

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: P383233

Luminaire Tested: **GLEON-SA5C-735-U-T2R**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P383233  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-8)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA5C-735-U-T2R  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(5) 70 CRI, 3500K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II  
ROADWAY OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 34308 lumens  
Efficiency: N/A  
Efficacy: 123.0 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B3 - U0 - G4

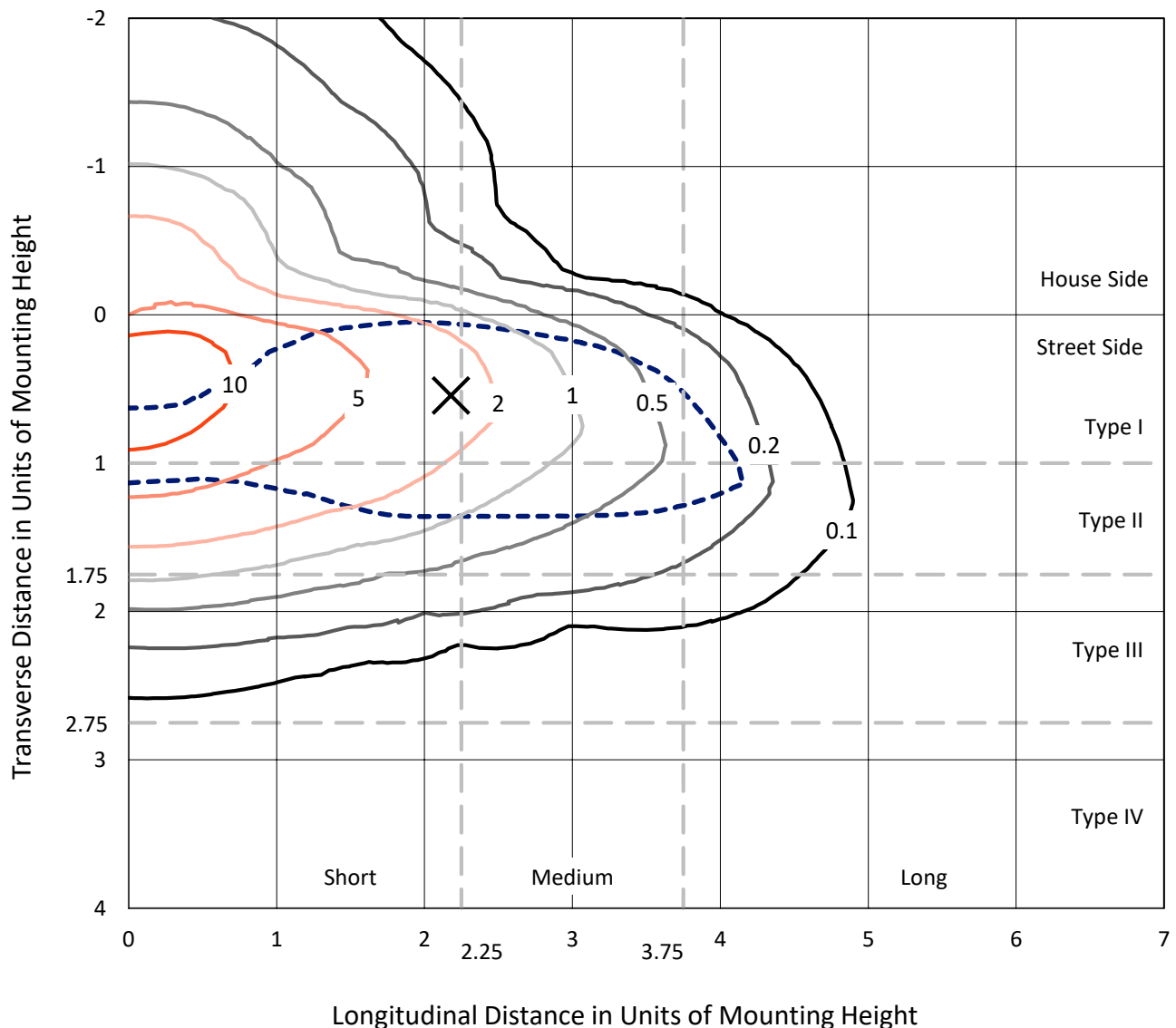
Input Watts (W): 279  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P383233  
 CATALOG NUMBER: GLEON-SA5C-735-U-T2R

## Iso-Footcandle Lines of Horizontal Illumination

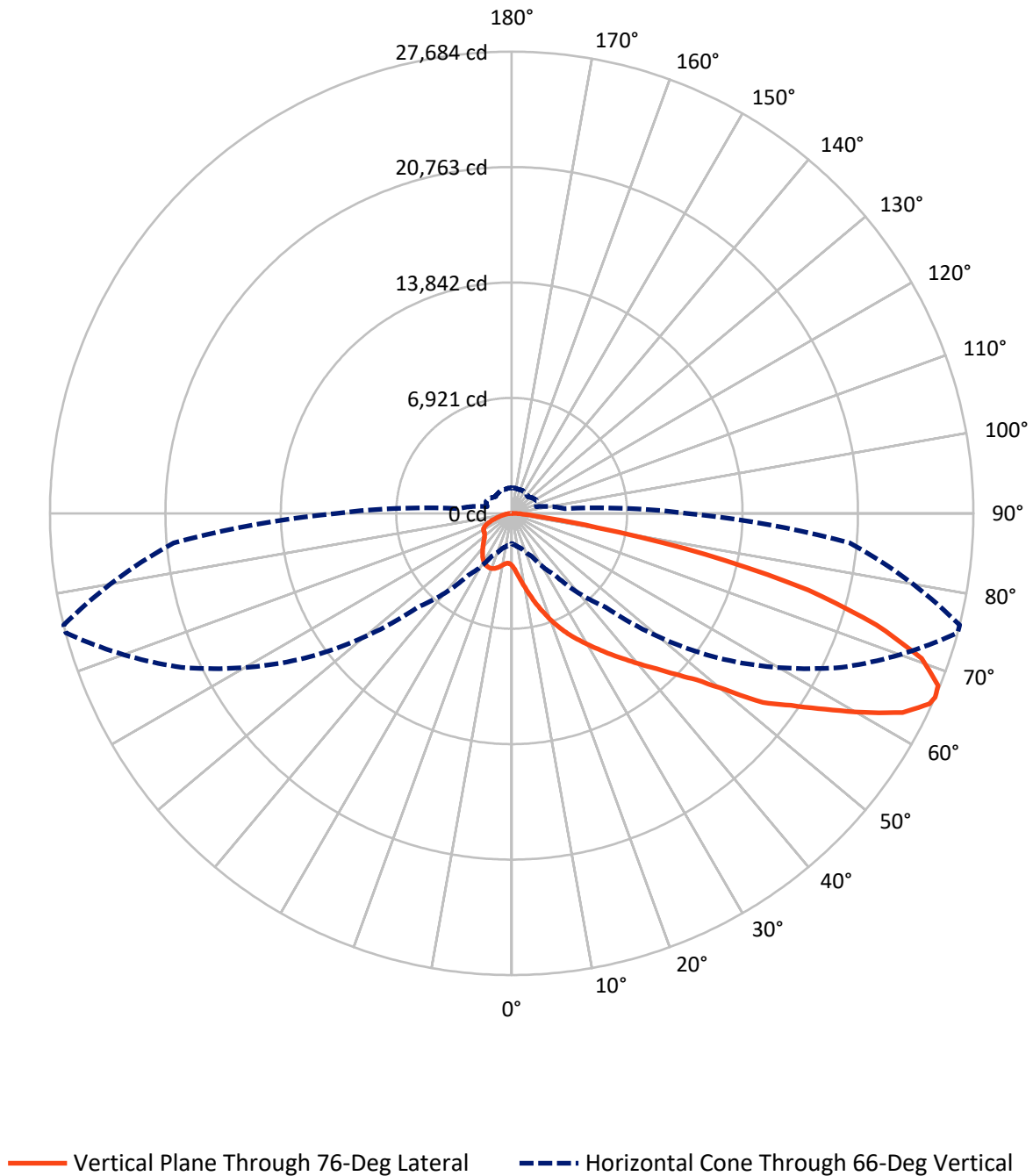
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 13.3 fc  
 Type II - Short - N/A

REPORT NUMBER: P383233  
CATALOG NUMBER: GLEON-SA5C-735-U-T2R

## Luminous Intensity Polar Plot



REPORT NUMBER: P383233

CATALOG NUMBER: GLEON-SA5C-735-U-T2R

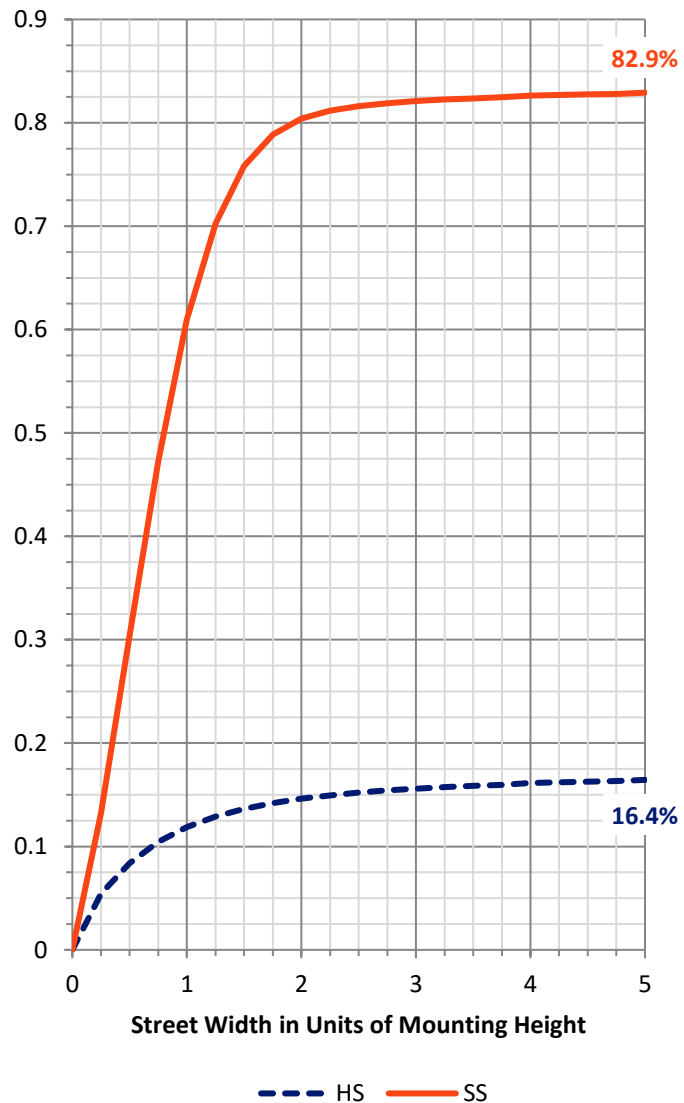
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 5772.8   | 0.0    | 5772.8  |
|                    | % Fixture | 16.8     | 0.0    | 16.8    |
| <b>Street Side</b> | Lumens    | 28535.1  | 0.0    | 28535.1 |
|                    | % Fixture | 83.2     | 0.0    | 83.2    |
| <b>Total</b>       | Lumens    | 34308.0  | 0.0    | 34308.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 378.9   | 1.1       |
| 10°-20°   | 1496.2  | 4.4       |
| 20°-30°   | 2907.4  | 8.5       |
| 30°-40°   | 4745.5  | 13.8      |
| 40°-50°   | 6483.5  | 18.9      |
| 50°-60°   | 7552.0  | 22.0      |
| 60°-70°   | 6770.5  | 19.7      |
| 70°-80°   | 3421.5  | 10.0      |
| 80°-90°   | 552.5   | 1.6       |
| 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°    | 34308.0 | 100.0     |
| 0°-180°   | 34308.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P383233

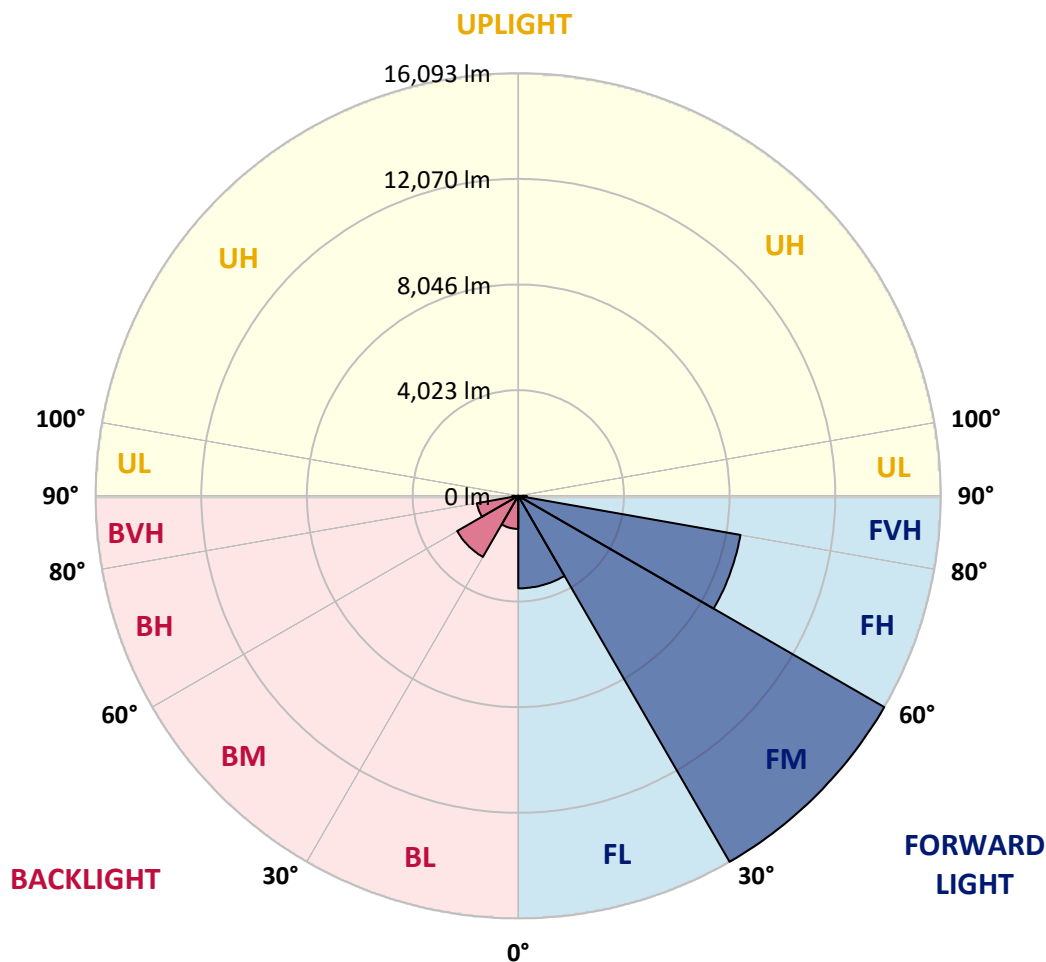
CATALOG NUMBER: GLEON-SA5C-735-U-T2R

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 3523.3  | 10.3      |                         |      |          |
| FM   | (30°-60°)   | 16092.8 | 46.9      |                         |      |          |
| FH   | (60°-80°)   | 8592.7  | 25.0      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 326.3   | 1.0       |                         |      | G3/500   |
| BL   | (0°-30°)    | 1259.1  | 3.7       | B3/2500                 |      |          |
| BM   | (30°-60°)   | 2688.2  | 7.8       | B3/5000                 |      |          |
| BH   | (60°-80°)   | 1599.3  | 4.7       | B3/2500                 |      | G3/2500  |
| BVH  | (80°-90°)   | 226.2   | 0.7       |                         |      | G3/500   |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |          |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |          |

**BUG Rating: B3-U0-G4**

Type II Short





REPORT NUMBER: P383233

CATALOG NUMBER: GLEON-SA5C-735-U-T2R

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 65°     | 75°     | 76°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 3133.1  | 3133.1  | 3133.1  | 3133.1  | 3133.1  | 3133.1  | 3133.1  | 3133.1  | 3133.1  | 3133.1  | 3133.1  |
| 2.5°  | 4159.2  | 4096.3  | 4090.5  | 3998.5  | 3977.5  | 3801.6  | 3672.3  | 3537.3  | 3383.5  | 3353.2  | 3232.1  |
| 5°    | 5342.5  | 5336.7  | 5256.4  | 5106.1  | 4988.5  | 4688.0  | 4390.9  | 4076.5  | 3731.8  | 3675.9  | 3403.3  |
| 7.5°  | 6407.1  | 6397.8  | 6336.1  | 6174.2  | 6004.1  | 5634.9  | 5211.0  | 4728.7  | 4169.7  | 4087.0  | 3635.1  |
| 10°   | 7215.4  | 7211.9  | 7191.0  | 7072.1  | 6927.7  | 6573.7  | 6105.5  | 5447.4  | 4678.7  | 4565.7  | 3925.1  |
| 12.5° | 7839.7  | 7846.7  | 7860.7  | 7818.8  | 7750.0  | 7448.4  | 6968.5  | 6209.1  | 5221.4  | 5109.6  | 4247.8  |
| 15°   | 8262.5  | 8283.5  | 8355.7  | 8415.0  | 8451.2  | 8266.0  | 7801.2  | 6988.3  | 5829.4  | 5695.5  | 4605.3  |
| 17.5° | 8475.7  | 8499.0  | 8623.6  | 8802.9  | 8968.3  | 8949.7  | 8580.5  | 7731.4  | 6413.0  | 6283.7  | 4989.6  |
| 20°   | 8659.7  | 8677.2  | 8816.9  | 9032.4  | 9324.7  | 9454.0  | 9246.7  | 8446.5  | 7052.4  | 6898.7  | 5397.3  |
| 22.5° | 9193.2  | 9215.2  | 9257.2  | 9379.5  | 9638.1  | 9875.6  | 9775.5  | 9123.2  | 7638.2  | 7495.0  | 5784.0  |
| 25°   | 10222.7 | 10249.5 | 10158.7 | 10055.0 | 10103.9 | 10269.3 | 10287.9 | 9740.5  | 8232.3  | 8070.4  | 6199.8  |
| 27.5° | 11463.2 | 11501.6 | 11346.7 | 11079.9 | 10847.0 | 10782.9 | 10760.9 | 10246.0 | 8799.4  | 8611.9  | 6610.9  |
| 30°   | 12678.0 | 12744.3 | 12542.8 | 12196.9 | 11769.5 | 11468.9 | 11246.5 | 10741.0 | 9358.5  | 9179.1  | 6998.8  |
| 32.5° | 13864.8 | 13838.0 | 13545.6 | 13207.9 | 12707.1 | 12330.9 | 11792.7 | 11272.1 | 9987.5  | 9781.3  | 7384.3  |
| 35°   | 14677.7 | 14687.1 | 14415.7 | 14015.0 | 13537.5 | 13248.7 | 12524.2 | 11845.2 | 10629.2 | 10439.4 | 7822.2  |
| 37.5° | 15369.6 | 15326.6 | 15019.1 | 14645.1 | 14234.0 | 14110.5 | 13380.3 | 12476.5 | 11324.5 | 11117.3 | 8288.2  |
| 40°   | 15600.3 | 15550.1 | 15348.6 | 15079.6 | 14750.0 | 14739.5 | 14324.9 | 13191.6 | 12110.8 | 11905.7 | 8813.5  |
| 42.5° | 15460.4 | 15396.4 | 15313.7 | 15240.3 | 15139.0 | 15185.6 | 15212.4 | 14030.2 | 12975.0 | 12745.5 | 9421.4  |
| 45°   | 14944.5 | 14847.8 | 14906.1 | 15065.6 | 15285.8 | 15549.0 | 16013.7 | 14958.5 | 13942.8 | 13750.7 | 10135.3 |
| 47.5° | 14151.3 | 14063.9 | 14245.7 | 14586.9 | 15185.6 | 15851.8 | 16772.0 | 15983.4 | 15098.2 | 14907.2 | 11152.2 |
| 50°   | 13035.5 | 13061.1 | 13320.9 | 13941.6 | 14846.6 | 15991.6 | 17706.0 | 17340.3 | 16777.7 | 16599.5 | 12539.4 |
| 52.5° | 11204.6 | 11209.2 | 11940.7 | 12959.8 | 14245.7 | 15919.4 | 18224.3 | 19074.6 | 19071.1 | 18855.6 | 13860.1 |
| 55°   | 9504.1  | 9607.8  | 10186.7 | 11541.2 | 13271.9 | 15630.5 | 18586.6 | 19917.9 | 20577.0 | 20324.3 | 15091.3 |
| 57.5° | 7843.2  | 7903.8  | 8452.4  | 9812.7  | 11882.4 | 14860.6 | 18958.1 | 20930.0 | 22312.5 | 22152.9 | 16621.7 |
| 60°   | 5954.1  | 6047.2  | 6614.5  | 7871.2  | 10105.1 | 13494.4 | 18993.0 | 21986.4 | 24386.9 | 24226.1 | 18330.3 |
| 62.5° | 3864.5  | 4025.3  | 4556.4  | 5733.9  | 7955.0  | 11529.6 | 18182.4 | 22677.0 | 26352.9 | 26295.8 | 19846.8 |
| 65°   | 2221.1  | 2342.3  | 2711.5  | 3619.9  | 5488.1  | 9062.7  | 16254.8 | 22411.5 | 27563.0 | 27530.4 | 20414.0 |
| 66°   | 1814.7  | 1890.3  | 2173.4  | 2829.1  | 4528.4  | 7958.5  | 15134.4 | 21851.3 | 27683.0 | 27684.2 | 20348.8 |
| 67.5° | 1451.3  | 1485.0  | 1611.9  | 2025.5  | 3341.6  | 6308.1  | 13132.2 | 20615.5 | 27533.9 | 27574.7 | 19928.3 |
| 70°   | 1200.9  | 1218.3  | 1257.9  | 1358.1  | 1824.0  | 3804.0  | 9321.3  | 17404.4 | 26037.3 | 26068.7 | 18287.2 |
| 72.5° | 1077.3  | 1087.9  | 1103.0  | 1116.9  | 1287.0  | 2125.6  | 5693.2  | 13923.0 | 22828.5 | 22869.2 | 15786.6 |
| 75°   | 976.1   | 981.9   | 979.5   | 980.7   | 1079.7  | 1354.6  | 2942.1  | 10395.1 | 18458.4 | 18376.9 | 12093.3 |
| 77.5° | 857.2   | 863.1   | 851.4   | 853.8   | 955.0   | 1041.3  | 1464.0  | 7277.2  | 12456.7 | 11881.3 | 6813.6  |
| 80°   | 724.5   | 729.1   | 724.5   | 732.6   | 831.6   | 786.2   | 851.4   | 4094.0  | 5508.0  | 5209.8  | 2422.6  |
| 82.5° | 547.4   | 567.2   | 581.2   | 613.8   | 684.9   | 559.0   | 569.5   | 1594.5  | 1677.2  | 1596.9  | 743.1   |
| 85°   | 240.0   | 292.3   | 437.9   | 469.4   | 514.8   | 335.5   | 373.8   | 649.9   | 682.5   | 661.6   | 270.2   |
| 87.5° | 62.9    | 68.7    | 216.7   | 272.6   | 285.3   | 151.4   | 194.5   | 295.9   | 312.2   | 295.9   | 89.7    |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



REPORT NUMBER: P383233

CATALOG NUMBER: GLEON-SA5C-735-U-T2R

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 3133.1  | 3133.1 | 3133.1 | 3133.1 | 3133.1 | 3133.1 | 3133.1 | 3133.1 | 3133.1 | 3133.1 | 3133.1 |
| 2.5°  | 3168.0  | 3111.0 | 3008.4 | 2917.6 | 2848.9 | 2802.3 | 2755.7 | 2732.4 | 2718.4 | 2704.5 | 2706.8 |
| 5°    | 3269.4  | 3154.0 | 2978.2 | 2853.5 | 2783.7 | 2739.4 | 2716.1 | 2706.8 | 2701.0 | 2687.0 | 2687.0 |
| 7.5°  | 3421.9  | 3258.9 | 3016.6 | 2888.5 | 2833.8 | 2800.0 | 2786.0 | 2781.3 | 2774.3 | 2758.0 | 2760.4 |
| 10°   | 3614.1  | 3385.8 | 3097.0 | 2972.4 | 2922.3 | 2885.0 | 2865.2 | 2858.2 | 2845.4 | 2826.8 | 2829.1 |
| 12.5° | 3840.1  | 3543.0 | 3202.9 | 3072.5 | 3012.0 | 2961.9 | 2929.3 | 2909.5 | 2887.3 | 2862.8 | 2864.0 |
| 15°   | 4087.0  | 3714.3 | 3317.1 | 3162.2 | 3079.5 | 3009.6 | 2957.2 | 2923.5 | 2888.5 | 2858.2 | 2857.1 |
| 17.5° | 4337.4  | 3879.7 | 3404.4 | 3211.1 | 3099.4 | 3007.3 | 2936.2 | 2883.9 | 2840.8 | 2803.5 | 2800.0 |
| 20°   | 4607.6  | 4028.8 | 3453.4 | 3206.5 | 3062.0 | 2952.5 | 2858.2 | 2793.0 | 2745.3 | 2708.0 | 2702.1 |
| 22.5° | 4882.5  | 4168.5 | 3461.5 | 3158.7 | 2979.4 | 2845.4 | 2746.4 | 2674.2 | 2625.3 | 2586.8 | 2572.8 |
| 25°   | 5134.0  | 4276.8 | 3427.7 | 3066.7 | 2864.0 | 2719.7 | 2623.0 | 2549.6 | 2510.0 | 2464.5 | 2450.5 |
| 27.5° | 5363.6  | 4352.6 | 3360.2 | 2949.1 | 2734.7 | 2592.7 | 2501.9 | 2438.9 | 2395.8 | 2360.9 | 2349.3 |
| 30°   | 5569.7  | 4393.3 | 3249.5 | 2809.3 | 2602.0 | 2472.7 | 2395.8 | 2352.7 | 2315.5 | 2271.2 | 2263.0 |
| 32.5° | 5765.3  | 4393.3 | 3107.5 | 2656.7 | 2470.4 | 2366.7 | 2321.3 | 2294.5 | 2252.6 | 2209.4 | 2197.8 |
| 35°   | 5961.1  | 4366.5 | 2939.8 | 2497.2 | 2349.3 | 2291.0 | 2288.6 | 2257.2 | 2193.1 | 2134.9 | 2119.8 |
| 37.5° | 6167.2  | 4311.8 | 2751.0 | 2348.1 | 2250.2 | 2257.2 | 2277.0 | 2207.1 | 2116.3 | 2033.6 | 2011.5 |
| 40°   | 6400.1  | 4236.1 | 2555.4 | 2218.8 | 2167.5 | 2242.0 | 2245.6 | 2134.9 | 1957.9 | 1882.2 | 1862.3 |
| 42.5° | 6673.8  | 4160.4 | 2373.7 | 2104.6 | 2102.3 | 2196.7 | 2186.2 | 1978.9 | 1872.9 | 1834.4 | 1824.0 |
| 45°   | 7033.7  | 4117.3 | 2201.3 | 1996.3 | 2051.1 | 2123.3 | 2084.8 | 1892.6 | 1848.4 | 1826.3 | 1817.0 |
| 47.5° | 7601.0  | 4139.4 | 2042.9 | 1910.1 | 1999.8 | 2049.9 | 1896.2 | 1857.7 | 1826.3 | 1799.5 | 1790.2 |
| 50°   | 8311.5  | 4126.6 | 1914.8 | 1850.7 | 1941.6 | 1973.0 | 1811.1 | 1812.3 | 1796.0 | 1765.7 | 1751.8 |
| 52.5° | 8846.1  | 4026.4 | 1832.1 | 1817.0 | 1890.3 | 1836.7 | 1757.6 | 1768.1 | 1759.9 | 1715.6 | 1700.4 |
| 55°   | 9362.0  | 3940.3 | 1790.2 | 1804.1 | 1853.0 | 1666.7 | 1694.7 | 1720.3 | 1712.1 | 1669.1 | 1662.1 |
| 57.5° | 10003.8 | 3924.0 | 1764.5 | 1807.7 | 1821.6 | 1581.7 | 1634.1 | 1667.8 | 1662.1 | 1643.4 | 1639.9 |
| 60°   | 10789.9 | 3928.6 | 1741.2 | 1813.4 | 1786.7 | 1518.8 | 1577.0 | 1620.1 | 1623.6 | 1620.1 | 1617.8 |
| 62.5° | 11222.1 | 3801.6 | 1683.0 | 1797.1 | 1724.9 | 1464.0 | 1517.6 | 1580.6 | 1581.7 | 1588.7 | 1587.5 |
| 65°   | 10855.1 | 3421.9 | 1574.7 | 1740.1 | 1621.3 | 1418.7 | 1466.3 | 1535.1 | 1517.6 | 1549.1 | 1549.1 |
| 66°   | 10498.7 | 3202.9 | 1521.1 | 1702.8 | 1577.0 | 1401.1 | 1450.0 | 1511.8 | 1489.6 | 1532.8 | 1532.8 |
| 67.5° | 9770.8  | 2833.8 | 1424.4 | 1623.6 | 1514.1 | 1376.7 | 1431.4 | 1473.3 | 1443.1 | 1507.2 | 1502.5 |
| 70°   | 8440.8  | 2192.0 | 1229.9 | 1444.3 | 1410.5 | 1340.6 | 1405.8 | 1396.5 | 1352.2 | 1450.0 | 1431.4 |
| 72.5° | 7116.5  | 1665.5 | 987.7  | 1209.0 | 1253.2 | 1295.1 | 1369.7 | 1298.7 | 1242.8 | 1311.4 | 1270.7 |
| 75°   | 5521.9  | 1252.1 | 780.4  | 939.9  | 1058.7 | 1224.1 | 1326.6 | 1185.7 | 1105.3 | 1098.3 | 1076.2 |
| 77.5° | 2985.1  | 859.5  | 618.5  | 717.5  | 840.9  | 1135.6 | 1297.5 | 1064.6 | 943.4  | 915.4  | 898.0  |
| 80°   | 1182.2  | 559.0  | 449.6  | 543.9  | 588.2  | 1007.5 | 1227.6 | 923.6  | 778.0  | 750.1  | 723.3  |
| 82.5° | 488.0   | 330.8  | 290.0  | 364.5  | 383.2  | 861.9  | 1101.8 | 757.1  | 601.0  | 831.6  | 882.8  |
| 85°   | 209.7   | 181.7  | 172.3  | 188.6  | 216.7  | 604.5  | 877.1  | 577.7  | 648.7  | 578.9  | 460.1  |
| 87.5° | 62.9    | 76.9   | 73.4   | 72.2   | 79.2   | 144.4  | 467.1  | 321.5  | 476.4  | 180.5  | 135.1  |
| 90°   | 0.0     | 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

All Brands

Data applicable to all product families using SA light engines

Report Number: SP1-2101-121-7

Luminaire Tested: IFLD-S-SA2A-735-U-T2

Test Date: 03/04/2021

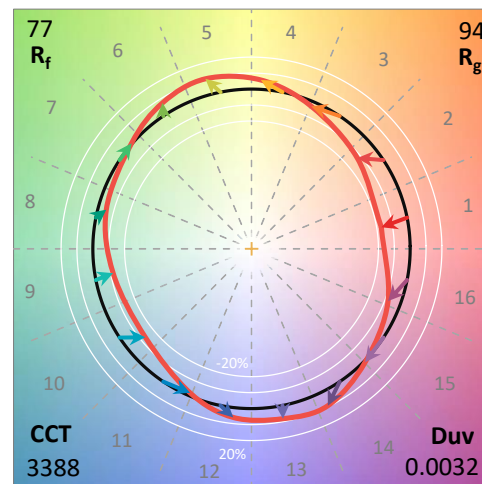
### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-7  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/04/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2A-735-U-T2**  
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 615mA.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 3388   | CRI (Ra): | 73.1 |      |       |
| CIE u':                   | 0.2371 | R1:       | 68.9 | R9:  | -34.6 |
| CIE v':                   | 0.5177 | R2:       | 81.1 | R10: | 57.8  |
| Duv:                      | 0.0032 | R3:       | 93.1 | R11: | 68.6  |
| CIE x:                    | 0.4153 | R4:       | 71.6 | R12: | 53.9  |
| CIE y:                    | 0.4030 | R5:       | 69.4 | R13: | 70.9  |
| CIE z:                    | 0.1817 | R6:       | 75.0 | R14: | 96.2  |
| Peak Wavelength (nm):     | 590    | R7:       | 79.5 |      |       |
| Dominant Wavelength (nm): | 580    | R8:       | 46.4 |      |       |
| Purity:                   | 45.7   |           |      |      |       |
| Rf:                       | 76.9   |           |      |      |       |
| Rg:                       | 94.4   |           |      |      |       |



### Test Conditions

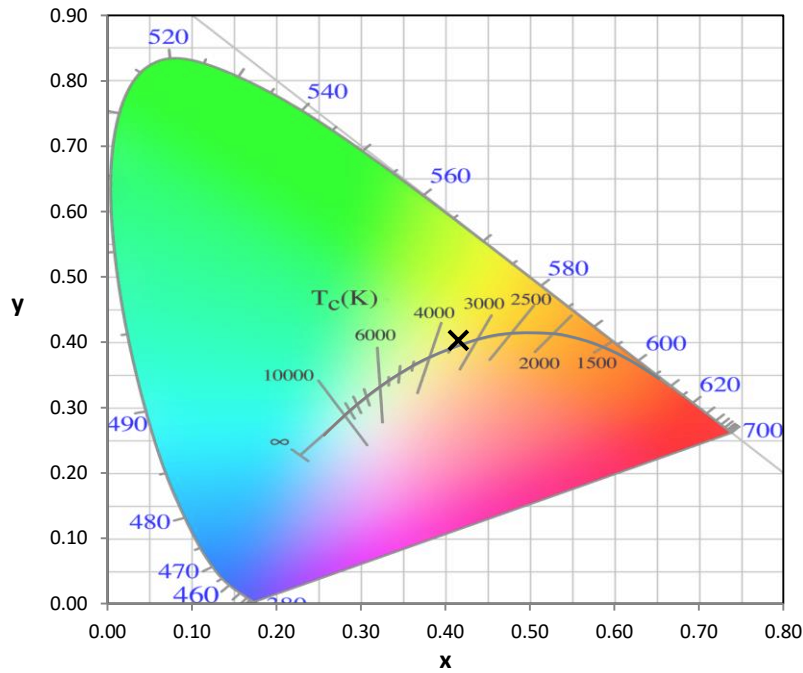
Stabilization Time: 81M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0/30%  
 Sphere Temperature (°C): 24.1

REPORT NUMBER: SP1-2101-121-7

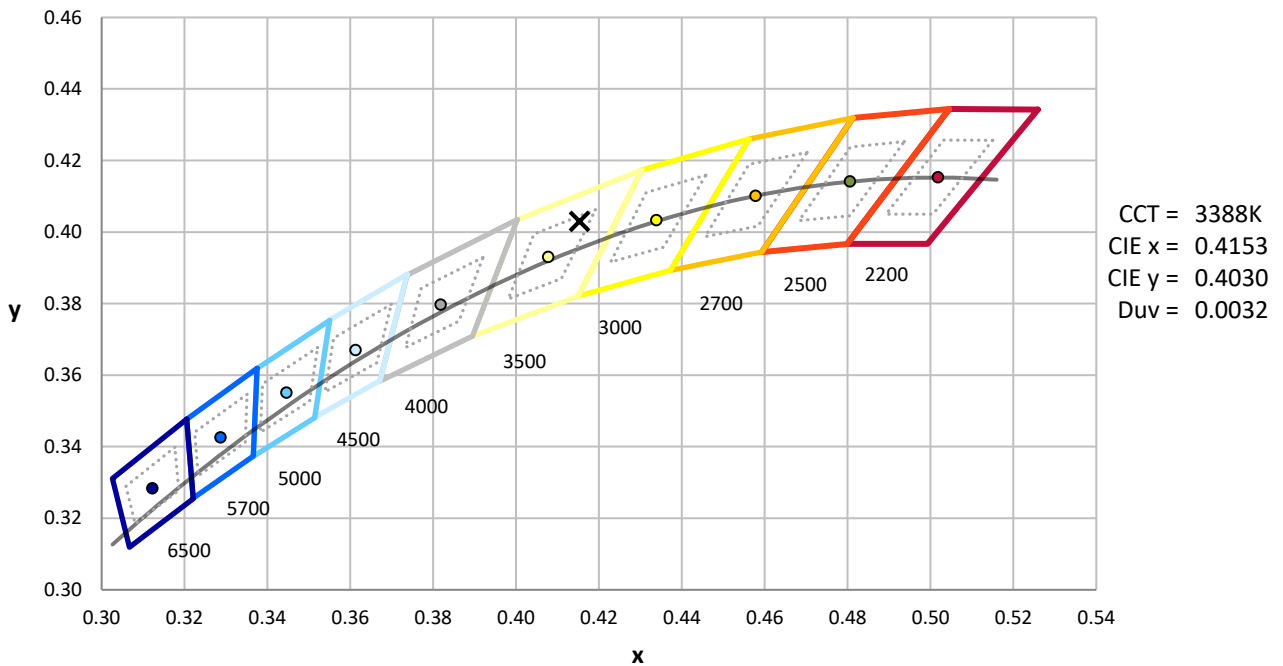
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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: SP1-2101-121-7

**CIE 1931 Chromaticity Diagram**



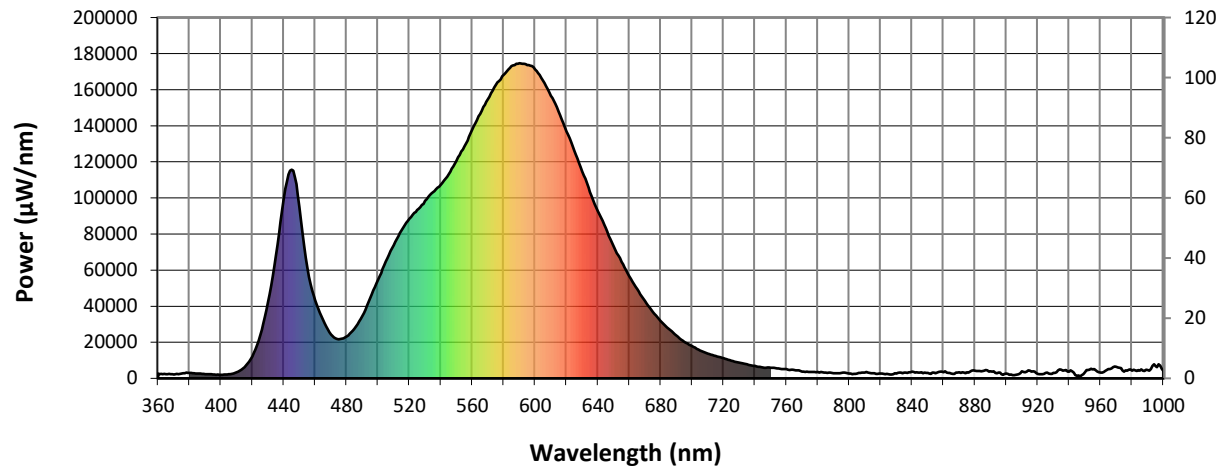
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 3500K 4-step quadrangle

REPORT NUMBER: SP1-2101-121-7

### Photopic Flux vs. Wavelength

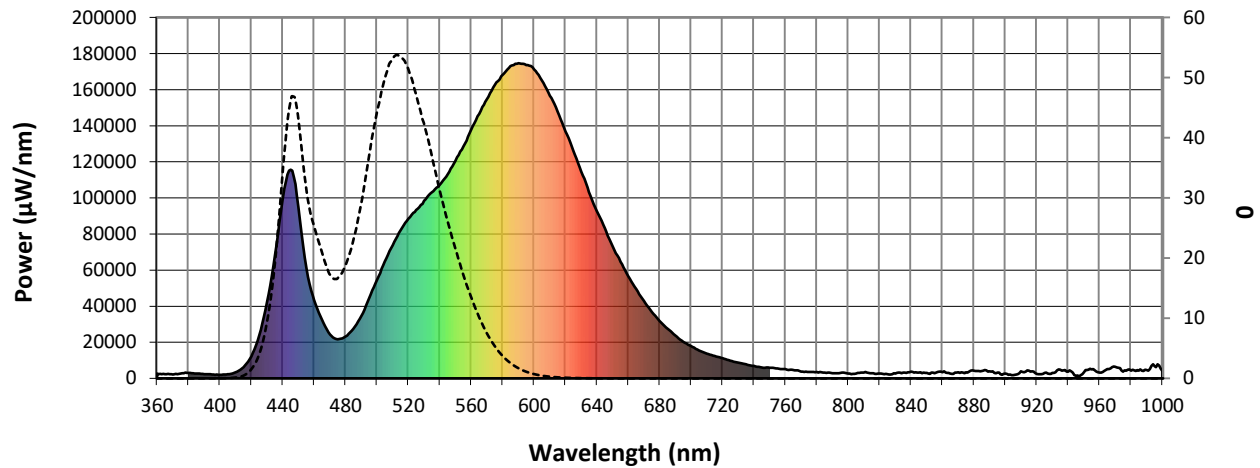


#####

| 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       | 2672             | 0.0              | 490       | 34553            | 4.9              | 620       | 136720           | 35.6             | 750       | 5870             | 0.0              | 880       | 4216             | 0.0              |
| 365       | 2252             | 0.0              | 495       | 44336            | 8.0              | 625       | 126308           | 27.9             | 755       | 5421             | 0.0              | 885       | 4132             | 0.0              |
| 370       | 2217             | 0.0              | 500       | 54643            | 12.1             | 630       | 114625           | 20.7             | 760       | 5097             | 0.0              | 890       | 3992             | 0.0              |
| 375       | 2697             | 0.0              | 505       | 64676            | 18.1             | 635       | 103216           | 15.5             | 765       | 4626             | 0.0              | 895       | 3214             | 0.0              |
| 380       | 3039             | 0.0              | 510       | 73825            | 25.4             | 640       | 92605            | 11.1             | 770       | 3782             | 0.0              | 900       | 2580             | 0.0              |
| 385       | 2655             | 0.0              | 515       | 81872            | 33.9             | 645       | 83234            | 8.0              | 775       | 3506             | 0.0              | 905       | 1776             | 0.0              |
| 390       | 2357             | 0.0              | 520       | 88574            | 43.0             | 650       | 73263            | 5.4              | 780       | 3507             | 0.0              | 910       | 3995             | 0.0              |
| 395       | 2186             | 0.0              | 525       | 93289            | 50.1             | 655       | 64627            | 3.7              | 785       | 3267             | 0.0              | 915       | 4288             | 0.0              |
| 400       | 2015             | 0.0              | 530       | 98393            | 57.9             | 660       | 56614            | 2.4              | 790       | 2849             | 0.0              | 920       | 2446             | 0.0              |
| 405       | 2234             | 0.0              | 535       | 103269           | 64.0             | 665       | 49537            | 1.6              | 795       | 3037             | 0.0              | 925       | 3009             | 0.0              |
| 410       | 3412             | 0.0              | 540       | 107316           | 69.9             | 670       | 42866            | 0.9              | 800       | 2716             | 0.0              | 930       | 3026             | 0.0              |
| 415       | 6135             | 0.0              | 545       | 113101           | 75.3             | 675       | 36708            | 0.6              | 805       | 2648             | 0.0              | 935       | 4734             | 0.0              |
| 420       | 12146            | 0.0              | 550       | 120690           | 82.0             | 680       | 31814            | 0.4              | 810       | 3187             | 0.0              | 940       | 3719             | 0.0              |
| 425       | 23983            | 0.1              | 555       | 128583           | 87.8             | 685       | 27485            | 0.2              | 815       | 2931             | 0.0              | 945       | 1480             | 0.0              |
| 430       | 42142            | 0.3              | 560       | 137796           | 93.6             | 690       | 23698            | 0.1              | 820       | 2717             | 0.0              | 950       | 3450             | 0.0              |
| 435       | 68228            | 0.8              | 565       | 146577           | 97.5             | 695       | 20309            | 0.1              | 825       | 2236             | 0.0              | 955       | 5051             | 0.0              |
| 440       | 99323            | 1.6              | 570       | 154581           | 100.5            | 700       | 17890            | 0.1              | 830       | 2628             | 0.0              | 960       | 3176             | 0.0              |
| 445       | 115584           | 2.4              | 575       | 162633           | 101.2            | 705       | 15500            | 0.0              | 835       | 3140             | 0.0              | 965       | 5178             | 0.0              |
| 450       | 94997            | 2.5              | 580       | 168101           | 99.9             | 710       | 13699            | 0.0              | 840       | 3675             | 0.0              | 970       | 6385             | 0.0              |
| 455       | 61433            | 2.1              | 585       | 173145           | 96.2             | 715       | 12398            | 0.0              | 845       | 3283             | 0.0              | 975       | 3810             | 0.0              |
| 460       | 43373            | 1.8              | 590       | 174675           | 90.3             | 720       | 11147            | 0.0              | 850       | 3055             | 0.0              | 980       | 4322             | 0.0              |
| 465       | 32472            | 1.7              | 595       | 173724           | 82.3             | 725       | 9761             | 0.0              | 855       | 2932             | 0.0              | 985       | 4200             | 0.0              |
| 470       | 24257            | 1.5              | 600       | 171241           | 73.8             | 730       | 8651             | 0.0              | 860       | 3382             | 0.0              | 990       | 4661             | 0.0              |
| 475       | 21690            | 1.7              | 605       | 165134           | 64.0             | 735       | 7730             | 0.0              | 865       | 2605             | 0.0              | 995       | 6746             | 0.0              |
| 480       | 23173            | 2.2              | 610       | 156652           | 53.8             | 740       | 6847             | 0.0              | 870       | 3325             | 0.0              | 1000      | 4150             | 0.0              |
| 485       | 27564            | 3.3              | 615       | 147879           | 44.6             | 745       | 6124             | 0.0              | 875       | 3325             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-7

### Scotopic Flux vs. Wavelength



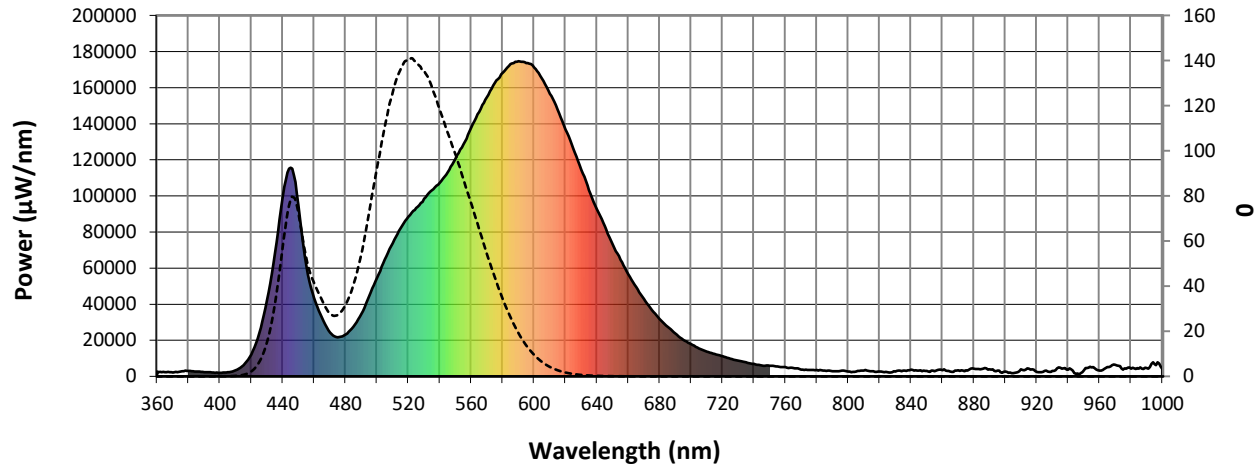
Scotopic Lumens: 12126

S/P: 1.36

| 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       | 2672             | 0.0              | 490       | 34553            | 53.2             | 620       | 136720           | 1.7              | 750       | 5870             | 0.0              | 880       | 4216             | 0.0              |
| 365       | 2252             | 0.0              | 495       | 44336            | 71.7             | 625       | 126308           | 1.1              | 755       | 5421             | 0.0              | 885       | 4132             | 0.0              |
| 370       | 2217             | 0.0              | 500       | 54643            | 91.4             | 630       | 114625           | 0.6              | 760       | 5097             | 0.0              | 890       | 3992             | 0.0              |
| 375       | 2697             | 0.0              | 505       | 64676            | 110.0            | 635       | 103216           | 0.4              | 765       | 4626             | 0.0              | 895       | 3214             | 0.0              |
| 380       | 3039             | 0.0              | 510       | 73825            | 125.1            | 640       | 92605            | 0.2              | 770       | 3782             | 0.0              | 900       | 2580             | 0.0              |
| 385       | 2655             | 0.0              | 515       | 81872            | 135.7            | 645       | 83234            | 0.1              | 775       | 3506             | 0.0              | 905       | 1776             | 0.0              |
| 390       | 2357             | 0.0              | 520       | 88574            | 140.8            | 650       | 73263            | 0.1              | 780       | 3507             | 0.0              | 910       | 3995             | 0.0              |
| 395       | 2186             | 0.0              | 525       | 93289            | 139.6            | 655       | 64627            | 0.1              | 785       | 3267             | 0.0              | 915       | 4288             | 0.0              |
| 400       | 2015             | 0.0              | 530       | 98393            | 135.7            | 660       | 56614            | 0.0              | 790       | 2849             | 0.0              | 920       | 2446             | 0.0              |
| 405       | 2234             | 0.1              | 535       | 103269           | 128.7            | 665       | 49537            | 0.0              | 795       | 3037             | 0.0              | 925       | 3009             | 0.0              |
| 410       | 3412             | 0.2              | 540       | 107316           | 118.6            | 670       | 42866            | 0.0              | 800       | 2716             | 0.0              | 930       | 3026             | 0.0              |
| 415       | 6135             | 0.6              | 545       | 113101           | 108.4            | 675       | 36708            | 0.0              | 805       | 2648             | 0.0              | 935       | 4734             | 0.0              |
| 420       | 12146            | 2.0              | 550       | 120690           | 98.7             | 680       | 31814            | 0.0              | 810       | 3187             | 0.0              | 940       | 3719             | 0.0              |
| 425       | 23983            | 5.9              | 555       | 128583           | 87.9             | 685       | 27485            | 0.0              | 815       | 2931             | 0.0              | 945       | 1480             | 0.0              |
| 430       | 42142            | 14.3             | 560       | 137796           | 77.0             | 690       | 23698            | 0.0              | 820       | 2717             | 0.0              | 950       | 3450             | 0.0              |
| 435       | 68228            | 30.5             | 565       | 146577           | 65.8             | 695       | 20309            | 0.0              | 825       | 2236             | 0.0              | 955       | 5051             | 0.0              |
| 440       | 99323            | 55.5             | 570       | 154581           | 54.6             | 700       | 17890            | 0.0              | 830       | 2628             | 0.0              | 960       | 3176             | 0.0              |
| 445       | 115584           | 77.4             | 575       | 162633           | 44.3             | 705       | 15500            | 0.0              | 835       | 3140             | 0.0              | 965       | 5178             | 0.0              |
| 450       | 94997            | 73.6             | 580       | 168101           | 34.6             | 710       | 13699            | 0.0              | 840       | 3675             | 0.0              | 970       | 6385             | 0.0              |
| 455       | 61433            | 53.7             | 585       | 173145           | 26.5             | 715       | 12398            | 0.0              | 845       | 3283             | 0.0              | 975       | 3810             | 0.0              |
| 460       | 43373            | 41.9             | 590       | 174675           | 19.5             | 720       | 11147            | 0.0              | 850       | 3055             | 0.0              | 980       | 4322             | 0.0              |
| 465       | 32472            | 34.3             | 595       | 173724           | 13.9             | 725       | 9761             | 0.0              | 855       | 2932             | 0.0              | 985       | 4200             | 0.0              |
| 470       | 24257            | 27.9             | 600       | 171241           | 9.7              | 730       | 8651             | 0.0              | 860       | 3382             | 0.0              | 990       | 4661             | 0.0              |
| 475       | 21690            | 27.1             | 605       | 165134           | 6.5              | 735       | 7730             | 0.0              | 865       | 2605             | 0.0              | 995       | 6746             | 0.0              |
| 480       | 23173            | 31.3             | 610       | 156652           | 4.2              | 740       | 6847             | 0.0              | 870       | 3325             | 0.0              | 1000      | 4150             | 0.0              |
| 485       | 27564            | 40.0             | 615       | 147879           | 2.7              | 745       | 6124             | 0.0              | 875       | 3325             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-7

### Melanopic Flux vs. Wavelength



Melanopic Lumens: 4490.7

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       | 2672             | 0.0              | 490       | 34553            | 28.8             | 620       | 136720           | 0.1              | 750       | 5870             | 0.0              | 880       | 4216             | 0.0              |
| 365       | 2252             | 0.0              | 495       | 44336            | 36.6             | 625       | 126308           | 0.1              | 755       | 5421             | 0.0              | 885       | 4132             | 0.0              |
| 370       | 2217             | 0.0              | 500       | 54643            | 43.9             | 630       | 114625           | 0.0              | 760       | 5097             | 0.0              | 890       | 3992             | 0.0              |
| 375       | 2697             | 0.0              | 505       | 64676            | 49.6             | 635       | 103216           | 0.0              | 765       | 4626             | 0.0              | 895       | 3214             | 0.0              |
| 380       | 3039             | 0.0              | 510       | 73825            | 53.0             | 640       | 92605            | 0.0              | 770       | 3782             | 0.0              | 900       | 2580             | 0.0              |
| 385       | 2655             | 0.0              | 515       | 81872            | 53.5             | 645       | 83234            | 0.0              | 775       | 3506             | 0.0              | 905       | 1776             | 0.0              |
| 390       | 2357             | 0.0              | 520       | 88574            | 51.6             | 650       | 73263            | 0.0              | 780       | 3507             | 0.0              | 910       | 3995             | 0.0              |
| 395       | 2186             | 0.0              | 525       | 93289            | 47.3             | 655       | 64627            | 0.0              | 785       | 3267             | 0.0              | 915       | 4288             | 0.0              |
| 400       | 2015             | 0.0              | 530       | 98393            | 42.5             | 660       | 56614            | 0.0              | 790       | 2849             | 0.0              | 920       | 2446             | 0.0              |
| 405       | 2234             | 0.0              | 535       | 103269           | 37.2             | 665       | 49537            | 0.0              | 795       | 3037             | 0.0              | 925       | 3009             | 0.0              |
| 410       | 3412             | 0.1              | 540       | 107316           | 31.4             | 670       | 42866            | 0.0              | 800       | 2716             | 0.0              | 930       | 3026             | 0.0              |
| 415       | 6135             | 0.4              | 545       | 113101           | 26.3             | 675       | 36708            | 0.0              | 805       | 2648             | 0.0              | 935       | 4734             | 0.0              |
| 420       | 12146            | 1.4              | 550       | 120690           | 21.7             | 680       | 31814            | 0.0              | 810       | 3187             | 0.0              | 940       | 3719             | 0.0              |
| 425       | 23983            | 3.7              | 555       | 128583           | 17.3             | 685       | 27485            | 0.0              | 815       | 2931             | 0.0              | 945       | 1480             | 0.0              |
| 430       | 42142            | 8.9              | 560       | 137796           | 13.6             | 690       | 23698            | 0.0              | 820       | 2717             | 0.0              | 950       | 3450             | 0.0              |
| 435       | 68228            | 18.2             | 565       | 146577           | 10.3             | 695       | 20309            | 0.0              | 825       | 2236             | 0.0              | 955       | 5051             | 0.0              |
| 440       | 99323            | 33.2             | 570       | 154581           | 7.6              | 700       | 17890            | 0.0              | 830       | 2628             | 0.0              | 960       | 3176             | 0.0              |
| 445       | 115584           | 45.6             | 575       | 162633           | 5.4              | 705       | 15500            | 0.0              | 835       | 3140             | 0.0              | 965       | 5178             | 0.0              |
| 450       | 94997            | 43.8             | 580       | 168101           | 3.8              | 710       | 13699            | 0.0              | 840       | 3675             | 0.0              | 970       | 6385             | 0.0              |
| 455       | 61433            | 32.2             | 585       | 173145           | 2.6              | 715       | 12398            | 0.0              | 845       | 3283             | 0.0              | 975       | 3810             | 0.0              |
| 460       | 43373            | 25.6             | 590       | 174675           | 1.7              | 720       | 11147            | 0.0              | 850       | 3055             | 0.0              | 980       | 4322             | 0.0              |
| 465       | 32472            | 21.2             | 595       | 173724           | 1.1              | 725       | 9761             | 0.0              | 855       | 2932             | 0.0              | 985       | 4200             | 0.0              |
| 470       | 24257            | 17.4             | 600       | 171241           | 0.7              | 730       | 8651             | 0.0              | 860       | 3382             | 0.0              | 990       | 4661             | 0.0              |
| 475       | 21690            | 16.6             | 605       | 165134           | 0.5              | 735       | 7730             | 0.0              | 865       | 2605             | 0.0              | 995       | 6746             | 0.0              |
| 480       | 23173            | 18.6             | 610       | 156652           | 0.3              | 740       | 6847             | 0.0              | 870       | 3325             | 0.0              | 1000      | 4150             | 0.0              |
| 485       | 27564            | 22.7             | 615       | 147879           | 0.2              | 745       | 6124             | 0.0              | 875       | 3325             | 0.0              |           |                  |                  |

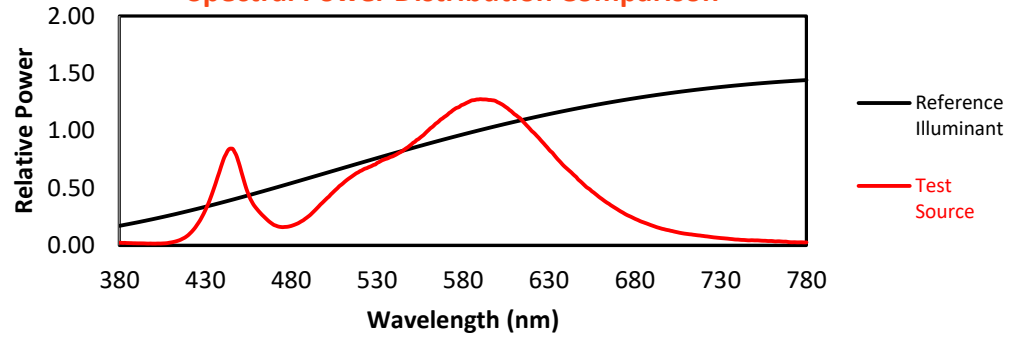
REPORT NUMBER: SP1-2101-121-7

TM-30-18

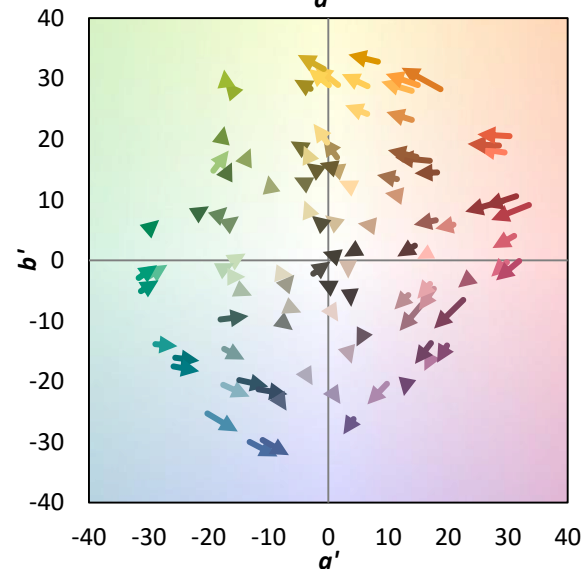
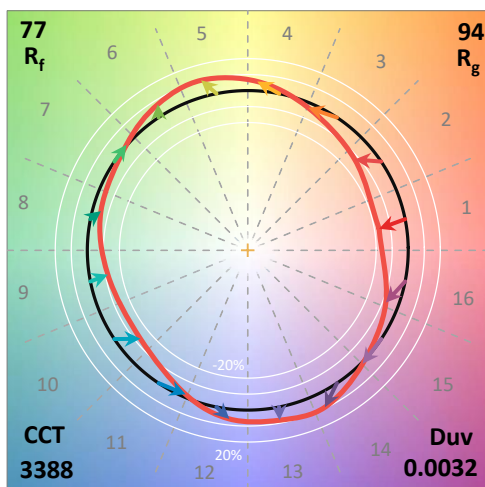
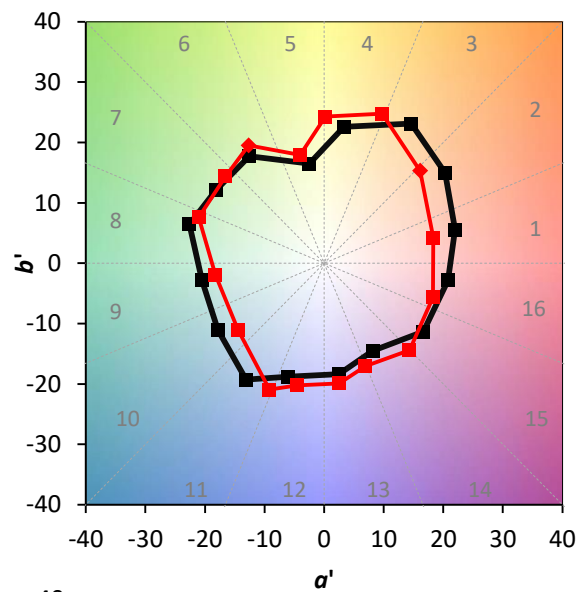
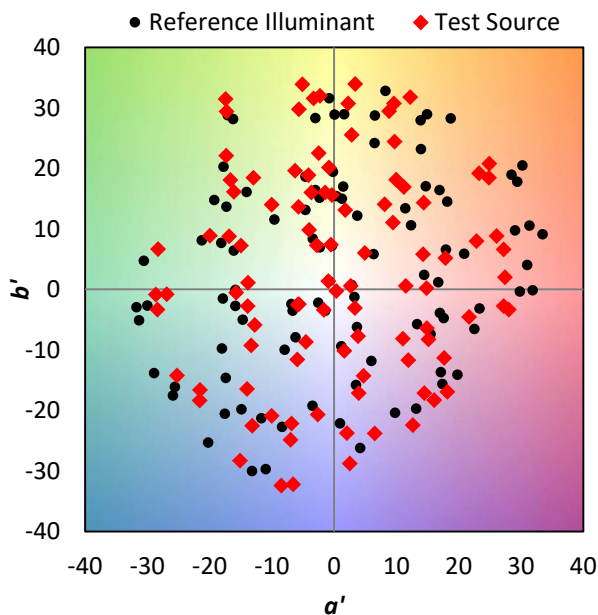
### Summary

$R_f = 76.9$   
 $R_g = 94.4$   
 CIE  $R_a = 73.1$   
 $R_g = -34.6$

### Spectral Power Distribution Comparison



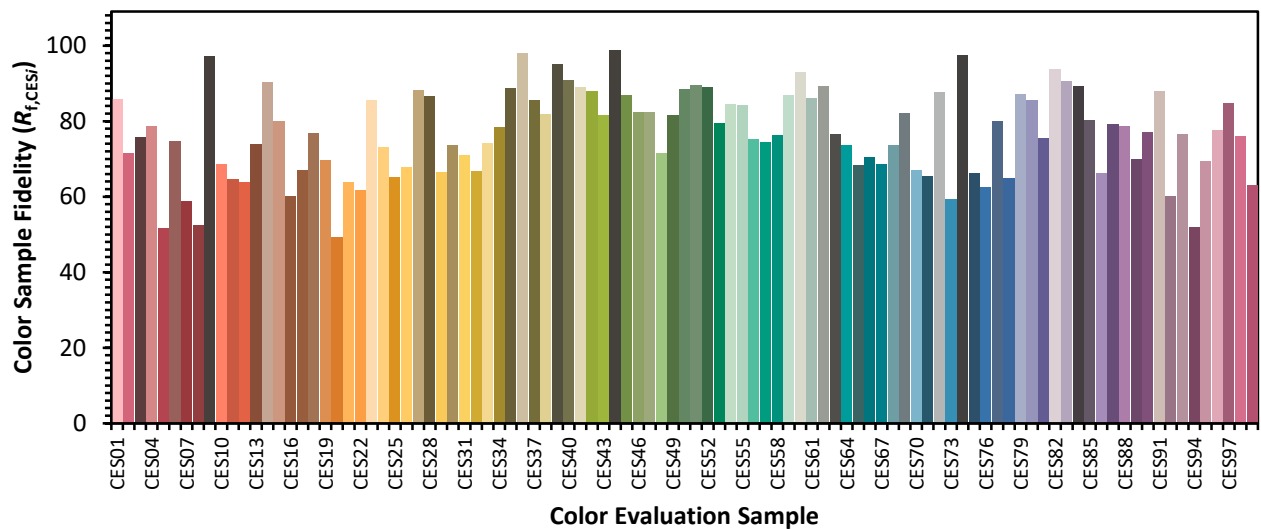
### Color Vector Graphics



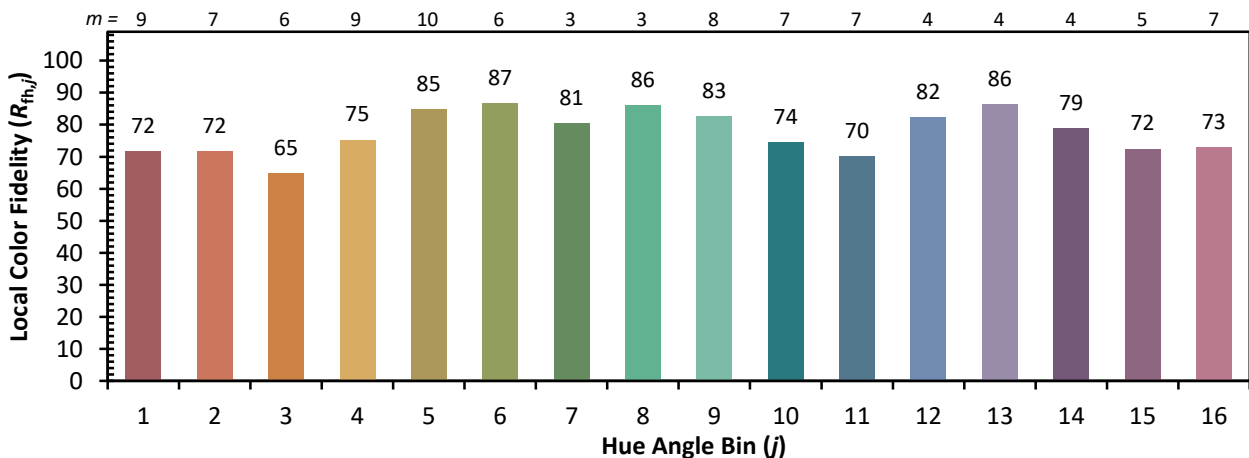
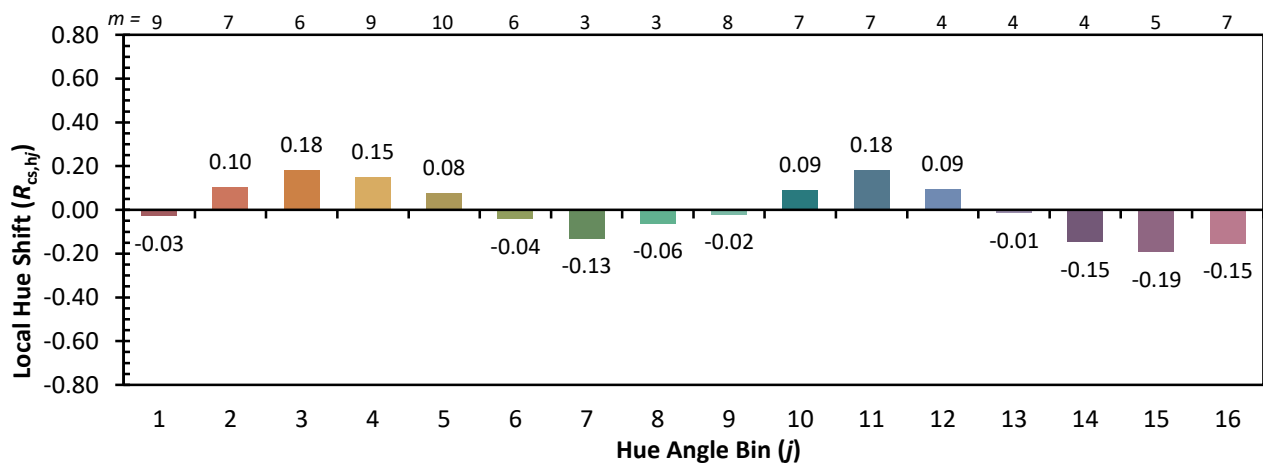
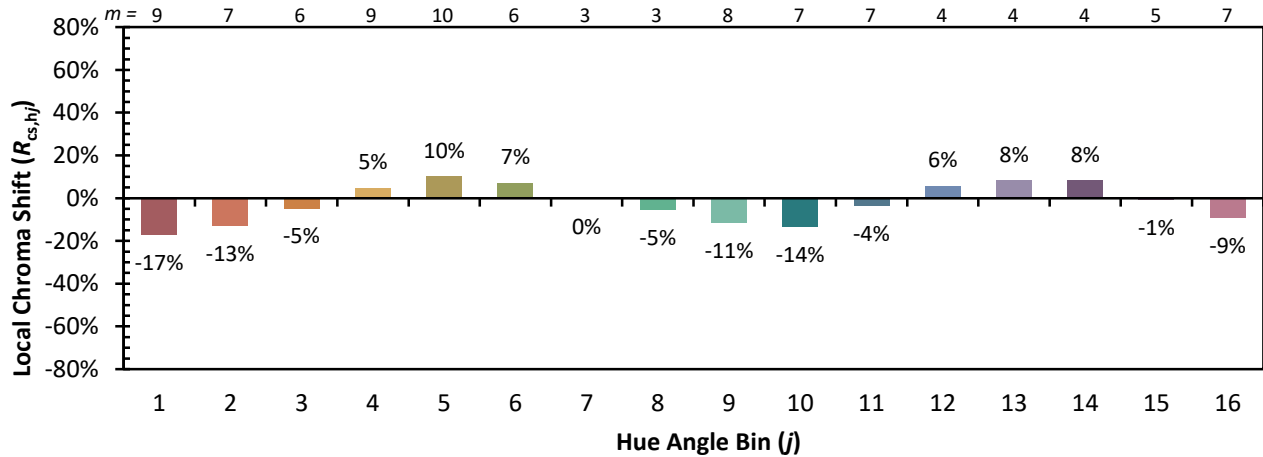


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

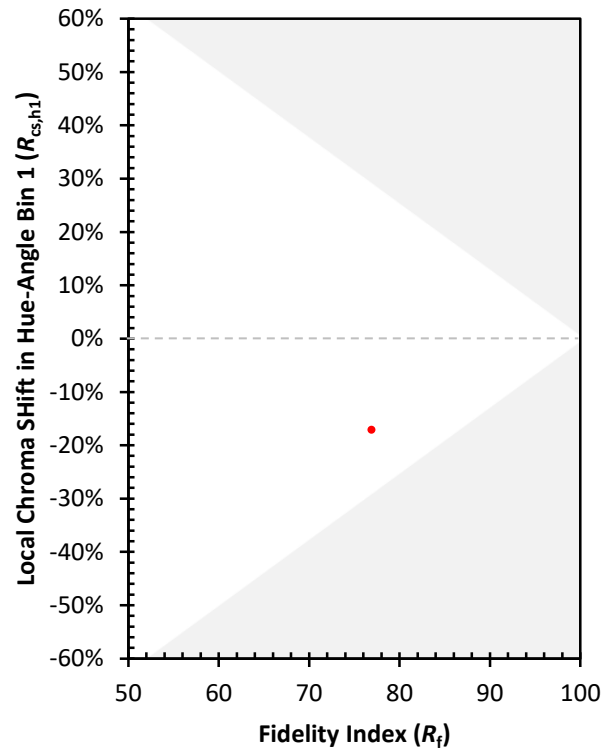
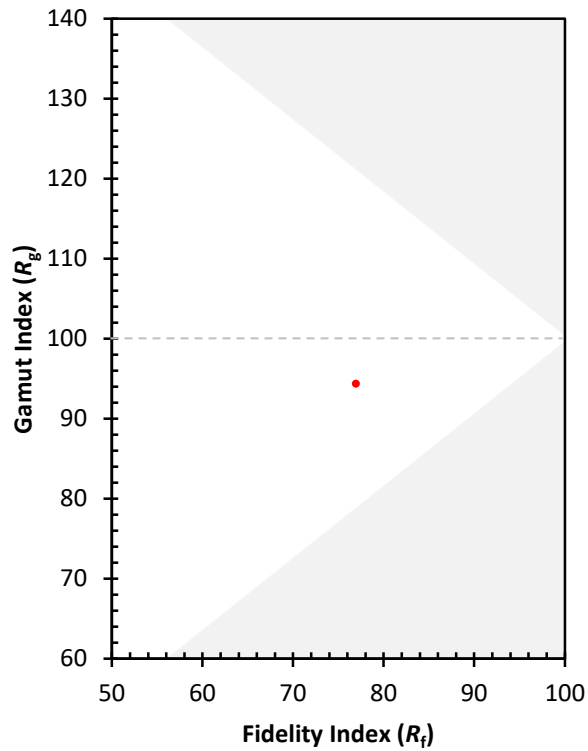
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 68 | CES51 = 90 | CES76 = 63 |
| CES02 = 62 | CES27 = 88 | CES52 = 89 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 80 | CES78 = 65 |
| CES04 = 70 | CES29 = 67 | CES54 = 84 | CES79 = 87 |
| CES05 = 48 | CES30 = 74 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 71 | CES56 = 75 | CES81 = 75 |
| CES07 = 40 | CES32 = 67 | CES57 = 74 | CES82 = 94 |
| CES08 = 39 | CES33 = 74 | CES58 = 76 | CES83 = 91 |
| CES09 = 29 | CES34 = 78 | 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 = 89 | CES87 = 79 |
| CES13 = 43 | CES38 = 82 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 95 | CES64 = 74 | CES89 = 70 |
| CES15 = 71 | CES40 = 91 | CES65 = 68 | CES90 = 77 |
| CES16 = 47 | CES41 = 89 | CES66 = 71 | CES91 = 88 |
| CES17 = 50 | CES42 = 88 | CES67 = 69 | CES92 = 60 |
| CES18 = 56 | CES43 = 82 | CES68 = 74 | CES93 = 77 |
| 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 = 82 | CES72 = 88 | CES97 = 85 |
| CES23 = 92 | CES48 = 72 | CES73 = 59 | CES98 = 76 |
| CES24 = 91 | CES49 = 82 | CES74 = 97 | CES99 = 63 |
| CES25 = 72 | CES50 = 88 | CES75 = 66 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)