

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: P321796

Luminaire Tested: **GLEON-SA2B-722-U-T3R-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P321796  
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-SA2B-722-U-T3R-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(2) 70 CRI, 2200K, 800mA 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: 6611 lumens  
Efficiency: N/A  
Efficacy: 77.8 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B1 - U0 - G2

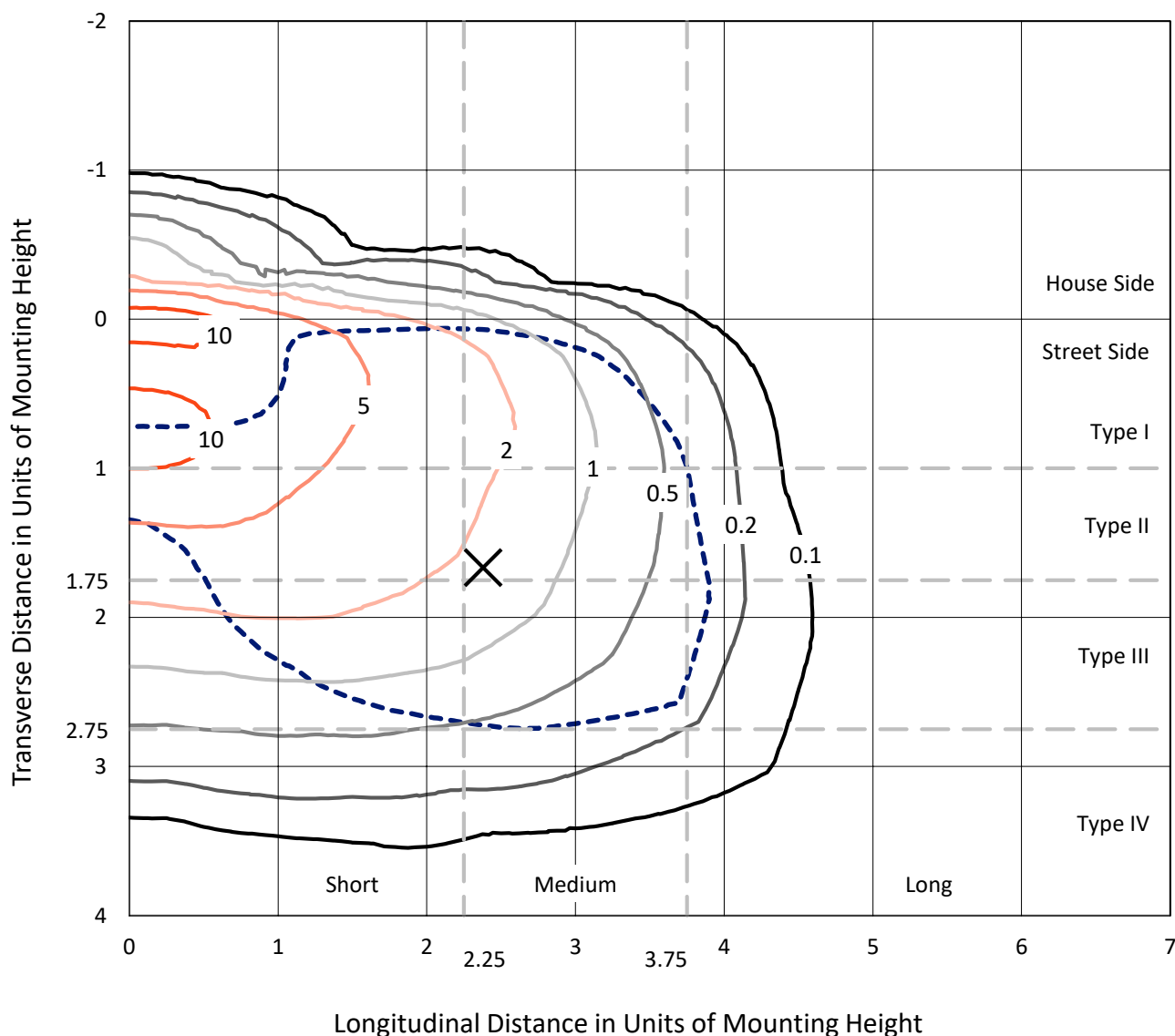
Input Watts (W): 85  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P321796  
 CATALOG NUMBER: GLEON-SA2B-722-U-T3R-HSS

## Iso-Footcandle Lines of Horizontal Illumination

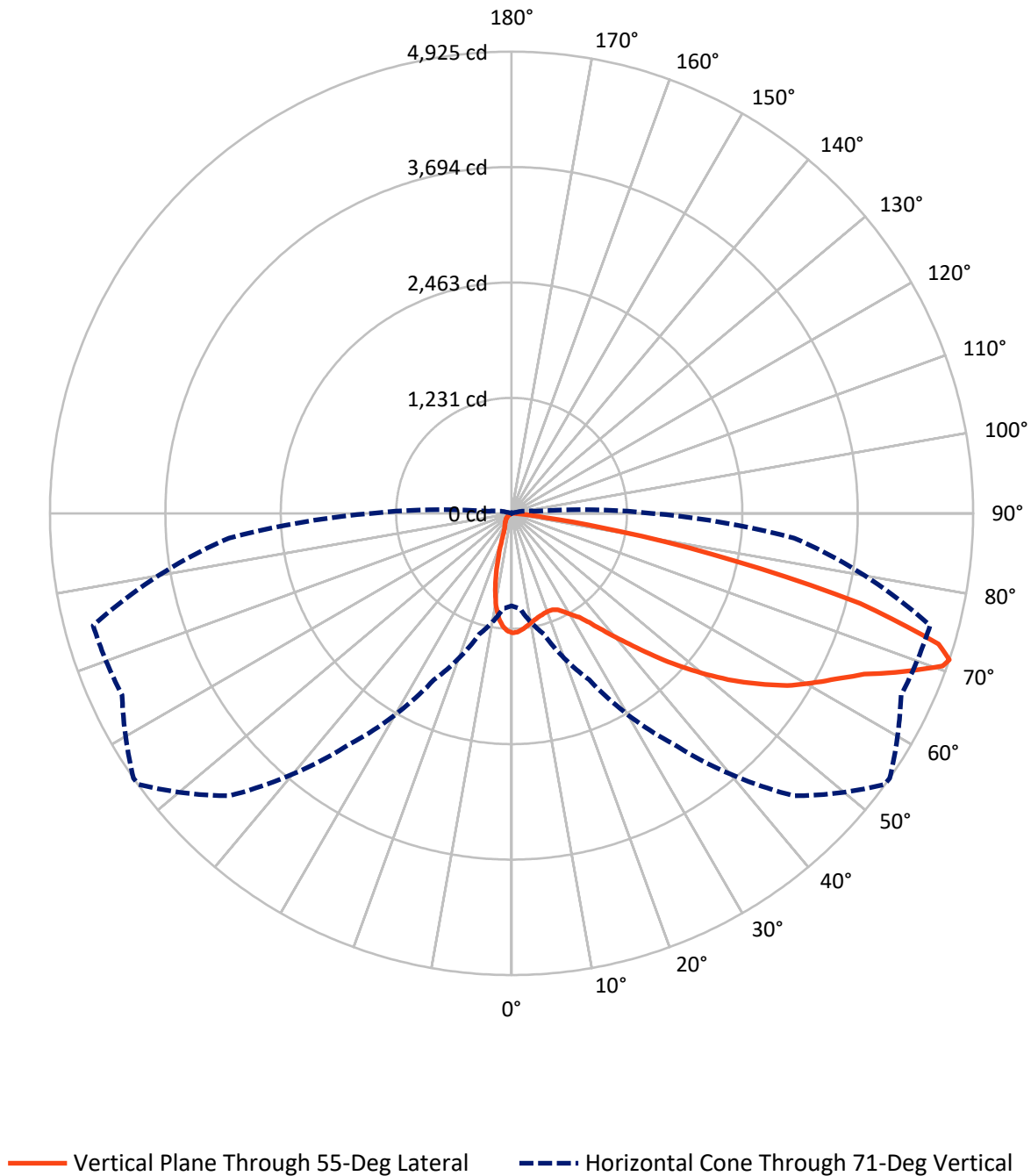
✕ Max cd  
 - - - 1/2 Max cd



Based on 10 foot mounting height. Maximum calculated value = 13.1 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    | 523.4    | 0.0    | 523.4  |
|                    | % Fixture | 7.9      | 0.0    | 7.9    |
| <b>Street Side</b> | Lumens    | 6087.6   | 0.0    | 6087.6 |
|                    | % Fixture | 92.1     | 0.0    | 92.1   |
| <b>Total</b>       | Lumens    | 6611.0   | 0.0    | 6611.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 108.7  | 1.6       |
| 10°-20°   | 245.4  | 3.7       |
| 20°-30°   | 394.4  | 6.0       |
| 30°-40°   | 670.1  | 10.1      |
| 40°-50°   | 1040.1 | 15.7      |
| 50°-60°   | 1398.3 | 21.2      |
| 60°-70°   | 1710.6 | 25.9      |
| 70°-80°   | 1000.2 | 15.1      |
| 80°-90°   | 43.2   | 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°    | 6611.0 | 100.0     |
| 0°-180°   | 6611.0 | 100.0     |

**Coefficient of Utilization**



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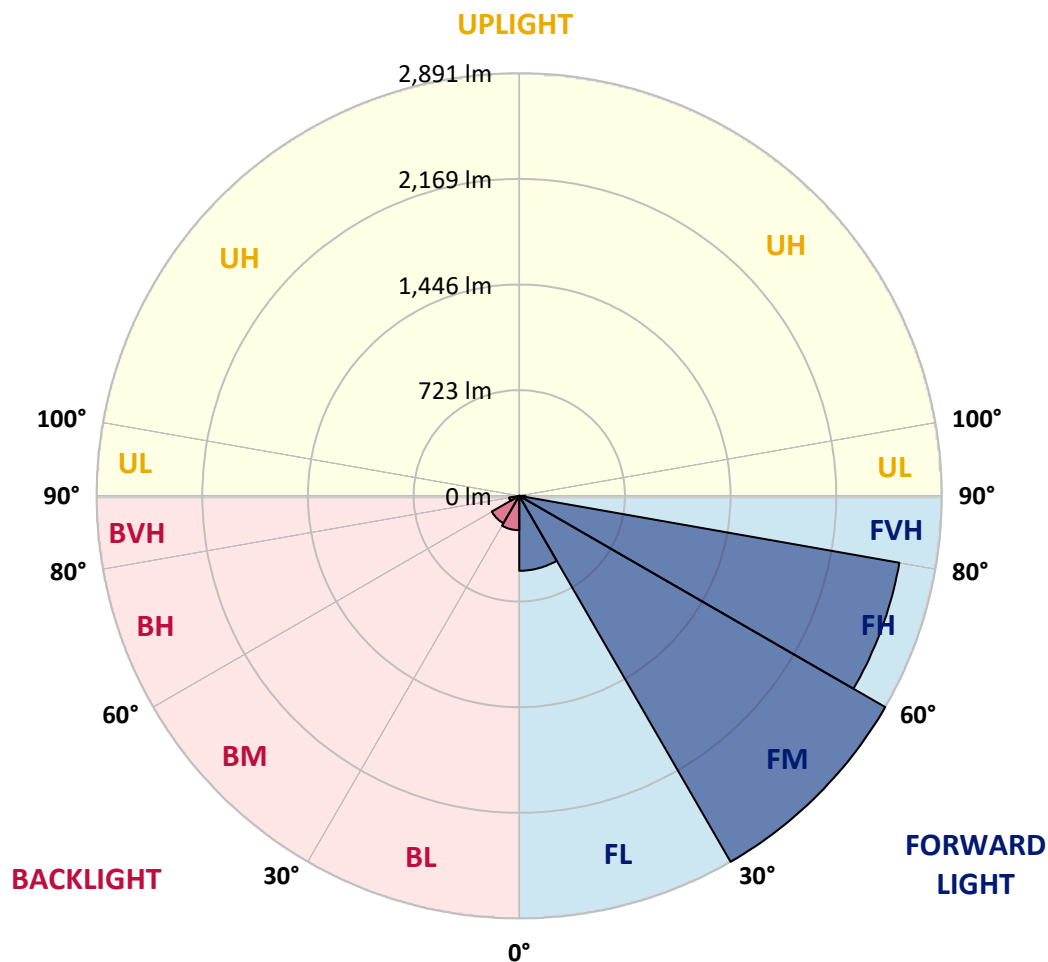
CATALOG NUMBER: GLEON-SA2B-722-U-T3R-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 512.9  | 7.8       |                         |      |         |
| FM   | (30°-60°)   | 2891.5 | 43.7      |                         |      |         |
| FH   | (60°-80°)   | 2640.7 | 39.9      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 42.5   | 0.6       |                         |      | G1/100  |
| BL   | (0°-30°)    | 235.6  | 3.6       | B1/500                  |      |         |
| BM   | (30°-60°)   | 217.0  | 3.3       | B0/220                  |      |         |
| BH   | (60°-80°)   | 70.1   | 1.1       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 0.7    | 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°    | 1275.0 | 1275.0 | 1275.0 | 1275.0 | 1275.0 | 1275.0 | 1275.0 | 1275.0 | 1275.0 | 1275.0 | 1275.0 |
| 2.5°  | 1237.6 | 1239.0 | 1244.4 | 1246.8 | 1252.4 | 1261.9 | 1266.6 | 1266.9 | 1274.7 | 1277.6 | 1280.0 |
| 5°    | 1150.0 | 1158.9 | 1167.8 | 1177.3 | 1194.5 | 1217.4 | 1239.9 | 1242.0 | 1266.9 | 1285.3 | 1295.1 |
| 7.5°  | 1074.6 | 1082.6 | 1093.3 | 1108.4 | 1132.8 | 1168.7 | 1206.4 | 1210.8 | 1258.0 | 1299.9 | 1321.9 |
| 10°   | 997.1  | 1003.6 | 1019.1 | 1041.3 | 1074.9 | 1123.0 | 1173.7 | 1181.2 | 1250.0 | 1319.5 | 1358.1 |
| 12.5° | 914.3  | 918.1  | 936.8  | 968.9  | 1018.2 | 1079.3 | 1146.1 | 1155.9 | 1245.0 | 1342.0 | 1400.8 |
| 15°   | 851.4  | 853.1  | 870.9  | 904.2  | 960.6  | 1040.1 | 1124.8 | 1136.6 | 1246.2 | 1369.1 | 1447.4 |
| 17.5° | 835.3  | 836.2  | 845.7  | 868.6  | 918.4  | 1005.1 | 1107.8 | 1122.4 | 1249.7 | 1395.5 | 1494.3 |
| 20°   | 900.3  | 894.1  | 884.3  | 880.7  | 902.1  | 984.0  | 1097.7 | 1114.1 | 1254.5 | 1418.9 | 1536.5 |
| 22.5° | 1078.7 | 1060.3 | 1019.7 | 965.3  | 932.4  | 985.5  | 1100.4 | 1116.7 | 1269.6 | 1447.7 | 1585.2 |
| 25°   | 1343.5 | 1318.0 | 1248.8 | 1142.0 | 1039.3 | 1028.3 | 1122.7 | 1139.3 | 1299.0 | 1482.2 | 1631.8 |
| 27.5° | 1644.8 | 1619.6 | 1535.0 | 1382.4 | 1207.3 | 1112.9 | 1173.7 | 1189.2 | 1342.6 | 1512.7 | 1667.4 |
| 30°   | 1933.4 | 1926.2 | 1826.5 | 1653.1 | 1418.6 | 1250.0 | 1239.6 | 1252.7 | 1375.0 | 1531.1 | 1695.6 |
| 32.5° | 2178.0 | 2166.7 | 2086.5 | 1917.9 | 1660.6 | 1414.8 | 1317.1 | 1321.0 | 1399.3 | 1554.9 | 1732.4 |
| 35°   | 2404.8 | 2390.8 | 2320.4 | 2161.0 | 1908.7 | 1616.0 | 1436.4 | 1430.8 | 1452.5 | 1602.7 | 1785.8 |
| 37.5° | 2602.7 | 2615.5 | 2537.4 | 2385.8 | 2131.4 | 1825.3 | 1597.3 | 1580.4 | 1535.6 | 1680.4 | 1863.3 |
| 40°   | 2768.4 | 2768.4 | 2727.7 | 2601.3 | 2371.8 | 2041.7 | 1779.3 | 1757.0 | 1660.6 | 1800.4 | 1961.6 |
| 42.5° | 2828.1 | 2840.8 | 2856.0 | 2784.4 | 2587.0 | 2266.7 | 1982.0 | 1958.9 | 1836.6 | 1970.5 | 2085.6 |
| 45°   | 2831.6 | 2851.8 | 2929.3 | 2929.0 | 2781.5 | 2490.2 | 2210.6 | 2199.6 | 2062.2 | 2188.9 | 2239.4 |
| 47.5° | 2781.5 | 2806.7 | 2934.3 | 3006.8 | 2935.5 | 2698.3 | 2460.6 | 2446.9 | 2327.3 | 2456.7 | 2400.3 |
| 50°   | 2704.0 | 2731.9 | 2880.3 | 3037.3 | 3040.3 | 2879.4 | 2723.9 | 2703.4 | 2619.1 | 2762.7 | 2566.5 |
| 52.5° | 2565.3 | 2619.4 | 2831.9 | 3044.5 | 3109.2 | 3035.8 | 2974.4 | 2965.5 | 2945.6 | 3057.5 | 2698.9 |
| 55°   | 2268.8 | 2328.8 | 2710.5 | 3046.8 | 3173.0 | 3174.5 | 3209.2 | 3211.6 | 3251.7 | 3333.0 | 2797.5 |
| 57.5° | 2128.7 | 2162.5 | 2498.6 | 3058.1 | 3267.7 | 3331.8 | 3448.5 | 3466.9 | 3528.9 | 3594.5 | 2910.0 |
| 60°   | 2040.5 | 2080.6 | 2394.1 | 3042.7 | 3416.4 | 3538.1 | 3670.2 | 3676.4 | 3742.9 | 3864.3 | 3062.3 |
| 62.5° | 1970.2 | 2009.6 | 2328.2 | 2983.3 | 3583.5 | 3786.3 | 3886.9 | 3887.5 | 3937.4 | 4185.8 | 3235.3 |
| 65°   | 1796.5 | 1829.8 | 2194.9 | 2916.5 | 3694.0 | 4031.8 | 4138.6 | 4134.8 | 4175.4 | 4524.8 | 3436.3 |
| 67.5° | 1545.4 | 1570.9 | 1922.7 | 2663.3 | 3652.4 | 4255.0 | 4518.6 | 4505.8 | 4456.6 | 4817.8 | 3515.3 |
| 70°   | 1194.8 | 1204.0 | 1515.4 | 2219.5 | 3262.9 | 4340.8 | 4885.8 | 4879.3 | 4629.0 | 4765.3 | 3225.8 |
| 71°   | 987.6  | 1017.9 | 1335.5 | 1958.9 | 3002.0 | 4261.5 | 4921.4 | 4925.3 | 4585.7 | 4622.2 | 3026.6 |
| 72.5° | 573.5  | 599.3  | 968.0  | 1504.4 | 2548.7 | 3930.8 | 4736.8 | 4764.7 | 4383.2 | 4204.2 | 2585.2 |
| 75°   | 122.9  | 131.5  | 358.9  | 728.2  | 1402.0 | 2755.0 | 3738.8 | 3838.2 | 3572.5 | 2860.1 | 1558.1 |
| 77.5° | 85.5   | 92.3   | 153.8  | 330.4  | 463.4  | 1361.3 | 2322.5 | 2434.7 | 2134.3 | 1074.9 | 498.7  |
| 80°   | 67.7   | 75.4   | 119.9  | 163.3  | 125.3  | 439.0  | 1087.9 | 1156.5 | 711.8  | 239.9  | 84.0   |
| 82.5° | 37.7   | 44.8   | 93.5   | 88.2   | 48.1   | 83.4   | 304.6  | 344.3  | 142.5  | 48.4   | 19.9   |
| 85°   | 11.0   | 13.4   | 60.3   | 64.1   | 20.5   | 16.0   | 51.9   | 64.4   | 27.0   | 12.8   | 8.9    |
| 87.5° | 0.0    | 0.0    | 29.1   | 24.6   | 5.9    | 2.4    | 4.7    | 5.3    | 5.3    | 5.3    | 5.9    |
| 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-SA2B-722-U-T3R-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1275.0 | 1275.0 | 1275.0 | 1275.0 | 1275.0 | 1275.0 | 1275.0 | 1275.0 | 1275.0 | 1275.0 | 1275.0 |
| 2.5°  | 1280.0 | 1282.1 | 1274.7 | 1264.9 | 1254.5 | 1241.7 | 1228.4 | 1218.0 | 1217.7 | 1212.6 | 1207.6 |
| 5°    | 1295.7 | 1294.5 | 1274.1 | 1242.9 | 1206.1 | 1167.8 | 1131.3 | 1090.0 | 1076.4 | 1059.4 | 1053.8 |
| 7.5°  | 1324.8 | 1316.5 | 1273.2 | 1204.9 | 1124.2 | 1044.0 | 961.2  | 877.8  | 842.2  | 810.1  | 804.5  |
| 10°   | 1361.3 | 1345.6 | 1267.5 | 1147.9 | 999.8  | 851.9  | 727.0  | 613.6  | 563.7  | 525.4  | 523.6  |
| 12.5° | 1399.3 | 1375.3 | 1251.8 | 1061.8 | 836.8  | 629.0  | 485.0  | 373.4  | 331.9  | 305.2  | 307.5  |
| 15°   | 1439.1 | 1403.2 | 1218.0 | 945.8  | 651.3  | 426.9  | 298.0  | 232.4  | 215.8  | 209.0  | 210.8  |
| 17.5° | 1479.8 | 1422.5 | 1170.8 | 805.9  | 468.1  | 275.5  | 206.3  | 187.9  | 187.9  | 189.4  | 190.0  |
| 20°   | 1515.1 | 1432.9 | 1101.3 | 649.2  | 317.3  | 200.7  | 180.5  | 177.8  | 179.3  | 181.7  | 182.0  |
| 22.5° | 1550.1 | 1433.5 | 1010.8 | 490.4  | 222.0  | 175.7  | 171.9  | 170.7  | 171.6  | 174.2  | 174.5  |
| 25°   | 1578.6 | 1426.3 | 897.4  | 348.8  | 177.2  | 165.6  | 163.9  | 163.3  | 163.9  | 167.1  | 167.1  |
| 27.5° | 1590.2 | 1400.5 | 759.0  | 245.2  | 158.8  | 154.4  | 153.8  | 154.4  | 155.3  | 157.6  | 157.9  |
| 30°   | 1591.4 | 1355.4 | 608.2  | 177.5  | 144.0  | 139.2  | 140.4  | 142.5  | 141.6  | 141.0  | 141.6  |
| 32.5° | 1594.4 | 1303.2 | 461.3  | 146.0  | 131.5  | 124.1  | 122.6  | 122.6  | 119.0  | 117.0  | 115.8  |
| 35°   | 1604.2 | 1241.7 | 334.5  | 131.2  | 118.7  | 110.1  | 104.5  | 98.0   | 91.1   | 87.6   | 86.7   |
| 37.5° | 1619.6 | 1177.3 | 239.6  | 121.4  | 107.5  | 97.7   | 87.0   | 75.4   | 65.6   | 62.9   | 62.9   |
| 40°   | 1647.8 | 1110.8 | 177.2  | 113.7  | 98.6   | 86.4   | 70.4   | 55.2   | 46.3   | 44.8   | 44.8   |
| 42.5° | 1692.3 | 1040.7 | 141.3  | 106.9  | 90.8   | 74.8   | 53.7   | 40.1   | 33.5   | 32.7   | 32.4   |
| 45°   | 1738.6 | 963.6  | 123.5  | 100.3  | 82.5   | 61.4   | 39.8   | 29.7   | 25.8   | 24.9   | 24.9   |
| 47.5° | 1784.9 | 881.3  | 114.9  | 94.1   | 74.5   | 47.8   | 29.7   | 23.5   | 21.7   | 21.7   | 22.0   |
| 50°   | 1824.1 | 795.5  | 108.6  | 87.3   | 64.1   | 36.2   | 23.5   | 19.9   | 19.3   | 20.5   | 20.8   |
| 52.5° | 1833.9 | 711.2  | 100.9  | 78.7   | 51.4   | 27.6   | 19.3   | 17.5   | 17.5   | 17.5   | 17.5   |
| 55°   | 1828.0 | 645.9  | 90.8   | 68.0   | 38.0   | 22.0   | 16.6   | 15.4   | 15.1   | 15.1   | 15.1   |
| 57.5° | 1848.2 | 607.3  | 72.7   | 52.8   | 27.3   | 17.8   | 14.5   | 13.7   | 13.1   | 12.8   | 12.8   |
| 60°   | 1888.8 | 582.1  | 51.9   | 38.0   | 20.5   | 14.8   | 12.5   | 11.6   | 10.7   | 10.1   | 10.1   |
| 62.5° | 1942.9 | 560.1  | 38.6   | 28.2   | 15.7   | 11.9   | 10.4   | 9.5    | 8.3    | 7.7    | 7.7    |
| 65°   | 1984.4 | 521.0  | 29.4   | 21.1   | 11.9   | 9.5    | 8.0    | 7.7    | 5.9    | 5.3    | 5.0    |
| 67.5° | 1920.9 | 434.9  | 23.7   | 15.4   | 8.9    | 7.4    | 6.2    | 5.9    | 3.6    | 3.0    | 3.0    |
| 70°   | 1647.5 | 302.8  | 19.0   | 11.3   | 6.5    | 5.9    | 5.0    | 3.9    | 2.7    | 2.4    | 2.4    |
| 71°   | 1494.0 | 252.9  | 17.2   | 9.5    | 5.6    | 5.6    | 4.7    | 3.3    | 2.4    | 2.1    | 2.1    |
| 72.5° | 1241.1 | 179.6  | 14.5   | 7.4    | 5.0    | 5.9    | 5.0    | 3.0    | 2.4    | 2.1    | 1.8    |
| 75°   | 720.4  | 75.1   | 10.1   | 5.0    | 3.9    | 7.1    | 6.5    | 2.7    | 1.8    | 1.5    | 1.5    |
| 77.5° | 216.7  | 27.6   | 5.6    | 3.3    | 3.0    | 6.2    | 7.4    | 2.4    | 0.9    | 0.3    | 0.3    |
| 80°   | 39.5   | 11.9   | 3.6    | 2.1    | 2.1    | 3.9    | 5.6    | 1.2    | 0.0    | 0.0    | 0.0    |
| 82.5° | 14.0   | 5.9    | 2.1    | 1.2    | 0.9    | 1.8    | 2.7    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 8.0    | 4.2    | 1.2    | 0.6    | 0.0    | 0.3    | 0.6    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 5.3    | 1.2    | 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.

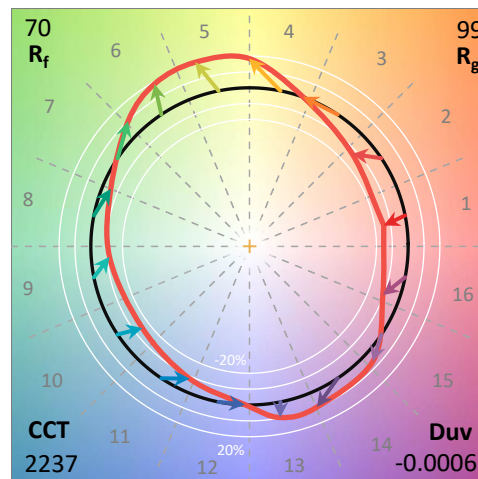
### Test Information

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)