

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: P321666

Luminaire Tested: **GLEON-SA2A-760-U-T3R-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P321666  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-11)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GLEON-SA2A-760-U-T3R-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(2) 70 CRI, 5700K, 615mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III  
ROADWAY OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 7334 lumens  
Efficiency: N/A  
Efficacy: 111.1 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B1 - U0 - G2

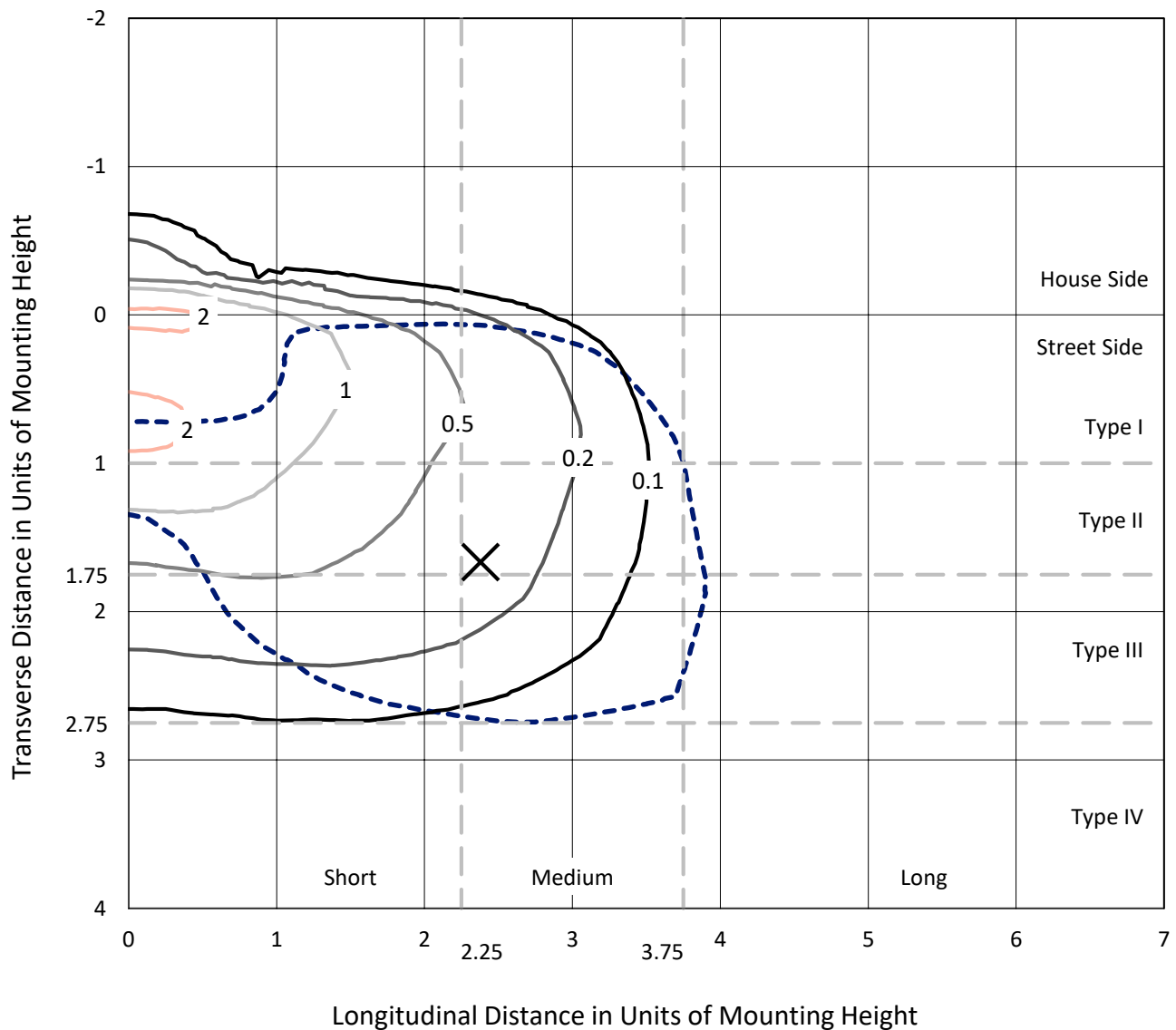
Input Watts (W): 66  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P321666  
 CATALOG NUMBER: GLEON-SA2A-760-U-T3R-HSS

## Iso-Footcandle Lines of Horizontal Illumination

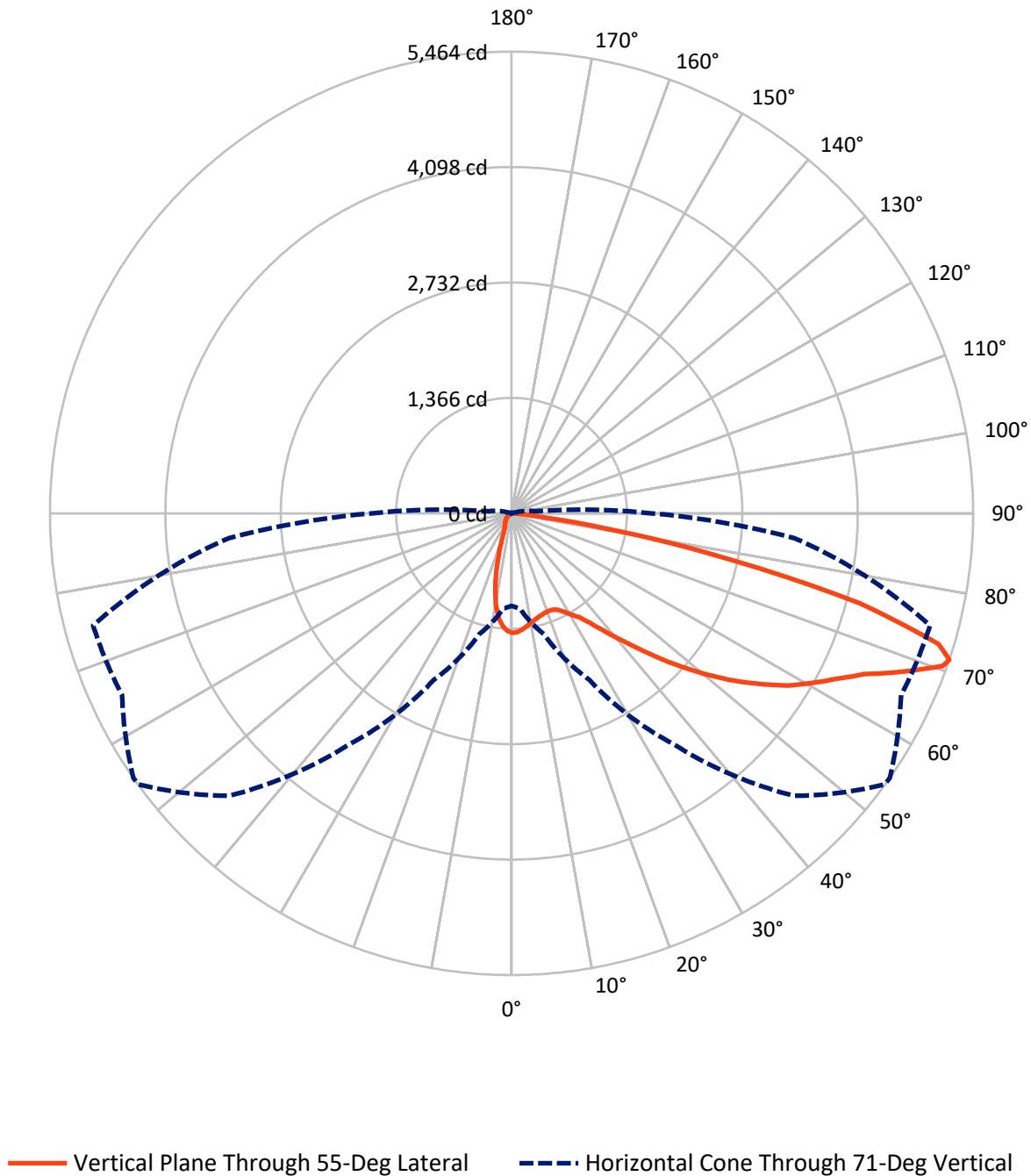
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 2.3 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 580.7    | 0.0    | 580.7  |
|                    | % Fixture | 7.9      | 0.0    | 7.9    |
| <b>Street Side</b> | Lumens    | 6753.3   | 0.0    | 6753.3 |
|                    | % Fixture | 92.1     | 0.0    | 92.1   |
| <b>Total</b>       | Lumens    | 7334.0   | 0.0    | 7334.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 120.6  | 1.6       |
| 10°-20°   | 272.3  | 3.7       |
| 20°-30°   | 437.5  | 6.0       |
| 30°-40°   | 743.4  | 10.1      |
| 40°-50°   | 1153.8 | 15.7      |
| 50°-60°   | 1551.3 | 21.2      |
| 60°-70°   | 1897.7 | 25.9      |
| 70°-80°   | 1109.5 | 15.1      |
| 80°-90°   | 48.0   | 0.7       |
| 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°    | 7334.0 | 100.0     |
| 0°-180°   | 7334.0 | 100.0     |

**Coefficient of Utilization**



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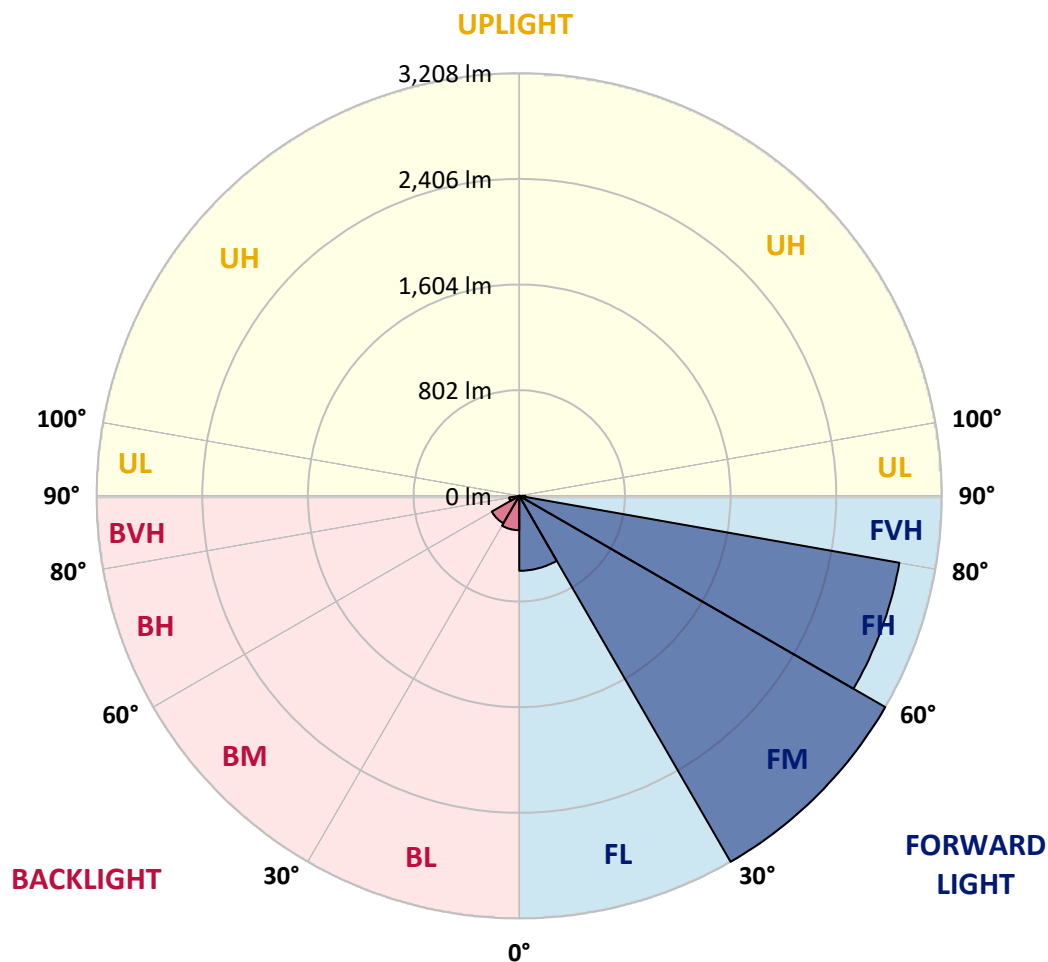
CATALOG NUMBER: GLEON-SA2A-760-U-T3R-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 569.0  | 7.8       |                         |      |         |
| FM   | (30°-60°)   | 3207.7 | 43.7      |                         |      |         |
| FH   | (60°-80°)   | 2929.4 | 39.9      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 47.2   | 0.6       |                         |      | G1/100  |
| BL   | (0°-30°)    | 261.4  | 3.6       | B1/500                  |      |         |
| BM   | (30°-60°)   | 240.7  | 3.3       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 77.8   | 1.1       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 0.8    | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

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

Type III Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 54°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1414.4 | 1414.4 | 1414.4 | 1414.4 | 1414.4 | 1414.4 | 1414.4 | 1414.4 | 1414.4 | 1414.4 | 1414.4 |
| 2.5°  | 1372.9 | 1374.5 | 1380.5 | 1383.1 | 1389.4 | 1399.9 | 1405.2 | 1405.5 | 1414.1 | 1417.4 | 1420.0 |
| 5°    | 1275.7 | 1285.6 | 1295.5 | 1306.0 | 1325.1 | 1350.5 | 1375.5 | 1377.8 | 1405.5 | 1425.9 | 1436.8 |
| 7.5°  | 1192.1 | 1201.0 | 1212.9 | 1229.6 | 1256.6 | 1296.5 | 1338.3 | 1343.3 | 1395.6 | 1442.1 | 1466.4 |
| 10°   | 1106.2 | 1113.4 | 1130.5 | 1155.2 | 1192.4 | 1245.8 | 1302.1 | 1310.3 | 1386.7 | 1463.8 | 1506.6 |
| 12.5° | 1014.3 | 1018.6 | 1039.3 | 1074.9 | 1129.5 | 1197.4 | 1271.5 | 1282.3 | 1381.1 | 1488.8 | 1554.0 |
| 15°   | 944.5  | 946.4  | 966.2  | 1003.1 | 1065.6 | 1153.9 | 1247.8 | 1260.9 | 1382.4 | 1518.8 | 1605.7 |
| 17.5° | 926.7  | 927.7  | 938.2  | 963.6  | 1018.9 | 1115.0 | 1229.0 | 1245.1 | 1386.4 | 1548.1 | 1657.7 |
| 20°   | 998.8  | 991.9  | 981.0  | 977.1  | 1000.8 | 1091.7 | 1217.8 | 1235.9 | 1391.7 | 1574.1 | 1704.5 |
| 22.5° | 1196.7 | 1176.3 | 1131.2 | 1070.9 | 1034.4 | 1093.3 | 1220.8 | 1238.9 | 1408.5 | 1606.0 | 1758.5 |
| 25°   | 1490.5 | 1462.1 | 1385.4 | 1266.9 | 1152.9 | 1140.7 | 1245.5 | 1263.9 | 1441.1 | 1644.2 | 1810.2 |
| 27.5° | 1824.7 | 1796.7 | 1702.9 | 1533.6 | 1339.3 | 1234.6 | 1302.1 | 1319.2 | 1489.5 | 1678.2 | 1849.7 |
| 30°   | 2144.8 | 2136.9 | 2026.2 | 1833.9 | 1573.8 | 1386.7 | 1375.2 | 1389.7 | 1525.4 | 1698.6 | 1881.0 |
| 32.5° | 2416.2 | 2403.6 | 2314.7 | 2127.7 | 1842.2 | 1569.5 | 1461.2 | 1465.4 | 1552.4 | 1724.9 | 1921.9 |
| 35°   | 2667.7 | 2652.3 | 2574.2 | 2397.4 | 2117.5 | 1792.8 | 1593.5 | 1587.3 | 1611.3 | 1777.9 | 1981.1 |
| 37.5° | 2887.4 | 2901.6 | 2814.9 | 2646.7 | 2364.4 | 2024.9 | 1772.0 | 1753.2 | 1703.5 | 1864.2 | 2067.1 |
| 40°   | 3071.1 | 3071.1 | 3026.0 | 2885.7 | 2631.2 | 2265.0 | 1973.9 | 1949.2 | 1842.2 | 1997.3 | 2176.1 |
| 42.5° | 3137.3 | 3151.5 | 3168.3 | 3088.9 | 2869.9 | 2514.6 | 2198.8 | 2173.1 | 2037.4 | 2186.0 | 2313.7 |
| 45°   | 3141.3 | 3163.7 | 3249.6 | 3249.3 | 3085.6 | 2762.6 | 2452.4 | 2440.2 | 2287.7 | 2428.3 | 2484.3 |
| 47.5° | 3085.6 | 3113.6 | 3255.2 | 3335.6 | 3256.6 | 2993.4 | 2729.7 | 2714.5 | 2581.8 | 2725.4 | 2662.8 |
| 50°   | 2999.7 | 3030.6 | 3195.3 | 3369.5 | 3372.8 | 3194.3 | 3021.8 | 2999.0 | 2905.5 | 3064.9 | 2847.2 |
| 52.5° | 2845.9 | 2905.8 | 3141.6 | 3377.4 | 3449.2 | 3367.9 | 3299.7 | 3289.8 | 3267.7 | 3391.9 | 2994.1 |
| 55°   | 2516.9 | 2583.4 | 3006.9 | 3380.0 | 3520.0 | 3521.6 | 3560.2 | 3562.8 | 3607.3 | 3697.5 | 3103.4 |
| 57.5° | 2361.5 | 2399.0 | 2771.8 | 3392.6 | 3625.0 | 3696.2 | 3825.6 | 3846.0 | 3914.8 | 3987.6 | 3228.2 |
| 60°   | 2263.7 | 2308.1 | 2655.9 | 3375.4 | 3790.0 | 3925.1 | 4071.6 | 4078.5 | 4152.3 | 4287.0 | 3397.2 |
| 62.5° | 2185.6 | 2229.4 | 2582.8 | 3309.6 | 3975.4 | 4200.4 | 4312.0 | 4312.6 | 4368.0 | 4643.6 | 3589.2 |
| 65°   | 1993.0 | 2029.9 | 2434.9 | 3235.5 | 4097.9 | 4472.7 | 4591.2 | 4587.0 | 4632.1 | 5019.7 | 3812.1 |
| 67.5° | 1714.4 | 1742.7 | 2132.9 | 2954.6 | 4051.8 | 4720.3 | 5012.8 | 4998.6 | 4943.9 | 5344.7 | 3899.7 |
| 70°   | 1325.5 | 1335.7 | 1681.1 | 2462.3 | 3619.8 | 4815.5 | 5420.1 | 5412.9 | 5135.3 | 5286.4 | 3578.6 |
| 71°   | 1095.6 | 1129.2 | 1481.6 | 2173.1 | 3330.3 | 4727.6 | 5459.6 | 5463.9 | 5087.2 | 5127.7 | 3357.6 |
| 72.5° | 636.2  | 664.9  | 1073.9 | 1668.9 | 2827.5 | 4360.7 | 5254.8 | 5285.8 | 4862.6 | 4664.0 | 2868.0 |
| 75°   | 136.3  | 145.9  | 398.1  | 807.8  | 1555.3 | 3056.3 | 4147.7 | 4258.0 | 3963.3 | 3172.9 | 1728.6 |
| 77.5° | 94.8   | 102.4  | 170.6  | 366.5  | 514.1  | 1510.2 | 2576.5 | 2701.0 | 2367.7 | 1192.4 | 553.2  |
| 80°   | 75.1   | 83.6   | 133.0  | 181.1  | 139.0  | 487.1  | 1206.9 | 1283.0 | 789.7  | 266.1  | 93.2   |
| 82.5° | 41.8   | 49.7   | 103.7  | 97.8   | 53.3   | 92.5   | 337.9  | 382.0  | 158.1  | 53.7   | 22.1   |
| 85°   | 12.2   | 14.8   | 66.9   | 71.1   | 22.7   | 17.8   | 57.6   | 71.5   | 30.0   | 14.2   | 9.9    |
| 87.5° | 0.0    | 0.0    | 32.3   | 27.3   | 6.6    | 2.6    | 5.3    | 5.9    | 5.9    | 5.9    | 6.6    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



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CATALOG NUMBER: GLEON-SA2A-760-U-T3R-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1414.4 | 1414.4 | 1414.4 | 1414.4 | 1414.4 | 1414.4 | 1414.4 | 1414.4 | 1414.4 | 1414.4 | 1414.4 |
| 2.5°  | 1420.0 | 1422.3 | 1414.1 | 1403.2 | 1391.7 | 1377.5 | 1362.7 | 1351.2 | 1350.8 | 1345.2 | 1339.6 |
| 5°    | 1437.4 | 1436.1 | 1413.4 | 1378.8 | 1338.0 | 1295.5 | 1255.0 | 1209.2 | 1194.1 | 1175.3 | 1169.1 |
| 7.5°  | 1469.7 | 1460.5 | 1412.4 | 1336.7 | 1247.1 | 1158.2 | 1066.3 | 973.8  | 934.3  | 898.7  | 892.4  |
| 10°   | 1510.2 | 1492.8 | 1406.2 | 1273.4 | 1109.1 | 945.1  | 806.5  | 680.7  | 625.4  | 582.9  | 580.9  |
| 12.5° | 1552.4 | 1525.7 | 1388.7 | 1177.9 | 928.3  | 697.8  | 538.1  | 414.3  | 368.2  | 338.5  | 341.2  |
| 15°   | 1596.5 | 1556.7 | 1351.2 | 1049.2 | 722.5  | 473.5  | 330.6  | 257.9  | 239.4  | 231.8  | 233.8  |
| 17.5° | 1641.6 | 1578.1 | 1298.8 | 894.1  | 519.3  | 305.6  | 228.9  | 208.5  | 208.5  | 210.1  | 210.8  |
| 20°   | 1680.8 | 1589.6 | 1221.7 | 720.2  | 352.0  | 222.6  | 200.2  | 197.3  | 198.9  | 201.5  | 201.9  |
| 22.5° | 1719.7 | 1590.2 | 1121.3 | 544.0  | 246.3  | 195.0  | 190.7  | 189.4  | 190.3  | 193.3  | 193.6  |
| 25°   | 1751.3 | 1582.3 | 995.5  | 386.9  | 196.6  | 183.8  | 181.8  | 181.1  | 181.8  | 185.4  | 185.4  |
| 27.5° | 1764.1 | 1553.7 | 842.0  | 272.0  | 176.2  | 171.2  | 170.6  | 171.2  | 172.2  | 174.9  | 175.2  |
| 30°   | 1765.4 | 1503.6 | 674.8  | 196.9  | 159.7  | 154.4  | 155.8  | 158.1  | 157.1  | 156.4  | 157.1  |
| 32.5° | 1768.7 | 1445.7 | 511.7  | 162.0  | 145.9  | 137.7  | 136.0  | 136.0  | 132.1  | 129.7  | 128.4  |
| 35°   | 1779.6 | 1377.5 | 371.1  | 145.6  | 131.7  | 122.2  | 115.9  | 108.7  | 101.1  | 97.1   | 96.2   |
| 37.5° | 1796.7 | 1306.0 | 265.8  | 134.7  | 119.2  | 108.3  | 96.5   | 83.6   | 72.8   | 69.8   | 69.8   |
| 40°   | 1828.0 | 1232.3 | 196.6  | 126.1  | 109.3  | 95.8   | 78.0   | 61.3   | 51.4   | 49.7   | 49.7   |
| 42.5° | 1877.4 | 1154.6 | 156.8  | 118.6  | 100.8  | 83.0   | 59.6   | 44.5   | 37.2   | 36.2   | 35.9   |
| 45°   | 1928.8 | 1068.9 | 137.0  | 111.3  | 91.5   | 68.2   | 44.1   | 32.9   | 28.7   | 27.7   | 27.7   |
| 47.5° | 1980.1 | 977.7  | 127.4  | 104.4  | 82.7   | 53.0   | 32.9   | 26.0   | 24.0   | 24.0   | 24.4   |
| 50°   | 2023.6 | 882.6  | 120.5  | 96.8   | 71.1   | 40.2   | 26.0   | 22.1   | 21.4   | 22.7   | 23.1   |
| 52.5° | 2034.5 | 789.0  | 112.0  | 87.3   | 57.0   | 30.6   | 21.4   | 19.4   | 19.4   | 19.4   | 19.4   |
| 55°   | 2027.9 | 716.6  | 100.8  | 75.4   | 42.2   | 24.4   | 18.4   | 17.1   | 16.8   | 16.8   | 16.8   |
| 57.5° | 2050.3 | 673.8  | 80.7   | 58.6   | 30.3   | 19.8   | 16.1   | 15.1   | 14.5   | 14.2   | 14.2   |
| 60°   | 2095.4 | 645.8  | 57.6   | 42.2   | 22.7   | 16.5   | 13.8   | 12.8   | 11.9   | 11.2   | 11.2   |
| 62.5° | 2155.3 | 621.4  | 42.8   | 31.3   | 17.5   | 13.2   | 11.5   | 10.5   | 9.2    | 8.6    | 8.6    |
| 65°   | 2201.4 | 577.9  | 32.6   | 23.4   | 13.2   | 10.5   | 8.9    | 8.6    | 6.6    | 5.9    | 5.6    |
| 67.5° | 2131.0 | 482.4  | 26.3   | 17.1   | 9.9    | 8.2    | 6.9    | 6.6    | 4.0    | 3.3    | 3.3    |
| 70°   | 1827.7 | 335.9  | 21.1   | 12.5   | 7.2    | 6.6    | 5.6    | 4.3    | 3.0    | 2.6    | 2.6    |
| 71°   | 1657.4 | 280.6  | 19.1   | 10.5   | 6.3    | 6.3    | 5.3    | 3.6    | 2.6    | 2.3    | 2.3    |
| 72.5° | 1376.8 | 199.2  | 16.1   | 8.2    | 5.6    | 6.6    | 5.6    | 3.3    | 2.6    | 2.3    | 2.0    |
| 75°   | 799.2  | 83.3   | 11.2   | 5.6    | 4.3    | 7.9    | 7.2    | 3.0    | 2.0    | 1.6    | 1.6    |
| 77.5° | 240.4  | 30.6   | 6.3    | 3.6    | 3.3    | 6.9    | 8.2    | 2.6    | 1.0    | 0.3    | 0.3    |
| 80°   | 43.8   | 13.2   | 4.0    | 2.3    | 2.3    | 4.3    | 6.3    | 1.3    | 0.0    | 0.0    | 0.0    |
| 82.5° | 15.5   | 6.6    | 2.3    | 1.3    | 1.0    | 2.0    | 3.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 8.9    | 4.6    | 1.3    | 0.7    | 0.0    | 0.3    | 0.7    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 5.9    | 1.3    | 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: SP1-1908-441-9-R4

Test Date: 10/23/2019

Luminaire Tested: SA1C-760-U-5WQ

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

### Test Information

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-9-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-760-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):                  | 5474   | CRI (Ra): | 71.7 |      |       |
| CIE u':                   | 0.2052 | R1:       | 70.6 | R9:  | -27.1 |
| CIE v':                   | 0.4804 | R2:       | 74.6 | R10: | 40.8  |
| Duv:                      | 0.0025 | R3:       | 78.3 | R11: | 74.6  |
| CIE x:                    | 0.3330 | R4:       | 73.8 | R12: | 50.4  |
| CIE y:                    | 0.3466 | R5:       | 72.4 | R13: | 70.0  |
| CIE z:                    | 0.3204 | R6:       | 67.5 | R14: | 87.8  |
| Peak Wavelength (nm):     | 442    | R7:       | 77.5 |      |       |
| Dominant Wavelength (nm): | 554    | R8:       | 58.9 |      |       |
| Purity:                   | 4.1    |           |      |      |       |
| Rf:                       | 72.1   |           |      |      |       |
| Rg:                       | 97.2   |           |      |      |       |



### Test Conditions

Stabilization Time: 240M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.6/31%  
 Sphere Temperature (°C): 25.9

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| 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            |

REPORT NUMBER: SP1-1908-441-9-R4

CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 5700K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



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| 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       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 13759.3**

**S/P: 1.85**

| $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|
| 360               | 3540                          | NR                             | 490               | 33363                         | NR                             | 620               | 80193                         | NR                             | 750               | 4663                          | NR                             | 880               | 4678                          | NR                             |
| 365               | 2862                          | NR                             | 495               | 44177                         | NR                             | 625               | 73091                         | NR                             | 755               | 4147                          | NR                             | 885               | 4128                          | NR                             |
| 370               | 2865                          | NR                             | 500               | 57019                         | NR                             | 630               | 66269                         | NR                             | 760               | 4040                          | NR                             | 890               | 4504                          | NR                             |
| 375               | 3254                          | NR                             | 505               | 70030                         | NR                             | 635               | 60012                         | NR                             | 765               | 3474                          | NR                             | 895               | 4371                          | NR                             |
| 380               | 3076                          | NR                             | 510               | 81972                         | NR                             | 640               | 53914                         | NR                             | 770               | 3469                          | NR                             | 900               | 4082                          | NR                             |
| 385               | 2904                          | NR                             | 515               | 92590                         | NR                             | 645               | 48385                         | NR                             | 775               | 3181                          | NR                             | 905               | 2982                          | NR                             |
| 390               | 2689                          | NR                             | 520               | 100305                        | NR                             | 650               | 43219                         | NR                             | 780               | 2969                          | NR                             | 910               | 4351                          | NR                             |
| 395               | 2619                          | NR                             | 525               | 107452                        | NR                             | 655               | 38562                         | NR                             | 785               | 3132                          | NR                             | 915               | 3365                          | NR                             |
| 400               | 2679                          | NR                             | 530               | 111373                        | NR                             | 660               | 34110                         | NR                             | 790               | 2507                          | NR                             | 920               | 3430                          | NR                             |
| 405               | 3515                          | NR                             | 535               | 114505                        | NR                             | 665               | 30085                         | NR                             | 795               | 2968                          | NR                             | 925               | 4264                          | NR                             |
| 410               | 6934                          | NR                             | 540               | 116408                        | NR                             | 670               | 26205                         | NR                             | 800               | 2758                          | NR                             | 930               | 4095                          | NR                             |
| 415               | 14943                         | NR                             | 545               | 118700                        | NR                             | 675               | 22906                         | NR                             | 805               | 2872                          | NR                             | 935               | 5048                          | NR                             |
| 420               | 31939                         | NR                             | 550               | 119209                        | NR                             | 680               | 20058                         | NR                             | 810               | 3094                          | NR                             | 940               | 4074                          | NR                             |
| 425               | 64701                         | NR                             | 555               | 120742                        | NR                             | 685               | 17413                         | NR                             | 815               | 3222                          | NR                             | 945               | 4949                          | NR                             |
| 430               | 110939                        | NR                             | 560               | 121594                        | NR                             | 690               | 15447                         | NR                             | 820               | 3238                          | NR                             | 950               | 4387                          | NR                             |
| 435               | 164597                        | NR                             | 565               | 121913                        | NR                             | 695               | 13398                         | NR                             | 825               | 3524                          | NR                             | 955               | 4978                          | NR                             |
| 440               | 207696                        | NR                             | 570               | 122147                        | NR                             | 700               | 11777                         | NR                             | 830               | 2921                          | NR                             | 960               | 4706                          | NR                             |
| 445               | 201830                        | NR                             | 575               | 121605                        | NR                             | 705               | 10412                         | NR                             | 835               | 3595                          | NR                             | 965               | 5083                          | NR                             |
| 450               | 145410                        | NR                             | 580               | 120248                        | NR                             | 710               | 9544                          | NR                             | 840               | 3016                          | NR                             | 970               | 4522                          | NR                             |
| 455               | 89594                         | NR                             | 585               | 117717                        | NR                             | 715               | 8940                          | NR                             | 845               | 4032                          | NR                             | 975               | 4740                          | NR                             |
| 460               | 58321                         | NR                             | 590               | 114359                        | NR                             | 720               | 7897                          | NR                             | 850               | 3579                          | NR                             | 980               | 6122                          | NR                             |
| 465               | 39318                         | NR                             | 595               | 109974                        | NR                             | 725               | 7045                          | NR                             | 855               | 4571                          | NR                             | 985               | 6450                          | NR                             |
| 470               | 27693                         | NR                             | 600               | 105269                        | NR                             | 730               | 6483                          | NR                             | 860               | 4485                          | NR                             | 990               | 4875                          | NR                             |
| 475               | 23081                         | NR                             | 605               | 99453                         | NR                             | 735               | 5838                          | NR                             | 865               | 3978                          | NR                             | 995               | 4764                          | NR                             |
| 480               | 23002                         | NR                             | 610               | 92921                         | NR                             | 740               | 5261                          | NR                             | 870               | 4298                          | NR                             | 1000              | 3640                          | NR                             |
| 485               | 26201                         | NR                             | 615               | 86989                         | NR                             | 745               | 4760                          | NR                             | 875               | 4356                          | NR                             |                   |                               |                                |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 5527.6 M/P: 0.74**

| 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       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

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### Summary

$R_f = 72.1$   
 $R_g = 97.2$   
 CIE  $R_a = 71.7$   
 $R_g = -27.1$



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 54 | CES51 = 88 | CES76 = 43 |
| CES02 = 59 | CES27 = 79 | CES52 = 90 | CES77 = 64 |
| CES03 = 30 | CES28 = 77 | CES53 = 77 | CES78 = 46 |
| CES04 = 69 | CES29 = 50 | CES54 = 81 | CES79 = 74 |
| CES05 = 46 | CES30 = 59 | CES55 = 80 | CES80 = 70 |
| CES06 = 50 | CES31 = 55 | CES56 = 70 | CES81 = 71 |
| CES07 = 38 | CES32 = 52 | CES57 = 68 | CES82 = 88 |
| CES08 = 38 | CES33 = 63 | CES58 = 70 | CES83 = 82 |
| CES09 = 29 | CES34 = 63 | CES59 = 88 | CES84 = 87 |
| CES10 = 72 | CES35 = 79 | CES60 = 92 | CES85 = 84 |
| CES11 = 55 | CES36 = 90 | CES61 = 88 | CES86 = 76 |
| CES12 = 61 | CES37 = 72 | CES62 = 81 | CES87 = 75 |
| CES13 = 41 | CES38 = 68 | CES63 = 75 | CES88 = 77 |
| CES14 = 74 | CES39 = 91 | CES64 = 72 | CES89 = 76 |
| CES15 = 70 | CES40 = 83 | CES65 = 65 | CES90 = 76 |
| CES16 = 46 | CES41 = 84 | CES66 = 66 | CES91 = 92 |
| CES17 = 48 | CES42 = 70 | CES67 = 64 | CES92 = 70 |
| CES18 = 55 | CES43 = 69 | CES68 = 71 | CES93 = 83 |
| CES19 = 70 | CES44 = 98 | CES69 = 80 | CES94 = 60 |
| CES20 = 64 | CES45 = 79 | CES70 = 58 | CES95 = 73 |
| CES21 = 85 | CES46 = 78 | CES71 = 55 | CES96 = 79 |
| CES22 = 77 | CES47 = 76 | CES72 = 84 | CES97 = 84 |
| CES23 = 91 | CES48 = 68 | CES73 = 47 | CES98 = 73 |
| CES24 = 90 | CES49 = 78 | CES74 = 94 | CES99 = 62 |
| CES25 = 71 | CES50 = 87 | CES75 = 51 |            |



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Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)