

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: P317508

Luminaire Tested: **GLEON-SA4A-760-U-T2R**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P317508  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-8)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA4A-760-U-T2R  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(4) 70 CRI, 5700K, 615mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II  
ROADWAY OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 19585 lumens  
Efficiency: N/A  
Efficacy: 151.8 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B2 - U0 - G2

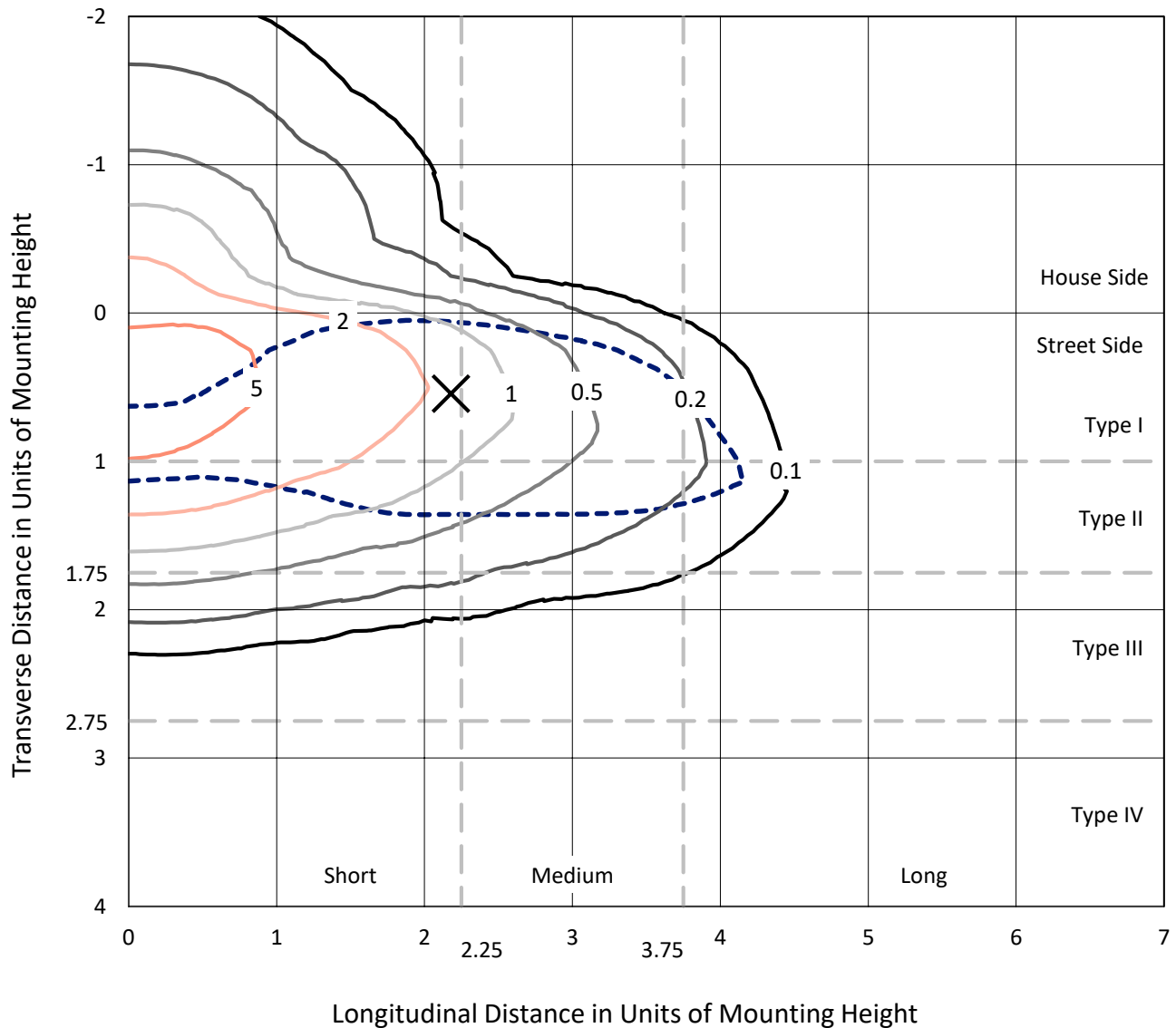
Input Watts (W): 129  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

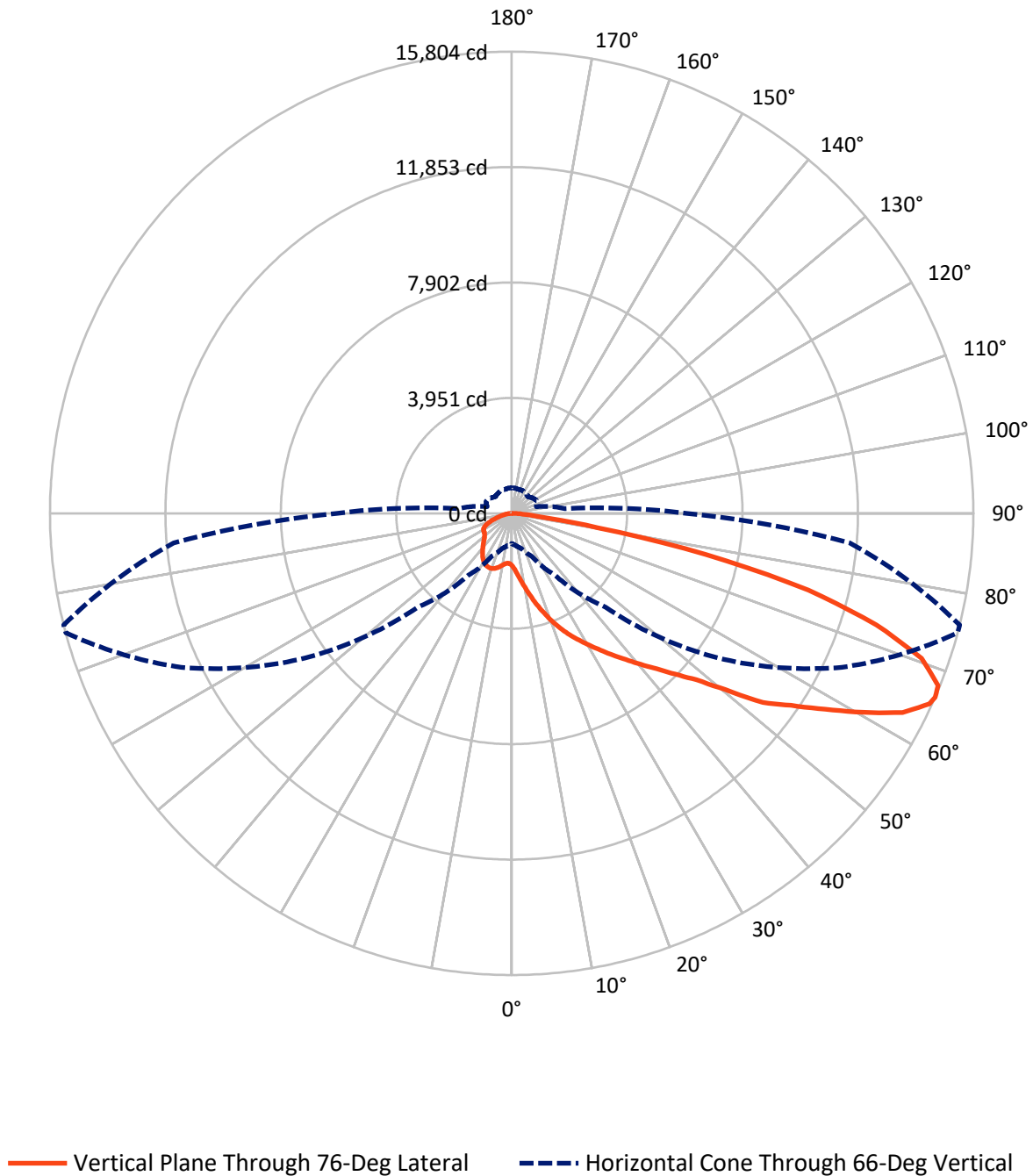
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 7.6 fc  
 Type II - Short - N/A

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## Luminous Intensity Polar Plot



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CATALOG NUMBER: GLEON-SA4A-760-U-T2R

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 3295.5   | 0.0    | 3295.5  |
|                    | % Fixture | 16.8     | 0.0    | 16.8    |
| <b>Street Side</b> | Lumens    | 16289.5  | 0.0    | 16289.5 |
|                    | % Fixture | 83.2     | 0.0    | 83.2    |
| <b>Total</b>       | Lumens    | 19585.0  | 0.0    | 19585.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 216.3   | 1.1       |
| 10°-20°   | 854.1   | 4.4       |
| 20°-30°   | 1659.7  | 8.5       |
| 30°-40°   | 2709.0  | 13.8      |
| 40°-50°   | 3701.2  | 18.9      |
| 50°-60°   | 4311.1  | 22.0      |
| 60°-70°   | 3865.0  | 19.7      |
| 70°-80°   | 1953.2  | 10.0      |
| 80°-90°   | 315.4   | 1.6       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 19585.0 | 100.0     |
| 0°-180°   | 19585.0 | 100.0     |

**Coefficient of Utilization**



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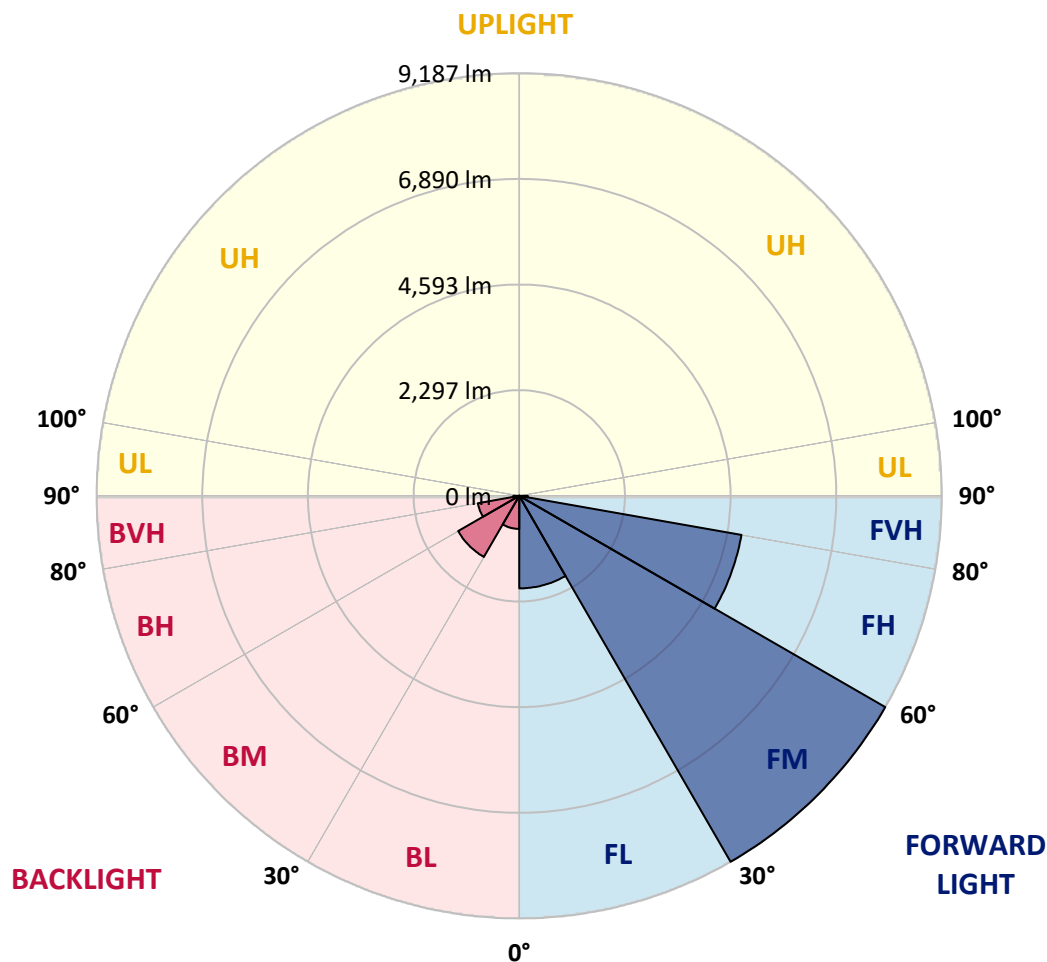
CATALOG NUMBER: GLEON-SA4A-760-U-T2R

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 2011.3 | 10.3      |                         |      |         |
| FM   | (30°-60°)   | 9186.7 | 46.9      |                         |      |         |
| FH   | (60°-80°)   | 4905.2 | 25.0      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 186.3  | 1.0       |                         |      | G2/225  |
| BL   | (0°-30°)    | 718.8  | 3.7       | B2/1000                 |      |         |
| BM   | (30°-60°)   | 1534.6 | 7.8       | B2/2500                 |      |         |
| BH   | (60°-80°)   | 913.0  | 4.7       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 129.1  | 0.7       |                         |      | G2/225  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B2-U0-G2**

Type II Short



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CATALOG NUMBER: GLEON-SA4A-760-U-T2R

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°     | 65°     | 75°     | 76°     | 85°     |
|-------|--------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|
| 0°    | 1788.6 | 1788.6 | 1788.6 | 1788.6 | 1788.6 | 1788.6 | 1788.6  | 1788.6  | 1788.6  | 1788.6  | 1788.6  |
| 2.5°  | 2374.3 | 2338.4 | 2335.1 | 2282.6 | 2270.6 | 2170.2 | 2096.4  | 2019.3  | 1931.5  | 1914.2  | 1845.1  |
| 5°    | 3049.8 | 3046.5 | 3000.6 | 2914.9 | 2847.7 | 2676.2 | 2506.6  | 2327.1  | 2130.3  | 2098.4  | 1942.8  |
| 7.5°  | 3657.6 | 3652.2 | 3617.0 | 3524.6 | 3427.5 | 3216.7 | 2974.7  | 2699.5  | 2380.3  | 2333.1  | 2075.1  |
| 10°   | 4119.0 | 4117.0 | 4105.0 | 4037.2 | 3954.8 | 3752.6 | 3485.3  | 3109.7  | 2670.9  | 2606.4  | 2240.7  |
| 12.5° | 4475.4 | 4479.4 | 4487.3 | 4463.4 | 4424.2 | 4252.0 | 3978.0  | 3544.5  | 2980.7  | 2916.9  | 2424.9  |
| 15°   | 4716.7 | 4728.7 | 4769.9 | 4803.8 | 4824.4 | 4718.7 | 4453.4  | 3989.3  | 3327.8  | 3251.3  | 2629.0  |
| 17.5° | 4838.4 | 4851.7 | 4922.8 | 5025.2 | 5119.6 | 5109.0 | 4898.2  | 4413.5  | 3660.9  | 3587.1  | 2848.4  |
| 20°   | 4943.5 | 4953.4 | 5033.2 | 5156.2 | 5323.1 | 5396.9 | 5278.6  | 4821.8  | 4025.9  | 3938.1  | 3081.1  |
| 22.5° | 5248.0 | 5260.6 | 5284.5 | 5354.4 | 5502.0 | 5637.6 | 5580.4  | 5208.1  | 4360.3  | 4278.6  | 3301.8  |
| 25°   | 5835.7 | 5851.0 | 5799.2 | 5740.0 | 5767.9 | 5862.3 | 5873.0  | 5560.5  | 4699.4  | 4607.0  | 3539.2  |
| 27.5° | 6543.8 | 6565.8 | 6477.4 | 6325.1 | 6192.1 | 6155.5 | 6142.9  | 5849.0  | 5023.2  | 4916.2  | 3773.9  |
| 30°   | 7237.3 | 7275.2 | 7160.2 | 6962.7 | 6718.7 | 6547.2 | 6420.2  | 6131.6  | 5342.4  | 5240.0  | 3995.3  |
| 32.5° | 7914.8 | 7899.5 | 7732.7 | 7539.8 | 7253.9 | 7039.2 | 6732.0  | 6434.8  | 5701.4  | 5583.7  | 4215.4  |
| 35°   | 8378.9 | 8384.3 | 8229.3 | 8000.6 | 7728.0 | 7563.1 | 7149.6  | 6761.9  | 6067.8  | 5959.4  | 4465.4  |
| 37.5° | 8773.9 | 8749.3 | 8573.7 | 8360.3 | 8125.6 | 8055.1 | 7638.2  | 7122.3  | 6464.7  | 6346.4  | 4731.4  |
| 40°   | 8905.5 | 8876.9 | 8761.9 | 8608.3 | 8420.2 | 8414.2 | 8177.5  | 7530.5  | 6913.5  | 6796.5  | 5031.2  |
| 42.5° | 8825.7 | 8789.2 | 8742.0 | 8700.1 | 8642.2 | 8668.8 | 8684.1  | 8009.3  | 7406.9  | 7275.9  | 5378.3  |
| 45°   | 8531.2 | 8476.0 | 8509.3 | 8600.3 | 8726.0 | 8876.3 | 9141.6  | 8539.2  | 7959.4  | 7849.7  | 5785.9  |
| 47.5° | 8078.4 | 8028.5 | 8132.3 | 8327.1 | 8668.8 | 9049.1 | 9574.4  | 9124.3  | 8619.0  | 8509.9  | 6366.3  |
| 50°   | 7441.4 | 7456.1 | 7604.3 | 7958.7 | 8475.3 | 9128.9 | 10107.6 | 9898.9  | 9577.7  | 9476.0  | 7158.2  |
| 52.5° | 6396.2 | 6398.9 | 6816.4 | 7398.2 | 8132.3 | 9087.7 | 10403.5 | 10888.9 | 10886.9 | 10763.9 | 7912.2  |
| 55°   | 5425.5 | 5484.7 | 5815.1 | 6588.4 | 7576.4 | 8922.8 | 10610.3 | 11370.3 | 11746.6 | 11602.3 | 8615.0  |
| 57.5° | 4477.4 | 4511.9 | 4825.1 | 5601.7 | 6783.2 | 8483.3 | 10822.4 | 11948.1 | 12737.3 | 12646.2 | 9488.6  |
| 60°   | 3398.9 | 3452.1 | 3775.9 | 4493.3 | 5768.6 | 7703.4 | 10842.3 | 12551.1 | 13921.5 | 13829.7 | 10464.0 |
| 62.5° | 2206.1 | 2297.9 | 2601.0 | 3273.3 | 4541.2 | 6581.7 | 10379.6 | 12945.4 | 15043.8 | 15011.2 | 11329.7 |
| 65°   | 1267.9 | 1337.1 | 1547.9 | 2066.5 | 3133.0 | 5173.5 | 9279.2  | 12793.8 | 15734.6 | 15716.0 | 11653.5 |
| 66°   | 1035.9 | 1079.1 | 1240.7 | 1615.0 | 2585.1 | 4543.2 | 8639.6  | 12474.0 | 15803.1 | 15803.8 | 11616.3 |
| 67.5° | 828.5  | 847.7  | 920.2  | 1156.2 | 1907.6 | 3601.0 | 7496.6  | 11768.5 | 15718.0 | 15741.3 | 11376.3 |
| 70°   | 685.5  | 695.5  | 718.1  | 775.3  | 1041.2 | 2171.5 | 5321.1  | 9935.4  | 14863.6 | 14881.6 | 10439.4 |
| 72.5° | 615.0  | 621.0  | 629.7  | 637.6  | 734.7  | 1213.4 | 3250.0  | 7948.1  | 13031.8 | 13055.1 | 9011.9  |
| 75°   | 557.2  | 560.5  | 559.2  | 559.8  | 616.4  | 773.3  | 1679.5  | 5934.1  | 10537.2 | 10490.6 | 6903.5  |
| 77.5° | 489.4  | 492.7  | 486.0  | 487.4  | 545.2  | 594.4  | 835.8   | 4154.2  | 7111.0  | 6782.5  | 3889.6  |
| 80°   | 413.6  | 416.2  | 413.6  | 418.2  | 474.7  | 448.8  | 486.0   | 2337.1  | 3144.3  | 2974.0  | 1383.0  |
| 82.5° | 312.5  | 323.8  | 331.8  | 350.4  | 391.0  | 319.1  | 325.1   | 910.2   | 957.4   | 911.6   | 424.2   |
| 85°   | 137.0  | 166.9  | 250.0  | 268.0  | 293.9  | 191.5  | 213.4   | 371.0   | 389.6   | 377.7   | 154.3   |
| 87.5° | 35.9   | 39.2   | 123.7  | 155.6  | 162.9  | 86.4   | 111.0   | 168.9   | 178.2   | 168.9   | 51.2    |
| 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: P317508

CATALOG NUMBER: GLEON-SA4A-760-U-T2R

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1788.6 | 1788.6 | 1788.6 | 1788.6 | 1788.6 | 1788.6 | 1788.6 | 1788.6 | 1788.6 | 1788.6 | 1788.6 |
| 2.5°  | 1808.5 | 1775.9 | 1717.4 | 1665.5 | 1626.3 | 1599.7 | 1573.1 | 1559.8 | 1551.9 | 1543.9 | 1545.2 |
| 5°    | 1866.3 | 1800.5 | 1700.1 | 1629.0 | 1589.1 | 1563.8 | 1550.5 | 1545.2 | 1541.9 | 1533.9 | 1533.9 |
| 7.5°  | 1953.4 | 1860.4 | 1722.1 | 1648.9 | 1617.7 | 1598.4 | 1590.4 | 1587.8 | 1583.8 | 1574.5 | 1575.8 |
| 10°   | 2063.2 | 1932.8 | 1767.9 | 1696.8 | 1668.2 | 1646.9 | 1635.6 | 1631.6 | 1624.3 | 1613.7 | 1615.0 |
| 12.5° | 2192.1 | 2022.6 | 1828.4 | 1754.0 | 1719.4 | 1690.8 | 1672.2 | 1660.9 | 1648.3 | 1634.3 | 1635.0 |
| 15°   | 2333.1 | 2120.3 | 1893.6 | 1805.2 | 1758.0 | 1718.1 | 1688.2 | 1668.9 | 1648.9 | 1631.6 | 1631.0 |
| 17.5° | 2476.0 | 2214.7 | 1943.5 | 1833.1 | 1769.3 | 1716.7 | 1676.2 | 1646.3 | 1621.7 | 1600.4 | 1598.4 |
| 20°   | 2630.3 | 2299.9 | 1971.4 | 1830.4 | 1748.0 | 1685.5 | 1631.6 | 1594.4 | 1567.1 | 1545.9 | 1542.5 |
| 22.5° | 2787.2 | 2379.6 | 1976.1 | 1803.2 | 1700.8 | 1624.3 | 1567.8 | 1526.6 | 1498.7 | 1476.7 | 1468.7 |
| 25°   | 2930.8 | 2441.5 | 1956.8 | 1750.7 | 1635.0 | 1552.5 | 1497.3 | 1455.4 | 1432.8 | 1406.9 | 1398.9 |
| 27.5° | 3061.8 | 2484.7 | 1918.2 | 1683.5 | 1561.2 | 1480.0 | 1428.2 | 1392.3 | 1367.7 | 1347.7 | 1341.1 |
| 30°   | 3179.5 | 2508.0 | 1855.0 | 1603.7 | 1485.4 | 1411.6 | 1367.7 | 1343.1 | 1321.8 | 1296.5 | 1291.9 |
| 32.5° | 3291.2 | 2508.0 | 1773.9 | 1516.6 | 1410.2 | 1351.1 | 1325.1 | 1309.8 | 1285.9 | 1261.3 | 1254.6 |
| 35°   | 3402.9 | 2492.7 | 1678.2 | 1425.5 | 1341.1 | 1307.8 | 1306.5 | 1288.6 | 1252.0 | 1218.7 | 1210.1 |
| 37.5° | 3520.6 | 2461.4 | 1570.5 | 1340.4 | 1284.6 | 1288.6 | 1299.9 | 1260.0 | 1208.1 | 1160.9 | 1148.3 |
| 40°   | 3653.6 | 2418.2 | 1458.8 | 1266.6 | 1237.4 | 1279.9 | 1281.9 | 1218.7 | 1117.7 | 1074.5 | 1063.2 |
| 42.5° | 3809.8 | 2375.0 | 1355.0 | 1201.5 | 1200.1 | 1254.0 | 1248.0 | 1129.6 | 1069.1 | 1047.2 | 1041.2 |
| 45°   | 4015.3 | 2350.4 | 1256.6 | 1139.6 | 1170.9 | 1212.1 | 1190.2 | 1080.4 | 1055.2 | 1042.5 | 1037.2 |
| 47.5° | 4339.1 | 2363.0 | 1166.2 | 1090.4 | 1141.6 | 1170.2 | 1082.4 | 1060.5 | 1042.5 | 1027.3 | 1021.9 |
| 50°   | 4744.7 | 2355.7 | 1093.1 | 1056.5 | 1108.4 | 1126.3 | 1033.9 | 1034.6 | 1025.3 | 1008.0 | 1000.0 |
| 52.5° | 5049.8 | 2298.5 | 1045.9 | 1037.2 | 1079.1 | 1048.5 | 1003.3 | 1009.3 | 1004.6 | 979.4  | 970.7  |
| 55°   | 5344.4 | 2249.3 | 1021.9 | 1029.9 | 1057.8 | 951.5  | 967.4  | 982.0  | 977.4  | 952.8  | 948.8  |
| 57.5° | 5710.7 | 2240.0 | 1007.3 | 1031.9 | 1039.9 | 902.9  | 932.8  | 952.1  | 948.8  | 938.2  | 936.2  |
| 60°   | 6159.5 | 2242.7 | 994.0  | 1035.2 | 1019.9 | 867.0  | 900.3  | 924.9  | 926.9  | 924.9  | 923.5  |
| 62.5° | 6406.2 | 2170.2 | 960.8  | 1025.9 | 984.7  | 835.8  | 866.4  | 902.3  | 902.9  | 906.9  | 906.2  |
| 65°   | 6196.8 | 1953.4 | 898.9  | 993.3  | 925.5  | 809.8  | 837.1  | 876.3  | 866.4  | 884.3  | 884.3  |
| 66°   | 5993.3 | 1828.4 | 868.3  | 972.1  | 900.3  | 799.9  | 827.8  | 863.0  | 850.4  | 875.0  | 875.0  |
| 67.5° | 5577.8 | 1617.7 | 813.2  | 926.9  | 864.4  | 785.9  | 817.1  | 841.1  | 823.8  | 860.4  | 857.7  |
| 70°   | 4818.5 | 1251.3 | 702.1  | 824.5  | 805.2  | 765.3  | 802.5  | 797.2  | 771.9  | 827.8  | 817.1  |
| 72.5° | 4062.5 | 950.8  | 563.8  | 690.2  | 715.4  | 739.4  | 781.9  | 741.4  | 709.4  | 748.7  | 725.4  |
| 75°   | 3152.2 | 714.8  | 445.5  | 536.6  | 604.4  | 698.8  | 757.3  | 676.9  | 631.0  | 627.0  | 614.4  |
| 77.5° | 1704.1 | 490.7  | 353.1  | 409.6  | 480.1  | 648.3  | 740.7  | 607.7  | 538.6  | 522.6  | 512.6  |
| 80°   | 674.9  | 319.1  | 256.6  | 310.5  | 335.8  | 575.1  | 700.8  | 527.3  | 444.1  | 428.2  | 412.9  |
| 82.5° | 278.6  | 188.8  | 165.6  | 208.1  | 218.7  | 492.0  | 629.0  | 432.2  | 343.1  | 474.7  | 504.0  |
| 85°   | 119.7  | 103.7  | 98.4   | 107.7  | 123.7  | 345.1  | 500.7  | 329.8  | 370.3  | 330.4  | 262.6  |
| 87.5° | 35.9   | 43.9   | 41.9   | 41.2   | 45.2   | 82.4   | 266.6  | 183.5  | 271.9  | 103.1  | 77.1   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

LM-79-2008: 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

REPORT NUMBER: SP1-1908-441-9-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 5700K 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       | 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**

| 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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**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)