

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: P323088

Luminaire Tested: **GLEON-SA4C-722-U-T4W-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P323088  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-19)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA4C-722-U-T4W-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(4) 70 CRI, 2200K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV WIDE OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 15202 lumens  
Efficiency: N/A  
Efficacy: 67.6 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B1 - U0 - G3

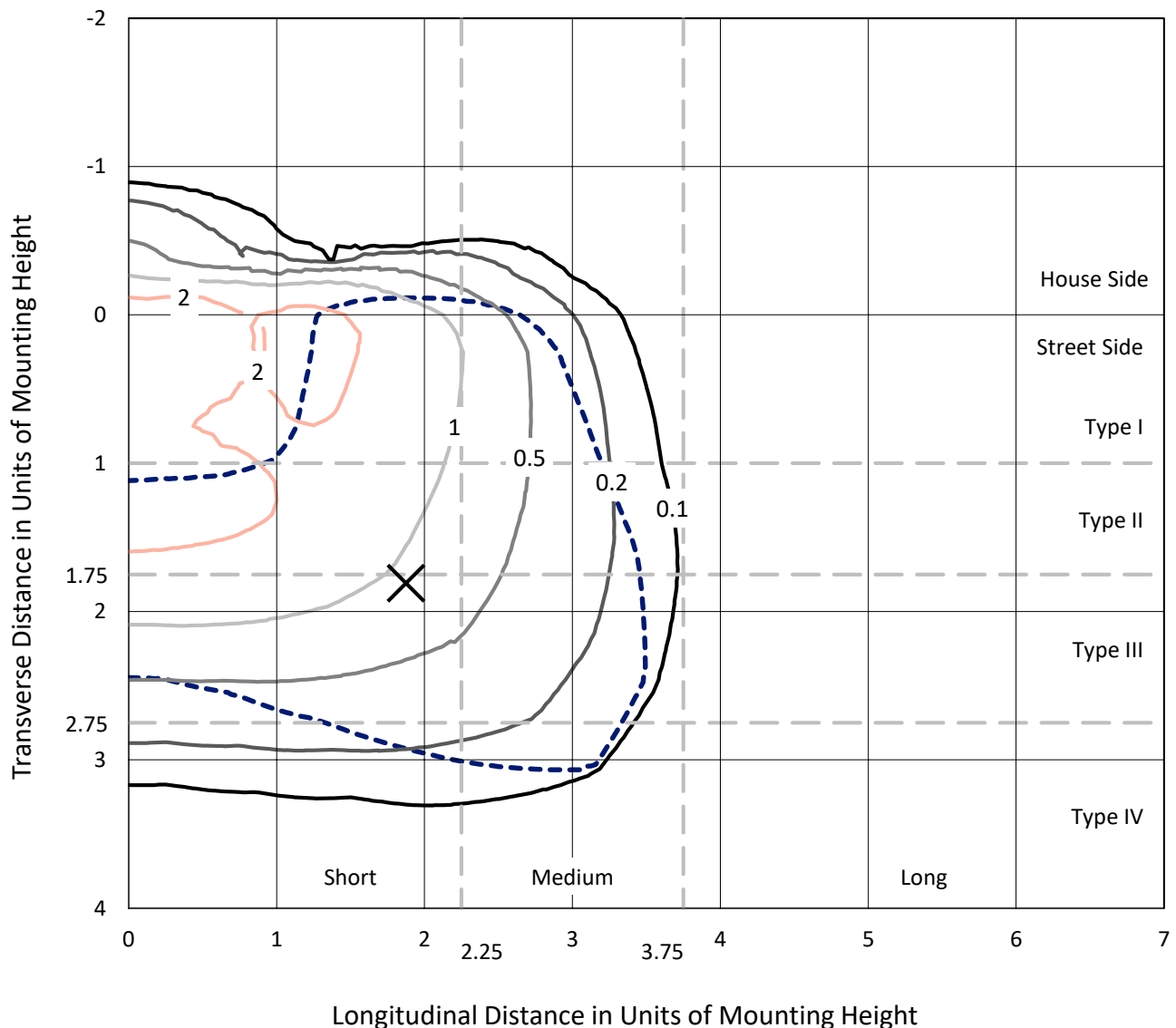
Input Watts (W): 225  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P323088  
 CATALOG NUMBER: GLEON-SA4C-722-U-T4W-HSS

## Iso-Footcandle Lines of Horizontal Illumination

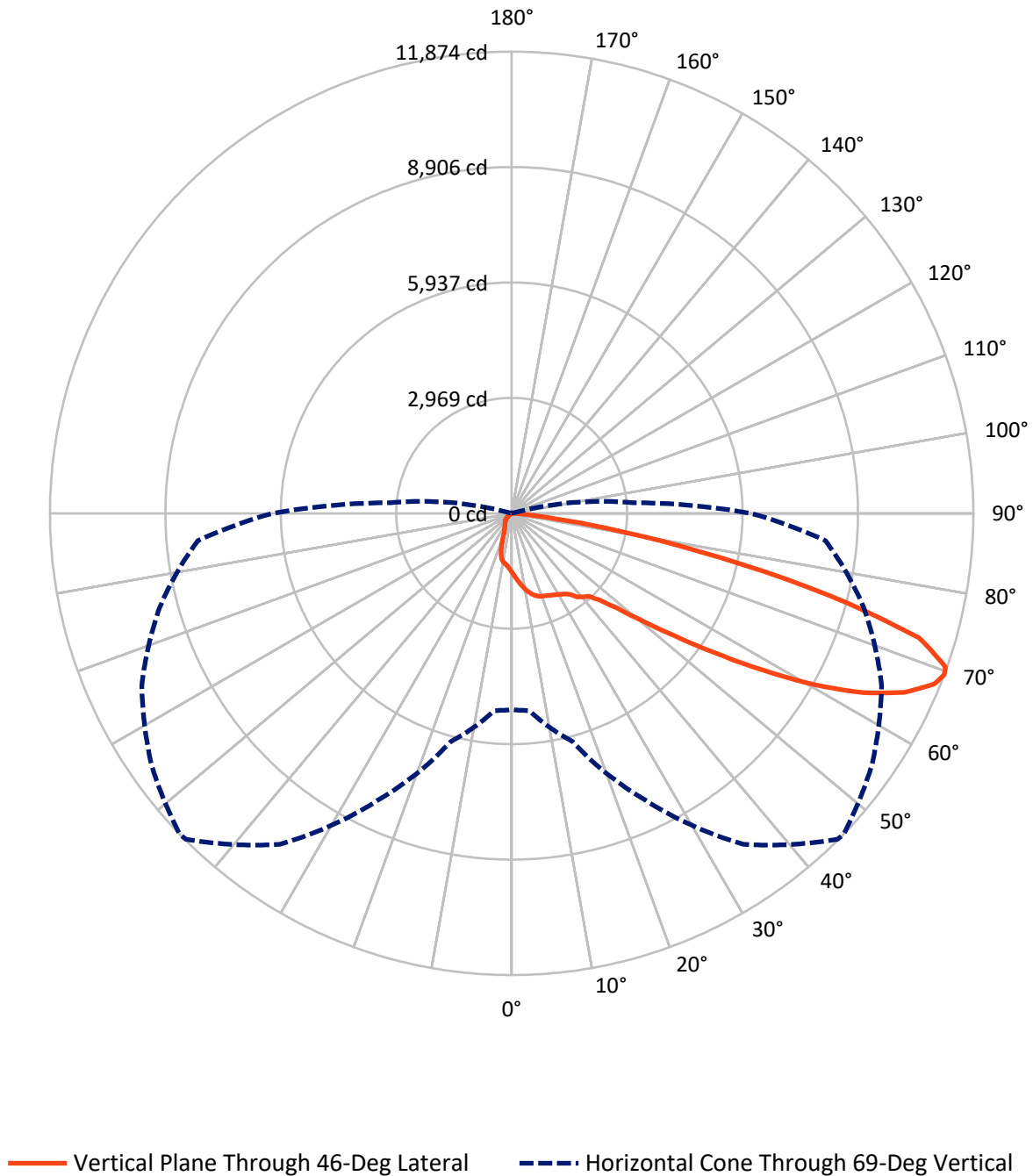
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 3.5 fc  
 Type IV - 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    | 1560.1   | 0.0    | 1560.1  |
|                    | % Fixture | 10.3     | 0.0    | 10.3    |
| <b>Street Side</b> | Lumens    | 13641.9  | 0.0    | 13641.9 |
|                    | % Fixture | 89.7     | 0.0    | 89.7    |
| <b>Total</b>       | Lumens    | 15202.0  | 0.0    | 15202.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 151.6   | 1.0       |
| 10°-20°   | 459.9   | 3.0       |
| 20°-30°   | 723.3   | 4.8       |
| 30°-40°   | 1037.3  | 6.8       |
| 40°-50°   | 1792.8  | 11.8      |
| 50°-60°   | 3541.8  | 23.3      |
| 60°-70°   | 4950.0  | 32.6      |
| 70°-80°   | 2391.4  | 15.7      |
| 80°-90°   | 153.7   | 1.0       |
| 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°    | 15202.0 | 100.0     |
| 0°-180°   | 15202.0 | 100.0     |

**Coefficient of Utilization**



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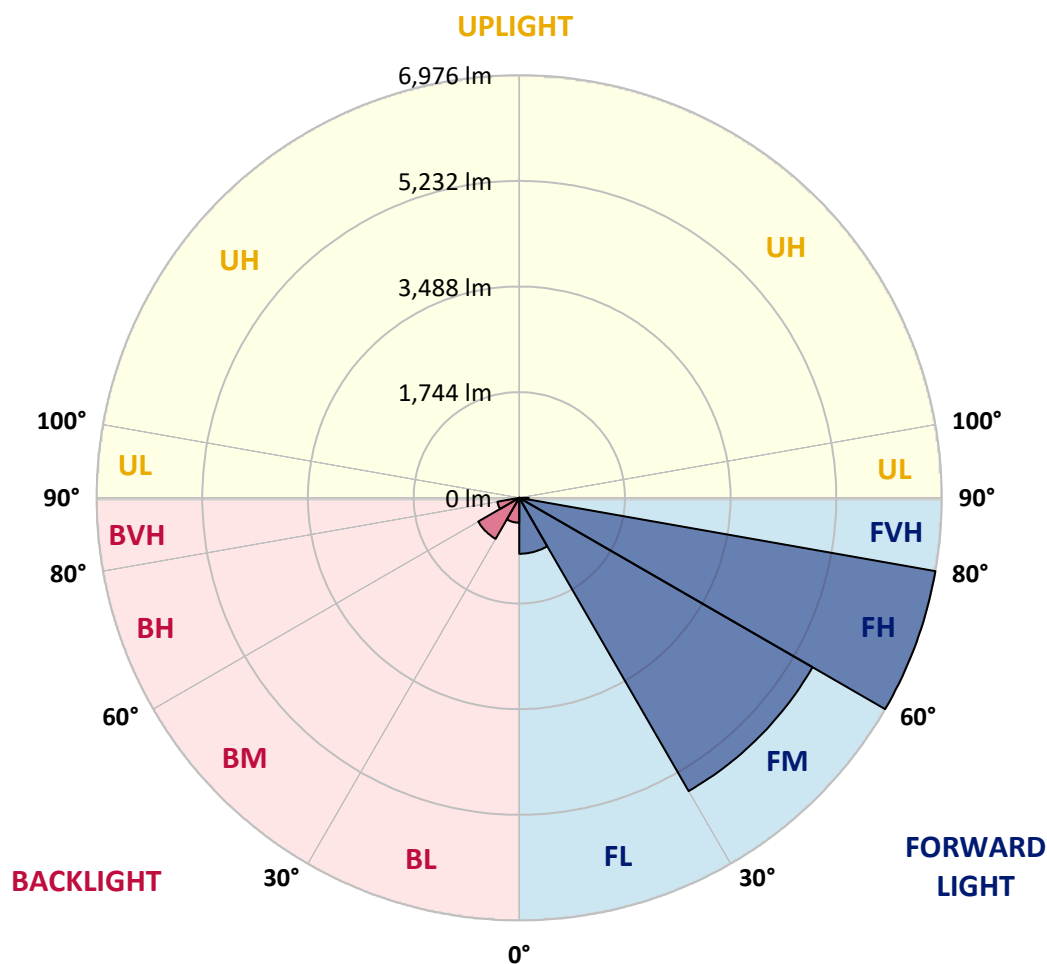
CATALOG NUMBER: GLEON-SA4C-722-U-T4W-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 923.7  | 6.1       |                         |      |         |
| FM   | (30°-60°)   | 5590.1 | 36.8      |                         |      |         |
| FH   | (60°-80°)   | 6975.6 | 45.9      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 152.4  | 1.0       |                         |      | G2/225  |
| BL   | (0°-30°)    | 411.2  | 2.7       | B1/500                  |      |         |
| BM   | (30°-60°)   | 781.8  | 5.1       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 365.8  | 2.4       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 1.3    | 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-G3**

Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°     | 45°     | 46°     | 55°     | 65°     | 75°     | 85°    |
|-------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|--------|
| 0°    | 1523.2 | 1523.2 | 1523.2 | 1523.2 | 1523.2  | 1523.2  | 1523.2  | 1523.2  | 1523.2  | 1523.2  | 1523.2 |
| 2.5°  | 1692.1 | 1690.0 | 1680.0 | 1675.7 | 1651.5  | 1637.2  | 1631.5  | 1613.7  | 1588.0  | 1562.4  | 1533.9 |
| 5°    | 1884.6 | 1883.8 | 1865.3 | 1847.5 | 1801.9  | 1759.1  | 1751.3  | 1709.9  | 1652.2  | 1598.0  | 1543.9 |
| 7.5°  | 2081.3 | 2072.0 | 2053.5 | 2019.3 | 1953.0  | 1884.6  | 1878.1  | 1819.7  | 1737.7  | 1659.3  | 1581.6 |
| 10°   | 2248.1 | 2242.4 | 2218.1 | 2166.1 | 2088.4  | 2010.7  | 2002.9  | 1930.9  | 1838.2  | 1742.0  | 1642.9 |
| 12.5° | 2377.8 | 2373.5 | 2341.4 | 2276.6 | 2193.9  | 2113.4  | 2102.7  | 2038.5  | 1939.4  | 1831.8  | 1714.9 |
| 15°   | 2456.9 | 2454.8 | 2415.6 | 2346.4 | 2265.2  | 2195.3  | 2186.1  | 2129.7  | 2037.8  | 1925.2  | 1793.3 |
| 17.5° | 2475.4 | 2476.2 | 2435.5 | 2365.7 | 2298.7  | 2248.8  | 2241.7  | 2198.9  | 2121.9  | 2010.0  | 1871.7 |
| 20°   | 2434.1 | 2442.7 | 2406.3 | 2345.7 | 2304.4  | 2278.0  | 2272.3  | 2246.6  | 2181.8  | 2076.3  | 1934.5 |
| 22.5° | 2375.7 | 2379.9 | 2355.0 | 2314.4 | 2297.2  | 2302.2  | 2299.4  | 2285.1  | 2230.2  | 2133.3  | 1996.5 |
| 25°   | 2340.0 | 2340.0 | 2325.0 | 2290.8 | 2302.2  | 2332.9  | 2333.6  | 2330.7  | 2287.3  | 2203.2  | 2072.0 |
| 27.5° | 2338.6 | 2334.3 | 2317.2 | 2291.5 | 2322.9  | 2370.0  | 2372.8  | 2392.0  | 2365.0  | 2288.0  | 2166.1 |
| 30°   | 2395.6 | 2390.6 | 2354.3 | 2320.8 | 2360.7  | 2411.3  | 2418.4  | 2460.5  | 2446.9  | 2379.9  | 2270.9 |
| 32.5° | 2528.9 | 2511.1 | 2430.5 | 2375.7 | 2405.6  | 2466.2  | 2475.4  | 2542.4  | 2563.8  | 2493.3  | 2372.1 |
| 35°   | 2711.4 | 2655.1 | 2538.9 | 2479.7 | 2482.6  | 2546.0  | 2554.6  | 2652.9  | 2716.4  | 2597.3  | 2450.5 |
| 37.5° | 2963.0 | 2935.2 | 2746.3 | 2588.1 | 2600.9  | 2697.1  | 2722.1  | 2829.0  | 2811.2  | 2654.3  | 2539.6 |
| 40°   | 3514.7 | 3471.2 | 3270.2 | 2891.7 | 2714.2  | 2819.7  | 2827.5  | 2884.6  | 2886.0  | 2783.4  | 2724.9 |
| 42.5° | 4265.9 | 4248.1 | 4036.4 | 3442.7 | 2937.3  | 2901.7  | 2915.9  | 3012.2  | 3119.8  | 3055.6  | 3052.8 |
| 45°   | 5097.7 | 5088.4 | 4863.9 | 4174.0 | 3388.5  | 3170.4  | 3188.2  | 3317.2  | 3523.2  | 3537.5  | 3628.0 |
| 47.5° | 5767.0 | 5762.7 | 5633.7 | 4990.1 | 4079.2  | 3625.8  | 3631.5  | 3768.4  | 4130.5  | 4309.4  | 4454.1 |
| 50°   | 6377.1 | 6397.8 | 6295.9 | 5873.2 | 5020.0  | 4339.3  | 4325.8  | 4417.0  | 4998.6  | 5291.6  | 5471.2 |
| 52.5° | 7225.3 | 7254.5 | 6968.7 | 6697.2 | 6007.2  | 5224.6  | 5213.9  | 5309.4  | 6042.1  | 6261.7  | 6293.7 |
| 55°   | 7974.4 | 7924.5 | 7698.6 | 7620.2 | 7211.1  | 6318.0  | 6315.1  | 6399.2  | 7051.4  | 7144.8  | 7203.9 |
| 57.5° | 8305.2 | 8285.9 | 8395.0 | 8574.6 | 8472.0  | 7610.2  | 7603.8  | 7539.7  | 7954.5  | 7964.5  | 8146.2 |
| 60°   | 8514.0 | 8537.5 | 8871.8 | 9425.6 | 9681.5  | 9000.8  | 8959.5  | 8568.2  | 8816.9  | 8794.8  | 8989.4 |
| 62.5° | 8357.2 | 8403.5 | 9005.1 | 9928.1 | 10586.7 | 10214.7 | 10156.2 | 9510.5  | 9553.9  | 9477.7  | 9658.7 |
| 65°   | 7524.7 | 7596.7 | 8582.4 | 9833.3 | 11035.8 | 11163.4 | 11104.2 | 10342.3 | 10139.1 | 10013.7 | 9913.2 |
| 67.5° | 6109.8 | 6152.6 | 7181.8 | 9008.7 | 10833.3 | 11729.3 | 11717.2 | 11071.4 | 10581.0 | 9923.1  | 9143.4 |
| 69°   | 5049.2 | 5091.3 | 6082.0 | 8140.5 | 10387.9 | 11850.5 | 11874.0 | 11305.2 | 10496.9 | 9372.9  | 8101.3 |
| 70°   | 4276.6 | 4321.5 | 5244.5 | 7396.4 | 9871.1  | 11794.2 | 11836.2 | 11283.1 | 10256.0 | 8735.7  | 7186.8 |
| 72.5° | 2243.1 | 2281.6 | 3228.8 | 5095.6 | 8047.1  | 10829.8 | 10957.4 | 10329.4 | 8693.6  | 6344.3  | 4249.5 |
| 75°   | 704.9  | 727.0  | 1260.9 | 2663.6 | 5509.7  | 8420.6  | 8449.9  | 8102.7  | 6173.3  | 3489.7  | 1769.8 |
| 77.5° | 268.7  | 262.3  | 419.8  | 981.5  | 2785.5  | 5302.3  | 5481.2  | 5063.5  | 3239.5  | 1233.8  | 408.4  |
| 80°   | 144.7  | 145.4  | 218.1  | 406.3  | 1191.7  | 2724.9  | 2876.0  | 2454.1  | 1151.1  | 384.9   | 94.1   |
| 82.5° | 62.7   | 65.6   | 122.6  | 215.3  | 547.4   | 1005.0  | 1080.6  | 899.5   | 439.8   | 258.7   | 34.9   |
| 85°   | 13.5   | 15.0   | 59.2   | 116.9  | 223.1   | 282.3   | 295.8   | 291.5   | 280.1   | 201.0   | 13.5   |
| 87.5° | 0.0    | 0.0    | 26.4   | 42.1   | 56.3    | 64.1    | 56.3    | 73.4    | 154.7   | 135.4   | 7.1    |
| 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: P323088

CATALOG NUMBER: GLEON-SA4C-722-U-T4W-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1523.2 | 1523.2 | 1523.2 | 1523.2 | 1523.2 | 1523.2 | 1523.2 | 1523.2 | 1523.2 | 1523.2 | 1523.2 |
| 2.5°  | 1524.6 | 1511.8 | 1489.7 | 1465.4 | 1448.3 | 1430.5 | 1416.3 | 1409.9 | 1402.7 | 1397.7 | 1404.2 |
| 5°    | 1521.8 | 1496.8 | 1454.0 | 1412.7 | 1382.8 | 1358.5 | 1338.6 | 1330.7 | 1322.9 | 1317.2 | 1316.5 |
| 7.5°  | 1546.7 | 1511.8 | 1446.2 | 1385.6 | 1339.3 | 1306.5 | 1279.4 | 1268.0 | 1258.7 | 1254.5 | 1250.9 |
| 10°   | 1594.5 | 1549.6 | 1461.9 | 1382.8 | 1322.9 | 1267.3 | 1208.9 | 1163.9 | 1134.7 | 1121.2 | 1116.2 |
| 12.5° | 1656.5 | 1600.2 | 1491.8 | 1397.7 | 1310.8 | 1203.9 | 1079.8 | 972.9  | 903.8  | 881.0  | 867.4  |
| 15°   | 1729.2 | 1659.3 | 1531.0 | 1417.0 | 1266.6 | 1071.3 | 861.0  | 721.3  | 657.2  | 644.3  | 630.1  |
| 17.5° | 1799.0 | 1722.0 | 1578.1 | 1420.5 | 1169.7 | 856.0  | 630.8  | 536.0  | 511.1  | 519.6  | 521.7  |
| 20°   | 1860.3 | 1784.1 | 1624.4 | 1389.2 | 993.6  | 642.2  | 488.2  | 464.7  | 474.0  | 490.4  | 493.2  |
| 22.5° | 1922.3 | 1843.9 | 1667.2 | 1306.5 | 768.4  | 487.5  | 439.8  | 445.5  | 454.7  | 471.1  | 474.0  |
| 25°   | 1997.9 | 1916.6 | 1707.1 | 1154.7 | 576.6  | 414.8  | 417.7  | 426.2  | 435.5  | 450.5  | 451.9  |
| 27.5° | 2084.8 | 2008.6 | 1733.4 | 957.2  | 427.7  | 381.3  | 390.6  | 403.4  | 412.7  | 426.9  | 429.8  |
| 30°   | 2200.3 | 2129.7 | 1742.0 | 752.7  | 358.5  | 351.4  | 355.7  | 371.4  | 384.9  | 397.7  | 399.9  |
| 32.5° | 2308.7 | 2249.5 | 1713.5 | 568.1  | 332.1  | 323.6  | 323.6  | 332.9  | 348.5  | 360.7  | 363.5  |
| 35°   | 2408.4 | 2370.0 | 1622.3 | 415.5  | 312.2  | 297.9  | 290.8  | 290.8  | 300.8  | 310.8  | 313.6  |
| 37.5° | 2540.3 | 2538.9 | 1474.7 | 331.4  | 292.9  | 276.6  | 261.6  | 250.2  | 246.6  | 248.8  | 250.2  |
| 40°   | 2766.2 | 2768.4 | 1282.3 | 297.2  | 276.6  | 254.5  | 231.6  | 211.0  | 191.7  | 185.3  | 184.6  |
| 42.5° | 3119.1 | 3087.0 | 1080.6 | 280.8  | 262.3  | 231.6  | 197.4  | 169.6  | 139.7  | 130.4  | 129.7  |
| 45°   | 3679.3 | 3489.0 | 866.7  | 265.9  | 247.3  | 206.0  | 163.2  | 125.4  | 101.2  | 94.1   | 94.1   |
| 47.5° | 4495.4 | 4017.2 | 671.4  | 249.5  | 227.4  | 176.8  | 123.3  | 90.5   | 74.1   | 70.6   | 71.3   |
| 50°   | 5339.3 | 4534.6 | 514.6  | 228.8  | 203.1  | 146.1  | 91.2   | 65.6   | 56.3   | 56.3   | 57.0   |
| 52.5° | 6087.7 | 4913.8 | 401.3  | 206.7  | 173.2  | 114.8  | 69.1   | 51.3   | 47.0   | 46.3   | 47.0   |
| 55°   | 6788.4 | 5158.3 | 307.2  | 181.0  | 137.6  | 85.5   | 52.7   | 42.1   | 39.2   | 37.8   | 37.1   |
| 57.5° | 7464.1 | 5279.5 | 230.2  | 146.1  | 99.8   | 62.0   | 42.1   | 35.6   | 32.8   | 30.6   | 29.9   |
| 60°   | 7913.9 | 5181.1 | 158.2  | 107.6  | 69.1   | 44.9   | 34.9   | 30.6   | 27.1   | 24.9   | 24.2   |
| 62.5° | 8167.6 | 4912.4 | 101.9  | 77.7   | 49.2   | 33.5   | 27.8   | 25.7   | 20.7   | 18.5   | 18.5   |
| 65°   | 8065.0 | 4469.1 | 71.3   | 55.6   | 35.6   | 24.9   | 20.7   | 20.7   | 15.0   | 12.1   | 11.4   |
| 67.5° | 7146.9 | 3775.5 | 54.2   | 41.3   | 25.7   | 18.5   | 15.7   | 17.8   | 9.3    | 5.7    | 5.7    |
| 69°   | 6149.0 | 3129.0 | 46.3   | 34.2   | 21.4   | 15.0   | 13.5   | 16.4   | 6.4    | 4.3    | 3.6    |
| 70°   | 5344.3 | 2699.2 | 42.1   | 29.9   | 17.8   | 12.8   | 12.1   | 15.7   | 6.4    | 3.6    | 2.9    |
| 72.5° | 3197.5 | 1505.4 | 32.1   | 21.4   | 11.4   | 10.0   | 10.0   | 17.8   | 6.4    | 3.6    | 2.9    |
| 75°   | 1292.2 | 530.3  | 23.5   | 15.0   | 8.6    | 8.6    | 12.1   | 22.8   | 5.7    | 2.9    | 2.1    |
| 77.5° | 292.9  | 116.2  | 13.5   | 9.3    | 5.7    | 8.6    | 14.3   | 17.8   | 3.6    | 1.4    | 0.0    |
| 80°   | 71.3   | 28.5   | 8.6    | 5.7    | 3.6    | 6.4    | 10.7   | 10.0   | 0.7    | 0.0    | 0.0    |
| 82.5° | 23.5   | 10.0   | 3.6    | 2.9    | 0.7    | 2.1    | 5.0    | 2.9    | 0.0    | 0.0    | 0.0    |
| 85°   | 10.0   | 5.7    | 1.4    | 0.7    | 0.0    | 0.0    | 0.7    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 6.4    | 2.1    | 0.0    | 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    |

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

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-10-R4

Test Date: 10/25/2019

Luminaire Tested: SA1C-722-U-5WQ

Data in this report applies to families of products SA1C-722-U-5WQ.

### Test Information

Test Method: LM-79-2008 Report  
 Number: SP1-1908-441-10-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-722-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):                  | 2237    | CRI (Ra): | 72.0 |      |       |
| CIE u':                   | 0.2876  | R1:       | 68.9 | R9:  | -17.4 |
| CIE v':                   | 0.5346  | R2:       | 83.0 | R10: | 61.3  |
| Duv:                      | -0.0006 | R3:       | 95.2 | R11: | 59.8  |
| CIE x:                    | 0.5005  | R4:       | 66.2 | R12: | 50.5  |
| CIE y:                    | 0.4134  | R5:       | 65.9 | R13: | 71.1  |
| CIE z:                    | 0.0860  | R6:       | 76.3 | R14: | 96.9  |
| Peak Wavelength (nm):     | 603     | R7:       | 76.7 |      |       |
| Dominant Wavelength (nm): | 587     | R8:       | 43.8 |      |       |
| Purity:                   | 74.5    |           |      |      |       |
| Rf:                       | 69.8    |           |      |      |       |
| Rg:                       | 99.2    |           |      |      |       |



### Test Conditions

Stabilization Time: 71M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.7/41%  
 Sphere Temperature (°C): 25.6

REPORT NUMBER: SP1-1908-441-10-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 2200K 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       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 4696.9**

**S/P: 0.85**

| 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       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 1470.8 M/P: 0.27**

| 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       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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### Summary

$R_f = 69.8$   
 $R_g = 99.2$   
 CIE  $R_a = 72.0$   
 $R_g = -17.4$



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 56 | CES51 = 74 | CES76 = 56 |
| CES02 = 65 | CES27 = 76 | CES52 = 76 | CES77 = 81 |
| CES03 = 32 | CES28 = 83 | CES53 = 65 | CES78 = 63 |
| CES04 = 72 | CES29 = 46 | CES54 = 78 | CES79 = 84 |
| CES05 = 52 | CES30 = 48 | CES55 = 75 | CES80 = 84 |
| CES06 = 52 | CES31 = 51 | CES56 = 65 | CES81 = 63 |
| CES07 = 44 | CES32 = 51 | CES57 = 62 | CES82 = 92 |
| CES08 = 42 | CES33 = 53 | CES58 = 66 | CES83 = 83 |
| CES09 = 29 | CES34 = 70 | CES59 = 84 | CES84 = 92 |
| CES10 = 78 | CES35 = 85 | CES60 = 90 | CES85 = 81 |
| CES11 = 61 | CES36 = 78 | CES61 = 84 | CES86 = 56 |
| CES12 = 68 | CES37 = 80 | CES62 = 70 | CES87 = 78 |
| CES13 = 45 | CES38 = 53 | CES63 = 68 | CES88 = 72 |
| CES14 = 75 | CES39 = 90 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 84 | CES65 = 67 | CES90 = 67 |
| CES16 = 49 | CES41 = 75 | CES66 = 64 | CES91 = 90 |
| CES17 = 51 | CES42 = 79 | CES67 = 63 | CES92 = 67 |
| CES18 = 57 | CES43 = 64 | CES68 = 69 | CES93 = 79 |
| CES19 = 74 | CES44 = 98 | CES69 = 80 | CES94 = 52 |
| CES20 = 68 | CES45 = 73 | CES70 = 63 | CES95 = 76 |
| CES21 = 89 | CES46 = 67 | CES71 = 63 | CES96 = 78 |
| CES22 = 81 | CES47 = 60 | CES72 = 87 | CES97 = 77 |
| CES23 = 92 | CES48 = 48 | CES73 = 56 | CES98 = 71 |
| CES24 = 92 | CES49 = 64 | CES74 = 87 | CES99 = 65 |
| CES25 = 74 | CES50 = 74 | CES75 = 66 |            |



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Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)