

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: P386622

Luminaire Tested: **GWC-SA2B-735-U-T3-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P386622  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-15)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GWC-SA2B-735-U-T3-HSS  
Description: GALLEON WALL LUMINAIRE  
(2) 70 CRI, 3500K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III  
OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 8164.3 lumens  
Efficiency: N/A  
Efficacy: 94.9 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 0.5' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B1 - U0 - G2

Input Watts (W): 86  
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: 28.75 FT

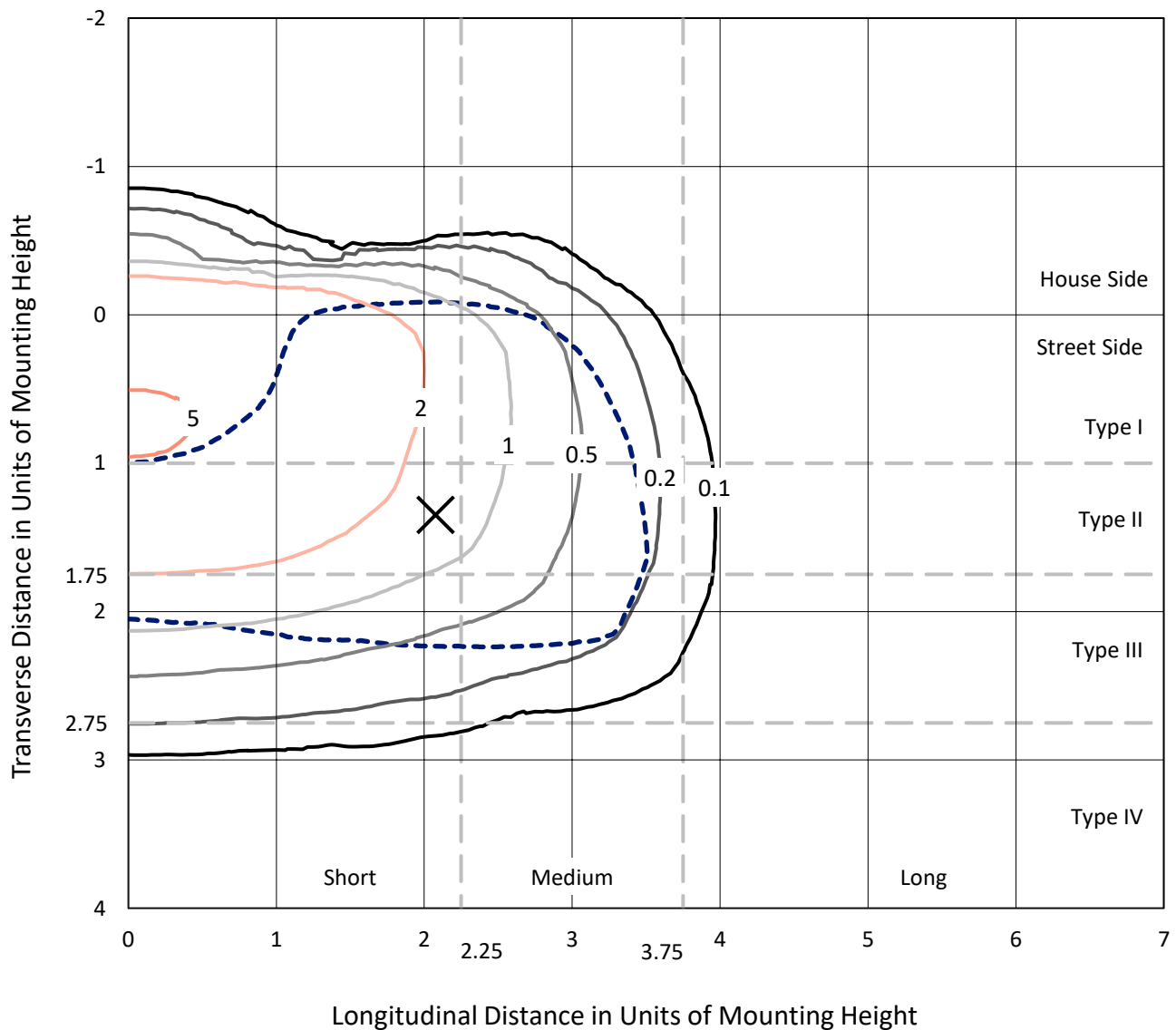


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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 - - - 1/2 Max cd

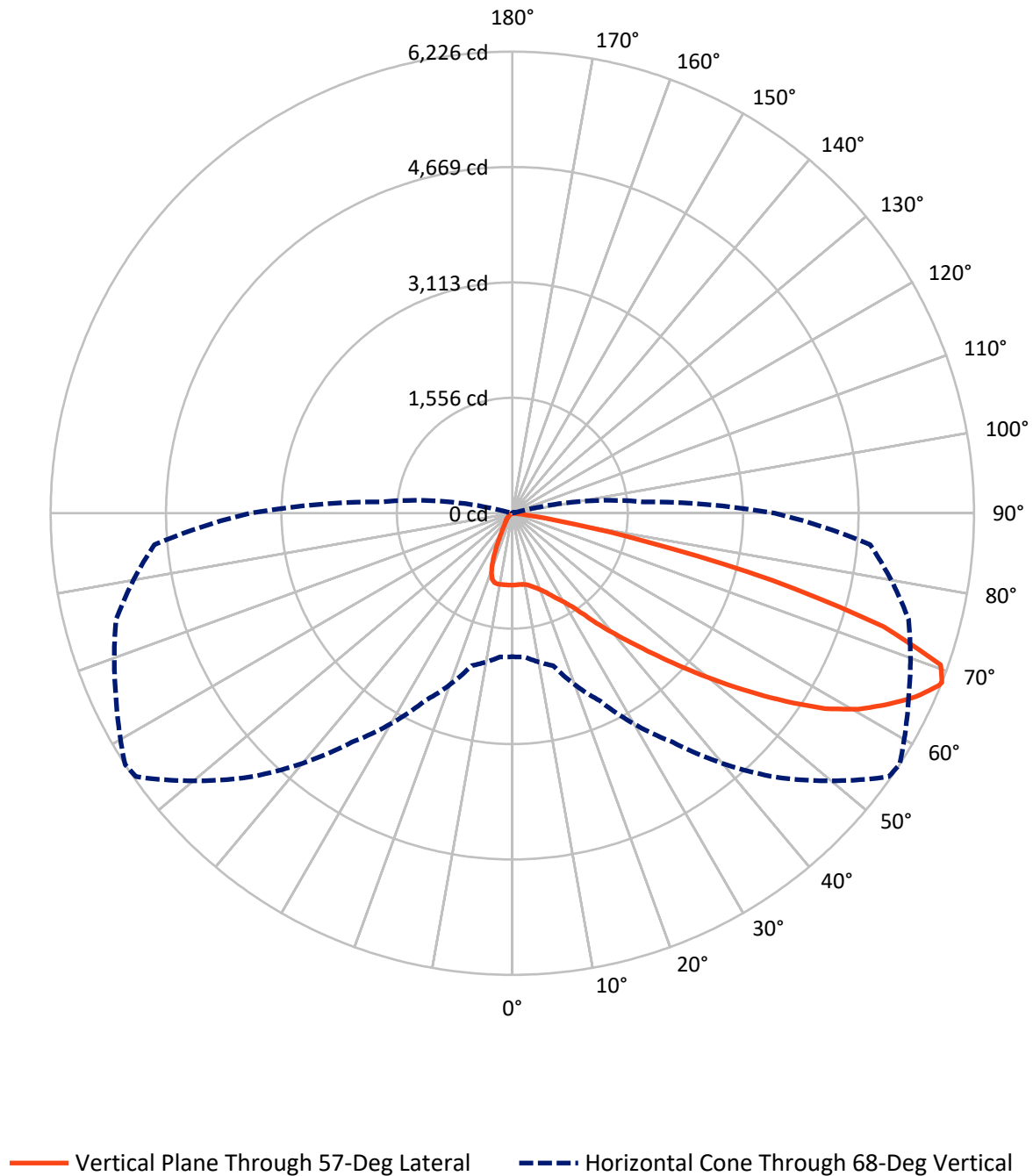


Based on 15 foot mounting height. Maximum calculated value = 5.6 fc  
 Type III - Short - N/A

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## Luminous Intensity Polar Plot



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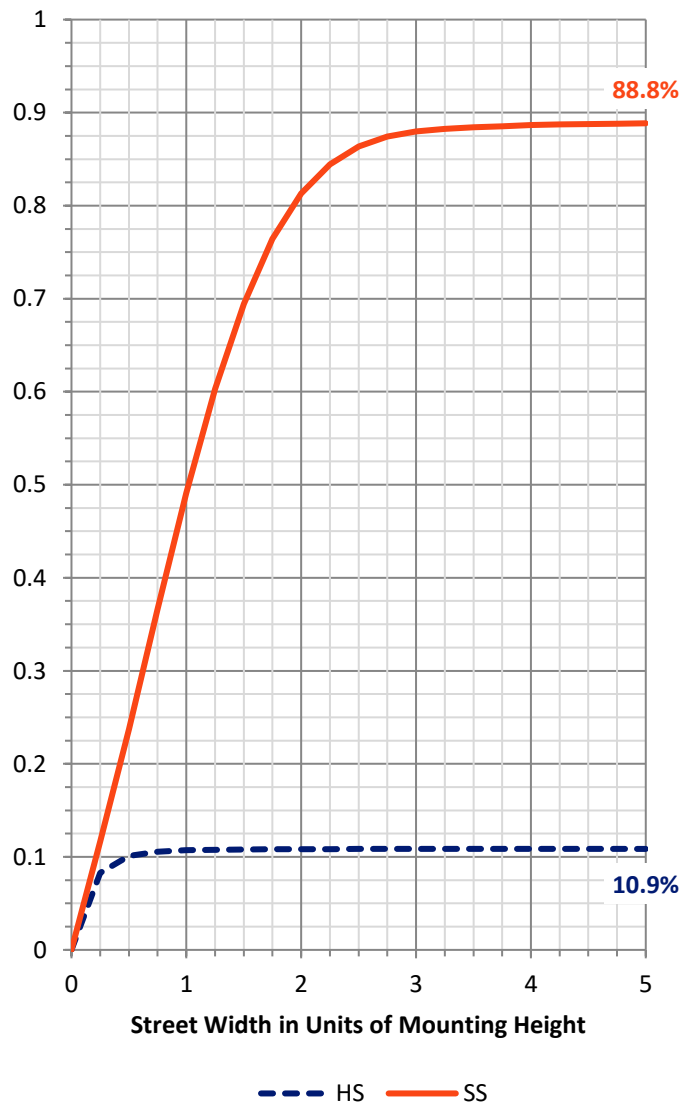
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 895.3    | 0.0    | 895.3  |
|                    | % Fixture | 11.0     | 0.0    | 11.0   |
| <b>Street Side</b> | Lumens    | 7269.0   | 0.0    | 7269.0 |
|                    | % Fixture | 89.0     | 0.0    | 89.0   |
| <b>Total</b>       | Lumens    | 8164.3   | 0.0    | 8164.3 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 90.8   | 1.1       |
| 10°-20°   | 251.6  | 3.1       |
| 20°-30°   | 434.0  | 5.3       |
| 30°-40°   | 749.1  | 9.2       |
| 40°-50°   | 1281.3 | 15.7      |
| 50°-60°   | 2050.0 | 25.1      |
| 60°-70°   | 2368.5 | 29.0      |
| 70°-80°   | 905.0  | 11.1      |
| 80°-90°   | 33.9   | 0.4       |
| 90°-100°  | 0.0    | 0.0       |
| 100°-110° | 0.0    | 0.0       |
| 110°-120° | 0.0    | 0.0       |
| 120°-130° | 0.0    | 0.0       |
| 130°-140° | 0.0    | 0.0       |
| 140°-150° | 0.0    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-90°    | 8164.3 | 100.0     |
| 0°-180°   | 8164.3 | 100.0     |

**Coefficient of Utilization**



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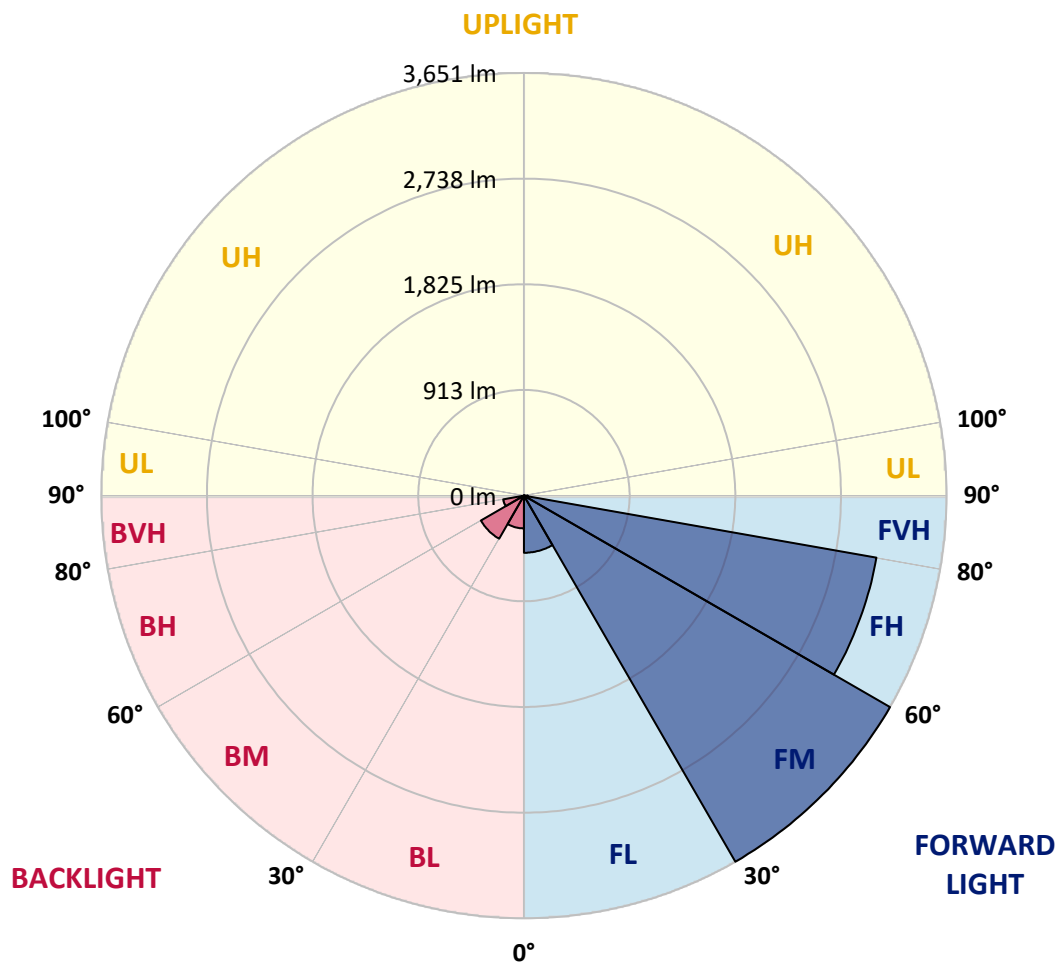
CATALOG NUMBER: GWC-SA2B-735-U-T3-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 493.5  | 6.0       |                         |      |         |
| FM   | (30°-60°)   | 3651.0 | 44.7      |                         |      |         |
| FH   | (60°-80°)   | 3091.3 | 37.9      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 33.3   | 0.4       |                         |      | G1/100  |
| BL   | (0°-30°)    | 282.9  | 3.5       | B1/500                  |      |         |
| BM   | (30°-60°)   | 429.4  | 5.3       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 182.3  | 2.2       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 0.6    | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G2**

Type III Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 57°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 970.1  | 970.1  | 970.1  | 970.1  | 970.1  | 970.1  | 970.1  | 970.1  | 970.1  | 970.1  | 970.1  |
| 2.5°  | 947.4  | 951.6  | 954.7  | 956.6  | 958.9  | 963.9  | 965.5  | 967.9  | 969.0  | 969.0  | 971.7  |
| 5°    | 909.9  | 914.5  | 921.1  | 926.5  | 937.3  | 951.2  | 961.3  | 965.1  | 972.1  | 978.2  | 981.7  |
| 7.5°  | 875.1  | 880.6  | 888.3  | 901.1  | 919.6  | 941.9  | 962.8  | 968.2  | 981.7  | 994.8  | 1001.4 |
| 10°   | 852.8  | 857.0  | 867.1  | 885.2  | 909.5  | 940.8  | 970.1  | 976.7  | 999.9  | 1021.9 | 1034.2 |
| 12.5° | 845.1  | 848.9  | 859.4  | 879.8  | 909.9  | 946.6  | 987.1  | 996.8  | 1030.7 | 1062.7 | 1080.1 |
| 15°   | 856.3  | 857.0  | 868.2  | 887.5  | 917.2  | 960.9  | 1015.3 | 1026.9 | 1069.7 | 1111.4 | 1133.0 |
| 17.5° | 899.5  | 896.0  | 901.8  | 910.3  | 933.9  | 979.8  | 1045.0 | 1062.4 | 1119.6 | 1168.5 | 1189.0 |
| 20°   | 1007.6 | 1007.6 | 994.4  | 971.3  | 971.7  | 1009.1 | 1085.2 | 1104.8 | 1174.7 | 1231.5 | 1250.1 |
| 22.5° | 1192.5 | 1189.0 | 1162.8 | 1106.0 | 1053.9 | 1059.7 | 1134.2 | 1159.7 | 1241.1 | 1301.7 | 1307.9 |
| 25°   | 1414.8 | 1410.6 | 1370.1 | 1290.2 | 1199.8 | 1141.6 | 1200.6 | 1229.9 | 1320.3 | 1374.0 | 1361.2 |
| 27.5° | 1650.3 | 1646.9 | 1606.7 | 1507.5 | 1378.9 | 1272.0 | 1279.7 | 1307.5 | 1400.9 | 1453.8 | 1413.3 |
| 30°   | 1878.5 | 1879.6 | 1839.9 | 1738.0 | 1592.5 | 1438.4 | 1380.1 | 1396.3 | 1479.4 | 1533.0 | 1475.0 |
| 32.5° | 2095.4 | 2097.0 | 2062.6 | 1948.8 | 1812.8 | 1631.8 | 1519.1 | 1514.9 | 1570.4 | 1623.3 | 1557.0 |
| 35°   | 2288.8 | 2292.7 | 2269.2 | 2180.8 | 2036.8 | 1847.2 | 1699.4 | 1689.3 | 1699.7 | 1759.6 | 1682.4 |
| 37.5° | 2475.3 | 2477.7 | 2459.9 | 2385.4 | 2264.9 | 2083.9 | 1927.2 | 1912.9 | 1890.4 | 1936.4 | 1848.0 |
| 40°   | 2679.5 | 2673.7 | 2653.3 | 2585.7 | 2482.3 | 2345.2 | 2171.9 | 2147.2 | 2108.2 | 2149.1 | 2065.7 |
| 42.5° | 2869.5 | 2862.9 | 2866.4 | 2789.9 | 2702.7 | 2613.9 | 2457.2 | 2414.7 | 2392.0 | 2439.0 | 2332.9 |
| 45°   | 3106.9 | 3103.4 | 3115.0 | 3048.6 | 2978.0 | 2913.4 | 2784.2 | 2737.9 | 2727.8 | 2783.0 | 2655.9 |
| 47.5° | 3341.2 | 3349.7 | 3385.6 | 3357.4 | 3328.8 | 3272.1 | 3130.4 | 3109.6 | 3115.8 | 3182.6 | 2996.9 |
| 50°   | 3536.5 | 3546.6 | 3645.0 | 3677.4 | 3718.8 | 3685.5 | 3543.5 | 3530.8 | 3555.0 | 3615.4 | 3363.6 |
| 52.5° | 3677.8 | 3698.3 | 3820.7 | 3970.1 | 4120.7 | 4143.0 | 4001.3 | 3989.8 | 4022.6 | 4031.9 | 3647.0 |
| 55°   | 3775.9 | 3794.0 | 3932.7 | 4205.9 | 4512.5 | 4608.9 | 4520.9 | 4476.2 | 4470.0 | 4378.5 | 3945.0 |
| 57.5° | 3793.3 | 3791.4 | 3990.5 | 4358.4 | 4819.7 | 5068.8 | 5013.2 | 4969.2 | 4842.6 | 4698.9 | 4286.6 |
| 60°   | 3695.2 | 3706.4 | 3937.7 | 4411.3 | 5012.8 | 5416.6 | 5420.9 | 5363.8 | 5166.5 | 5010.4 | 4617.9 |
| 62.5° | 3393.4 | 3438.9 | 3672.5 | 4272.7 | 5010.4 | 5556.7 | 5719.7 | 5676.0 | 5440.1 | 5265.7 | 4953.7 |
| 65°   | 2903.9 | 2920.0 | 3142.8 | 3797.9 | 4671.9 | 5498.1 | 5988.7 | 5972.5 | 5686.8 | 5513.5 | 5126.3 |
| 67.5° | 2120.6 | 2085.5 | 2319.4 | 2990.7 | 3955.4 | 5156.1 | 6181.8 | 6202.2 | 5877.1 | 5564.4 | 4942.5 |
| 68°   | 1935.2 | 1945.7 | 2127.9 | 2791.1 | 3767.8 | 5035.2 | 6194.5 | 6225.7 | 5896.1 | 5531.2 | 4842.2 |
| 70°   | 1153.5 | 1173.6 | 1336.1 | 1921.7 | 2866.4 | 4351.5 | 6057.0 | 6128.4 | 5783.4 | 5188.8 | 4188.2 |
| 72.5° | 294.6  | 318.5  | 472.1  | 860.1  | 1637.2 | 3066.0 | 5113.1 | 5234.0 | 5021.2 | 4209.4 | 2827.4 |
| 75°   | 121.2  | 127.4  | 168.7  | 283.3  | 609.9  | 1381.3 | 3370.2 | 3628.8 | 3480.9 | 2520.1 | 1277.8 |
| 77.5° | 83.8   | 88.0   | 108.5  | 157.2  | 264.1  | 468.3  | 1652.3 | 1839.1 | 1656.9 | 860.1  | 278.7  |
| 80°   | 60.2   | 63.7   | 77.6   | 104.6  | 151.7  | 167.1  | 538.6  | 622.7  | 494.5  | 188.8  | 69.1   |
| 82.5° | 35.9   | 38.6   | 57.9   | 74.5   | 92.2   | 79.9   | 134.0  | 152.1  | 143.3  | 93.8   | 30.9   |
| 85°   | 17.8   | 20.9   | 39.0   | 53.3   | 49.8   | 33.6   | 41.0   | 45.6   | 56.4   | 57.1   | 16.6   |
| 87.5° | 1.1    | 2.3    | 22.7   | 32.0   | 13.9   | 7.7    | 11.9   | 14.7   | 20.1   | 28.2   | 7.0    |
| 90°   | 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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CATALOG NUMBER: GWC-SA2B-735-U-T3-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 970.1  | 970.1  | 970.1  | 970.1  | 970.1 | 970.1 | 970.1 | 970.1 | 970.1 | 970.1 | 970.1 |
| 2.5°  | 972.8  | 973.2  | 970.5  | 969.4  | 970.1 | 965.5 | 963.5 | 964.4 | 964.4 | 965.5 | 963.5 |
| 5°    | 982.5  | 982.5  | 977.8  | 971.7  | 968.2 | 959.3 | 953.5 | 952.0 | 950.9 | 950.1 | 948.5 |
| 7.5°  | 1003.4 | 1001.0 | 992.9  | 979.4  | 967.9 | 948.5 | 933.9 | 926.1 | 922.3 | 920.7 | 919.6 |
| 10°   | 1036.9 | 1032.7 | 1019.1 | 994.1  | 967.4 | 933.1 | 901.1 | 878.2 | 859.4 | 851.7 | 847.0 |
| 12.5° | 1082.1 | 1075.9 | 1053.2 | 1011.4 | 964.8 | 901.4 | 831.9 | 765.1 | 702.9 | 677.5 | 664.8 |
| 15°   | 1134.2 | 1125.3 | 1089.4 | 1026.1 | 948.9 | 830.0 | 679.1 | 562.0 | 476.0 | 443.6 | 429.7 |
| 17.5° | 1187.1 | 1175.5 | 1121.1 | 1035.4 | 901.4 | 682.2 | 476.4 | 359.8 | 302.3 | 286.8 | 281.4 |
| 20°   | 1240.4 | 1223.4 | 1148.5 | 1028.4 | 794.1 | 491.9 | 314.2 | 262.9 | 246.3 | 241.7 | 240.1 |
| 22.5° | 1290.9 | 1264.7 | 1173.2 | 1001.4 | 628.8 | 330.1 | 248.7 | 232.4 | 227.0 | 224.3 | 223.5 |
| 25°   | 1335.0 | 1298.2 | 1194.8 | 918.0  | 445.1 | 249.4 | 224.0 | 218.5 | 211.6 | 206.6 | 206.9 |
| 27.5° | 1376.2 | 1331.9 | 1208.0 | 780.5  | 296.8 | 213.1 | 207.3 | 200.0 | 187.2 | 179.9 | 179.9 |
| 30°   | 1426.1 | 1376.7 | 1217.5 | 600.6  | 218.5 | 188.3 | 183.7 | 172.6 | 155.2 | 145.5 | 145.5 |
| 32.5° | 1501.0 | 1444.6 | 1211.4 | 421.6  | 181.0 | 165.6 | 154.8 | 139.4 | 120.4 | 111.2 | 110.8 |
| 35°   | 1615.6 | 1549.6 | 1167.4 | 276.4  | 159.8 | 144.0 | 126.6 | 107.7 | 91.1  | 83.4  | 83.0  |
| 37.5° | 1770.0 | 1690.1 | 1068.6 | 197.6  | 143.3 | 123.9 | 103.1 | 82.2  | 69.9  | 64.8  | 64.4  |
| 40°   | 1970.4 | 1853.4 | 927.3  | 160.2  | 127.8 | 104.6 | 79.6  | 63.7  | 55.2  | 51.4  | 51.8  |
| 42.5° | 2210.9 | 2028.2 | 757.8  | 138.2  | 112.7 | 86.0  | 62.2  | 50.2  | 44.8  | 42.1  | 41.3  |
| 45°   | 2478.0 | 2200.8 | 580.3  | 123.2  | 97.7  | 69.5  | 48.7  | 39.7  | 35.5  | 34.0  | 34.0  |
| 47.5° | 2771.8 | 2368.8 | 424.6  | 110.0  | 81.4  | 53.6  | 39.0  | 32.4  | 28.9  | 27.8  | 27.4  |
| 50°   | 3038.6 | 2485.4 | 306.1  | 96.1   | 66.8  | 42.5  | 31.7  | 27.1  | 24.7  | 23.2  | 23.2  |
| 52.5° | 3260.9 | 2522.0 | 225.5  | 81.1   | 54.0  | 34.0  | 26.2  | 23.2  | 20.9  | 19.7  | 19.7  |
| 55°   | 3456.7 | 2507.0 | 167.6  | 66.8   | 43.6  | 27.8  | 22.4  | 19.7  | 17.8  | 16.6  | 16.6  |
| 57.5° | 3644.3 | 2458.3 | 125.0  | 54.4   | 35.1  | 22.4  | 18.9  | 16.6  | 14.7  | 13.9  | 13.9  |
| 60°   | 3797.5 | 2377.2 | 93.0   | 44.0   | 28.2  | 18.1  | 15.8  | 13.5  | 11.9  | 10.8  | 10.8  |
| 62.5° | 3921.9 | 2287.7 | 68.3   | 36.3   | 22.4  | 14.3  | 12.4  | 11.2  | 8.9   | 7.7   | 7.7   |
| 65°   | 3922.6 | 2139.1 | 51.4   | 30.2   | 17.4  | 11.2  | 9.3   | 8.9   | 5.8   | 4.6   | 4.2   |
| 67.5° | 3638.8 | 1844.1 | 39.4   | 25.8   | 13.5  | 8.5   | 7.0   | 7.3   | 3.1   | 2.0   | 1.5   |
| 68°   | 3535.8 | 1769.3 | 37.1   | 25.5   | 12.8  | 8.1   | 6.6   | 7.3   | 2.7   | 1.5   | 1.1   |
| 70°   | 2981.1 | 1407.5 | 29.7   | 24.7   | 11.2  | 6.2   | 5.4   | 7.3   | 2.3   | 1.1   | 0.8   |
| 72.5° | 1906.7 | 816.9  | 22.0   | 19.7   | 8.5   | 4.6   | 3.5   | 6.6   | 2.3   | 0.8   | 0.4   |
| 75°   | 811.4  | 253.3  | 15.0   | 13.9   | 5.0   | 3.5   | 2.3   | 4.2   | 1.5   | 0.4   | 0.0   |
| 77.5° | 171.1  | 57.1   | 8.9    | 8.5    | 3.5   | 2.3   | 1.5   | 1.1   | 0.4   | 0.0   | 0.0   |
| 80°   | 44.0   | 16.6   | 4.6    | 4.2    | 2.0   | 1.1   | 0.8   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 13.9   | 6.6    | 2.7    | 2.0    | 0.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 7.0    | 3.9    | 1.5    | 0.8    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 3.9    | 1.1    | 0.4    | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |



Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

INVUE

Report Number: SP1-2104-224-2

Luminaire Tested: CCW-SA-2A-735-U-SL4

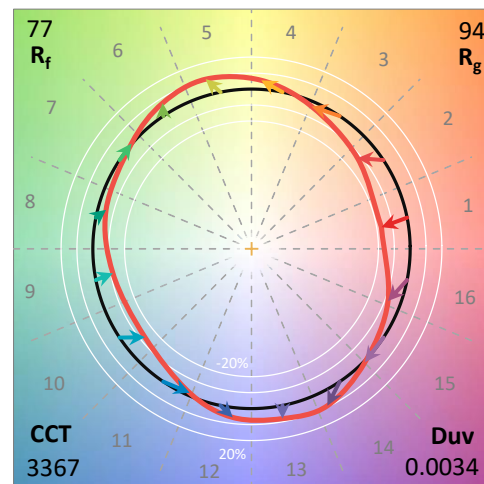
Test Date: 04/26/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2104-224-2  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 04/26/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: INVUE  
 Catalog Number: **CCW-SA-2A-735-U-SL4**  
 Description: INVUE WALL PACK ClearCurve Light Square

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 3367   | CRI (Ra): | 73.3 |      |       |
| CIE u':                   | 0.2376 | R1:       | 69.1 | R9:  | -34.3 |
| CIE v':                   | 0.5184 | R2:       | 81.3 | R10: | 58.3  |
| Duv:                      | 0.0034 | R3:       | 93.4 | R11: | 69.1  |
| CIE x:                    | 0.4168 | R4:       | 71.8 | R12: | 54.2  |
| CIE y:                    | 0.4041 | R5:       | 69.6 | R13: | 71.1  |
| CIE z:                    | 0.1791 | R6:       | 75.4 | R14: | 96.4  |
| Peak Wavelength (nm):     | 590    | R7:       | 79.5 |      |       |
| Dominant Wavelength (nm): | 580    | R8:       | 46.4 |      |       |
| Purity:                   | 46.5   |           |      |      |       |
| Rf:                       | 77.2   |           |      |      |       |
| Rg:                       | 94.4   |           |      |      |       |



### Test Conditions

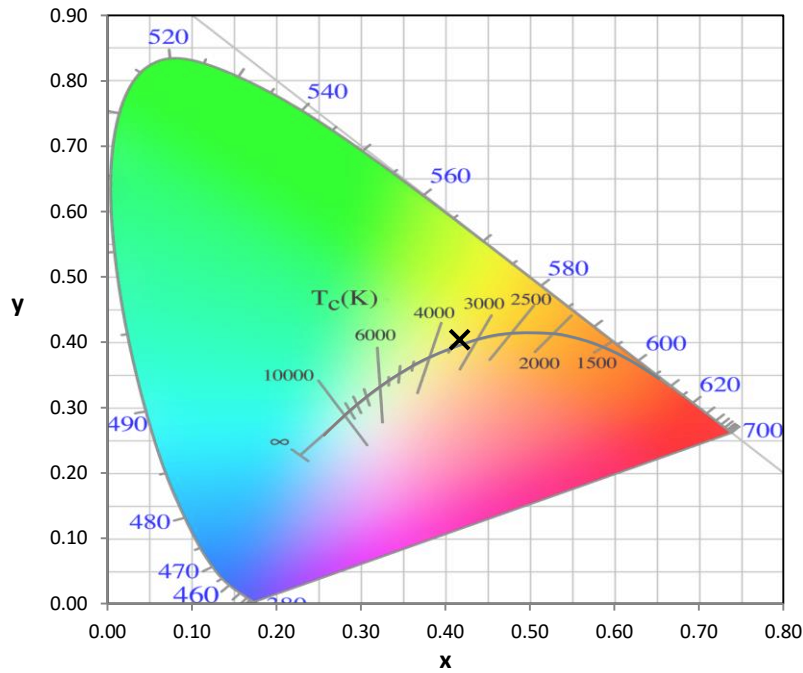
Stabilization Time: 71M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.9/38%  
 Sphere Temperature (°C): 24.2

REPORT NUMBER: SP1-2104-224-2

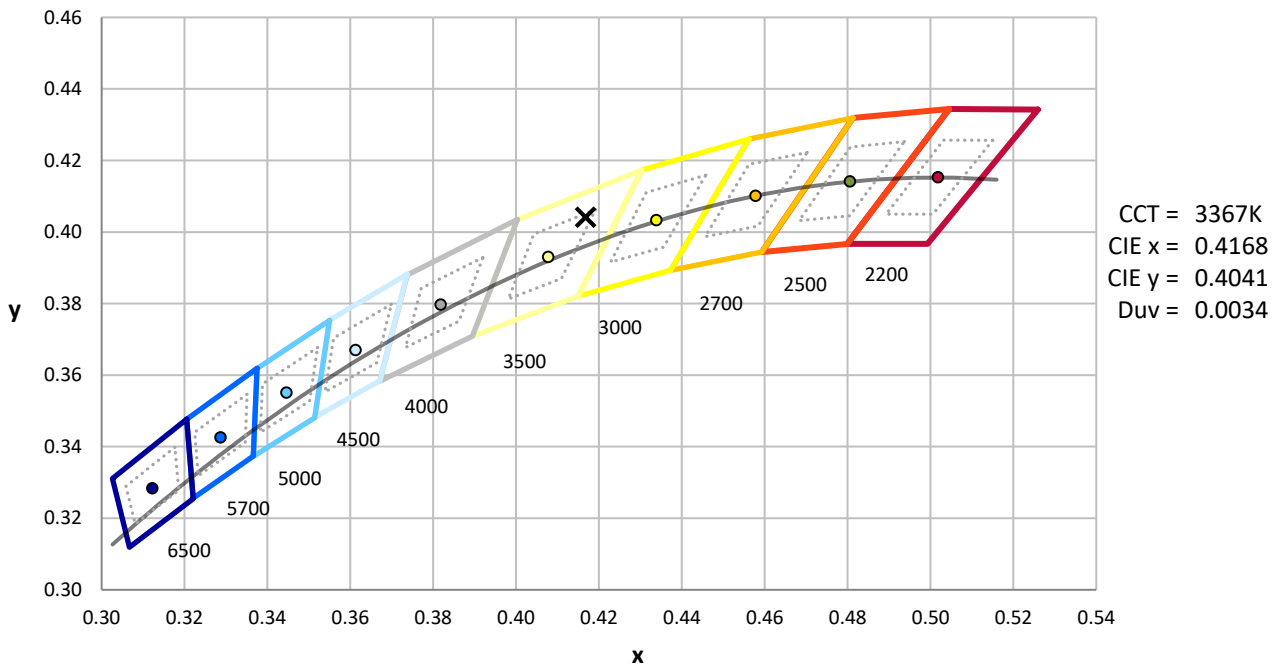
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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            |

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**CIE 1931 Chromaticity Diagram**



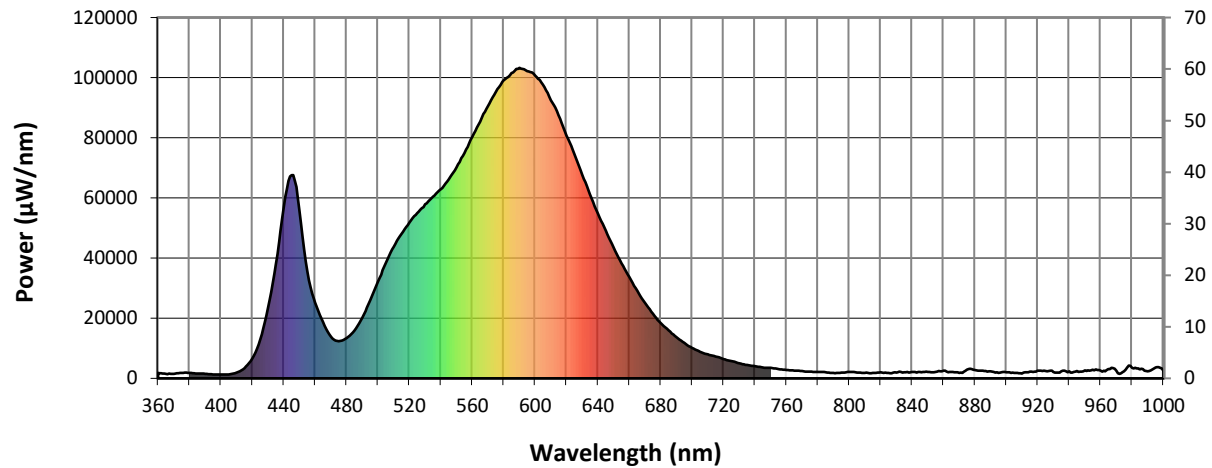
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 3500K 4-step quadrangle

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### Photopic Flux vs. Wavelength

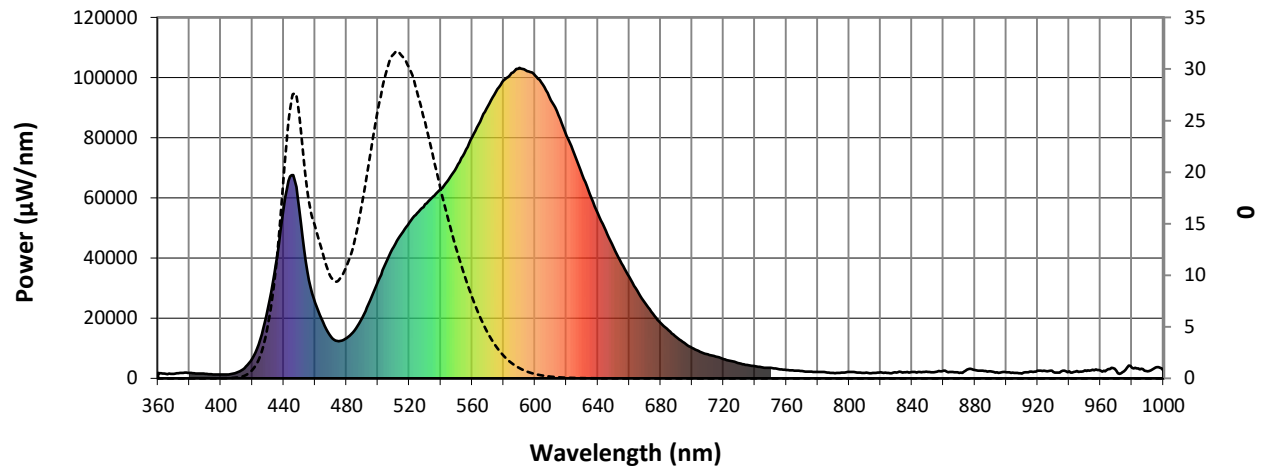


#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1840             | 0.0              | 490       | 20271            | 2.9              | 620       | 80709            | 21.0             | 750       | 3465             | 0.0              | 880       | 2800             | 0.0              |
| 365       | 1514             | 0.0              | 495       | 25910            | 4.7              | 625       | 74695            | 16.5             | 755       | 3075             | 0.0              | 885       | 2582             | 0.0              |
| 370       | 1514             | 0.0              | 500       | 32216            | 7.1              | 630       | 67709            | 12.3             | 760       | 2794             | 0.0              | 890       | 2353             | 0.0              |
| 375       | 1843             | 0.0              | 505       | 38336            | 10.7             | 635       | 61156            | 9.2              | 765       | 2593             | 0.0              | 895       | 1819             | 0.0              |
| 380       | 1796             | 0.0              | 510       | 43738            | 15.0             | 640       | 54795            | 6.5              | 770       | 2401             | 0.0              | 900       | 2024             | 0.0              |
| 385       | 1575             | 0.0              | 515       | 47977            | 19.9             | 645       | 49111            | 4.7              | 775       | 2233             | 0.0              | 905       | 1851             | 0.0              |
| 390       | 1527             | 0.0              | 520       | 51818            | 25.1             | 650       | 43533            | 3.2              | 780       | 2166             | 0.0              | 910       | 1602             | 0.0              |
| 395       | 1326             | 0.0              | 525       | 54890            | 29.5             | 655       | 38234            | 2.2              | 785       | 2051             | 0.0              | 915       | 2200             | 0.0              |
| 400       | 1233             | 0.0              | 530       | 57872            | 34.1             | 660       | 33754            | 1.4              | 790       | 1765             | 0.0              | 920       | 2530             | 0.0              |
| 405       | 1329             | 0.0              | 535       | 60410            | 37.5             | 665       | 29162            | 0.9              | 795       | 1903             | 0.0              | 925       | 2487             | 0.0              |
| 410       | 1902             | 0.0              | 540       | 62857            | 41.0             | 670       | 25117            | 0.5              | 800       | 2127             | 0.0              | 930       | 2089             | 0.0              |
| 415       | 3436             | 0.0              | 545       | 66165            | 44.0             | 675       | 21511            | 0.4              | 805       | 1867             | 0.0              | 935       | 2293             | 0.0              |
| 420       | 6571             | 0.0              | 550       | 70124            | 47.7             | 680       | 18435            | 0.2              | 810       | 1775             | 0.0              | 940       | 2315             | 0.0              |
| 425       | 12957            | 0.1              | 555       | 74973            | 51.2             | 685       | 16004            | 0.1              | 815       | 1812             | 0.0              | 945       | 2481             | 0.0              |
| 430       | 23376            | 0.2              | 560       | 80227            | 54.5             | 690       | 13701            | 0.1              | 820       | 1973             | 0.0              | 950       | 2701             | 0.0              |
| 435       | 38205            | 0.5              | 565       | 85358            | 56.8             | 695       | 11765            | 0.0              | 825       | 1773             | 0.0              | 955       | 2892             | 0.0              |
| 440       | 56691            | 0.9              | 570       | 90422            | 58.8             | 700       | 10145            | 0.0              | 830       | 1925             | 0.0              | 960       | 2609             | 0.0              |
| 445       | 67585            | 1.4              | 575       | 95259            | 59.3             | 705       | 8865             | 0.0              | 835       | 2001             | 0.0              | 965       | 3066             | 0.0              |
| 450       | 55963            | 1.5              | 580       | 99033            | 58.8             | 710       | 7954             | 0.0              | 840       | 2142             | 0.0              | 970       | 2566             | 0.0              |
| 455       | 35549            | 1.2              | 585       | 101572           | 56.4             | 715       | 7285             | 0.0              | 845       | 2101             | 0.0              | 975       | 2375             | 0.0              |
| 460       | 25268            | 1.0              | 590       | 103264           | 53.4             | 720       | 6412             | 0.0              | 850       | 2097             | 0.0              | 980       | 3526             | 0.0              |
| 465       | 18712            | 1.0              | 595       | 102194           | 48.4             | 725       | 5721             | 0.0              | 855       | 2090             | 0.0              | 985       | 2982             | 0.0              |
| 470       | 13835            | 0.9              | 600       | 100645           | 43.4             | 730       | 5017             | 0.0              | 860       | 2535             | 0.0              | 990       | 2305             | 0.0              |
| 475       | 12398            | 1.0              | 605       | 97644            | 37.8             | 735       | 4459             | 0.0              | 865       | 2101             | 0.0              | 995       | 3671             | 0.0              |
| 480       | 13406            | 1.3              | 610       | 92487            | 31.8             | 740       | 4062             | 0.0              | 870       | 1798             | 0.0              | 1000      | 2560             | 0.0              |
| 485       | 15865            | 1.9              | 615       | 87436            | 26.4             | 745       | 3636             | 0.0              | 875       | 2857             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



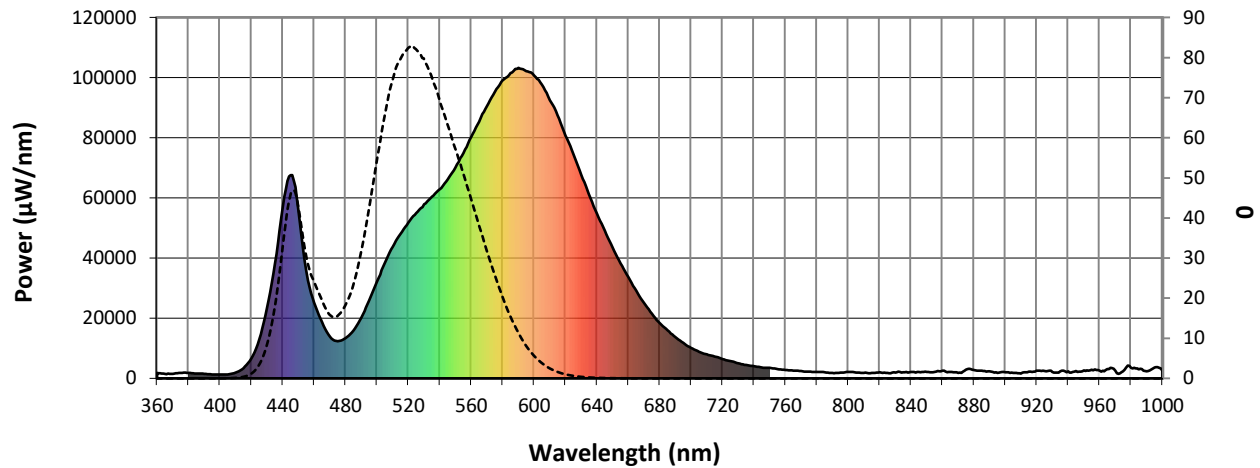
Scotopic Lumens: 7088.7

S/P: 1.35

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1840             | 0.0              | 490       | 20271            | 31.2             | 620       | 80709            | 1.0              | 750       | 3465             | 0.0              | 880       | 2800             | 0.0              |
| 365       | 1514             | 0.0              | 495       | 25910            | 41.9             | 625       | 74695            | 0.6              | 755       | 3075             | 0.0              | 885       | 2582             | 0.0              |
| 370       | 1514             | 0.0              | 500       | 32216            | 53.9             | 630       | 67709            | 0.4              | 760       | 2794             | 0.0              | 890       | 2353             | 0.0              |
| 375       | 1843             | 0.0              | 505       | 38336            | 65.2             | 635       | 61156            | 0.2              | 765       | 2593             | 0.0              | 895       | 1819             | 0.0              |
| 380       | 1796             | 0.0              | 510       | 43738            | 74.1             | 640       | 54795            | 0.1              | 770       | 2401             | 0.0              | 900       | 2024             | 0.0              |
| 385       | 1575             | 0.0              | 515       | 47977            | 79.5             | 645       | 49111            | 0.1              | 775       | 2233             | 0.0              | 905       | 1851             | 0.0              |
| 390       | 1527             | 0.0              | 520       | 51818            | 82.4             | 650       | 43533            | 0.1              | 780       | 2166             | 0.0              | 910       | 1602             | 0.0              |
| 395       | 1326             | 0.0              | 525       | 54890            | 82.1             | 655       | 38234            | 0.0              | 785       | 2051             | 0.0              | 915       | 2200             | 0.0              |
| 400       | 1233             | 0.0              | 530       | 57872            | 79.8             | 660       | 33754            | 0.0              | 790       | 1765             | 0.0              | 920       | 2530             | 0.0              |
| 405       | 1329             | 0.0              | 535       | 60410            | 75.3             | 665       | 29162            | 0.0              | 795       | 1903             | 0.0              | 925       | 2487             | 0.0              |
| 410       | 1902             | 0.1              | 540       | 62857            | 69.5             | 670       | 25117            | 0.0              | 800       | 2127             | 0.0              | 930       | 2089             | 0.0              |
| 415       | 3436             | 0.4              | 545       | 66165            | 63.4             | 675       | 21511            | 0.0              | 805       | 1867             | 0.0              | 935       | 2293             | 0.0              |
| 420       | 6571             | 1.1              | 550       | 70124            | 57.3             | 680       | 18435            | 0.0              | 810       | 1775             | 0.0              | 940       | 2315             | 0.0              |
| 425       | 12957            | 3.2              | 555       | 74973            | 51.2             | 685       | 16004            | 0.0              | 815       | 1812             | 0.0              | 945       | 2481             | 0.0              |
| 430       | 23376            | 8.0              | 560       | 80227            | 44.8             | 690       | 13701            | 0.0              | 820       | 1973             | 0.0              | 950       | 2701             | 0.0              |
| 435       | 38205            | 17.1             | 565       | 85358            | 38.3             | 695       | 11765            | 0.0              | 825       | 1773             | 0.0              | 955       | 2892             | 0.0              |
| 440       | 56691            | 31.7             | 570       | 90422            | 31.9             | 700       | 10145            | 0.0              | 830       | 1925             | 0.0              | 960       | 2609             | 0.0              |
| 445       | 67585            | 45.3             | 575       | 95259            | 25.9             | 705       | 8865             | 0.0              | 835       | 2001             | 0.0              | 965       | 3066             | 0.0              |
| 450       | 55963            | 43.4             | 580       | 99033            | 20.4             | 710       | 7954             | 0.0              | 840       | 2142             | 0.0              | 970       | 2566             | 0.0              |
| 455       | 35549            | 31.1             | 585       | 101572           | 15.5             | 715       | 7285             | 0.0              | 845       | 2101             | 0.0              | 975       | 2375             | 0.0              |
| 460       | 25268            | 24.4             | 590       | 103264           | 11.5             | 720       | 6412             | 0.0              | 850       | 2097             | 0.0              | 980       | 3526             | 0.0              |
| 465       | 18712            | 19.8             | 595       | 102194           | 8.1              | 725       | 5721             | 0.0              | 855       | 2090             | 0.0              | 985       | 2982             | 0.0              |
| 470       | 13835            | 15.9             | 600       | 100645           | 5.7              | 730       | 5017             | 0.0              | 860       | 2535             | 0.0              | 990       | 2305             | 0.0              |
| 475       | 12398            | 15.5             | 605       | 97644            | 3.8              | 735       | 4459             | 0.0              | 865       | 2101             | 0.0              | 995       | 3671             | 0.0              |
| 480       | 13406            | 18.1             | 610       | 92487            | 2.5              | 740       | 4062             | 0.0              | 870       | 1798             | 0.0              | 1000      | 2560             | 0.0              |
| 485       | 15865            | 23.0             | 615       | 87436            | 1.6              | 745       | 3636             | 0.0              | 875       | 2857             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: 2621

M/P: 0.5

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1840             | 0.0              | 490       | 20271            | 16.9             | 620       | 80709            | 0.1              | 750       | 3465             | 0.0              | 880       | 2800             | 0.0              |
| 365       | 1514             | 0.0              | 495       | 25910            | 21.4             | 625       | 74695            | 0.0              | 755       | 3075             | 0.0              | 885       | 2582             | 0.0              |
| 370       | 1514             | 0.0              | 500       | 32216            | 25.9             | 630       | 67709            | 0.0              | 760       | 2794             | 0.0              | 890       | 2353             | 0.0              |
| 375       | 1843             | 0.0              | 505       | 38336            | 29.4             | 635       | 61156            | 0.0              | 765       | 2593             | 0.0              | 895       | 1819             | 0.0              |
| 380       | 1796             | 0.0              | 510       | 43738            | 31.4             | 640       | 54795            | 0.0              | 770       | 2401             | 0.0              | 900       | 2024             | 0.0              |
| 385       | 1575             | 0.0              | 515       | 47977            | 31.3             | 645       | 49111            | 0.0              | 775       | 2233             | 0.0              | 905       | 1851             | 0.0              |
| 390       | 1527             | 0.0              | 520       | 51818            | 30.2             | 650       | 43533            | 0.0              | 780       | 2166             | 0.0              | 910       | 1602             | 0.0              |
| 395       | 1326             | 0.0              | 525       | 54890            | 27.8             | 655       | 38234            | 0.0              | 785       | 2051             | 0.0              | 915       | 2200             | 0.0              |
| 400       | 1233             | 0.0              | 530       | 57872            | 25.0             | 660       | 33754            | 0.0              | 790       | 1765             | 0.0              | 920       | 2530             | 0.0              |
| 405       | 1329             | 0.0              | 535       | 60410            | 21.7             | 665       | 29162            | 0.0              | 795       | 1903             | 0.0              | 925       | 2487             | 0.0              |
| 410       | 1902             | 0.1              | 540       | 62857            | 18.4             | 670       | 25117            | 0.0              | 800       | 2127             | 0.0              | 930       | 2089             | 0.0              |
| 415       | 3436             | 0.2              | 545       | 66165            | 15.4             | 675       | 21511            | 0.0              | 805       | 1867             | 0.0              | 935       | 2293             | 0.0              |
| 420       | 6571             | 0.8              | 550       | 70124            | 12.6             | 680       | 18435            | 0.0              | 810       | 1775             | 0.0              | 940       | 2315             | 0.0              |
| 425       | 12957            | 2.0              | 555       | 74973            | 10.1             | 685       | 16004            | 0.0              | 815       | 1812             | 0.0              | 945       | 2481             | 0.0              |
| 430       | 23376            | 4.9              | 560       | 80227            | 7.9              | 690       | 13701            | 0.0              | 820       | 1973             | 0.0              | 950       | 2701             | 0.0              |
| 435       | 38205            | 10.2             | 565       | 85358            | 6.0              | 695       | 11765            | 0.0              | 825       | 1773             | 0.0              | 955       | 2892             | 0.0              |
| 440       | 56691            | 18.9             | 570       | 90422            | 4.4              | 700       | 10145            | 0.0              | 830       | 1925             | 0.0              | 960       | 2609             | 0.0              |
| 445       | 67585            | 26.7             | 575       | 95259            | 3.2              | 705       | 8865             | 0.0              | 835       | 2001             | 0.0              | 965       | 3066             | 0.0              |
| 450       | 55963            | 25.8             | 580       | 99033            | 2.2              | 710       | 7954             | 0.0              | 840       | 2142             | 0.0              | 970       | 2566             | 0.0              |
| 455       | 35549            | 18.6             | 585       | 101572           | 1.5              | 715       | 7285             | 0.0              | 845       | 2101             | 0.0              | 975       | 2375             | 0.0              |
| 460       | 25268            | 14.9             | 590       | 103264           | 1.0              | 720       | 6412             | 0.0              | 850       | 2097             | 0.0              | 980       | 3526             | 0.0              |
| 465       | 18712            | 12.2             | 595       | 102194           | 0.7              | 725       | 5721             | 0.0              | 855       | 2090             | 0.0              | 985       | 2982             | 0.0              |
| 470       | 13835            | 9.9              | 600       | 100645           | 0.4              | 730       | 5017             | 0.0              | 860       | 2535             | 0.0              | 990       | 2305             | 0.0              |
| 475       | 12398            | 9.5              | 605       | 97644            | 0.3              | 735       | 4459             | 0.0              | 865       | 2101             | 0.0              | 995       | 3671             | 0.0              |
| 480       | 13406            | 10.8             | 610       | 92487            | 0.2              | 740       | 4062             | 0.0              | 870       | 1798             | 0.0              | 1000      | 2560             | 0.0              |
| 485       | 15865            | 13.1             | 615       | 87436            | 0.1              | 745       | 3636             | 0.0              | 875       | 2857             | 0.0              |           |                  |                  |

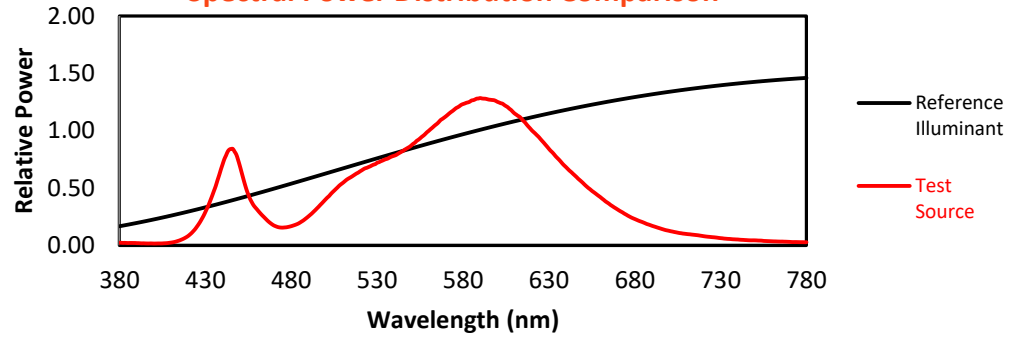
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TM-30-18

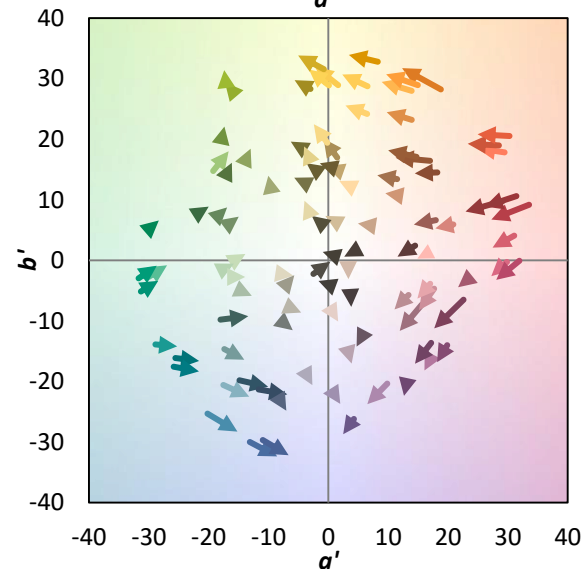
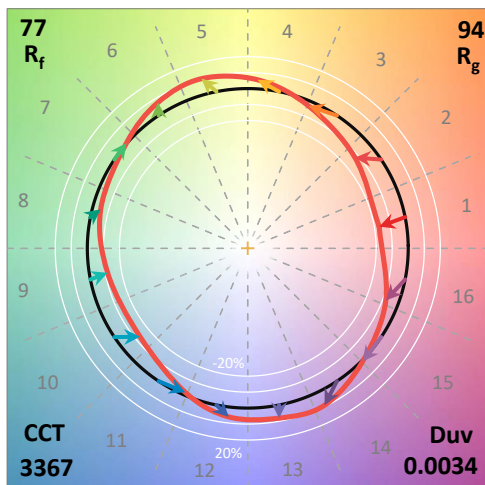
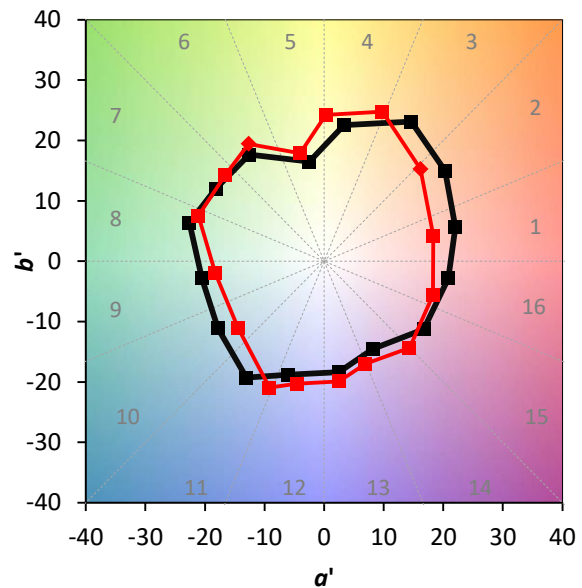
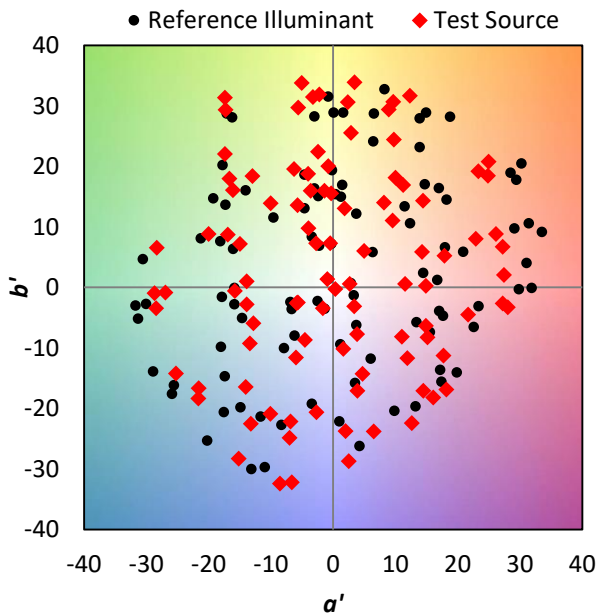
### Summary

$R_f = 77.2$   
 $R_g = 94.4$   
 CIE  $R_a = 73.3$   
 $R_g = -34.3$

### Spectral Power Distribution Comparison



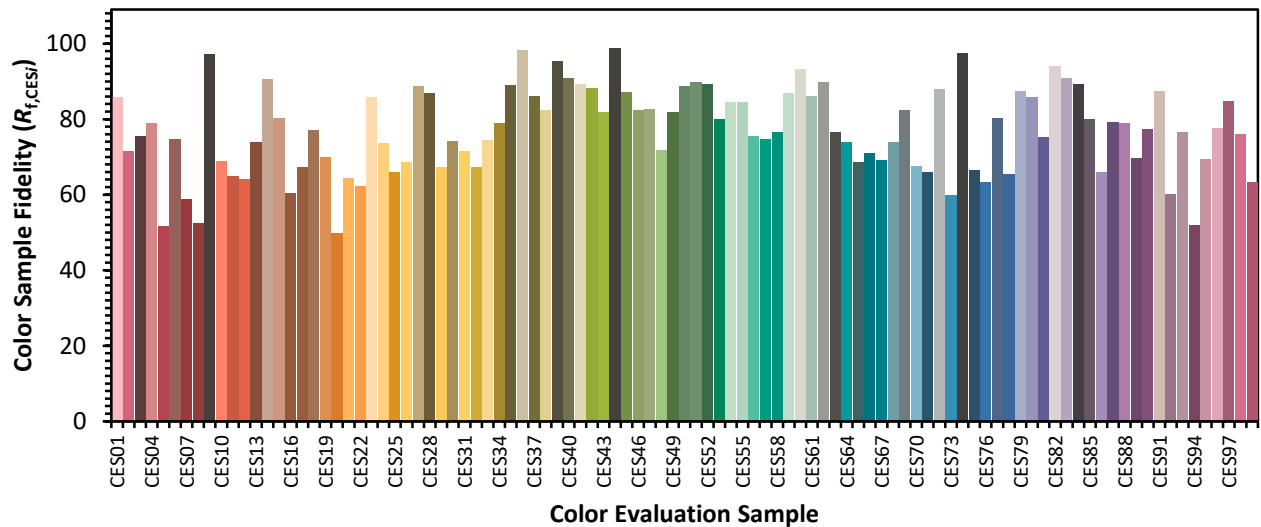
### Color Vector Graphics



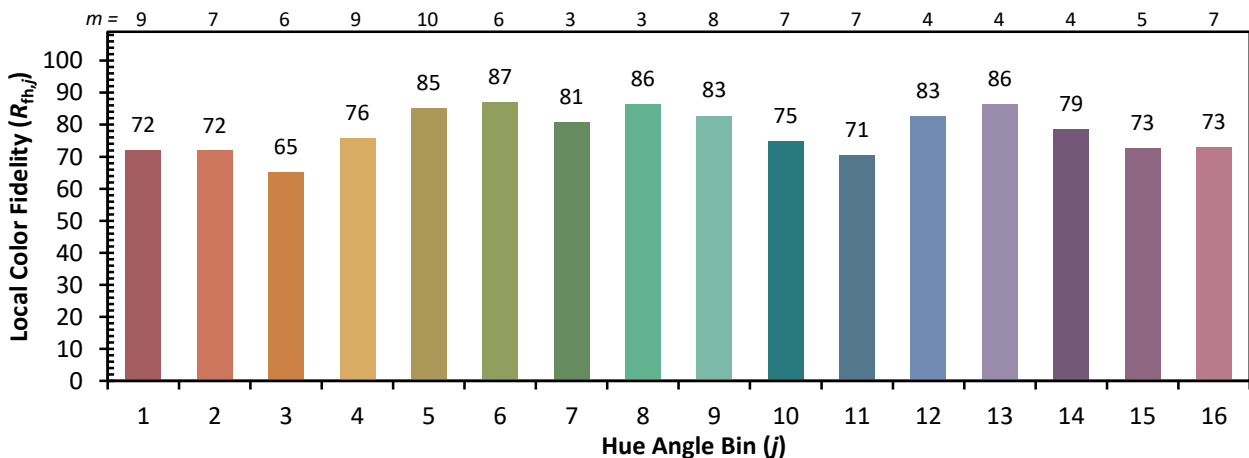
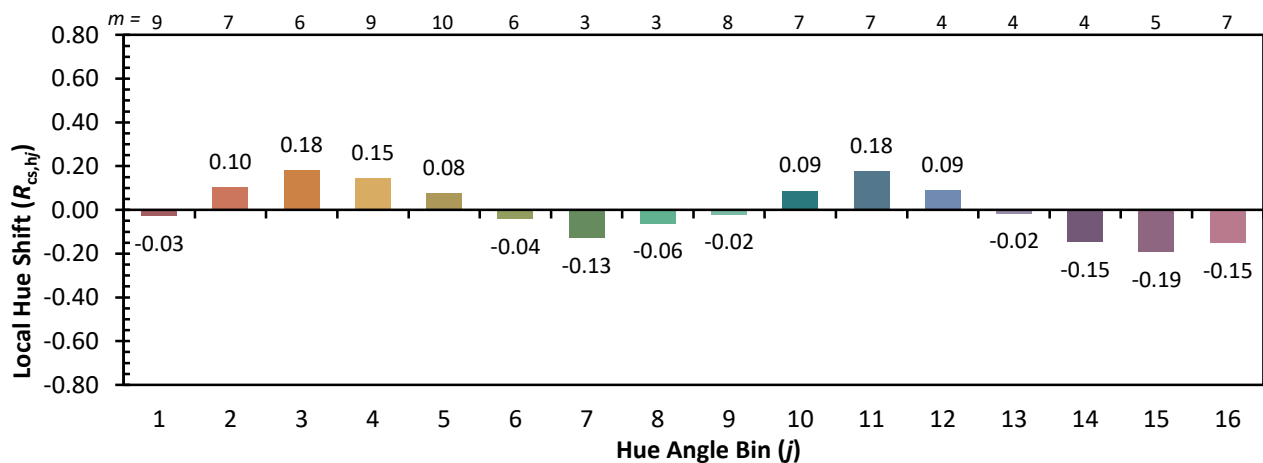
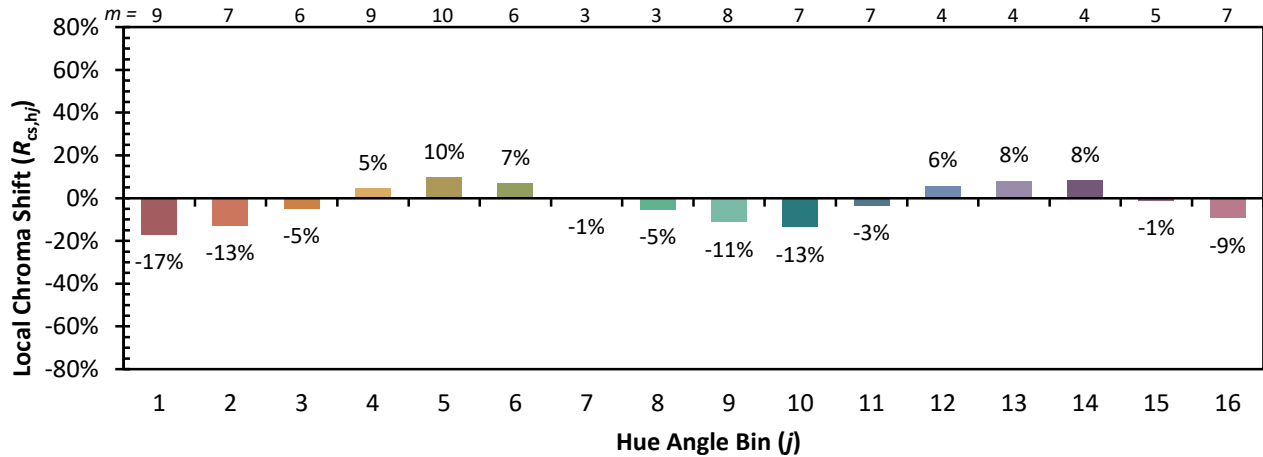


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

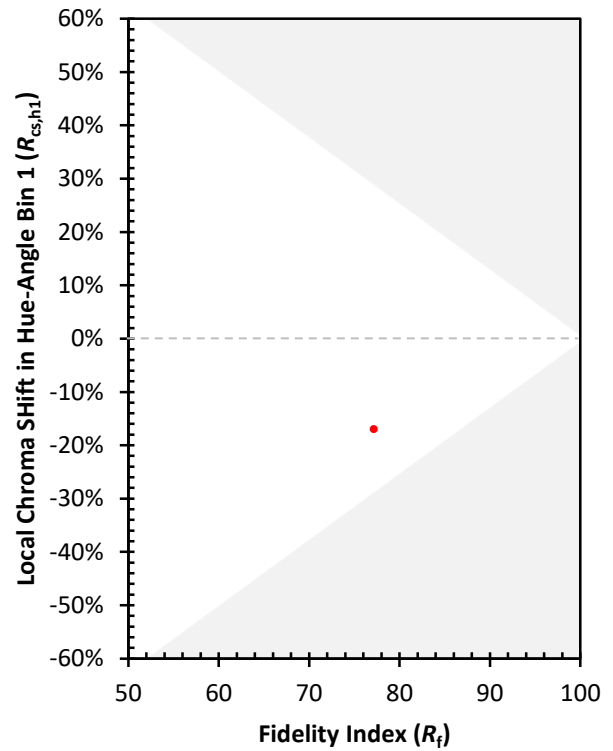
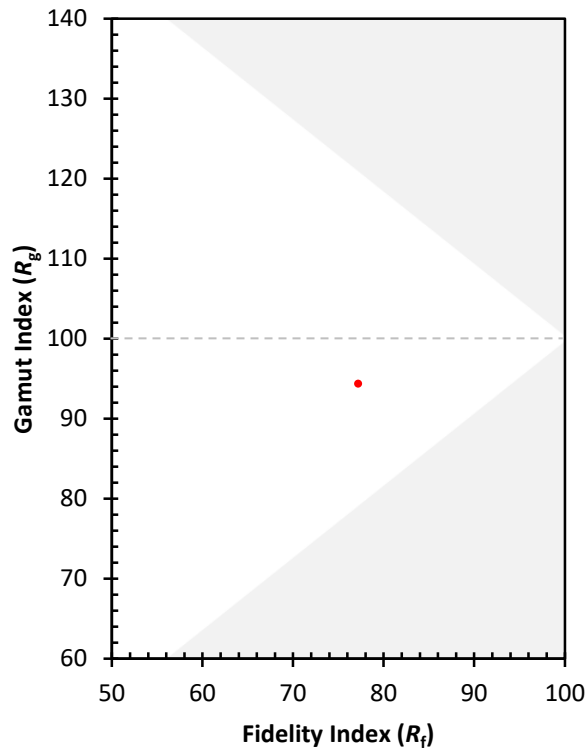
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 69 | CES51 = 90 | CES76 = 63 |
| CES02 = 62 | CES27 = 89 | CES52 = 89 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 80 | CES78 = 65 |
| CES04 = 70 | CES29 = 67 | CES54 = 85 | CES79 = 87 |
| CES05 = 48 | CES30 = 74 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 71 | CES56 = 76 | CES81 = 75 |
| CES07 = 41 | CES32 = 67 | CES57 = 75 | CES82 = 94 |
| CES08 = 39 | CES33 = 75 | CES58 = 77 | CES83 = 91 |
| CES09 = 29 | CES34 = 79 | CES59 = 87 | CES84 = 89 |
| CES10 = 75 | CES35 = 89 | CES60 = 93 | CES85 = 80 |
| CES11 = 58 | CES36 = 98 | CES61 = 86 | CES86 = 66 |
| CES12 = 64 | CES37 = 86 | CES62 = 90 | CES87 = 79 |
| CES13 = 43 | CES38 = 82 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 95 | CES64 = 74 | CES89 = 70 |
| CES15 = 71 | CES40 = 91 | CES65 = 69 | CES90 = 77 |
| CES16 = 47 | CES41 = 89 | CES66 = 71 | CES91 = 87 |
| CES17 = 50 | CES42 = 88 | CES67 = 69 | CES92 = 60 |
| CES18 = 56 | CES43 = 82 | CES68 = 74 | CES93 = 76 |
| CES19 = 72 | CES44 = 99 | CES69 = 82 | CES94 = 52 |
| CES20 = 65 | CES45 = 87 | CES70 = 67 | CES95 = 69 |
| CES21 = 86 | CES46 = 82 | CES71 = 66 | CES96 = 78 |
| CES22 = 79 | CES47 = 83 | CES72 = 88 | CES97 = 85 |
| CES23 = 92 | CES48 = 72 | CES73 = 60 | CES98 = 76 |
| CES24 = 91 | CES49 = 82 | CES74 = 97 | CES99 = 63 |
| CES25 = 72 | CES50 = 89 | CES75 = 67 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)