

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: STREETWORKS

Report Number: P522123

Luminaire Tested: **CST-CA10-210-760-U-T5R-HSS-HM-EX120**

Issue Date: 5/10/2021

Test Information

Test Method: LM-79-08
Report Number: P522123
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1808-894-6)
Test Lab: COOPER LIGHTING SOLUTIONS
Issue Date: 5/10/2021
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: STREETWORKS
Catalog Number: CST-CA10-210-760-U-T5R-HSS-HM-EX120
Description: CELESTEON HIGH MAST LUMINAIRE
Light Source: (10) 5700K CCT, 70 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 26801 lumens
Efficiency: N/A
Efficacy: 125.9 lumens/watt
Luminous Opening: Circular (Dia: 2.08' x H: 0')
IES Classification: Type IV - Short
BUG Rating: B4 - U2 - G4

Input Watts (W): 212.9
Input Voltage (V): 120
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

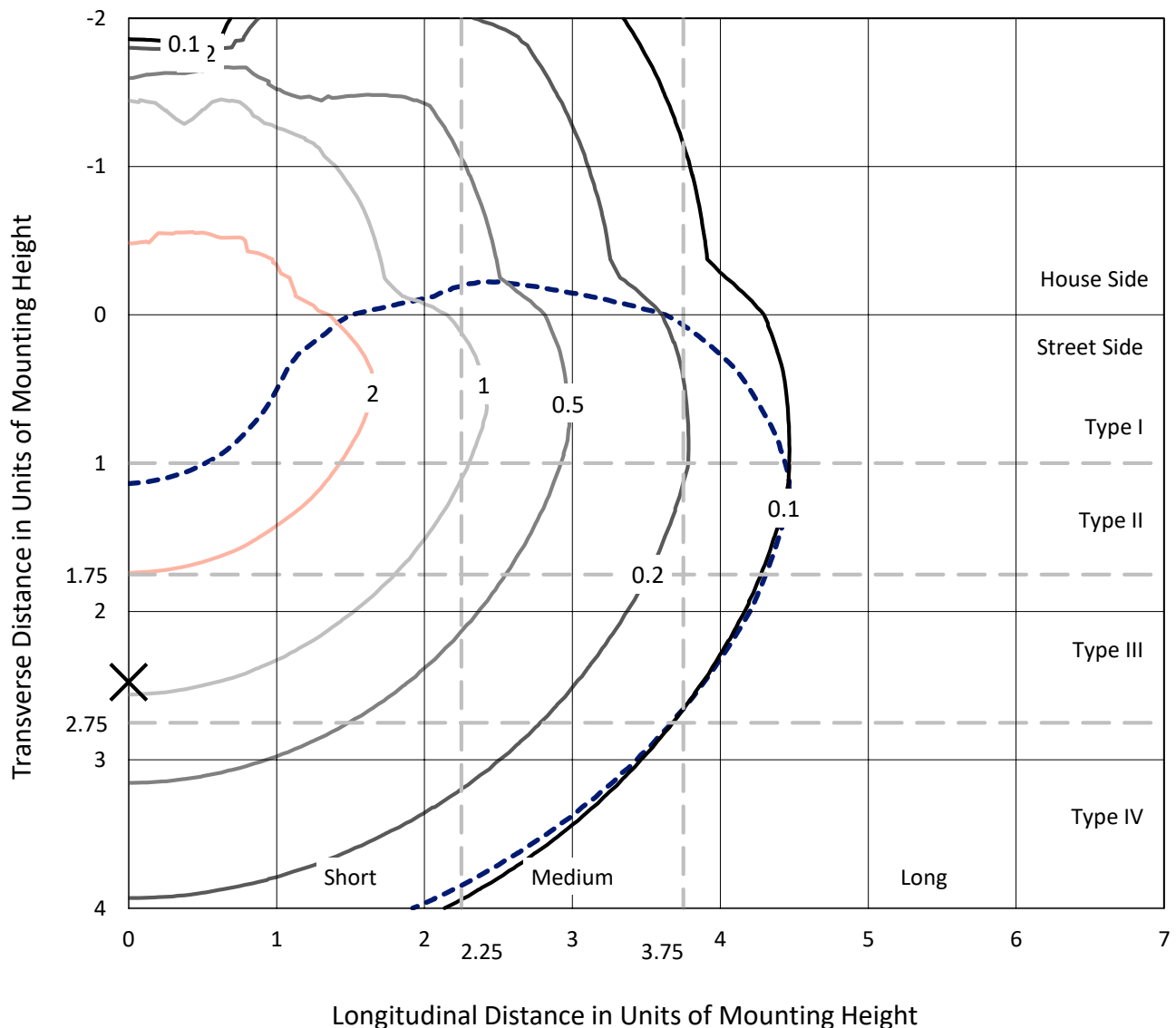


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Iso-Footcandle Lines of Horizontal Illumination

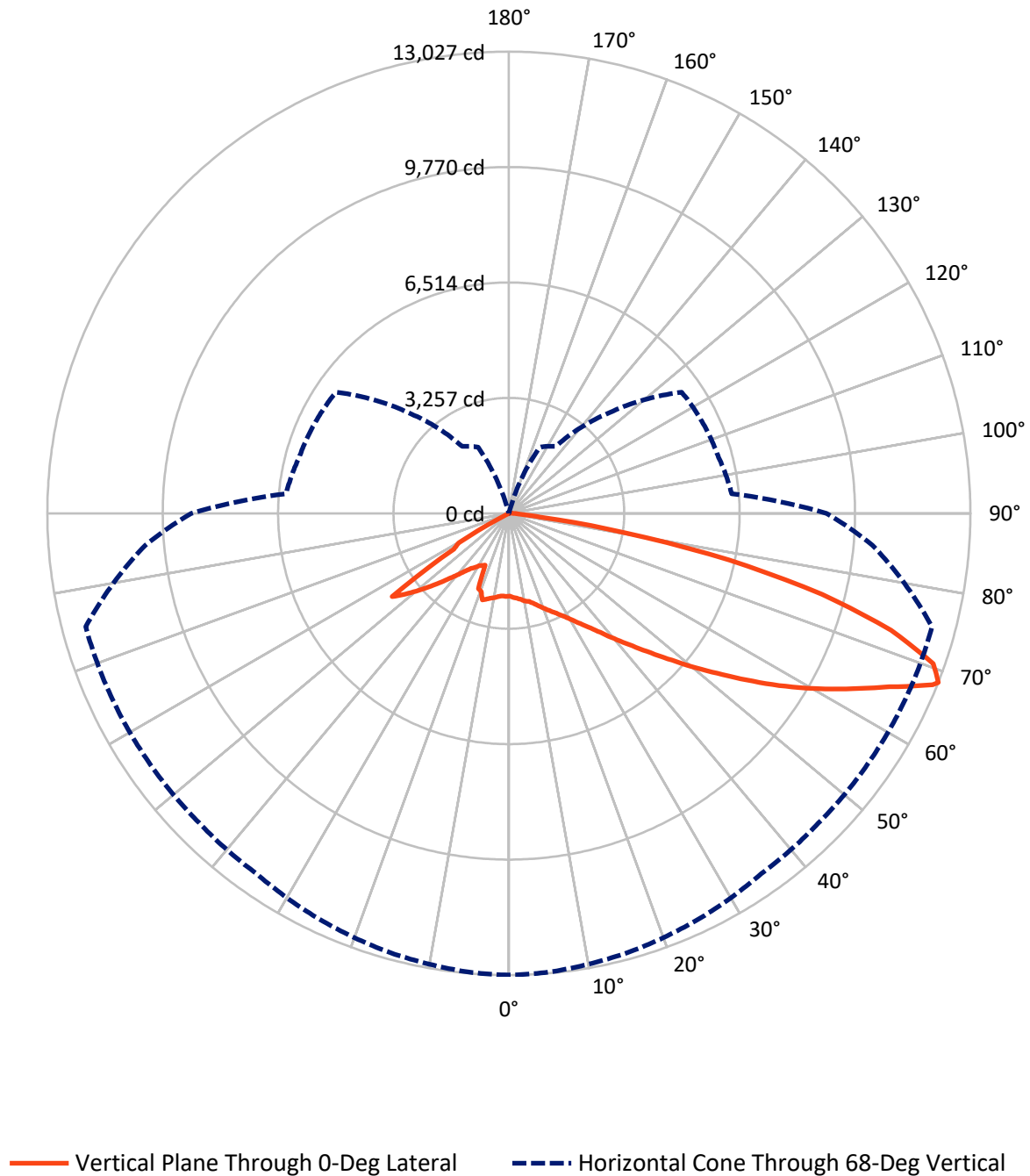
× Max cd
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 3.8 fc
 Type IV - Short - N/A

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Luminous Intensity Polar Plot



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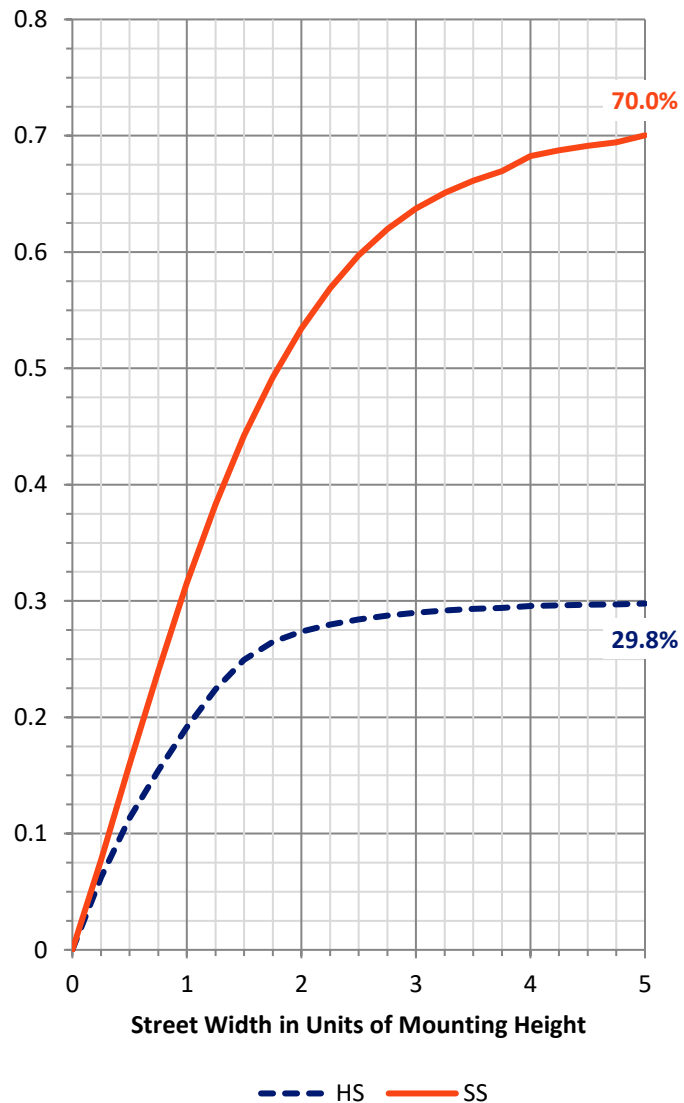
FLUX DISTRIBUTION:

		Downward	Upward	Total
House Side	Lumens	7989.1	1.2	7990.3
	% Fixture	29.8	0.0	29.8
Street Side	Lumens	18799.7	11.0	18810.7
	% Fixture	70.1	0.0	70.2
Total	Lumens	26788.8	12.2	26801.0
	% Fixture	100.0	0.0	100.0

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	226.8	0.8
10°-20°	721.8	2.7
20°-30°	1236.3	4.6
30°-40°	2005.5	7.5
40°-50°	3382.3	12.6
50°-60°	5513.2	20.6
60°-70°	7394.1	27.6
70°-80°	5743.3	21.4
80°-90°	565.6	2.1
90°-100°	10.7	0.0
100°-110°	0.6	0.0
110°-120°	0.2	0.0
120°-130°	0.1	0.0
130°-140°	0.2	0.0
140°-150°	0.2	0.0
150°-160°	0.1	0.0
160°-170°	0.1	0.0
170°-180°	0.0	0.0
0°-90°	26788.8	100.0
0°-180°	26801.0	100.0

Coefficient of Utilization



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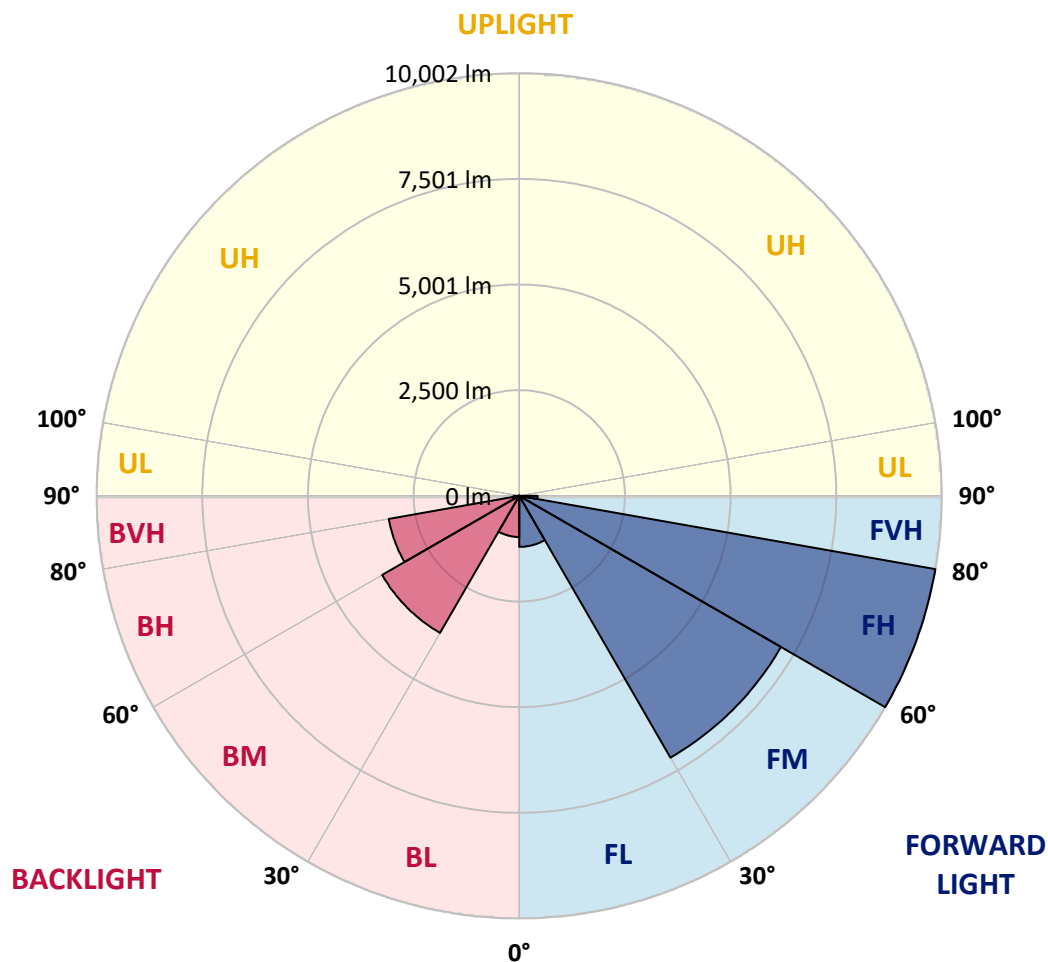
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LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

Zone		Lumens	% Fixture	Zone Rating/Lumen Limit		
				B	U	G
FL	(0°-30°)	1208.9	4.5			
FM	(30°-60°)	7154.1	26.7			
FH	(60°-80°)	10001.8	37.3			G4/12000
FVH	(80°-90°)	434.9	1.6			G3/500
BL	(0°-30°)	976.0	3.6	B2/1000		
BM	(30°-60°)	3746.9	14.0	B3/5000		
BH	(60°-80°)	3135.5	11.7	B4/5000		G4/5000
BVH	(80°-90°)	130.7	0.5			G2/225
UL	(90°-100°)	10.7	0.0		U2/50	
UH	(100°-180°)	1.5	0.0		U1/10	

BUG Rating: B4-U2-G4

Type IV Short



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CANDELA DISTRIBUTION (FULL):

	0°	5°	15°	25°	35°	45°	55°	65°	75°	85°	90°
0°	2336.6	2336.6	2336.6	2336.6	2336.6	2336.6	2336.6	2336.6	2336.6	2336.6	2336.6
2.5°	2375.3	2368.7	2367.6	2380.9	2338.8	2359.8	2341.0	2356.5	2346.5	2354.3	2355.4
5°	2407.5	2395.3	2387.5	2403.1	2376.5	2386.4	2365.4	2372.0	2344.3	2359.8	2362.0
7.5°	2454.0	2434.1	2431.9	2436.3	2413.0	2420.8	2386.4	2394.2	2374.2	2365.4	2373.1
10°	2517.2	2498.4	2484.0	2493.9	2462.9	2467.3	2430.8	2431.9	2417.5	2400.8	2414.1
12.5°	2552.7	2554.9	2548.3	2556.0	2530.5	2516.1	2490.6	2481.8	2467.3	2447.4	2440.7
15°	2641.4	2636.9	2623.6	2635.8	2632.5	2619.2	2588.2	2568.2	2537.2	2526.1	2515.0
17.5°	2750.0	2735.6	2724.5	2740.0	2756.6	2728.9	2699.0	2671.3	2630.3	2608.1	2594.8
20°	2864.2	2854.2	2843.1	2867.5	2873.0	2852.0	2829.8	2788.8	2741.1	2712.3	2684.6
22.5°	2991.6	2971.7	2975.0	3007.1	2997.2	2987.2	2958.4	2925.1	2867.5	2830.9	2751.1
25°	3123.5	3112.4	3128.0	3142.4	3134.6	3113.6	3099.1	3074.8	3010.5	2966.1	2849.8
27.5°	3287.6	3269.8	3289.8	3295.3	3288.7	3283.1	3263.2	3244.3	3174.5	3124.6	2979.4
30°	3480.4	3459.4	3491.5	3483.8	3477.1	3481.6	3469.4	3428.3	3366.3	3298.7	3153.5
32.5°	3709.9	3682.2	3718.8	3702.1	3686.6	3717.6	3688.8	3650.0	3576.9	3498.2	3356.3
35°	3975.9	3977.0	3995.9	3968.1	3962.6	3995.9	3977.0	3929.4	3861.7	3779.7	3578.0
37.5°	4298.5	4289.6	4337.3	4324.0	4304.0	4348.3	4353.9	4294.0	4172.1	4091.2	3852.9
40°	4690.8	4688.6	4704.1	4706.4	4700.8	4721.9	4731.9	4652.0	4573.3	4451.4	3635.6
42.5°	5109.8	5118.7	5146.4	5126.4	5153.1	5180.8	5184.1	5117.6	5004.5	4270.7	3861.7
45°	5613.0	5640.8	5659.6	5655.2	5667.4	5707.3	5710.6	5675.1	5564.3	4626.6	4271.9
47.5°	6190.5	6217.1	6222.7	6258.1	6247.1	6303.6	6295.8	6296.9	6178.3	5122.0	4718.5
50°	6854.5	6866.7	6912.1	6932.1	6904.4	6980.8	6960.9	6985.3	6839.0	5689.5	5198.5
52.5°	7559.4	7580.5	7599.3	7674.7	7639.2	7705.7	7679.1	7735.7	7566.1	6267.0	5731.6
55°	8360.8	8364.1	8396.3	8472.8	8426.2	8506.0	8467.2	8488.3	8353.1	6905.5	6287.0
57.5°	9209.9	9198.8	9211.0	9271.9	9229.8	9289.7	9274.2	9294.1	9167.8	7577.2	6692.6
60°	10050.1	10033.4	10051.2	10092.2	10034.5	10137.6	10082.2	10101.0	9964.7	8263.3	7271.2
62.5°	10894.7	10882.5	10862.5	10903.5	10819.3	10872.5	10895.8	10864.7	10745.0	8884.0	7774.5
65°	11801.4	11789.2	11716.0	11741.5	11590.8	11565.3	11574.1	11584.1	11504.3	9499.2	8326.5
67.5°	12903.1	12885.4	12748.0	12575.0	12357.8	12310.1	12314.6	12341.2	12352.2	10290.6	8972.7
68°	13027.3	12995.1	12842.2	12641.5	12414.3	12358.9	12353.4	12358.9	12364.4	10297.2	8966.0
70°	12710.3	12698.1	12581.7	12338.9	12106.2	11973.2	11857.9	11853.5	11800.3	9770.7	8470.6
72.5°	11279.3	11263.8	11125.2	10953.4	10809.3	10600.9	10451.3	10460.2	10372.6	8635.7	7414.2
75°	9127.8	9126.7	8960.5	8816.4	8818.6	8803.1	8753.2	8840.8	8749.9	7324.4	6323.5
77.5°	6361.2	6383.4	6372.3	6288.1	6406.7	6570.7	6749.2	6917.7	6865.6	5786.0	5042.2
80°	3323.0	3385.1	3604.6	3614.6	3697.7	3857.3	3979.2	4092.3	4100.0	3283.1	2912.9
82.5°	883.4	902.3	976.5	955.5	948.8	981.0	1007.6	1010.9	1013.1	855.7	799.2
85°	274.9	282.6	273.8	261.6	242.7	221.7	216.1	176.2	139.7	115.3	100.9
87.5°	195.1	208.4	188.4	177.3	157.4	149.6	134.1	105.3	82.0	57.6	38.8
90°	100.9	103.1	92.0	78.7	73.2	68.7	58.7	42.1	21.1	11.1	10.0
92.5°	51.0	52.1	45.4	38.8	33.3	28.8	22.2	12.2	6.7	3.3	1.1
95°	20.0	21.1	18.8	16.6	13.3	10.0	8.9	6.7	4.4	2.2	1.1
97.5°	6.7	6.7	6.7	5.5	5.5	5.5	5.5	4.4	3.3	2.2	1.1
100°	0.0	0.0	0.0	1.1	2.2	3.3	3.3	3.3	2.2	1.1	1.1
102.5°	0.0	0.0	0.0	0.0	0.0	1.1	2.2	2.2	2.2	1.1	1.1
105°	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1	1.1
107.5°	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1



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CANDELA DISTRIBUTION (continued):

	0°	5°	15°	25°	35°	45°	55°	65°	75°	85°	90°
110°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1
112.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1
115°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
117.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
120°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
122.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
125°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
127.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
130°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1
132.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1
135°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1
137.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1
140°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1
142.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1
145°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1
147.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1
150°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1
152.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1
155°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1
157.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1
160°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1
162.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1
165°	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1
167.5°	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1
170°	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1
172.5°	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1
175°	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1
177.5°	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1
180°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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CANDELA DISTRIBUTION (continued):

	95°	105°	115°	125°	135°	145°	155°	165°	175°	180°
0°	2336.6	2336.6	2336.6	2336.6	2336.6	2336.6	2336.6	2336.6	2336.6	2336.6
2.5°	2349.9	2343.2	2346.5	2318.8	2325.5	2307.7	2345.4	2335.4	2331.0	2346.5
5°	2355.4	2331.0	2351.0	2332.1	2335.4	2309.9	2341.0	2328.8	2327.7	2336.6
7.5°	2357.6	2345.4	2364.3	2333.2	2343.2	2333.2	2356.5	2344.3	2355.4	2363.2
10°	2388.6	2382.0	2379.8	2368.7	2376.5	2354.3	2383.1	2383.1	2388.6	2409.7
12.5°	2434.1	2425.2	2419.7	2399.7	2407.5	2400.8	2424.1	2428.6	2438.5	2447.4
15°	2496.2	2480.6	2475.1	2457.4	2462.9	2461.8	2478.4	2479.5	2501.7	2500.6
17.5°	2576.0	2553.8	2560.5	2547.2	2548.3	2539.4	2530.5	2530.5	2550.5	2554.9
20°	2671.3	2544.9	2378.7	2285.6	2268.9	2281.1	2328.8	2407.5	2308.8	2336.6
22.5°	2499.5	2385.3	2377.6	2356.5	2343.2	2046.1	1969.7	1945.3	2072.7	2292.2
25°	2521.7	2472.9	2458.5	2431.9	2039.5	2036.2	2014.0	1977.4	1616.1	1608.3
27.5°	2639.2	2591.5	2568.2	2130.4	2121.5	2120.4	2087.2	1720.3	1637.1	1648.2
30°	2776.6	2721.2	2304.4	2237.9	2230.1	2212.4	2021.8	1699.2	1698.1	1699.2
32.5°	2935.1	2751.1	2370.9	2367.6	2372.0	2317.7	1791.2	1784.6	1783.4	1794.5
35°	3152.3	2552.7	2537.2	2553.8	2530.5	2004.0	1898.7	1895.4	1896.5	1891.0
37.5°	3008.3	2752.2	2748.9	2748.9	2694.6	2050.6	2029.5	2045.0	2042.8	2035.1
40°	3069.2	2993.8	2973.9	2967.2	2277.8	2212.4	2200.2	2220.2	2223.5	2229.0
42.5°	3365.2	3296.4	3286.5	3207.8	2478.4	2457.4	2419.7	2440.7	2438.5	2445.2
45°	3728.7	3682.2	3638.9	2781.0	2748.9	2722.3	2683.5	2707.9	2714.5	2710.1
47.5°	4152.1	4101.2	3788.6	3058.1	3057.0	3036.0	2992.7	3012.7	3009.4	3009.4
50°	4577.8	4522.4	3441.6	3410.6	3399.5	3366.3	3330.8	3334.1	3335.2	3346.3
52.5°	5053.3	4039.1	3809.6	3747.6	3756.4	3734.3	3699.9	2801.0	3683.3	3693.3
55°	4723.0	4227.5	4214.2	4132.2	4153.3	4124.4	4102.3	2763.3	3663.3	4048.0
57.5°	4669.8	4634.3	4623.2	4539.0	4565.6	4291.8	4496.9	3023.8	2533.9	1851.1
60°	5076.6	5038.9	5032.2	4958.0	4955.8	3410.6	4087.9	2073.9	1620.5	1631.6
62.5°	5471.2	5410.2	5426.8	5339.3	3764.2	2078.3	1832.2	46.6	74.3	78.7
65°	5911.2	5809.2	5825.9	5744.9	3882.8	2191.3	1980.7	24.4	21.1	20.0
67.5°	6334.6	6156.2	6070.8	5985.5	4032.4	2307.7	2063.9	6.7	0.0	0.0
68°	6313.6	6125.1	6037.6	5956.7	4016.9	2304.4	2059.4	6.7	0.0	0.0
70°	5957.8	5788.2	5705.0	5643.0	3835.1	2225.7	1976.3	6.7	0.0	0.0
72.5°	5208.5	5114.3	5061.1	5006.7	3407.3	1990.7	1772.4	6.7	0.0	0.0
75°	4425.9	4399.3	4366.1	4246.4	2839.8	1629.4	1456.5	6.7	0.0	0.0
77.5°	3507.0	3505.9	3425.0	3284.3	2138.1	1196.0	1074.1	5.5	0.0	0.0
80°	1896.5	2067.2	2005.1	1933.1	1212.6	650.6	619.6	4.4	0.0	0.0
82.5°	533.2	504.3	484.4	453.3	254.9	141.9	138.6	4.4	0.0	0.0
85°	74.3	82.0	90.9	103.1	58.7	37.7	33.3	2.2	0.0	0.0
87.5°	42.1	47.7	58.7	61.0	22.2	17.7	5.5	0.0	0.0	0.0
90°	8.9	10.0	11.1	11.1	4.4	4.4	0.0	0.0	0.0	0.0
92.5°	0.0	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95°	1.1	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97.5°	1.1	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100°	1.1	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
102.5°	1.1	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
105°	1.1	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
107.5°	1.1	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0

REPORT NUMBER: P522123

CATALOG NUMBER: CST-CA10-210-760-U-T5R-HSS-HM-EX120

CANDELA DISTRIBUTION (continued):

	95°	105°	115°	125°	135°	145°	155°	165°	175°	180°
110°	1.1	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
112.5°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
115°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
117.5°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
120°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
122.5°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
125°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
127.5°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
130°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
132.5°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
135°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
137.5°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
140°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
142.5°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
145°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
147.5°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
150°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
152.5°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
155°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
157.5°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
160°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
162.5°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
165°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
167.5°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
170°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
172.5°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
175°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
177.5°	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
180°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

LM-79-08: Approved Method: Electrical and Photometric Measurements of Solid-
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

STREETWORKS

Report Number: SP1-2104-215-3

Luminaire Tested: CST-CA6-230-757-U-T4

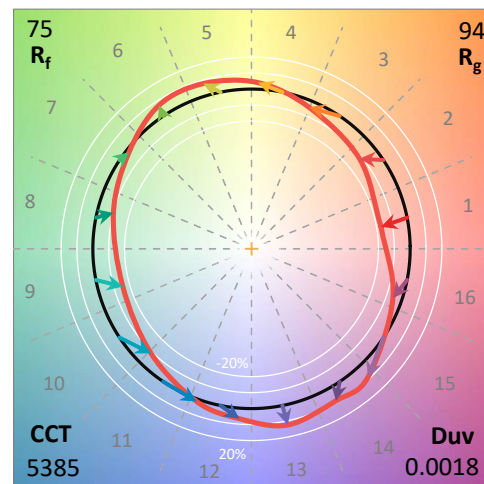
Test Date: 04/21/2021

Test Information

Test Method: LM-79-08
 Report Number: SP1-2104-215-3
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1
 Measurement Geometry: 4π
 Issue Date: 04/21/2021
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
 Product Line: STREETWORKS
 Catalog Number: **CST-CA6-230-757-U-T4**
 Description: STREETWORKS HIGH MAST LUMINAIRE

Spectral Parameters

CCT (K):	5385	CRI (Ra):	74.4		
CIE u':	0.2065	R1:	71.8	R9:	-25.2
CIE v':	0.4808	R2:	79.4	R10:	50.6
Duv:	0.0018	R3:	84.2	R11:	72.0
CIE x:	0.3351	R4:	74.7	R12:	46.0
CIE y:	0.3467	R5:	72.8	R13:	73.1
CIE z:	0.3182	R6:	71.2	R14:	91.2
Peak Wavelength (nm):	450	R7:	82.2		
Dominant Wavelength (nm):	560	R8:	58.6		
Purity:	4.7				
Rf:	75.3				
Rg:	94.2				



Test Conditions

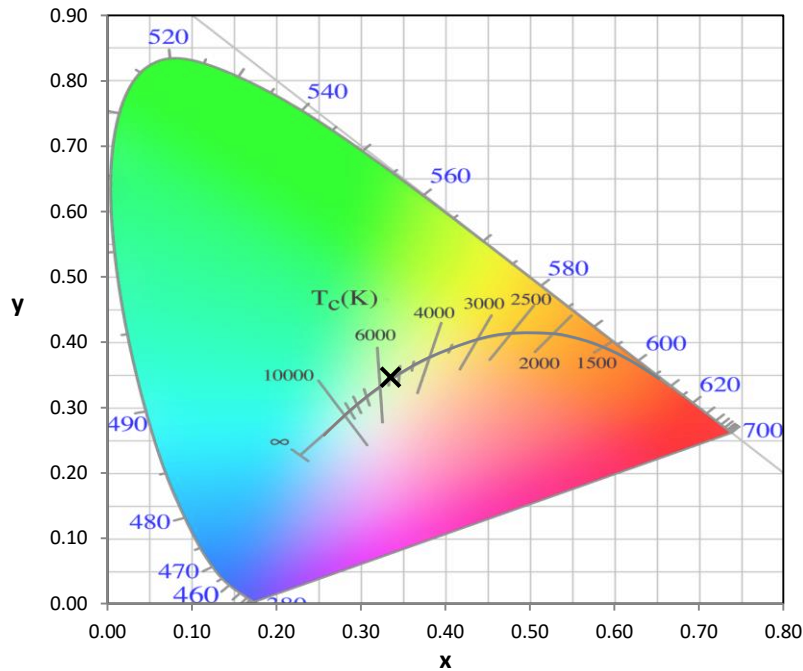
Stabilization Time: 66M
 Operation Time: 12H
 Room Temperature (°C) / RH%: 25.7/32%
 Sphere Temperature (°C): 24.8

REPORT NUMBER: SP1-2104-215-3

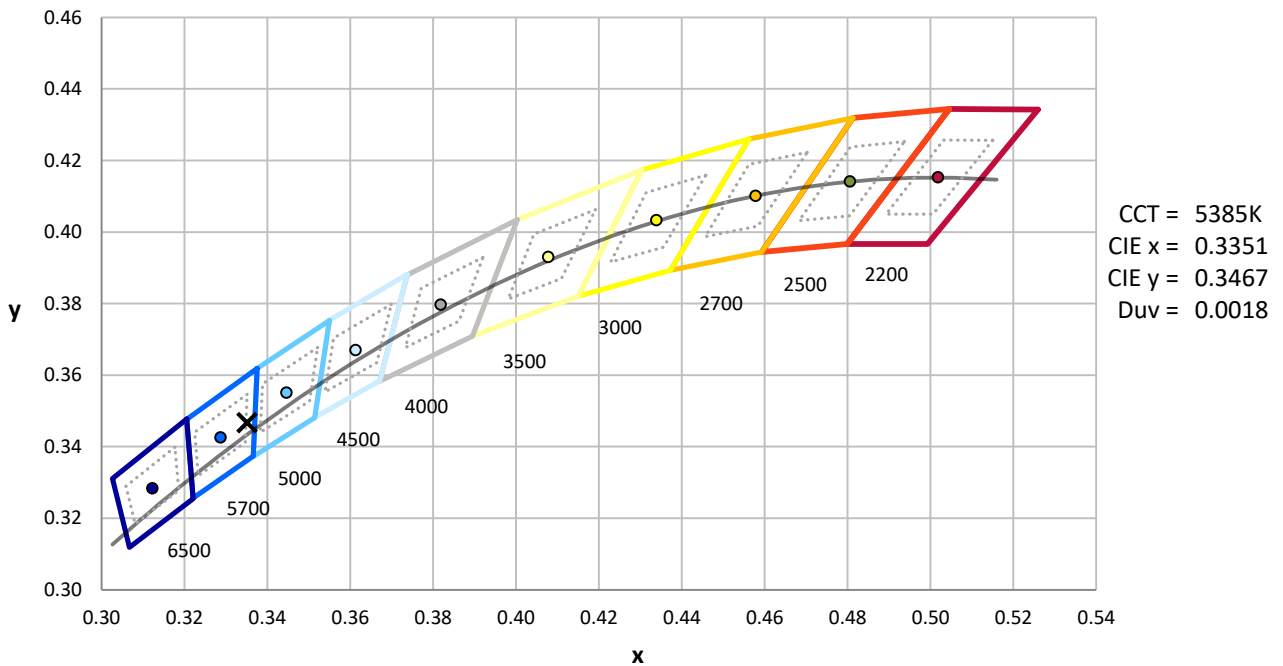
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	1/31/2021	7/31/2021
Power Meter	IN0071	12/1/2020	12/1/2021
AC Power Source	IN0063	12/1/2020	12/1/2021
DC Power Source	IN0208	12/1/2020	12/1/2021
Sphere Thermometer	IN0085	12/1/2020	12/1/2021
Room Thermometer	IN0046	12/1/2020	12/1/2021

REPORT NUMBER: SP1-2104-215-3

CIE 1931 Chromaticity Diagram



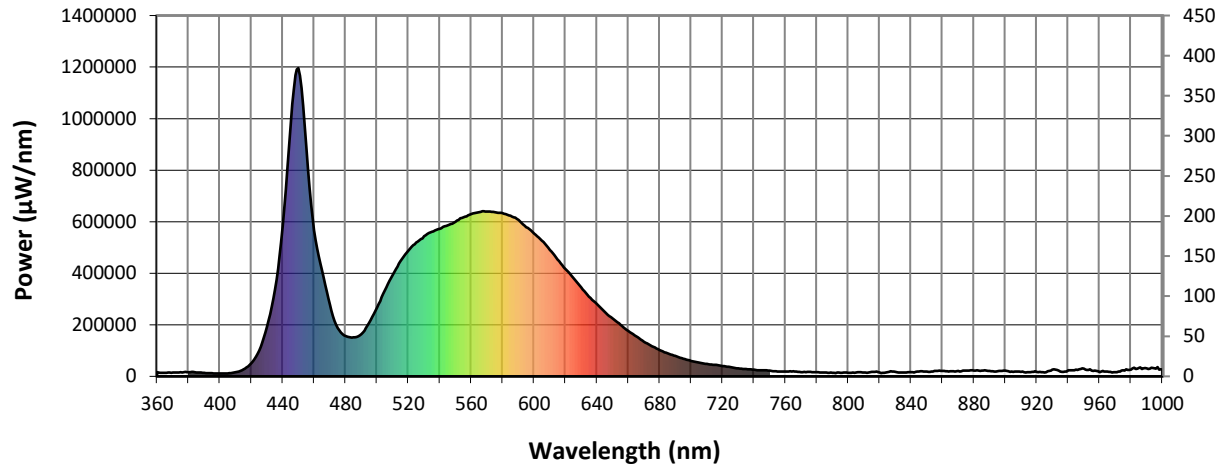
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 5700K 7-step quadrangle

REPORT NUMBER: SP1-2104-215-3

Photopic Flux vs. Wavelength

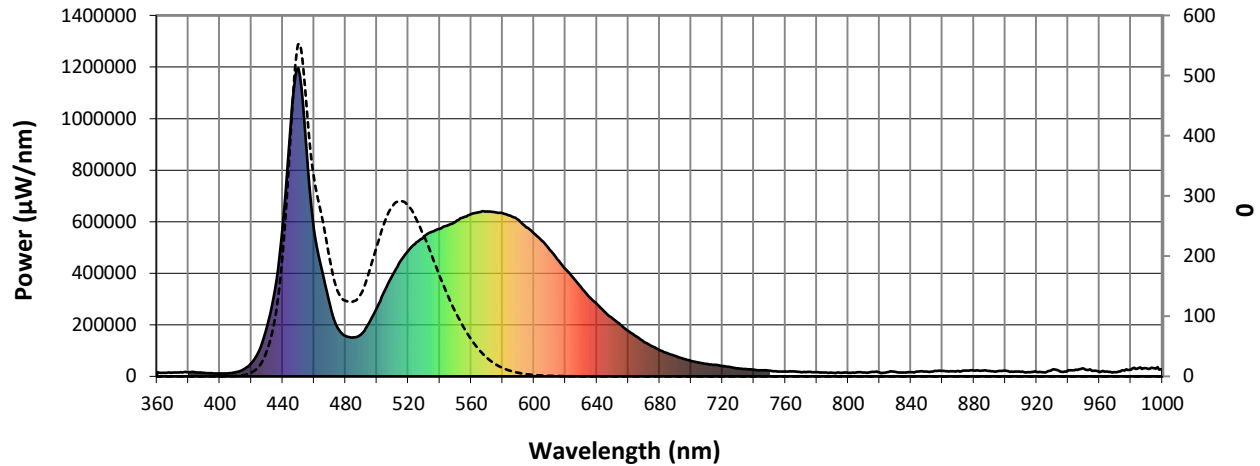


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λ (nm)	Power (μW/nm)	Lumens (Φ/nm)	λ (nm)	Power (μW/nm)	Lumens (Φ/nm)	λ (nm)	Power (μW/nm)	Lumens (Φ/nm)	λ (nm)	Power (μW/nm)	Lumens (Φ/nm)	λ (nm)	Power (μW/nm)	Lumens (Φ/nm)
360	16696	0.0	490	164243	23.3	620	415797	108.2	750	22190	0.0	880	22866	0.0
365	13447	0.0	495	207773	37.7	625	382869	84.5	755	18942	0.0	885	21901	0.0
370	14521	0.0	500	267487	59.0	630	344785	62.4	760	18760	0.0	890	20912	0.0
375	15598	0.0	505	333279	93.2	635	309549	46.5	765	19375	0.0	895	19858	0.0
380	16553	0.0	510	393084	135.0	640	280226	33.5	770	16788	0.0	900	21828	0.0
385	15196	0.0	515	446481	185.0	645	249624	24.0	775	17302	0.0	905	17086	0.0
390	13481	0.0	520	488198	236.7	650	224464	16.4	780	15672	0.0	910	17542	0.0
395	11977	0.0	525	518433	278.3	655	199646	11.5	785	14771	0.0	915	16185	0.0
400	11331	0.0	530	543281	319.9	660	175926	7.3	790	13984	0.0	920	17995	0.0
405	11814	0.0	535	561190	348.0	665	155139	4.9	795	14040	0.0	925	15557	0.0
410	16208	0.0	540	572451	373.0	670	134630	2.9	800	13342	0.0	930	26095	0.0
415	26808	0.0	545	585457	389.7	675	117218	2.0	805	14668	0.0	935	19199	0.0
420	50871	0.1	550	599090	407.1	680	102027	1.2	810	14789	0.0	940	23080	0.0
425	101020	0.5	555	616995	421.4	685	89213	0.8	815	17650	0.0	945	26343	0.0
430	192411	1.5	560	629425	427.7	690	78917	0.4	820	14937	0.0	950	29934	0.0
435	336902	4.0	565	636833	423.4	695	68780	0.3	825	16011	0.0	955	22346	0.0
440	581105	9.1	570	639836	416.0	700	60229	0.2	830	16981	0.0	960	16017	0.0
445	974221	20.3	575	636704	396.2	705	53321	0.1	835	15554	0.0	965	18299	0.0
450	1195987	31.0	580	633339	376.3	710	47871	0.1	840	16030	0.0	970	16401	0.0
455	889289	29.8	585	623206	346.3	715	44671	0.0	845	19004	0.0	975	23481	0.0
460	566512	23.2	590	607134	313.9	720	40236	0.0	850	18632	0.0	980	26457	0.0
465	410582	21.2	595	578226	274.1	725	35616	0.0	855	21549	0.0	985	32065	0.0
470	276356	17.2	600	554348	238.9	730	31102	0.0	860	21257	0.0	990	31414	0.0
475	187504	14.7	605	526616	203.9	735	28341	0.0	865	20272	0.0	995	30650	0.0
480	156769	14.9	610	490933	168.7	740	25553	0.0	870	20808	0.0	1000	26490	0.0
485	151040	17.9	615	453646	136.9	745	23976	0.0	875	22729	0.0			

REPORT NUMBER: SP1-2104-215-3

Scotopic Flux vs. Wavelength



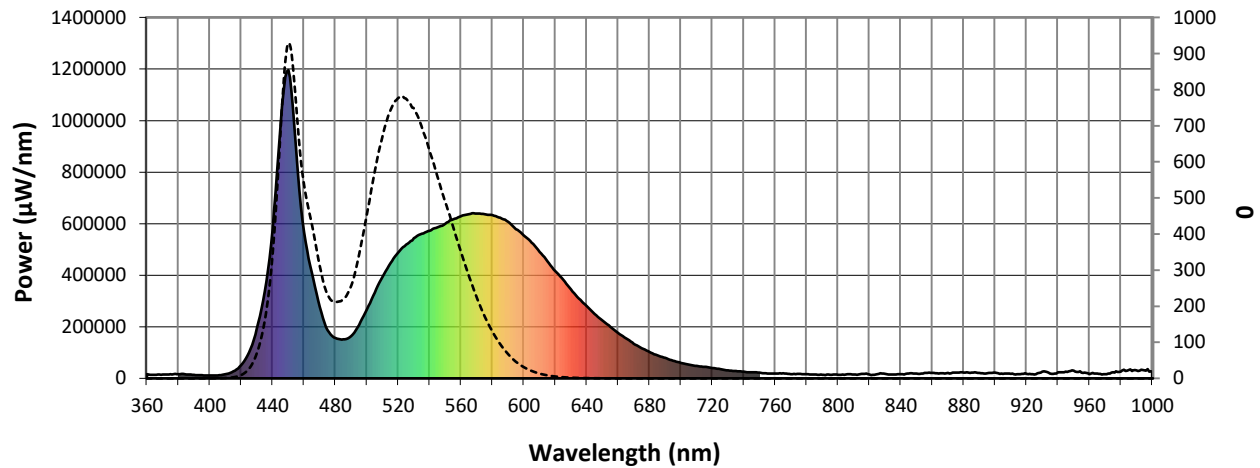
Scotopic Lumens: 72376.6

S/P: 1.89

λ (nm)	Power (μW/nm)	Lumens (Φ/nm)	λ (nm)	Power (μW/nm)	Lumens (Φ/nm)	λ (nm)	Power (μW/nm)	Lumens (Φ/nm)	λ (nm)	Power (μW/nm)	Lumens (Φ/nm)	λ (nm)	Power (μW/nm)	Lumens (Φ/nm)
360	16696	0.0	490	164243	252.9	620	415797	5.2	750	22190	0.0	880	22866	0.0
365	13447	0.0	495	207773	335.9	625	382869	3.2	755	18942	0.0	885	21901	0.0
370	14521	0.0	500	267487	447.4	630	344785	2.0	760	18760	0.0	890	20912	0.0
375	15598	0.0	505	333279	566.6	635	309549	1.2	765	19375	0.0	895	19858	0.0
380	16553	0.0	510	393084	666.2	640	280226	0.7	770	16788	0.0	900	21828	0.0
385	15196	0.0	515	446481	740.0	645	249624	0.4	775	17302	0.0	905	17086	0.0
390	13481	0.1	520	488198	776.0	650	224464	0.3	780	15672	0.0	910	17542	0.0
395	11977	0.1	525	518433	775.6	655	199646	0.2	785	14771	0.0	915	16185	0.0
400	11331	0.2	530	543281	749.0	660	175926	0.1	790	13984	0.0	920	17995	0.0
405	11814	0.4	535	561190	699.3	665	155139	0.1	795	14040	0.0	925	15557	0.0
410	16208	1.0	540	572451	632.6	670	134630	0.0	800	13342	0.0	930	26095	0.0
415	26808	2.8	545	585457	561.3	675	117218	0.0	805	14668	0.0	935	19199	0.0
420	50871	8.4	550	599090	489.9	680	102027	0.0	810	14789	0.0	940	23080	0.0
425	101020	24.7	555	616995	421.7	685	89213	0.0	815	17650	0.0	945	26343	0.0
430	192411	65.5	560	629425	351.8	690	78917	0.0	820	14937	0.0	950	29934	0.0
435	336902	150.6	565	636833	285.7	695	68780	0.0	825	16011	0.0	955	22346	0.0
440	581105	324.8	570	639836	225.8	700	60229	0.0	830	16981	0.0	960	16017	0.0
445	974221	652.3	575	636704	173.4	705	53321	0.0	835	15554	0.0	965	18299	0.0
450	1195987	927.0	580	633339	130.5	710	47871	0.0	840	16030	0.0	970	16401	0.0
455	889289	777.1	585	623206	95.2	715	44671	0.0	845	19004	0.0	975	23481	0.0
460	566512	547.2	590	607134	67.6	720	40236	0.0	850	18632	0.0	980	26457	0.0
465	410582	433.6	595	578226	46.1	725	35616	0.0	855	21549	0.0	985	32065	0.0
470	276356	318.2	600	554348	31.2	730	31102	0.0	860	21257	0.0	990	31414	0.0
475	187504	234.4	605	526616	20.7	735	28341	0.0	865	20272	0.0	995	30650	0.0
480	156769	211.8	610	490933	13.3	740	25553	0.0	870	20808	0.0	1000	26490	0.0
485	151040	218.9	615	453646	8.4	745	23976	0.0	875	22729	0.0			

REPORT NUMBER: SP1-2104-215-3

Melanopic Flux vs. Wavelength



Melanopic Lumens: 29860.2 **M/P: 0.78**

λ (nm)	Power (μW/nm)	Lumens (Φ/nm)	λ (nm)	Power (μW/nm)	Lumens (Φ/nm)	λ (nm)	Power (μW/nm)	Lumens (Φ/nm)	λ (nm)	Power (μW/nm)	Lumens (Φ/nm)	λ (nm)	Power (μW/nm)	Lumens (Φ/nm)
360	16696	0.0	490	164243	136.7	620	415797	0.3	750	22190	0.0	880	22866	0.0
365	13447	0.0	495	207773	171.5	625	382869	0.2	755	18942	0.0	885	21901	0.0
370	14521	0.0	500	267487	215.0	630	344785	0.1	760	18760	0.0	890	20912	0.0
375	15598	0.0	505	333279	255.8	635	309549	0.1	765	19375	0.0	895	19858	0.0
380	16553	0.0	510	393084	282.2	640	280226	0.0	770	16788	0.0	900	21828	0.0
385	15196	0.0	515	446481	291.7	645	249624	0.0	775	17302	0.0	905	17086	0.0
390	13481	0.0	520	488198	284.2	650	224464	0.0	780	15672	0.0	910	17542	0.0
395	11977	0.1	525	518433	262.9	655	199646	0.0	785	14771	0.0	915	16185	0.0
400	11331	0.1	530	543281	234.8	660	175926	0.0	790	13984	0.0	920	17995	0.0
405	11814	0.2	535	561190	202.0	665	155139	0.0	795	14040	0.0	925	15557	0.0
410	16208	0.6	540	572451	167.5	670	134630	0.0	800	13342	0.0	930	26095	0.0
415	26808	1.8	545	585457	136.0	675	117218	0.0	805	14668	0.0	935	19199	0.0
420	50871	5.8	550	599090	107.5	680	102027	0.0	810	14789	0.0	940	23080	0.0
425	101020	15.7	555	616995	83.2	685	89213	0.0	815	17650	0.0	945	26343	0.0
430	192411	40.6	560	629425	62.1	690	78917	0.0	820	14937	0.0	950	29934	0.0
435	336902	89.9	565	636833	44.7	695	68780	0.0	825	16011	0.0	955	22346	0.0
440	581105	194.2	570	639836	31.3	700	60229	0.0	830	16981	0.0	960	16017	0.0
445	974221	384.3	575	636704	21.2	705	53321	0.0	835	15554	0.0	965	18299	0.0
450	1195987	551.1	580	633339	14.2	710	47871	0.0	840	16030	0.0	970	16401	0.0
455	889289	465.9	585	623206	9.3	715	44671	0.0	845	19004	0.0	975	23481	0.0
460	566512	333.8	590	607134	6.0	720	40236	0.0	850	18632	0.0	980	26457	0.0
465	410582	268.3	595	578226	3.7	725	35616	0.0	855	21549	0.0	985	32065	0.0
470	276356	197.8	600	554348	2.3	730	31102	0.0	860	21257	0.0	990	31414	0.0
475	187504	143.2	605	526616	1.5	735	28341	0.0	865	20272	0.0	995	30650	0.0
480	156769	126.0	610	490933	0.9	740	25553	0.0	870	20808	0.0	1000	26490	0.0
485	151040	124.5	615	453646	0.5	745	23976	0.0	875	22729	0.0			

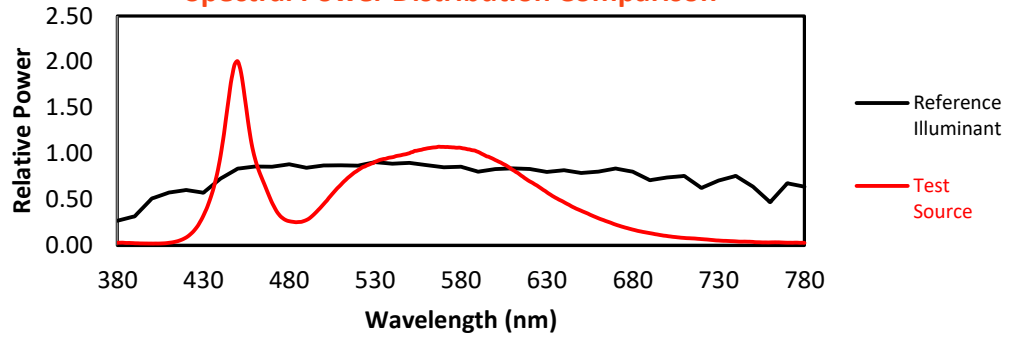
REPORT NUMBER: SP1-2104-215-3

TM-30-18

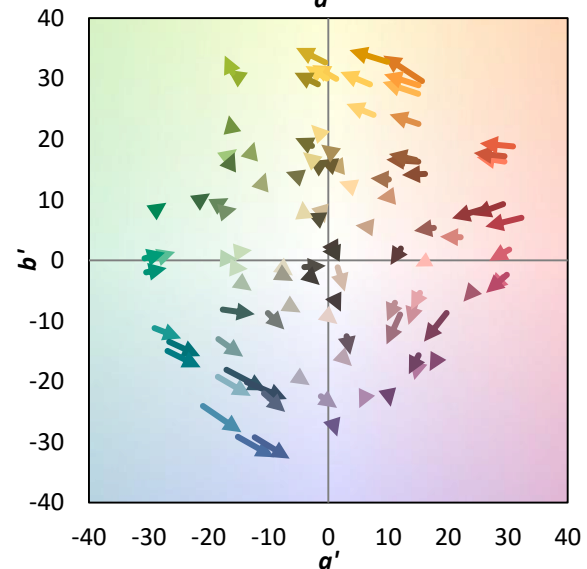
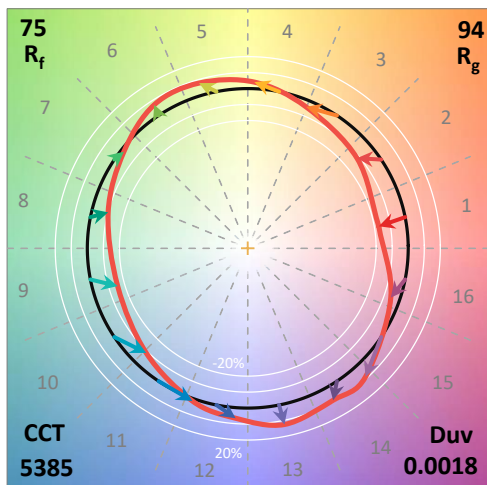
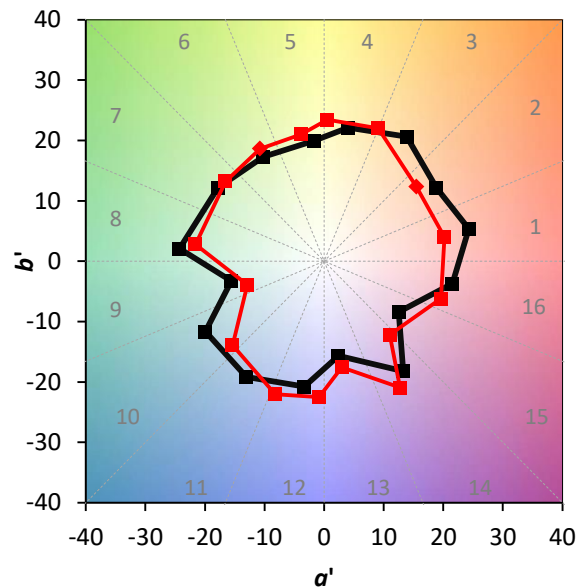
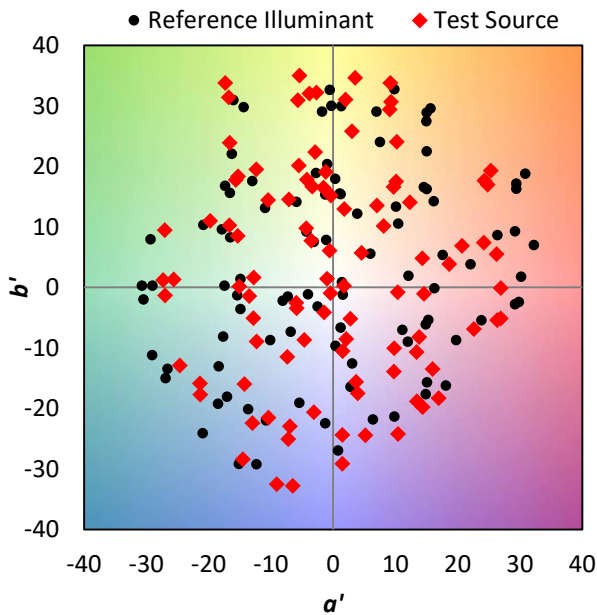
Summary

$R_f = 75.3$
 $R_g = 94.2$
 CIE $R_a = 74.4$
 $R_g = -25.2$

Spectral Power Distribution Comparison

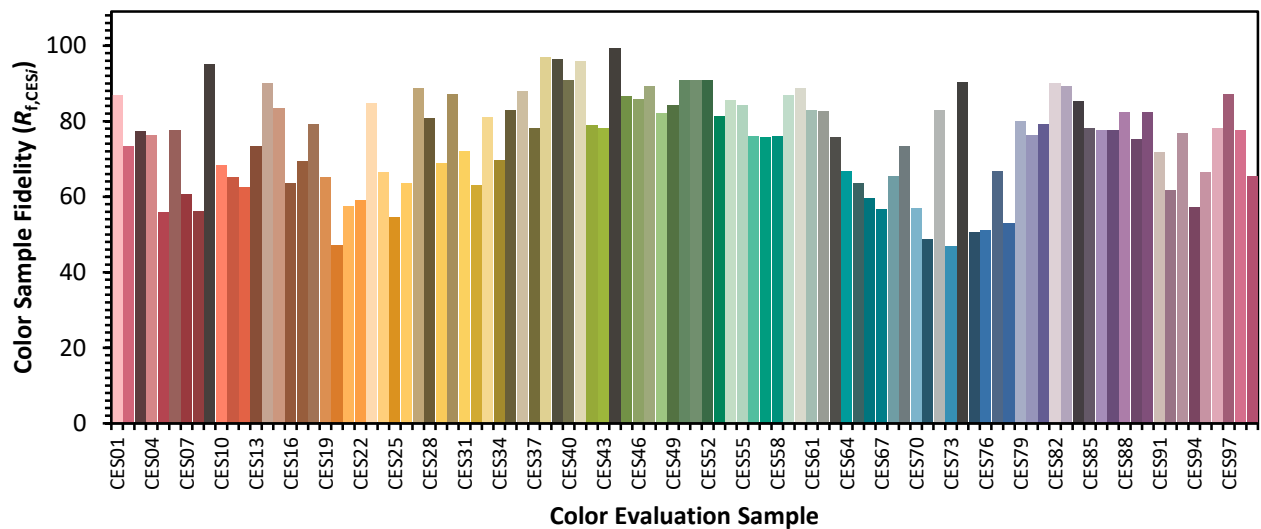


Color Vector Graphics

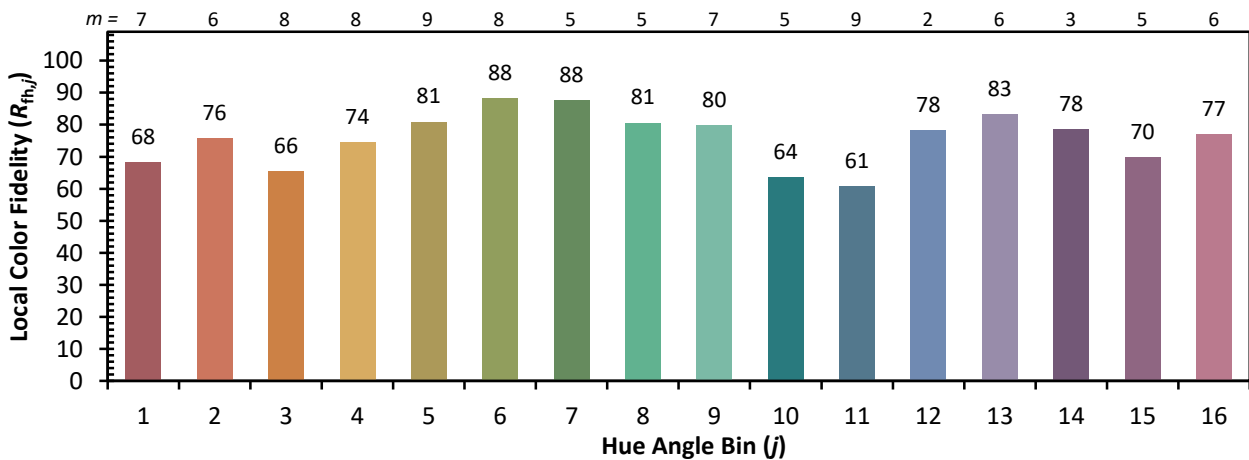
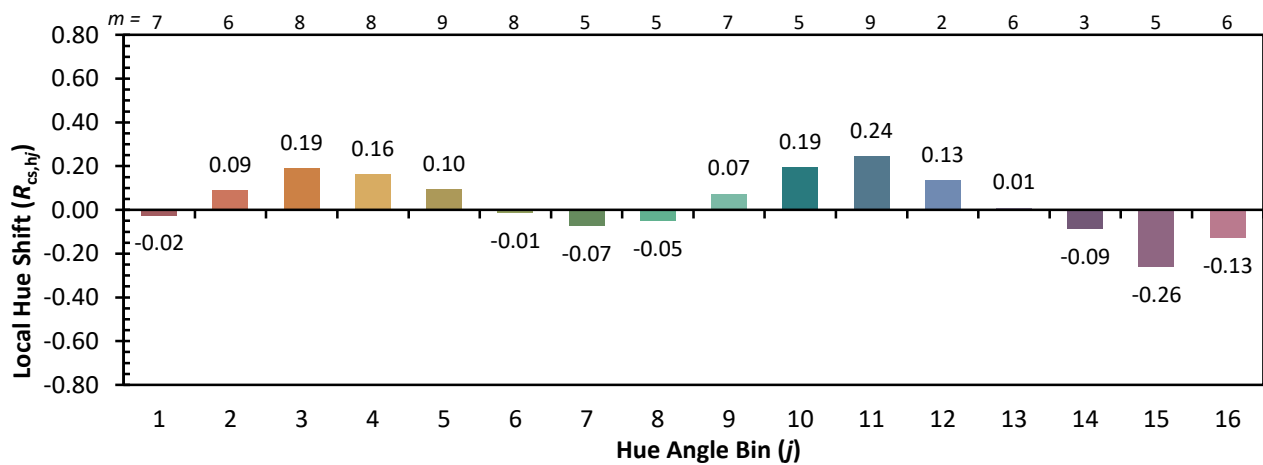
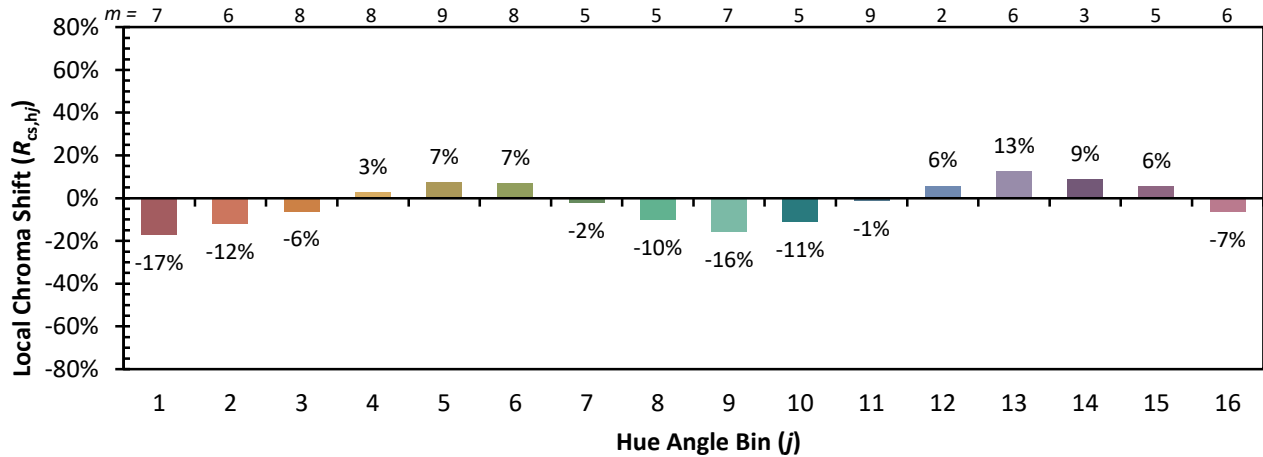


Individual Sample Fidelity Index ($R_{f,i}$)

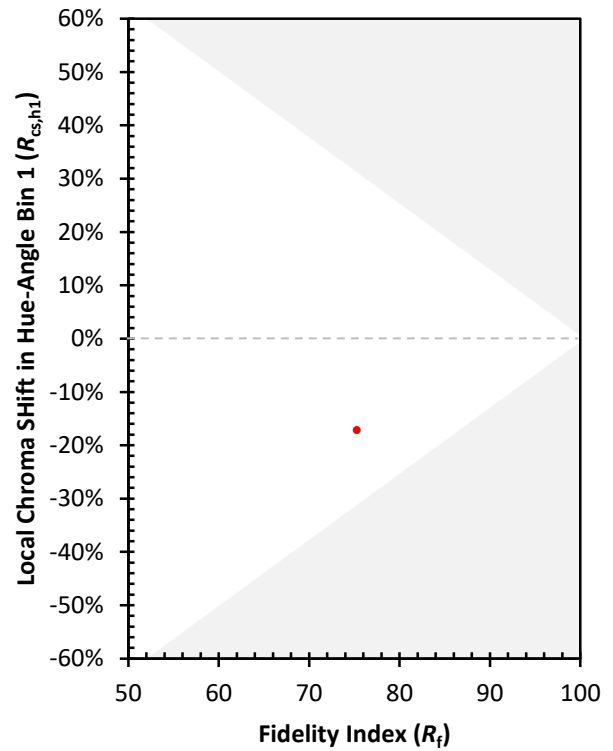
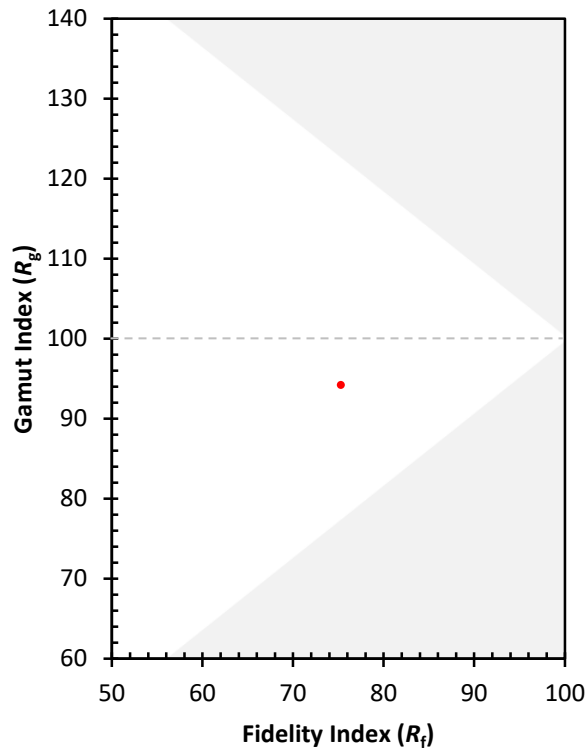
CES01 = 85	CES26 = 64	CES51 = 91	CES76 = 51
CES02 = 59	CES27 = 89	CES52 = 91	CES77 = 67
CES03 = 30	CES28 = 81	CES53 = 81	CES78 = 53
CES04 = 69	CES29 = 69	CES54 = 86	CES79 = 80
CES05 = 46	CES30 = 87	CES55 = 84	CES80 = 76
CES06 = 50	CES31 = 72	CES56 = 76	CES81 = 79
CES07 = 38	CES32 = 63	CES57 = 76	CES82 = 90
CES08 = 38	CES33 = 81	CES58 = 76	CES83 = 89
CES09 = 29	CES34 = 70	CES59 = 87	CES84 = 85
CES10 = 72	CES35 = 83	CES60 = 89	CES85 = 78
CES11 = 55	CES36 = 88	CES61 = 83	CES86 = 78
CES12 = 61	CES37 = 78	CES62 = 83	CES87 = 77
CES13 = 41	CES38 = 97	CES63 = 76	CES88 = 82
CES14 = 74	CES39 = 96	CES64 = 67	CES89 = 75
CES15 = 70	CES40 = 91	CES65 = 64	CES90 = 82
CES16 = 46	CES41 = 96	CES66 = 60	CES91 = 72
CES17 = 48	CES42 = 79	CES67 = 57	CES92 = 62
CES18 = 55	CES43 = 78	CES68 = 65	CES93 = 77
CES19 = 71	CES44 = 99	CES69 = 73	CES94 = 57
CES20 = 64	CES45 = 87	CES70 = 57	CES95 = 66
CES21 = 85	CES46 = 86	CES71 = 49	CES96 = 78
CES22 = 77	CES47 = 89	CES72 = 83	CES97 = 87
CES23 = 91	CES48 = 82	CES73 = 47	CES98 = 78
CES24 = 90	CES49 = 84	CES74 = 90	CES99 = 65
CES25 = 71	CES50 = 91	CES75 = 51	



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)