

Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

Brand: McGRAW-EDISON

Report Number: P639811

Luminaire Tested: GWS-SA5C-750-U-T2-W

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P639811  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-19)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA5C-750-U-T2-W  
Description: GALLEON WALL SLIM LUMINAIRE. (5) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II OPTICS  
Light Source: (80) 5000K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 24167 lumens  
Efficiency: N/A  
Efficacy: 153.4 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B3 - U0 - G4

Input Watts (W): 157.5  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 0  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



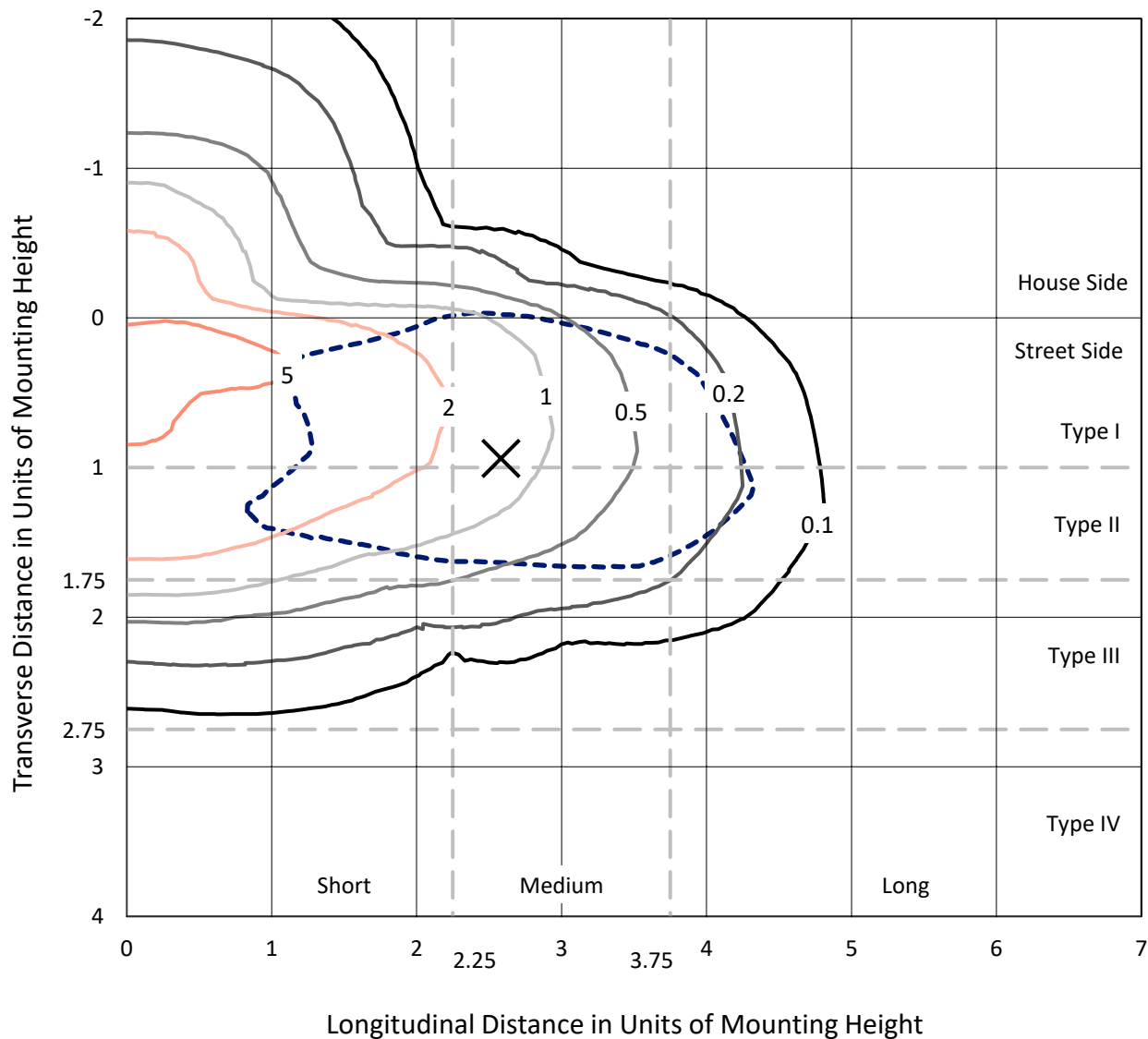
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## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd

--- 1/2 Max cd

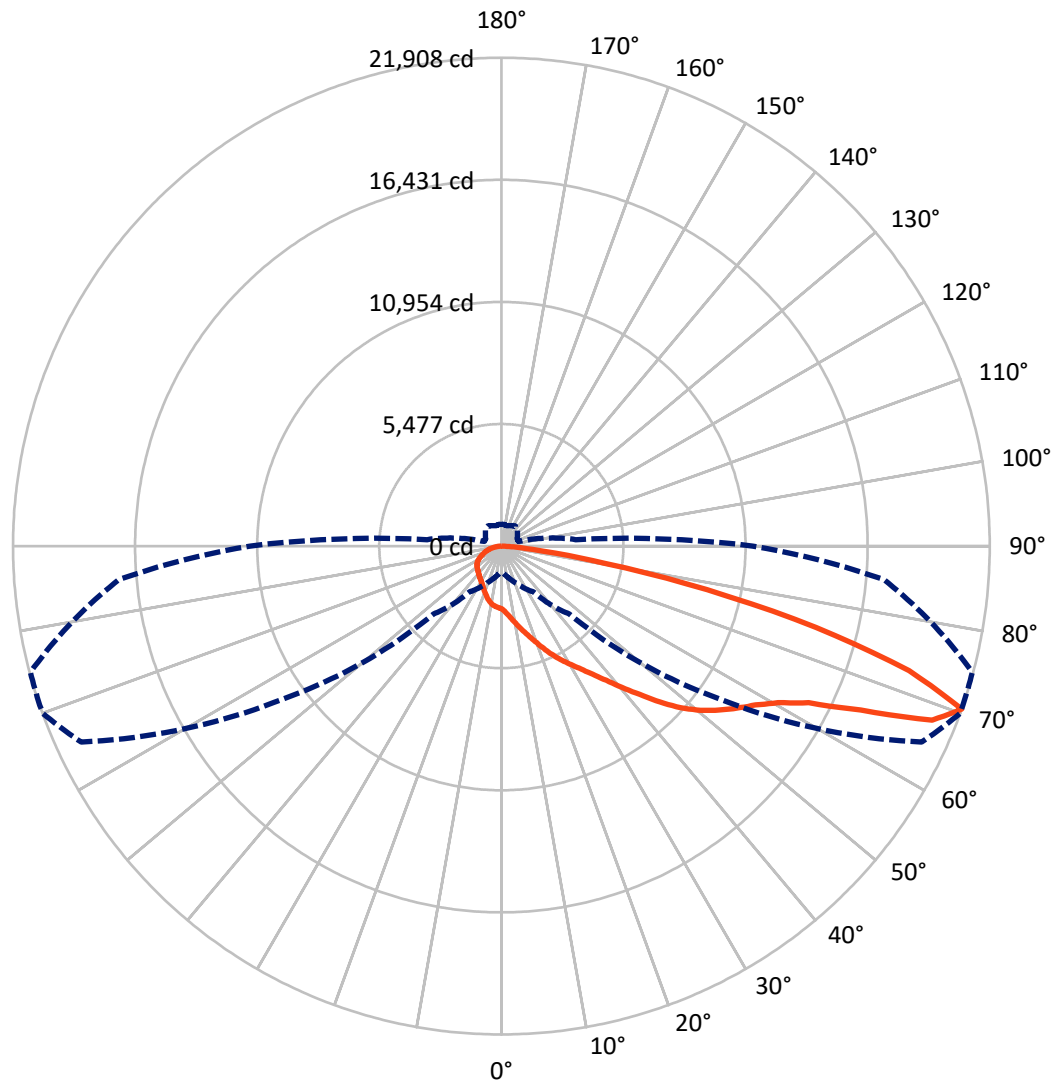


Based on 25 foot mounting height. Maximum calculated value = 6.5 fc  
 Type II - Medium - N/A

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## Luminous Intensity Polar Plot



— Vertical Plane Through 70-Deg Lateral    - - - Horizontal Cone Through 70-Deg Vertical

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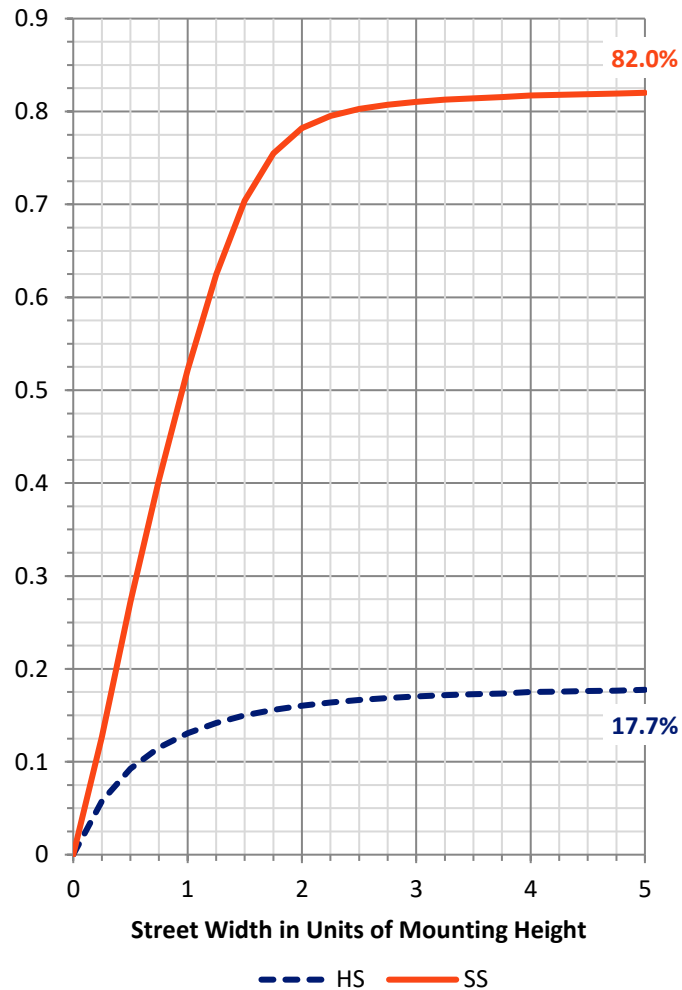
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 4330.8   | 0.0    | 4330.8  |
|                    | % Fixture | 17.9     | 0.0    | 17.9    |
| <b>Street Side</b> | Lumens    | 19836.2  | 0.0    | 19836.2 |
|                    | % Fixture | 82.1     | 0.0    | 82.1    |
| <b>Total</b>       | Lumens    | 24167.0  | 0.0    | 24167.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 286.5   | 1.2       |
| 10°-20°   | 931.8   | 3.9       |
| 20°-30°   | 1650.8  | 6.8       |
| 30°-40°   | 2484.5  | 10.3      |
| 40°-50°   | 3758.7  | 15.6      |
| 50°-60°   | 5384.6  | 22.3      |
| 60°-70°   | 5952.0  | 24.6      |
| 70°-80°   | 3358.9  | 13.9      |
| 80°-90°   | 359.3   | 1.5       |
| 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°    | 24167.0 | 100.0     |
| 0°-180°   | 24167.0 | 100.0     |

**Coefficient of Utilization**



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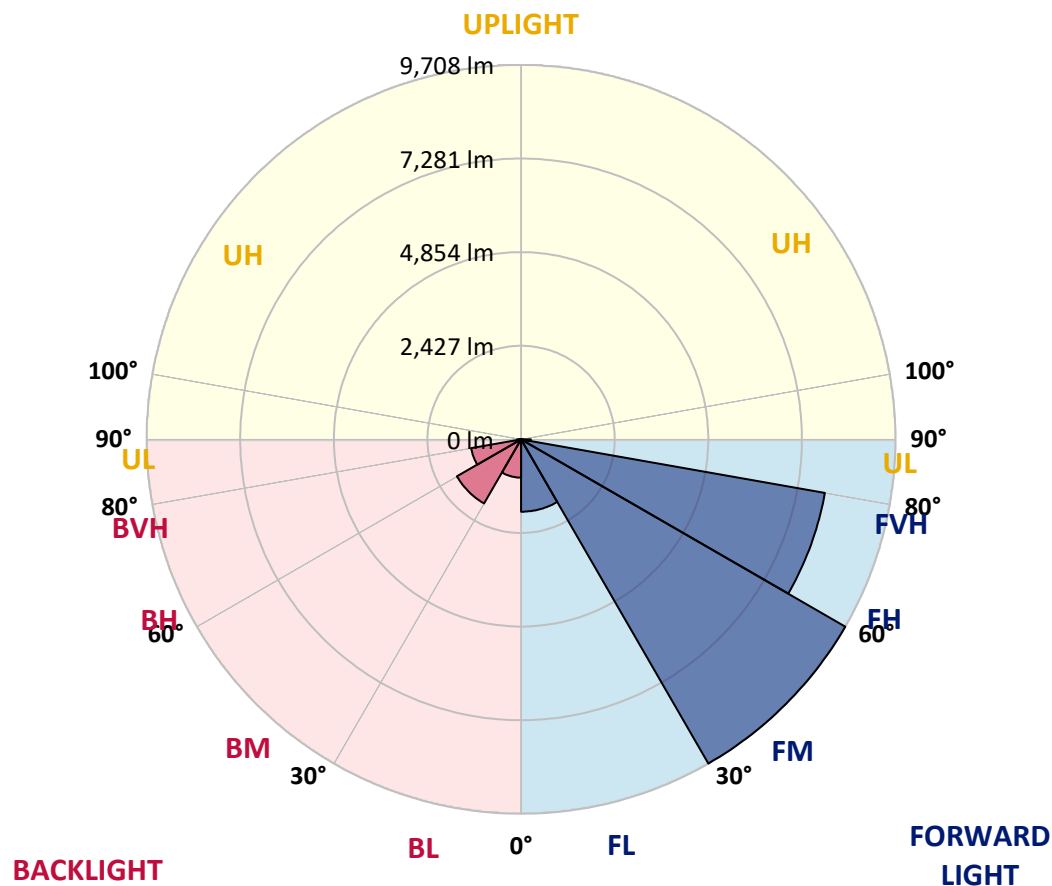
CATALOG NUMBER: GWS-SA5C-750-U-T2-W

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|--------|-----------|-------------------------|------|----------|
|      |             |        |           | B                       | U    | G        |
| FL   | (0°-30°)    | 1876.1 | 7.8       |                         |      |          |
| FM   | (30°-60°)   | 9707.9 | 40.2      |                         |      |          |
| FH   | (60°-80°)   | 7998.3 | 33.1      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 254.0  | 1.1       |                         |      | G3/500   |
| BL   | (0°-30°)    | 993.0  | 4.1       | B2/1000                 |      |          |
| BM   | (30°-60°)   | 1919.9 | 7.9       | B2/2500                 |      |          |
| BH   | (60°-80°)   | 1312.6 | 5.4       | B3/2500                 |      | G3/2500  |
| BVH  | (80°-90°)   | 105.3  | 0.4       |                         |      | G2/225   |
| 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 Medium



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°     | 25°     | 35°     | 45°     | 55°     | 65°     | 70°     | 75°     | 85°     |
|-------|--------|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 2818.4 | 2818.4 | 2818.4  | 2818.4  | 2818.4  | 2818.4  | 2818.4  | 2818.4  | 2818.4  | 2818.4  | 2818.4  |
| 2.5°  | 3122.2 | 3117.0 | 3120.5  | 3117.0  | 3097.8  | 3050.6  | 3012.2  | 2963.3  | 2930.1  | 2910.9  | 2865.5  |
| 5°    | 3488.9 | 3483.7 | 3471.5  | 3454.0  | 3419.1  | 3354.5  | 3258.4  | 3151.9  | 3087.3  | 3038.4  | 2942.4  |
| 7.5°  | 3752.6 | 3752.6 | 3750.8  | 3729.9  | 3705.4  | 3637.3  | 3523.8  | 3384.1  | 3289.8  | 3206.0  | 3048.9  |
| 10°   | 3887.0 | 3895.8 | 3908.0  | 3937.7  | 3932.5  | 3895.8  | 3789.3  | 3639.1  | 3520.3  | 3422.6  | 3188.6  |
| 12.5° | 3960.4 | 3965.6 | 3986.6  | 4047.7  | 4110.6  | 4119.3  | 4056.4  | 3899.3  | 3770.1  | 3639.1  | 3344.0  |
| 15°   | 4054.7 | 4056.4 | 4084.4  | 4157.7  | 4250.3  | 4342.8  | 4327.1  | 4169.9  | 4037.2  | 3892.3  | 3516.9  |
| 17.5° | 4128.0 | 4140.2 | 4190.9  | 4276.5  | 4391.7  | 4519.2  | 4596.0  | 4498.2  | 4334.1  | 4168.2  | 3705.4  |
| 20°   | 4154.2 | 4162.9 | 4229.3  | 4360.3  | 4517.4  | 4697.3  | 4868.4  | 4842.2  | 4676.3  | 4480.8  | 3918.5  |
| 22.5° | 4248.5 | 4248.5 | 4297.4  | 4407.4  | 4592.5  | 4854.4  | 5132.1  | 5200.2  | 5053.5  | 4824.8  | 4147.2  |
| 25°   | 4456.3 | 4449.3 | 4472.0  | 4517.4  | 4657.1  | 4980.2  | 5392.3  | 5596.6  | 5432.4  | 5175.7  | 4376.0  |
| 27.5° | 4740.9 | 4737.5 | 4735.7  | 4742.7  | 4789.8  | 5090.2  | 5612.3  | 5966.8  | 5802.6  | 5512.8  | 4580.3  |
| 30°   | 5050.0 | 5039.5 | 5062.2  | 5041.3  | 5030.8  | 5221.1  | 5799.1  | 6298.6  | 6171.1  | 5846.3  | 4749.7  |
| 32.5° | 5470.9 | 5451.6 | 5446.4  | 5378.3  | 5336.4  | 5425.5  | 5949.3  | 6675.7  | 6574.5  | 6206.0  | 4940.0  |
| 35°   | 6026.1 | 6008.7 | 5919.6  | 5811.4  | 5687.4  | 5729.3  | 6136.2  | 7044.2  | 7051.2  | 6656.5  | 5189.7  |
| 37.5° | 6586.7 | 6590.2 | 6520.3  | 6265.4  | 6137.9  | 6113.5  | 6420.8  | 7493.0  | 7643.1  | 7194.4  | 5512.8  |
| 40°   | 7052.9 | 7073.9 | 7073.9  | 6805.0  | 6614.6  | 6591.9  | 6820.7  | 8025.6  | 8324.2  | 7854.4  | 5921.4  |
| 42.5° | 7407.4 | 7426.6 | 7487.7  | 7293.9  | 7093.1  | 7171.7  | 7306.1  | 8559.9  | 9096.0  | 8669.9  | 6438.3  |
| 45°   | 7796.8 | 7812.5 | 7845.7  | 7733.9  | 7616.9  | 7826.5  | 7856.2  | 9199.0  | 9979.6  | 9584.9  | 7038.9  |
| 47.5° | 8313.7 | 8299.7 | 8303.2  | 8221.1  | 8130.3  | 8469.1  | 8462.1  | 9736.8  | 10833.4 | 10587.2 | 7690.3  |
| 50°   | 8956.3 | 8982.5 | 8958.0  | 8795.6  | 8689.1  | 8998.2  | 9038.3  | 10332.3 | 11584.3 | 11579.1 | 8346.9  |
| 52.5° | 9574.4 | 9584.9 | 9714.1  | 9721.1  | 9502.8  | 9438.2  | 9543.0  | 10933.0 | 12218.2 | 12487.1 | 8977.2  |
| 55°   | 9605.9 | 9646.0 | 10033.7 | 10313.1 | 10665.8 | 10147.2 | 10052.9 | 11505.7 | 12831.1 | 13375.9 | 9632.1  |
| 57.5° | 8937.1 | 9001.7 | 9660.0  | 10262.4 | 11243.8 | 11364.3 | 10926.0 | 12246.1 | 13444.0 | 14250.8 | 10389.9 |
| 60°   | 7508.7 | 7643.1 | 8537.2  | 9459.2  | 10983.6 | 12239.1 | 12712.4 | 13251.9 | 14249.0 | 15144.8 | 11310.2 |
| 62.5° | 4795.1 | 4847.5 | 6101.2  | 7644.9  | 9811.9  | 12153.6 | 14657.6 | 15024.3 | 15474.9 | 16309.5 | 12728.1 |
| 65°   | 2401.0 | 2568.7 | 3303.8  | 4562.8  | 7075.6  | 10709.5 | 15640.7 | 18270.5 | 17718.7 | 18303.7 | 15026.1 |
| 67.5° | 1629.2 | 1683.3 | 2055.3  | 2741.5  | 4149.0  | 7587.3  | 15031.3 | 21005.1 | 20842.7 | 20938.7 | 17476.0 |
| 70°   | 1201.4 | 1236.3 | 1529.7  | 1941.8  | 2509.3  | 4307.9  | 11966.7 | 20799.0 | 21907.9 | 21872.9 | 17219.3 |
| 72.5° | 876.6  | 894.1  | 1115.8  | 1482.5  | 1859.7  | 2228.2  | 7307.9  | 16802.0 | 19124.4 | 20132.0 | 15059.3 |
| 75°   | 637.4  | 658.3  | 775.3   | 1108.8  | 1445.9  | 1390.0  | 3607.7  | 12136.1 | 14584.3 | 16522.6 | 12268.8 |
| 77.5° | 475.0  | 501.2  | 555.3   | 695.0   | 1012.8  | 995.3   | 1559.4  | 7880.6  | 9433.0  | 10791.5 | 7452.8  |
| 80°   | 342.3  | 347.5  | 378.9   | 445.3   | 642.6   | 583.2   | 742.1   | 4108.8  | 4711.3  | 5161.8  | 2921.4  |
| 82.5° | 207.8  | 213.0  | 253.2   | 274.2   | 398.1   | 366.7   | 385.9   | 1330.6  | 1906.9  | 2023.9  | 1091.4  |
| 85°   | 61.1   | 64.6   | 115.2   | 125.7   | 165.9   | 157.2   | 155.4   | 541.3   | 646.1   | 826.0   | 429.6   |
| 87.5° | 0.0    | 0.0    | 0.0     | 0.0     | 1.7     | 10.5    | 19.2    | 96.0    | 144.9   | 200.8   | 104.8   |
| 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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**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2818.4  | 2818.4 | 2818.4 | 2818.4 | 2818.4 | 2818.4 | 2818.4 | 2818.4 | 2818.4 | 2818.4 | 2818.4 |
| 2.5°  | 2848.1  | 2807.9 | 2786.9 | 2750.3 | 2724.1 | 2697.9 | 2671.7 | 2647.2 | 2636.8 | 2621.1 | 2624.5 |
| 5°    | 2898.7  | 2835.8 | 2773.0 | 2701.4 | 2640.3 | 2589.6 | 2544.2 | 2504.1 | 2486.6 | 2470.9 | 2477.9 |
| 7.5°  | 2975.5  | 2881.2 | 2760.7 | 2629.8 | 2533.7 | 2463.9 | 2416.7 | 2388.8 | 2380.1 | 2367.9 | 2367.9 |
| 10°   | 3073.3  | 2931.9 | 2720.6 | 2533.7 | 2418.5 | 2362.6 | 2341.7 | 2339.9 | 2348.6 | 2350.4 | 2346.9 |
| 12.5° | 3181.6  | 2980.8 | 2661.2 | 2420.2 | 2322.5 | 2305.0 | 2320.7 | 2350.4 | 2380.1 | 2395.8 | 2392.3 |
| 15°   | 3293.3  | 3012.2 | 2559.9 | 2312.0 | 2252.6 | 2275.3 | 2325.9 | 2385.3 | 2442.9 | 2472.6 | 2470.9 |
| 17.5° | 3398.1  | 3019.2 | 2429.0 | 2207.2 | 2191.5 | 2249.1 | 2336.4 | 2429.0 | 2507.5 | 2549.5 | 2551.2 |
| 20°   | 3515.1  | 3007.0 | 2294.5 | 2112.9 | 2130.4 | 2224.7 | 2339.9 | 2451.7 | 2544.2 | 2586.1 | 2596.6 |
| 22.5° | 3621.6  | 2965.1 | 2163.5 | 2023.9 | 2078.0 | 2195.0 | 2312.0 | 2416.7 | 2498.8 | 2539.0 | 2552.9 |
| 25°   | 3717.7  | 2884.7 | 2020.4 | 1948.8 | 2037.8 | 2153.1 | 2242.1 | 2315.5 | 2373.1 | 2397.5 | 2416.7 |
| 27.5° | 3770.1  | 2764.2 | 1912.1 | 1889.4 | 1999.4 | 2093.7 | 2142.6 | 2165.3 | 2184.5 | 2177.5 | 2191.5 |
| 30°   | 3780.5  | 2614.1 | 1817.8 | 1842.2 | 1941.8 | 2011.6 | 2022.1 | 1999.4 | 1966.2 | 1912.1 | 1924.3 |
| 32.5° | 3770.1  | 2441.2 | 1739.2 | 1791.6 | 1877.2 | 1919.1 | 1905.1 | 1845.7 | 1765.4 | 1681.6 | 1686.8 |
| 35°   | 3773.5  | 2266.6 | 1674.6 | 1735.7 | 1802.1 | 1824.8 | 1789.9 | 1707.8 | 1622.2 | 1545.4 | 1541.9 |
| 37.5° | 3812.0  | 2119.9 | 1620.5 | 1681.6 | 1728.7 | 1732.2 | 1693.8 | 1608.3 | 1564.6 | 1507.0 | 1500.0 |
| 40°   | 3918.5  | 2011.6 | 1571.6 | 1627.5 | 1657.1 | 1655.4 | 1611.7 | 1550.6 | 1580.3 | 1561.1 | 1555.9 |
| 42.5° | 4093.1  | 1945.3 | 1531.4 | 1569.8 | 1590.8 | 1594.3 | 1559.4 | 1520.9 | 1585.6 | 1561.1 | 1552.4 |
| 45°   | 4374.2  | 1941.8 | 1503.5 | 1512.2 | 1545.4 | 1569.8 | 1545.4 | 1501.7 | 1526.2 | 1407.4 | 1384.7 |
| 47.5° | 4707.8  | 2001.1 | 1482.5 | 1461.6 | 1519.2 | 1562.9 | 1524.4 | 1454.6 | 1403.9 | 1295.7 | 1280.0 |
| 50°   | 5109.4  | 2121.6 | 1463.3 | 1407.4 | 1480.8 | 1536.7 | 1498.2 | 1402.2 | 1325.4 | 1267.7 | 1259.0 |
| 52.5° | 5586.1  | 2280.5 | 1438.9 | 1346.3 | 1423.2 | 1522.7 | 1498.2 | 1397.0 | 1295.7 | 1243.3 | 1234.6 |
| 55°   | 6085.5  | 2463.9 | 1410.9 | 1273.0 | 1358.5 | 1526.2 | 1510.5 | 1360.3 | 1273.0 | 1245.0 | 1238.1 |
| 57.5° | 6705.4  | 2683.9 | 1360.3 | 1187.4 | 1300.9 | 1494.8 | 1461.6 | 1339.3 | 1257.3 | 1234.6 | 1227.6 |
| 60°   | 7510.4  | 3010.5 | 1264.3 | 1100.1 | 1234.6 | 1438.9 | 1417.9 | 1304.4 | 1215.4 | 1196.1 | 1190.9 |
| 62.5° | 8785.2  | 3564.0 | 1147.3 | 1016.3 | 1156.0 | 1321.9 | 1353.3 | 1238.1 | 1163.0 | 1161.2 | 1159.5 |
| 65°   | 10863.1 | 4229.3 | 1009.3 | 941.2  | 1073.9 | 1225.8 | 1267.7 | 1170.0 | 1108.8 | 1128.0 | 1126.3 |
| 67.5° | 12319.5 | 4286.9 | 895.8  | 862.6  | 977.9  | 1121.1 | 1182.2 | 1100.1 | 1033.8 | 1070.4 | 1068.7 |
| 70°   | 11284.0 | 3344.0 | 798.0  | 780.6  | 874.8  | 1007.6 | 1089.6 | 1012.8 | 946.4  | 981.4  | 974.4  |
| 72.5° | 9516.8  | 2563.4 | 705.5  | 695.0  | 770.1  | 888.8  | 970.9  | 925.5  | 855.6  | 855.6  | 839.9  |
| 75°   | 7648.4  | 2114.7 | 607.7  | 602.4  | 653.1  | 768.3  | 860.9  | 784.0  | 719.4  | 715.9  | 705.5  |
| 77.5° | 4386.5  | 1386.5 | 509.9  | 506.4  | 522.1  | 642.6  | 668.8  | 653.1  | 604.2  | 581.5  | 574.5  |
| 80°   | 1747.9  | 721.2  | 401.6  | 378.9  | 394.6  | 471.5  | 527.4  | 501.2  | 459.3  | 431.3  | 415.6  |
| 82.5° | 677.5   | 361.5  | 282.9  | 248.0  | 270.7  | 340.5  | 382.4  | 373.7  | 345.7  | 282.9  | 265.4  |
| 85°   | 275.9   | 176.4  | 169.4  | 143.2  | 157.2  | 183.4  | 220.0  | 190.3  | 157.2  | 111.8  | 106.5  |
| 87.5° | 73.3    | 64.6   | 62.9   | 38.4   | 29.7   | 8.7    | 1.7    | 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    |

LM-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-4-R4

Test Date: 10/02/2019

Luminaire Tested: SA1C-750-U-5WQ

Data in this report applies to families of products SA1C-760-U-5WQ .

### Test Information

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-4-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **SA1C-750-U-5WQ**  
 Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-4-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. ROADWAY AND AREA LUMINAIRE. (1) 70 CRI, 5000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 4884   | CRI (Ra): | 73.5 |      |       |
| CIE u':                   | 0.2101 | R1:       | 70.5 | R9:  | -28.4 |
| CIE v':                   | 0.4904 | R2:       | 77.7 | R10: | 48.6  |
| Duv:                      | 0.0037 | R3:       | 84.6 | R11: | 73.2  |
| CIE x:                    | 0.3493 | R4:       | 74.7 | R12: | 50.7  |
| CIE y:                    | 0.3624 | R5:       | 71.9 | R13: | 71.2  |
| CIE z:                    | 0.2884 | R6:       | 70.7 | R14: | 91.4  |
| Peak Wavelength (nm):     | 444    | R7:       | 81.2 |      |       |
| Dominant Wavelength (nm): | 571    | R8:       | 56.9 |      |       |
| Purity:                   | 13.7   |           |      |      |       |
| Rf:                       | 74.9   |           |      |      |       |
| Rg:                       | 96.3   |           |      |      |       |



REPORT NUMBER: SP1-1908-441-4-R4

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/28/2019        | 12/28/2019           |
| Power Meter                    | IN0071                | 12/5/2018        | 12/5/2019            |
| AC Power Source                | IN0063                | 12/5/2018        | 12/5/2019            |
| DC Power Source                | IN0208                | 12/5/2018        | 12/5/2019            |
| Sphere Thermometer             | IN0085                | 12/5/2018        | 12/5/2019            |
| Room Thermometer               | IN0046                | 12/5/2018        | 12/5/2019            |

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**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 5000K 4-step quadrangle

REPORT NUMBER: SP1-1908-441-4-R4

**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       | 2945             | NR               | 490       | 37941            | NR               | 620       | 88803            | NR               | 750       | 3908             | NR               | 880       | 2997             | NR               |
| 365       | 2596             | NR               | 495       | 48525            | NR               | 625       | 80578            | NR               | 755       | 3988             | NR               | 885       | 2927             | NR               |
| 370       | 2732             | NR               | 500       | 60609            | NR               | 630       | 73127            | NR               | 760       | 3335             | NR               | 890       | 2649             | NR               |
| 375       | 2894             | NR               | 505       | 72036            | NR               | 635       | 66244            | NR               | 765       | 3438             | NR               | 895       | 2828             | NR               |
| 380       | 2822             | NR               | 510       | 82168            | NR               | 640       | 59440            | NR               | 770       | 3427             | NR               | 900       | 1407             | NR               |
| 385       | 2394             | NR               | 515       | 90898            | NR               | 645       | 52864            | NR               | 775       | 2759             | NR               | 905       | 2224             | NR               |
| 390       | 2370             | NR               | 520       | 97142            | NR               | 650       | 47085            | NR               | 780       | 2340             | NR               | 910       | 2905             | NR               |
| 395       | 2267             | NR               | 525       | 103255           | NR               | 655       | 41789            | NR               | 785       | 2412             | NR               | 915       | 3350             | NR               |
| 400       | 2262             | NR               | 530       | 106697           | NR               | 660       | 37064            | NR               | 790       | 1999             | NR               | 920       | 3114             | NR               |
| 405       | 3000             | NR               | 535       | 110081           | NR               | 665       | 32299            | NR               | 795       | 2054             | NR               | 925       | 2834             | NR               |
| 410       | 5324             | NR               | 540       | 112494           | NR               | 670       | 28142            | NR               | 800       | 2331             | NR               | 930       | 2271             | NR               |
| 415       | 10725            | NR               | 545       | 115513           | NR               | 675       | 24505            | NR               | 805       | 2648             | NR               | 935       | 2228             | NR               |
| 420       | 22128            | NR               | 550       | 117203           | NR               | 680       | 21162            | NR               | 810       | 2485             | NR               | 940       | 2833             | NR               |
| 425       | 44095            | NR               | 555       | 119753           | NR               | 685       | 18400            | NR               | 815       | 2409             | NR               | 945       | 2941             | NR               |
| 430       | 77002            | NR               | 560       | 122602           | NR               | 690       | 16065            | NR               | 820       | 2221             | NR               | 950       | 2323             | NR               |
| 435       | 119881           | NR               | 565       | 124314           | NR               | 695       | 13860            | NR               | 825       | 1562             | NR               | 955       | 1667             | NR               |
| 440       | 164454           | NR               | 570       | 126775           | NR               | 700       | 12177            | NR               | 830       | 2249             | NR               | 960       | 749              | NR               |
| 445       | 179997           | NR               | 575       | 127511           | NR               | 705       | 10757            | NR               | 835       | 2573             | NR               | 965       | 2669             | NR               |
| 450       | 142822           | NR               | 580       | 127577           | NR               | 710       | 9601             | NR               | 840       | 2764             | NR               | 970       | 3968             | NR               |
| 455       | 90008            | NR               | 585       | 126153           | NR               | 715       | 8944             | NR               | 845       | 3109             | NR               | 975       | 3886             | NR               |
| 460       | 60557            | NR               | 590       | 123678           | NR               | 720       | 7947             | NR               | 850       | 2963             | NR               | 980       | 2788             | NR               |
| 465       | 43305            | NR               | 595       | 119774           | NR               | 725       | 7062             | NR               | 855       | 2336             | NR               | 985       | 3496             | NR               |
| 470       | 31089            | NR               | 600       | 115733           | NR               | 730       | 6004             | NR               | 860       | 2118             | NR               | 990       | 2913             | NR               |
| 475       | 26278            | NR               | 605       | 109231           | NR               | 735       | 5594             | NR               | 865       | 3144             | NR               | 995       | 4659             | NR               |
| 480       | 27060            | NR               | 610       | 102408           | NR               | 740       | 5165             | NR               | 870       | 3069             | NR               | 1000      | 1308             | NR               |
| 485       | 30698            | NR               | 615       | 96015            | NR               | 745       | 4687             | NR               | 875       | 3311             | NR               |           |                  |                  |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 13493.5

S/P: 1.77

| 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       | 2945             | NR               | 490       | 37941            | NR               | 620       | 88803            | NR               | 750       | 3908             | NR               | 880       | 2997             | NR               |
| 365       | 2596             | NR               | 495       | 48525            | NR               | 625       | 80578            | NR               | 755       | 3988             | NR               | 885       | 2927             | NR               |
| 370       | 2732             | NR               | 500       | 60609            | NR               | 630       | 73127            | NR               | 760       | 3335             | NR               | 890       | 2649             | NR               |
| 375       | 2894             | NR               | 505       | 72036            | NR               | 635       | 66244            | NR               | 765       | 3438             | NR               | 895       | 2828             | NR               |
| 380       | 2822             | NR               | 510       | 82168            | NR               | 640       | 59440            | NR               | 770       | 3427             | NR               | 900       | 1407             | NR               |
| 385       | 2394             | NR               | 515       | 90898            | NR               | 645       | 52864            | NR               | 775       | 2759             | NR               | 905       | 2224             | NR               |
| 390       | 2370             | NR               | 520       | 97142            | NR               | 650       | 47085            | NR               | 780       | 2340             | NR               | 910       | 2905             | NR               |
| 395       | 2267             | NR               | 525       | 103255           | NR               | 655       | 41789            | NR               | 785       | 2412             | NR               | 915       | 3350             | NR               |
| 400       | 2262             | NR               | 530       | 106697           | NR               | 660       | 37064            | NR               | 790       | 1999             | NR               | 920       | 3114             | NR               |
| 405       | 3000             | NR               | 535       | 110081           | NR               | 665       | 32299            | NR               | 795       | 2054             | NR               | 925       | 2834             | NR               |
| 410       | 5324             | NR               | 540       | 112494           | NR               | 670       | 28142            | NR               | 800       | 2331             | NR               | 930       | 2271             | NR               |
| 415       | 10725            | NR               | 545       | 115513           | NR               | 675       | 24505            | NR               | 805       | 2648             | NR               | 935       | 2228             | NR               |
| 420       | 22128            | NR               | 550       | 117203           | NR               | 680       | 21162            | NR               | 810       | 2485             | NR               | 940       | 2833             | NR               |
| 425       | 44095            | NR               | 555       | 119753           | NR               | 685       | 18400            | NR               | 815       | 2409             | NR               | 945       | 2941             | NR               |
| 430       | 77002            | NR               | 560       | 122602           | NR               | 690       | 16065            | NR               | 820       | 2221             | NR               | 950       | 2323             | NR               |
| 435       | 119881           | NR               | 565       | 124314           | NR               | 695       | 13860            | NR               | 825       | 1562             | NR               | 955       | 1667             | NR               |
| 440       | 164454           | NR               | 570       | 126775           | NR               | 700       | 12177            | NR               | 830       | 2249             | NR               | 960       | 749              | NR               |
| 445       | 179997           | NR               | 575       | 127511           | NR               | 705       | 10757            | NR               | 835       | 2573             | NR               | 965       | 2669             | NR               |
| 450       | 142822           | NR               | 580       | 127577           | NR               | 710       | 9601             | NR               | 840       | 2764             | NR               | 970       | 3968             | NR               |
| 455       | 90008            | NR               | 585       | 126153           | NR               | 715       | 8944             | NR               | 845       | 3109             | NR               | 975       | 3886             | NR               |
| 460       | 60557            | NR               | 590       | 123678           | NR               | 720       | 7947             | NR               | 850       | 2963             | NR               | 980       | 2788             | NR               |
| 465       | 43305            | NR               | 595       | 119774           | NR               | 725       | 7062             | NR               | 855       | 2336             | NR               | 985       | 3496             | NR               |
| 470       | 31089            | NR               | 600       | 115733           | NR               | 730       | 6004             | NR               | 860       | 2118             | NR               | 990       | 2913             | NR               |
| 475       | 26278            | NR               | 605       | 109231           | NR               | 735       | 5594             | NR               | 865       | 3144             | NR               | 995       | 4659             | NR               |
| 480       | 27060            | NR               | 610       | 102408           | NR               | 740       | 5165             | NR               | 870       | 3069             | NR               | 1000      | 1308             | NR               |
| 485       | 30698            | NR               | 615       | 96015            | NR               | 745       | 4687             | NR               | 875       | 3311             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 5378.9**

**M/P: 0.71**

| 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       | 2945             | NR               | 490       | 37941            | NR               | 620       | 88803            | NR               | 750       | 3908             | NR               | 880       | 2997             | NR               |
| 365       | 2596             | NR               | 495       | 48525            | NR               | 625       | 80578            | NR               | 755       | 3988             | NR               | 885       | 2927             | NR               |
| 370       | 2732             | NR               | 500       | 60609            | NR               | 630       | 73127            | NR               | 760       | 3335             | NR               | 890       | 2649             | NR               |
| 375       | 2894             | NR               | 505       | 72036            | NR               | 635       | 66244            | NR               | 765       | 3438             | NR               | 895       | 2828             | NR               |
| 380       | 2822             | NR               | 510       | 82168            | NR               | 640       | 59440            | NR               | 770       | 3427             | NR               | 900       | 1407             | NR               |
| 385       | 2394             | NR               | 515       | 90898            | NR               | 645       | 52864            | NR               | 775       | 2759             | NR               | 905       | 2224             | NR               |
| 390       | 2370             | NR               | 520       | 97142            | NR               | 650       | 47085            | NR               | 780       | 2340             | NR               | 910       | 2905             | NR               |
| 395       | 2267             | NR               | 525       | 103255           | NR               | 655       | 41789            | NR               | 785       | 2412             | NR               | 915       | 3350             | NR               |
| 400       | 2262             | NR               | 530       | 106697           | NR               | 660       | 37064            | NR               | 790       | 1999             | NR               | 920       | 3114             | NR               |
| 405       | 3000             | NR               | 535       | 110081           | NR               | 665       | 32299            | NR               | 795       | 2054             | NR               | 925       | 2834             | NR               |
| 410       | 5324             | NR               | 540       | 112494           | NR               | 670       | 28142            | NR               | 800       | 2331             | NR               | 930       | 2271             | NR               |
| 415       | 10725            | NR               | 545       | 115513           | NR               | 675       | 24505            | NR               | 805       | 2648             | NR               | 935       | 2228             | NR               |
| 420       | 22128            | NR               | 550       | 117203           | NR               | 680       | 21162            | NR               | 810       | 2485             | NR               | 940       | 2833             | NR               |
| 425       | 44095            | NR               | 555       | 119753           | NR               | 685       | 18400            | NR               | 815       | 2409             | NR               | 945       | 2941             | NR               |
| 430       | 77002            | NR               | 560       | 122602           | NR               | 690       | 16065            | NR               | 820       | 2221             | NR               | 950       | 2323             | NR               |
| 435       | 119881           | NR               | 565       | 124314           | NR               | 695       | 13860            | NR               | 825       | 1562             | NR               | 955       | 1667             | NR               |
| 440       | 164454           | NR               | 570       | 126775           | NR               | 700       | 12177            | NR               | 830       | 2249             | NR               | 960       | 749              | NR               |
| 445       | 179997           | NR               | 575       | 127511           | NR               | 705       | 10757            | NR               | 835       | 2573             | NR               | 965       | 2669             | NR               |
| 450       | 142822           | NR               | 580       | 127577           | NR               | 710       | 9601             | NR               | 840       | 2764             | NR               | 970       | 3968             | NR               |
| 455       | 90008            | NR               | 585       | 126153           | NR               | 715       | 8944             | NR               | 845       | 3109             | NR               | 975       | 3886             | NR               |
| 460       | 60557            | NR               | 590       | 123678           | NR               | 720       | 7947             | NR               | 850       | 2963             | NR               | 980       | 2788             | NR               |
| 465       | 43305            | NR               | 595       | 119774           | NR               | 725       | 7062             | NR               | 855       | 2336             | NR               | 985       | 3496             | NR               |
| 470       | 31089            | NR               | 600       | 115733           | NR               | 730       | 6004             | NR               | 860       | 2118             | NR               | 990       | 2913             | NR               |
| 475       | 26278            | NR               | 605       | 109231           | NR               | 735       | 5594             | NR               | 865       | 3144             | NR               | 995       | 4659             | NR               |
| 480       | 27060            | NR               | 610       | 102408           | NR               | 740       | 5165             | NR               | 870       | 3069             | NR               | 1000      | 1308             | NR               |
| 485       | 30698            | NR               | 615       | 96015            | NR               | 745       | 4687             | NR               | 875       | 3311             | NR               |           |                  |                  |

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**Summary**

$R_f = 74.9$   
 $R_g = 96.3$   
 CIE  $R_a = 73.5$   
 $R_g = -28.4$

**Spectral Power Distribution Comparison**



**Color Vector Graphics**



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

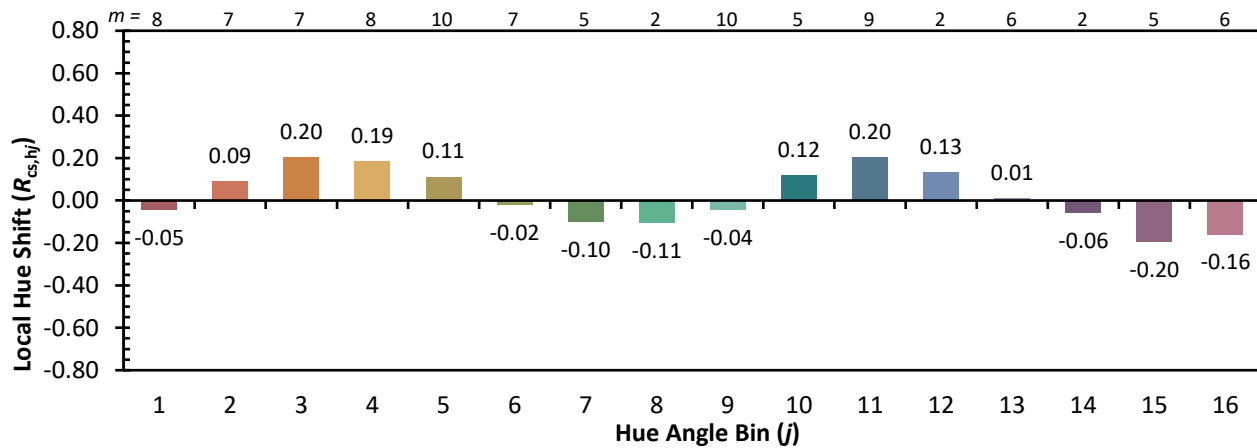
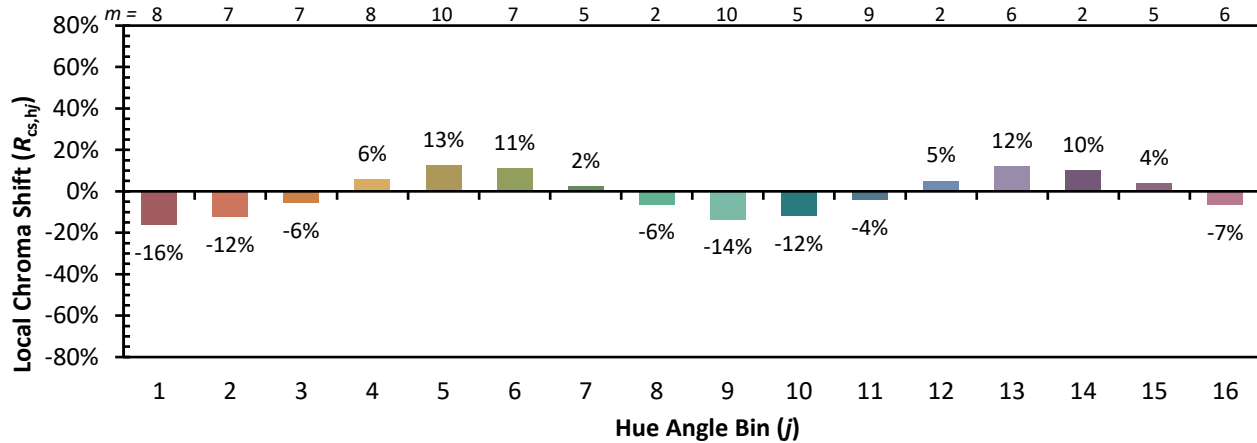
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 61 | CES51 = 90 | CES76 = 52 |
| CES02 = 60 | CES27 = 84 | CES52 = 91 | CES77 = 71 |
| CES03 = 30 | CES28 = 81 | CES53 = 79 | CES78 = 54 |
| CES04 = 69 | CES29 = 58 | CES54 = 83 | CES79 = 80 |
| CES05 = 46 | CES30 = 67 | CES55 = 83 | CES80 = 77 |
| CES06 = 50 | CES31 = 63 | CES56 = 73 | CES81 = 77 |
| CES07 = 39 | CES32 = 59 | CES57 = 72 | CES82 = 90 |
| CES08 = 38 | CES33 = 69 | CES58 = 73 | CES83 = 86 |
| CES09 = 29 | CES34 = 69 | CES59 = 88 | CES84 = 88 |
| CES10 = 73 | CES35 = 83 | CES60 = 93 | CES85 = 84 |
| CES11 = 56 | CES36 = 95 | CES61 = 88 | CES86 = 75 |
| CES12 = 61 | CES37 = 78 | CES62 = 85 | CES87 = 78 |
| CES13 = 41 | CES38 = 76 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 93 | CES64 = 74 | CES89 = 75 |
| CES15 = 70 | CES40 = 86 | CES65 = 67 | CES90 = 77 |
| CES16 = 46 | CES41 = 87 | CES66 = 69 | CES91 = 89 |
| CES17 = 49 | CES42 = 78 | CES67 = 67 | CES92 = 66 |
| CES18 = 55 | CES43 = 75 | CES68 = 73 | CES93 = 80 |
| CES19 = 71 | CES44 = 99 | CES69 = 81 | CES94 = 57 |
| CES20 = 64 | CES45 = 83 | CES70 = 63 | CES95 = 71 |
| CES21 = 85 | CES46 = 81 | CES71 = 60 | CES96 = 78 |
| CES22 = 77 | CES47 = 80 | CES72 = 86 | CES97 = 85 |
| CES23 = 91 | CES48 = 72 | CES73 = 53 | CES98 = 75 |
| CES24 = 90 | CES49 = 81 | CES74 = 96 | CES99 = 62 |
| CES25 = 71 | CES50 = 89 | CES75 = 58 |            |



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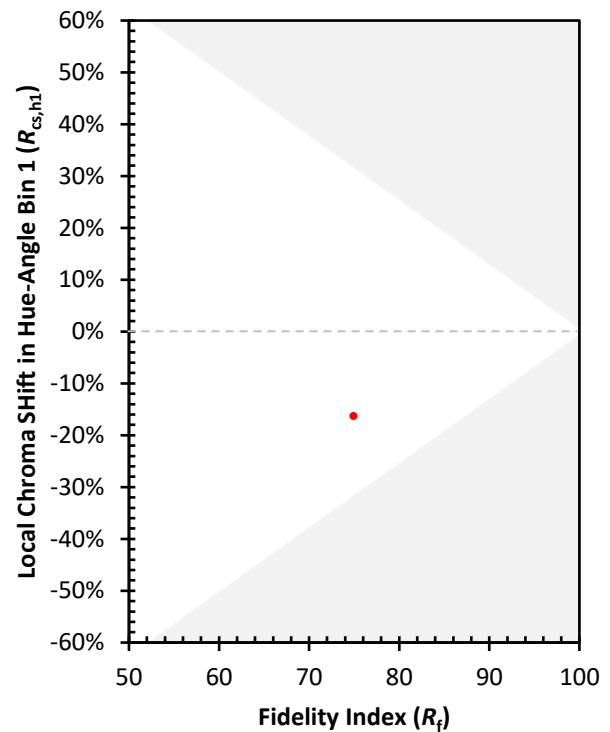
Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)