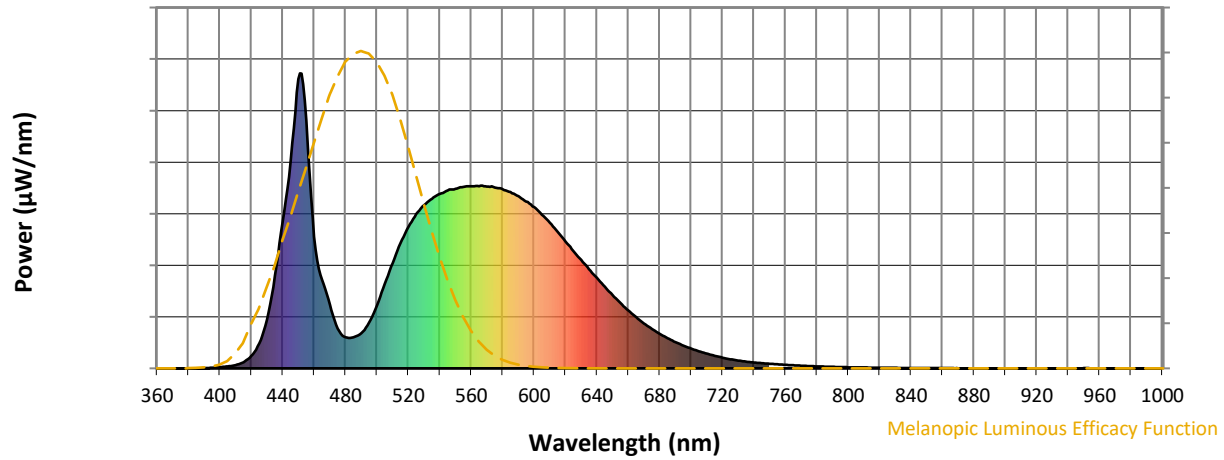
**S/P: 1.74**

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	430	NR	750	16	NR	880	0	NR
365	0	NR	495	156	NR	625	398	NR	755	14	NR	885	0	NR
370	0	NR	500	214	NR	630	368	NR	760	12	NR	890	0	NR
375	0	NR	505	286	NR	635	336	NR	765	11	NR	895	0	NR
380	0	NR	510	357	NR	640	306	NR	770	9	NR	900	0	NR
385	0	NR	515	425	NR	645	276	NR	775	8	NR	905	0	NR
390	1	NR	520	480	NR	650	248	NR	780	7	NR	910	0	NR
395	2	NR	525	523	NR	655	221	NR	785	6	NR	915	0	NR
400	4	NR	530	554	NR	660	196	NR	790	5	NR	920	0	NR
405	7	NR	535	575	NR	665	173	NR	795	4	NR	925	0	NR
410	11	NR	540	592	NR	670	152	NR	800	4	NR	930	0	NR
415	21	NR	545	603	NR	675	133	NR	805	3	NR	935	0	NR
420	42	NR	550	609	NR	680	117	NR	810	3	NR	940	0	NR
425	85	NR	555	615	NR	685	102	NR	815	3	NR	945	0	NR
430	165	NR	560	617	NR	690	89	NR	820	2	NR	950	1	NR
435	316	NR	565	617	NR	695	77	NR	825	2	NR	955	0	NR
440	497	NR	570	616	NR	700	67	NR	830	2	NR	960	0	NR
445	702	NR	575	613	NR	705	58	NR	835	2	NR	965	0	NR
450	981	NR	580	607	NR	710	50	NR	840	1	NR	970	0	NR
455	840	NR	585	598	NR	715	43	NR	845	1	NR	975	0	NR
460	446	NR	590	583	NR	720	36	NR	850	1	NR	980	0	NR
465	300	NR	595	566	NR	725	31	NR	855	1	NR	985	0	NR
470	215	NR	600	546	NR	730	26	NR	860	1	NR	990	0	NR
475	135	NR	605	521	NR	735	23	NR	865	1	NR	995	0	NR
480	105	NR	610	494	NR	740	20	NR	870	1	NR	1000	0	NR
485	106	NR	615	463	NR	745	18	NR	875	0	NR			



REPORT NUMBER: SP1-2411-284-3

**Melanopic Flux vs. Wavelength**



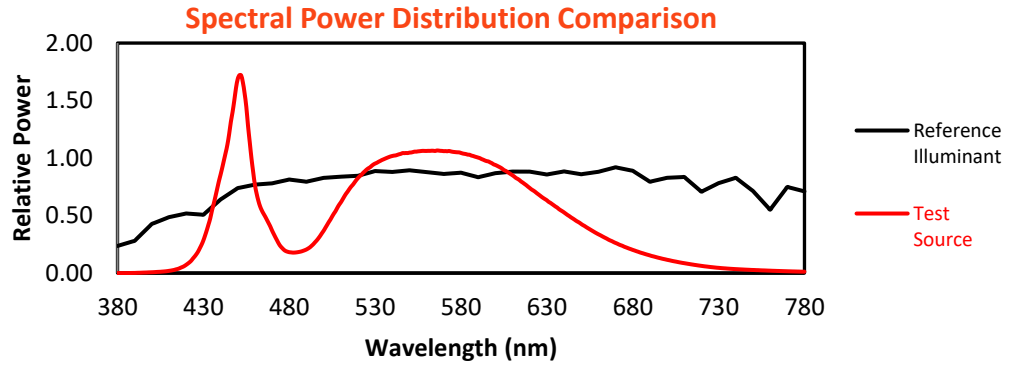
**Melanopic Lumens: NR**

**M/P: 3.51**

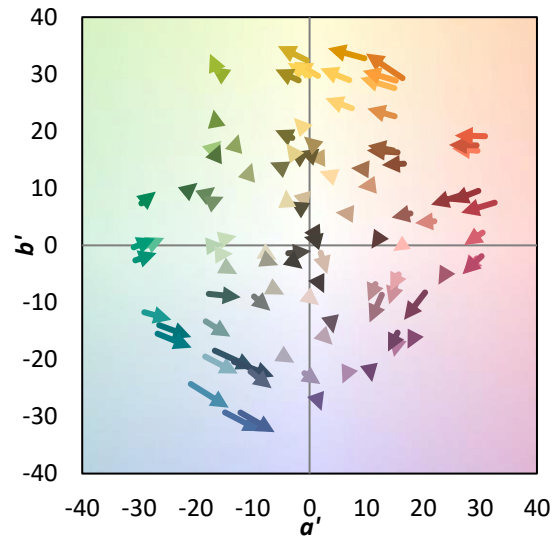
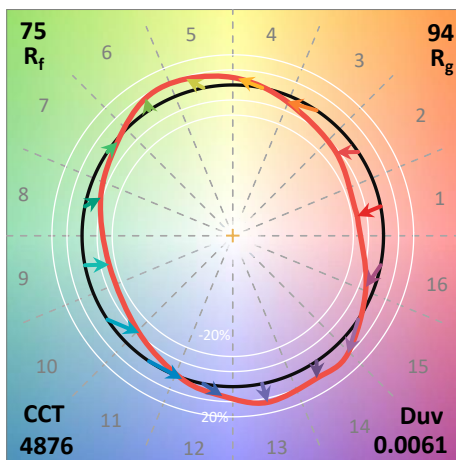
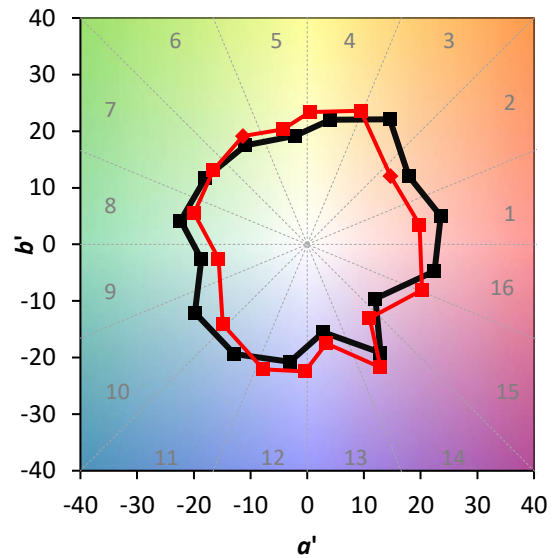
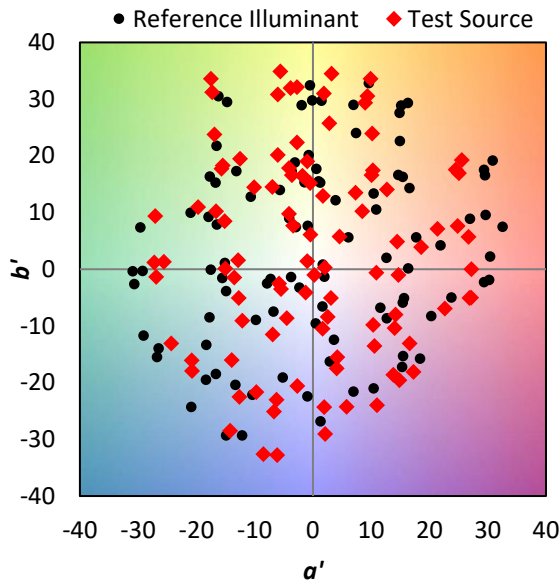
λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)	λ (nm)	Power W <sup>^</sup> /nm	Lumens (φ/nm)
360	0	NR	490	119	NR	620	430	NR	750	16	NR	880	0	NR
365	0	NR	495	156	NR	625	398	NR	755	14	NR	885	0	NR
370	0	NR	500	214	NR	630	368	NR	760	12	NR	890	0	NR
375	0	NR	505	286	NR	635	336	NR	765	11	NR	895	0	NR
380	0	NR	510	357	NR	640	306	NR	770	9	NR	900	0	NR
385	0	NR	515	425	NR	645	276	NR	775	8	NR	905	0	NR
390	1	NR	520	480	NR	650	248	NR	780	7	NR	910	0	NR
395	2	NR	525	523	NR	655	221	NR	785	6	NR	915	0	NR
400	4	NR	530	554	NR	660	196	NR	790	5	NR	920	0	NR
405	7	NR	535	575	NR	665	173	NR	795	4	NR	925	0	NR
410	11	NR	540	592	NR	670	152	NR	800	4	NR	930	0	NR
415	21	NR	545	603	NR	675	133	NR	805	3	NR	935	0	NR
420	42	NR	550	609	NR	680	117	NR	810	3	NR	940	0	NR
425	85	NR	555	615	NR	685	102	NR	815	3	NR	945	0	NR
430	165	NR	560	617	NR	690	89	NR	820	2	NR	950	1	NR
435	316	NR	565	617	NR	695	77	NR	825	2	NR	955	0	NR
440	497	NR	570	616	NR	700	67	NR	830	2	NR	960	0	NR
445	702	NR	575	613	NR	705	58	NR	835	2	NR	965	0	NR
450	981	NR	580	607	NR	710	50	NR	840	1	NR	970	0	NR
455	840	NR	585	598	NR	715	43	NR	845	1	NR	975	0	NR
460	446	NR	590	583	NR	720	36	NR	850	1	NR	980	0	NR
465	300	NR	595	566	NR	725	31	NR	855	1	NR	985	0	NR
470	215	NR	600	546	NR	730	26	NR	860	1	NR	990	0	NR
475	135	NR	605	521	NR	735	23	NR	865	1	NR	995	0	NR
480	105	NR	610	494	NR	740	20	NR	870	1	NR	1000	0	NR
485	106	NR	615	463	NR	745	18	NR	875	0	NR			

**Summary**

$R_f = 74.6$   
 $R_g = 94.4$   
 CIE  $R_a = 72.6$   
 $R_g = -24.6$

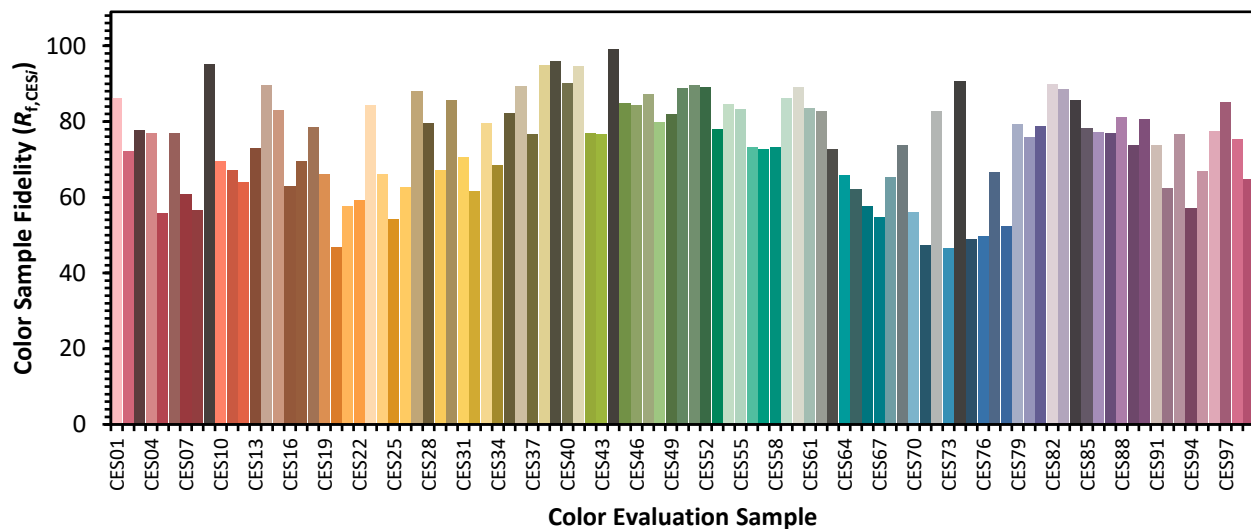


**Color Vector Graphics**

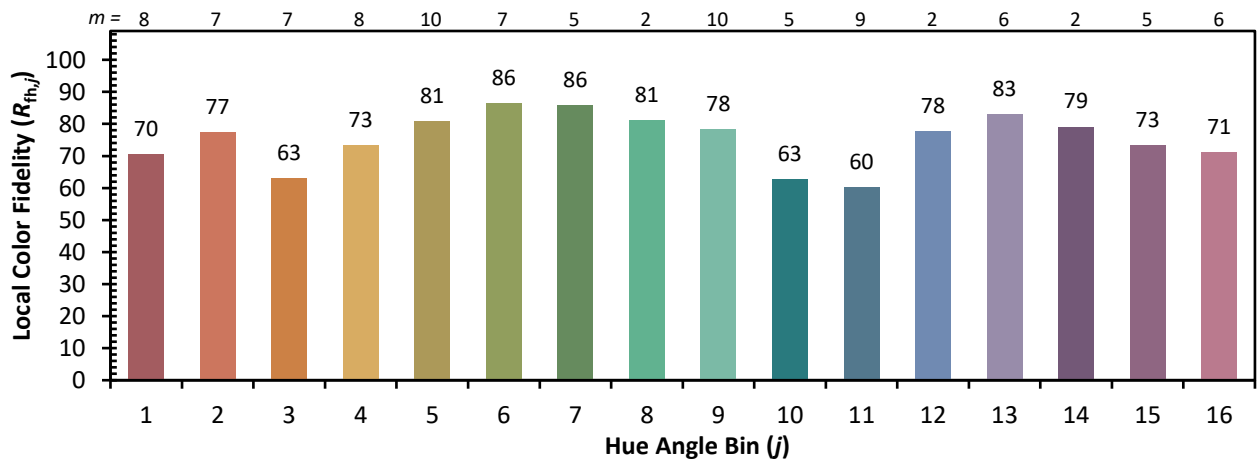
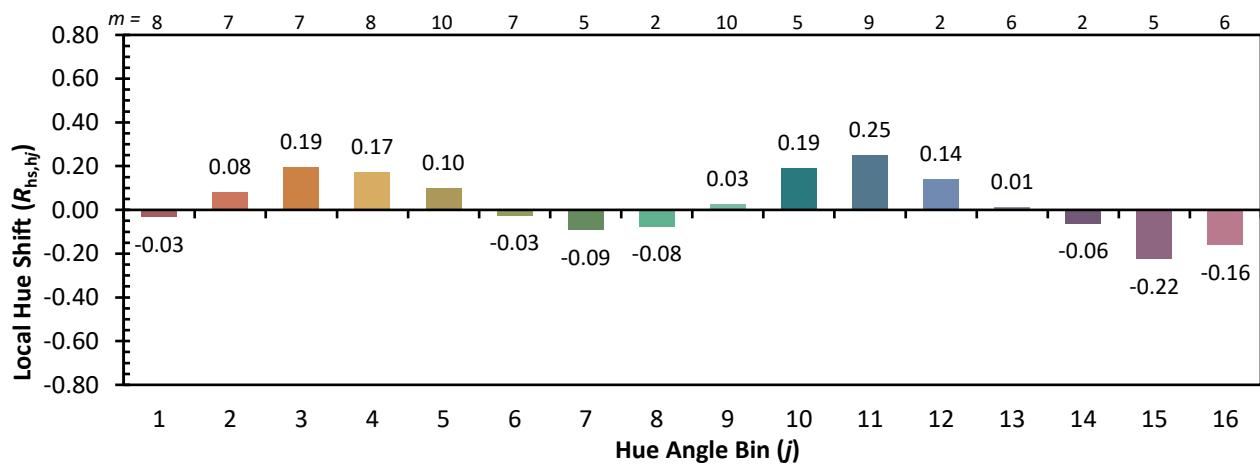
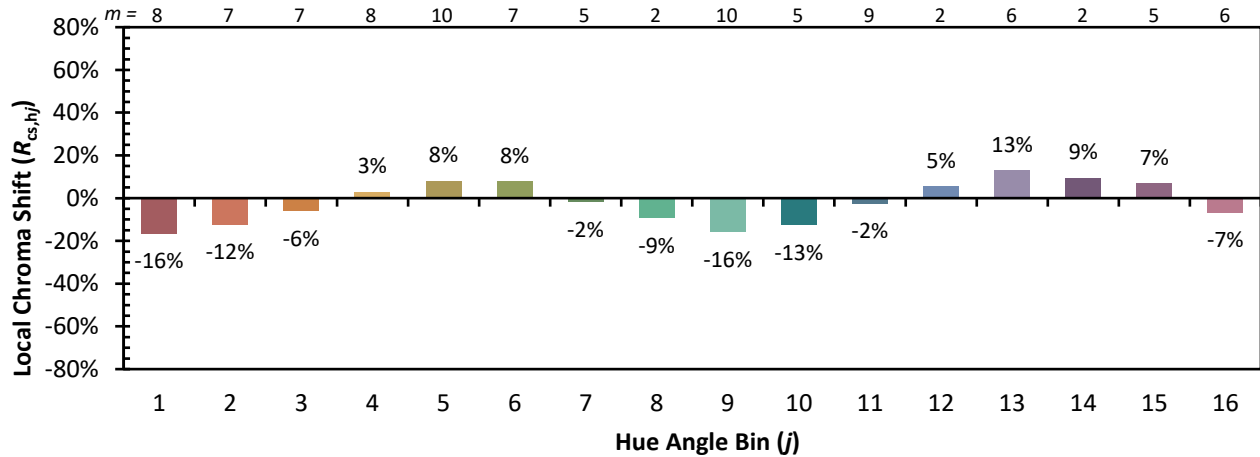


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

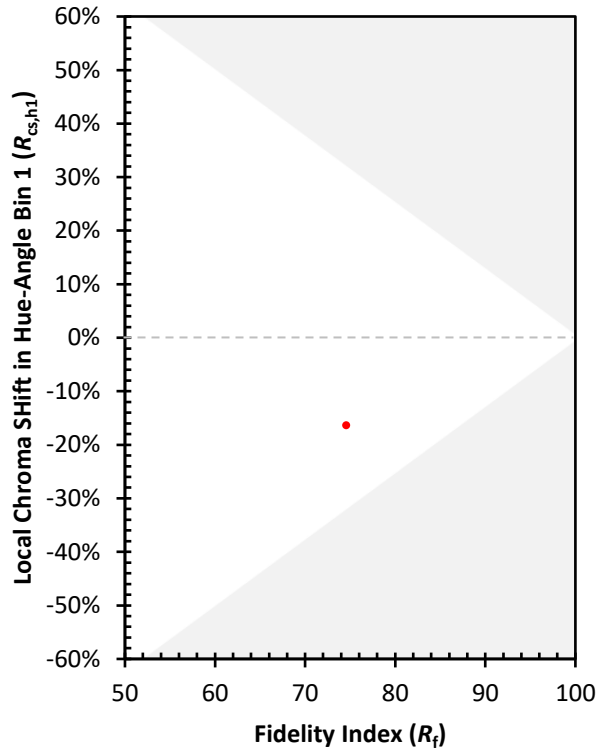
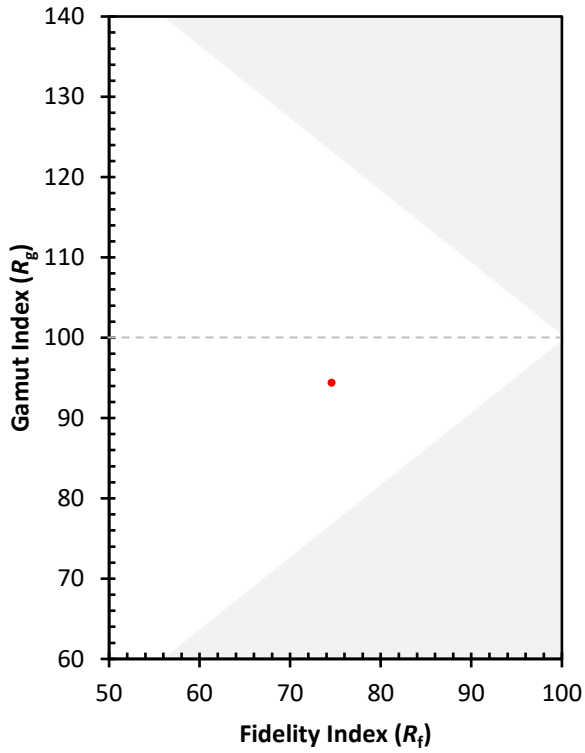
CES01 = 85	CES26 = 63	CES51 = 90	CES76 = 50
CES02 = 59	CES27 = 88	CES52 = 89	CES77 = 67
CES03 = 30	CES28 = 80	CES53 = 78	CES78 = 52
CES04 = 69	CES29 = 67	CES54 = 85	CES79 = 79
CES05 = 46	CES30 = 86	CES55 = 83	CES80 = 76
CES06 = 50	CES31 = 70	CES56 = 73	CES81 = 79
CES07 = 39	CES32 = 62	CES57 = 73	CES82 = 90
CES08 = 38	CES33 = 80	CES58 = 73	CES83 = 89
CES09 = 29	CES34 = 69	CES59 = 86	CES84 = 86
CES10 = 72	CES35 = 82	CES60 = 89	CES85 = 78
CES11 = 55	CES36 = 89	CES61 = 83	CES86 = 77
CES12 = 61	CES37 = 77	CES62 = 83	CES87 = 77
CES13 = 41	CES38 = 95	CES63 = 73	CES88 = 81
CES14 = 74	CES39 = 96	CES64 = 66	CES89 = 74
CES15 = 70	CES40 = 90	CES65 = 62	CES90 = 81
CES16 = 46	CES41 = 95	CES66 = 58	CES91 = 74
CES17 = 49	CES42 = 77	CES67 = 55	CES92 = 62
CES18 = 55	CES43 = 77	CES68 = 65	CES93 = 77
CES19 = 71	CES44 = 99	CES69 = 74	CES94 = 57
CES20 = 64	CES45 = 85	CES70 = 56	CES95 = 67
CES21 = 85	CES46 = 84	CES71 = 47	CES96 = 77
CES22 = 77	CES47 = 87	CES72 = 83	CES97 = 85
CES23 = 91	CES48 = 80	CES73 = 46	CES98 = 75
CES24 = 90	CES49 = 82	CES74 = 91	CES99 = 65
CES25 = 71	CES50 = 89	CES75 = 49	



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)