

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: P321162

Luminaire Tested: **GLEON-SA8B-722-U-AFL**

Issue Date: 3/3/2020

### Test Information

Test Method: LM-79-08  
Report Number: P321162  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-29)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA8B-722-U-AFL  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(8) 70 CRI, 2200K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND AUTOMOTIVE  
FRONTLINE OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

### Summary

Lumens per Lamp: N/A  
Luminaire Lumens: 34541 lumens  
Efficiency: N/A  
Efficacy: 103.4 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B3 - U0 - G3

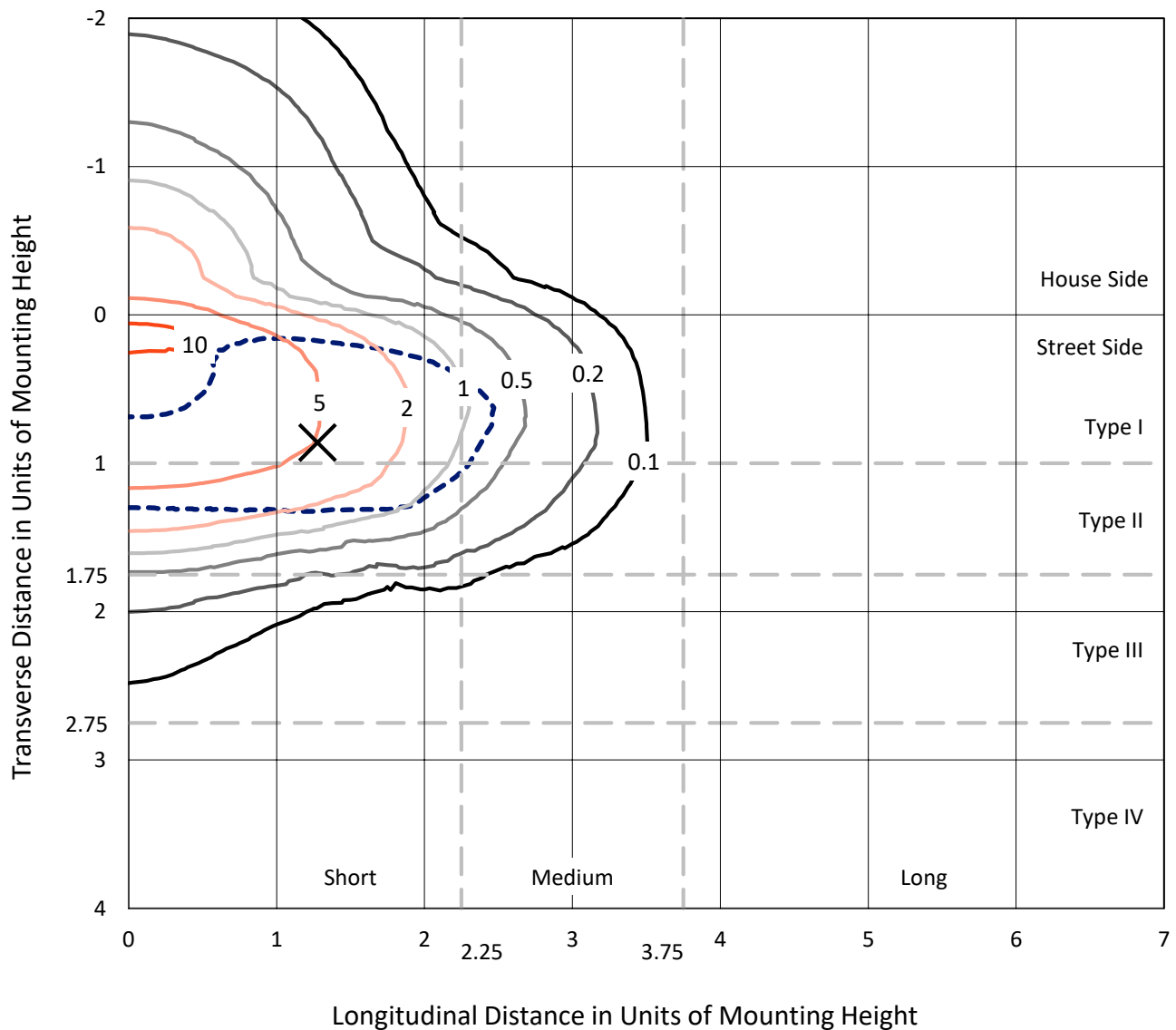
Input Watts (W): 334  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P321162  
 CATALOG NUMBER: GLEON-SA8B-722-U-AFL

## Iso-Footcandle Lines of Horizontal Illumination

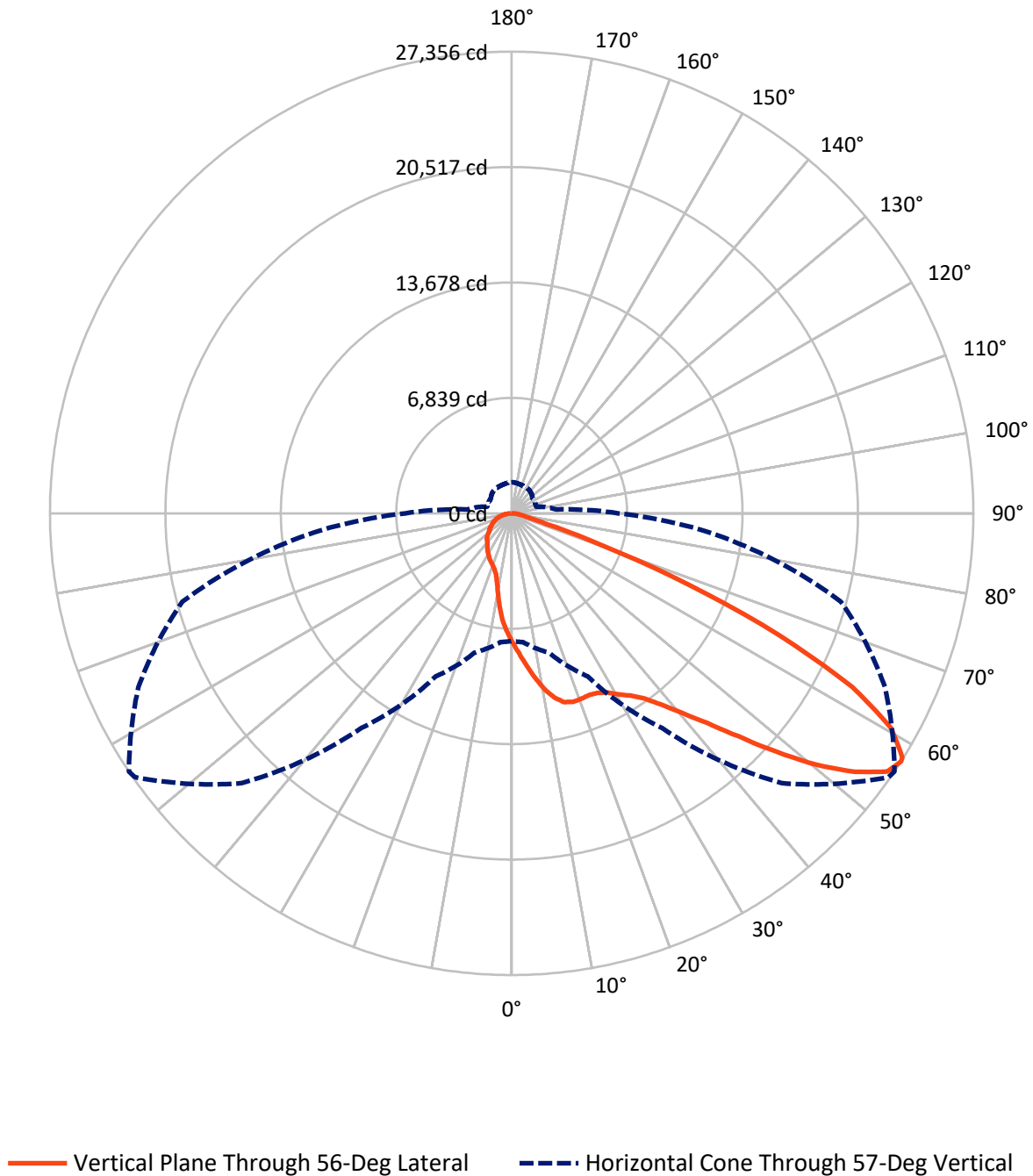
✕ Max cd  
 - - - 1/2 Max cd



Based on 30 foot mounting height. Maximum calculated value = 11.8 fc  
 Type II - Short - N/A

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## Luminous Intensity Polar Plot



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CATALOG NUMBER: GLEON-SA8B-722-U-AFL

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 5954.1   | 0.0    | 5954.1  |
|                    | % Fixture | 17.2     | 0.0    | 17.2    |
| <b>Street Side</b> | Lumens    | 28586.9  | 0.0    | 28586.9 |
|                    | % Fixture | 82.8     | 0.0    | 82.8    |
| <b>Total</b>       | Lumens    | 34541.0  | 0.0    | 34541.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 731.8   | 2.1       |
| 10°-20°   | 2069.1  | 6.0       |
| 20°-30°   | 3370.1  | 9.8       |
| 30°-40°   | 5038.0  | 14.6      |
| 40°-50°   | 7641.5  | 22.1      |
| 50°-60°   | 8564.8  | 24.8      |
| 60°-70°   | 5058.7  | 14.6      |
| 70°-80°   | 1657.4  | 4.8       |
| 80°-90°   | 409.5   | 1.2       |
| 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°    | 34541.0 | 100.0     |
| 0°-180°   | 34541.0 | 100.0     |

**Coefficient of Utilization**



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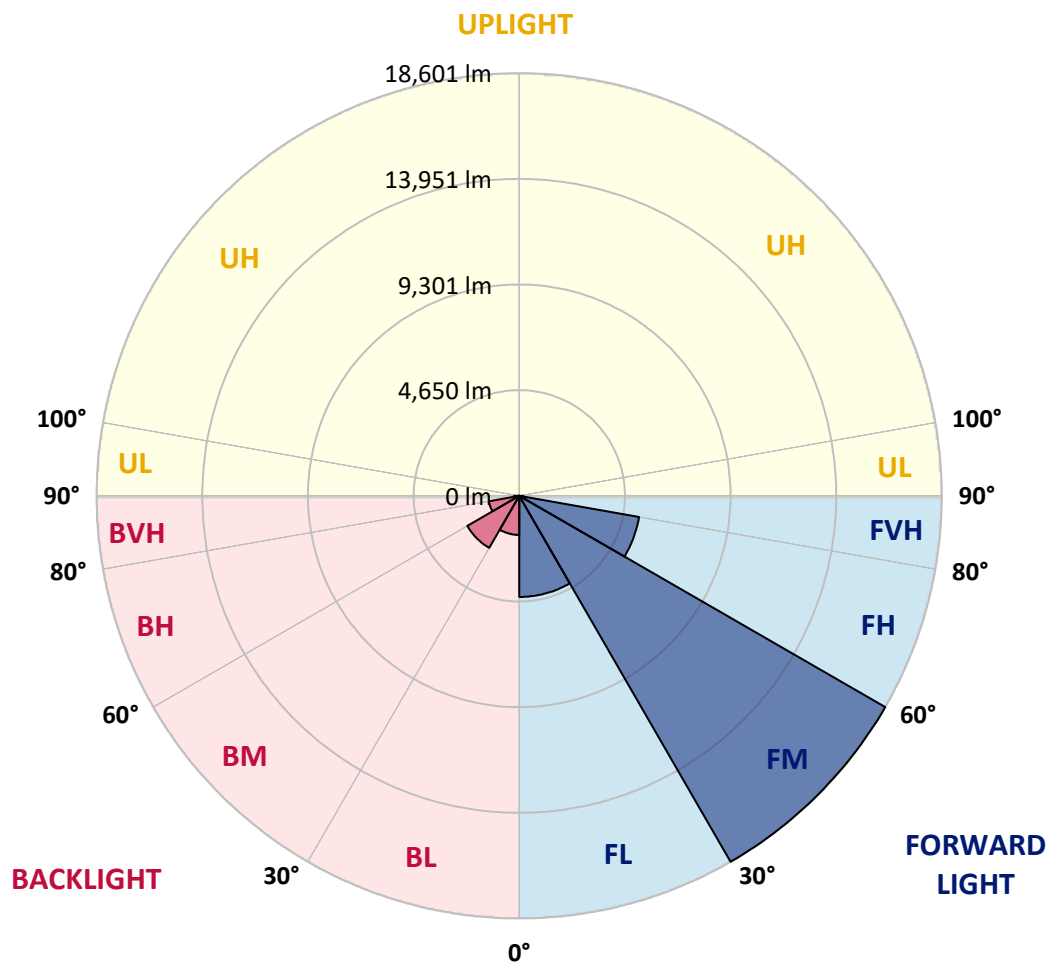
CATALOG NUMBER: GLEON-SA8B-722-U-AFL

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 4449.4  | 12.9      |                         |      |         |
| FM   | (30°-60°)   | 18601.5 | 53.9      |                         |      |         |
| FH   | (60°-80°)   | 5355.7  | 15.5      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 180.3   | 0.5       |                         |      | G2/225  |
| BL   | (0°-30°)    | 1721.7  | 5.0       | B3/2500                 |      |         |
| BM   | (30°-60°)   | 2642.8  | 7.7       | B3/5000                 |      |         |
| BH   | (60°-80°)   | 1360.5  | 3.9       | B3/2500                 |      | G3/2500 |
| BVH  | (80°-90°)   | 229.2   | 0.7       |                         |      | G3/500  |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G3**

Type II Short



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CATALOG NUMBER: GLEON-SA8B-722-U-AFL

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 56°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 7661.2  | 7661.2  | 7661.2  | 7661.2  | 7661.2  | 7661.2  | 7661.2  | 7661.2  | 7661.2  | 7661.2  | 7661.2  |
| 2.5°  | 8797.2  | 8878.0  | 8842.3  | 8718.9  | 8623.9  | 8489.8  | 8340.2  | 8295.1  | 8137.2  | 7960.4  | 7747.9  |
| 5°    | 10189.6 | 10149.3 | 10091.1 | 9898.8  | 9695.8  | 9459.6  | 9084.5  | 9025.1  | 8673.8  | 8273.7  | 7851.2  |
| 7.5°  | 10982.6 | 10979.0 | 10944.6 | 10831.8 | 10646.7 | 10338.0 | 9885.8  | 9815.7  | 9285.1  | 8641.7  | 7986.5  |
| 10°   | 10867.4 | 10859.1 | 10916.1 | 11033.6 | 11089.4 | 11025.3 | 10644.3 | 10574.2 | 9922.6  | 9048.9  | 8143.2  |
| 12.5° | 10213.4 | 10218.1 | 10309.5 | 10556.4 | 10892.4 | 11296.0 | 11234.2 | 11199.8 | 10583.7 | 9509.5  | 8333.1  |
| 15°   | 9704.1  | 9714.8  | 9787.2  | 10002.1 | 10398.6 | 11131.0 | 11592.7 | 11604.6 | 11223.6 | 10017.5 | 8555.1  |
| 17.5° | 9481.0  | 9503.5  | 9536.8  | 9687.5  | 10050.8 | 10802.2 | 11678.2 | 11742.3 | 11783.9 | 10544.6 | 8768.7  |
| 20°   | 9552.2  | 9573.6  | 9583.1  | 9679.2  | 9977.2  | 10602.7 | 11618.9 | 11734.0 | 12213.6 | 11040.8 | 8982.4  |
| 22.5° | 9871.5  | 9884.6  | 9890.5  | 9915.4  | 10146.9 | 10659.7 | 11579.7 | 11700.8 | 12524.6 | 11485.9 | 9143.9  |
| 25°   | 10400.9 | 10391.4 | 10353.5 | 10321.4 | 10476.9 | 10885.3 | 11669.9 | 11785.0 | 12777.4 | 11889.5 | 9249.5  |
| 27.5° | 11034.8 | 11023.0 | 10949.4 | 10861.5 | 10950.5 | 11236.6 | 11929.9 | 12021.3 | 13004.1 | 12267.0 | 9302.9  |
| 30°   | 11795.7 | 11764.9 | 11626.0 | 11521.5 | 11555.9 | 11763.7 | 12358.4 | 12441.5 | 13354.3 | 12695.5 | 9355.1  |
| 32.5° | 12675.3 | 12642.1 | 12441.5 | 12268.2 | 12268.2 | 12441.5 | 12800.0 | 12868.8 | 13651.1 | 13179.8 | 9439.4  |
| 35°   | 13776.9 | 13735.4 | 13474.2 | 13183.4 | 13101.5 | 13189.3 | 13401.8 | 13450.5 | 14185.3 | 13790.0 | 9592.6  |
| 37.5° | 15075.5 | 15019.8 | 14681.4 | 14292.1 | 14112.8 | 14108.1 | 14261.2 | 14360.9 | 15038.7 | 14591.2 | 9852.5  |
| 40°   | 16377.7 | 16338.6 | 16043.0 | 15736.7 | 15385.4 | 15272.6 | 15508.8 | 15539.7 | 16154.6 | 15586.0 | 10184.9 |
| 42.5° | 17384.4 | 17377.2 | 17322.6 | 17363.0 | 17003.3 | 16775.4 | 16960.6 | 16985.5 | 17517.3 | 16662.6 | 10538.6 |
| 45°   | 17916.2 | 17928.0 | 18192.7 | 18779.1 | 18912.1 | 18745.9 | 18837.3 | 18844.4 | 19074.7 | 17748.8 | 10862.7 |
| 47.5° | 17490.0 | 17551.7 | 18221.2 | 19532.9 | 20621.4 | 21173.4 | 21021.5 | 21109.3 | 20584.6 | 18681.8 | 11116.7 |
| 50°   | 15829.3 | 15905.3 | 17044.9 | 19197.0 | 21419.1 | 23522.6 | 23443.1 | 23422.9 | 21802.6 | 19365.5 | 11254.4 |
| 52.5° | 13772.2 | 13831.5 | 14771.7 | 17450.8 | 20833.9 | 24821.2 | 25551.3 | 25446.8 | 22885.2 | 19877.2 | 11280.5 |
| 55°   | 10639.5 | 10732.1 | 11633.1 | 13965.7 | 18466.9 | 24325.0 | 27101.6 | 27007.8 | 23871.6 | 20145.4 | 11249.7 |
| 57°   | 7563.9  | 7661.2  | 8556.3  | 10658.5 | 15534.9 | 22607.4 | 27255.9 | 27355.6 | 24404.6 | 20190.5 | 11284.1 |
| 57.5° | 6749.6  | 6849.3  | 7736.0  | 9777.7  | 14620.9 | 21986.6 | 27122.9 | 27289.1 | 24500.7 | 20183.4 | 11303.1 |
| 60°   | 3398.5  | 3436.5  | 4001.5  | 5458.1  | 9242.4  | 17774.9 | 25388.6 | 25817.2 | 24587.4 | 19834.4 | 11385.0 |
| 62.5° | 2113.0  | 2085.6  | 2067.8  | 2514.2  | 4496.5  | 11787.4 | 21809.7 | 22634.7 | 22929.1 | 18989.3 | 11186.8 |
| 65°   | 1857.7  | 1806.7  | 1610.8  | 1575.2  | 1985.9  | 5725.1  | 16424.0 | 17450.8 | 19385.7 | 17657.4 | 10714.3 |
| 67.5° | 1745.0  | 1695.1  | 1474.3  | 1341.4  | 1342.6  | 2269.6  | 10196.8 | 11353.0 | 15101.7 | 15405.5 | 9599.7  |
| 70°   | 1628.6  | 1583.5  | 1377.0  | 1220.3  | 1143.1  | 1257.1  | 4691.2  | 5568.5  | 9844.2  | 12109.1 | 8023.3  |
| 72.5° | 1479.1  | 1448.2  | 1252.3  | 1090.9  | 1009.0  | 941.3   | 1796.0  | 2121.3  | 5699.0  | 8132.5  | 5572.0  |
| 75°   | 1322.4  | 1293.9  | 1126.5  | 972.2   | 872.5   | 740.7   | 1011.4  | 1089.7  | 2895.2  | 4160.6  | 2743.3  |
| 77.5° | 1150.3  | 1133.6  | 1001.9  | 859.4   | 779.9   | 613.7   | 715.8   | 753.8   | 1241.7  | 1784.1  | 1375.8  |
| 80°   | 915.2   | 947.3   | 876.0   | 765.6   | 692.1   | 491.4   | 506.9   | 531.8   | 722.9   | 871.3   | 781.1   |
| 82.5° | 595.9   | 651.7   | 686.1   | 622.0   | 569.8   | 387.0   | 364.4   | 375.1   | 471.3   | 531.8   | 339.5   |
| 85°   | 248.1   | 279.0   | 451.1   | 407.2   | 378.7   | 282.5   | 244.5   | 249.3   | 292.0   | 302.7   | 138.9   |
| 87.5° | 110.4   | 117.5   | 198.2   | 186.4   | 160.3   | 97.3    | 104.5   | 114.0   | 155.5   | 147.2   | 53.4    |
| 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: P321162

CATALOG NUMBER: GLEON-SA8B-722-U-AFL

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 7661.2 | 7661.2 | 7661.2 | 7661.2 | 7661.2 | 7661.2 | 7661.2 | 7661.2 | 7661.2 | 7661.2 | 7661.2 |
| 2.5°  | 7668.3 | 7568.6 | 7397.7 | 7209.0 | 7054.6 | 6931.2 | 6806.5 | 6721.1 | 6621.4 | 6568.0 | 6540.6 |
| 5°    | 7674.3 | 7478.4 | 7118.7 | 6749.6 | 6419.6 | 6118.1 | 5830.8 | 5610.0 | 5403.5 | 5291.9 | 5261.0 |
| 7.5°  | 7699.2 | 7404.8 | 6823.2 | 6215.4 | 5629.0 | 5093.6 | 4680.5 | 4421.8 | 4235.4 | 4152.3 | 4128.6 |
| 10°   | 7719.4 | 7318.2 | 6457.6 | 5557.8 | 4760.1 | 4217.6 | 3897.1 | 3752.3 | 3688.2 | 3677.5 | 3666.8 |
| 12.5° | 7766.9 | 7229.1 | 6073.0 | 4871.7 | 4084.6 | 3709.5 | 3598.0 | 3588.5 | 3606.3 | 3632.4 | 3632.4 |
| 15°   | 7841.7 | 7141.3 | 5633.7 | 4282.9 | 3654.9 | 3523.2 | 3545.7 | 3598.0 | 3646.6 | 3687.0 | 3692.9 |
| 17.5° | 7896.3 | 7033.3 | 5161.3 | 3811.6 | 3425.8 | 3461.4 | 3542.2 | 3615.8 | 3665.6 | 3704.8 | 3708.3 |
| 20°   | 7935.4 | 6865.9 | 4656.8 | 3451.9 | 3294.1 | 3404.5 | 3505.4 | 3570.6 | 3605.1 | 3644.2 | 3650.2 |
| 22.5° | 7915.3 | 6641.5 | 4209.3 | 3194.4 | 3187.2 | 3321.4 | 3417.5 | 3495.9 | 3469.7 | 3431.8 | 3456.7 |
| 25°   | 7817.9 | 6332.9 | 3748.7 | 3002.1 | 3074.5 | 3209.8 | 3328.5 | 3276.3 | 3188.4 | 3171.8 | 3181.3 |
| 27.5° | 7644.6 | 5938.8 | 3322.6 | 2824.0 | 2943.9 | 3106.5 | 3099.4 | 3047.2 | 3016.3 | 2994.9 | 3008.0 |
| 30°   | 7458.2 | 5511.5 | 2949.8 | 2668.5 | 2799.1 | 2933.2 | 2905.9 | 2904.7 | 2873.8 | 2839.4 | 2856.0 |
| 32.5° | 7274.2 | 5081.8 | 2654.2 | 2540.3 | 2689.9 | 2707.7 | 2767.0 | 2784.8 | 2724.3 | 2651.9 | 2647.1 |
| 35°   | 7114.0 | 4675.8 | 2429.9 | 2424.0 | 2558.1 | 2560.5 | 2647.1 | 2622.2 | 2471.4 | 2396.7 | 2396.7 |
| 37.5° | 6994.1 | 4271.0 | 2259.0 | 2319.5 | 2384.8 | 2446.5 | 2490.4 | 2387.2 | 2362.2 | 2320.7 | 2319.5 |
| 40°   | 6941.9 | 3914.9 | 2152.1 | 2240.0 | 2262.5 | 2340.9 | 2228.1 | 2268.5 | 2280.3 | 2259.0 | 2259.0 |
| 42.5° | 6887.3 | 3605.1 | 2059.5 | 2179.4 | 2175.9 | 2165.2 | 2108.2 | 2160.4 | 2207.9 | 2209.1 | 2205.5 |
| 45°   | 6832.7 | 3338.0 | 1977.6 | 2050.0 | 2099.9 | 1984.7 | 1995.4 | 2051.2 | 2117.7 | 2141.4 | 2141.4 |
| 47.5° | 6772.1 | 3126.7 | 1902.8 | 1913.5 | 1990.7 | 1913.5 | 1905.2 | 1948.0 | 2026.3 | 2064.3 | 2072.6 |
| 50°   | 6639.2 | 2936.8 | 1817.4 | 1793.6 | 1815.0 | 1841.1 | 1848.2 | 1868.4 | 1955.1 | 2015.6 | 2029.9 |
| 52.5° | 6455.2 | 2767.0 | 1708.2 | 1683.2 | 1683.2 | 1781.8 | 1815.0 | 1820.9 | 1894.5 | 1966.9 | 1981.2 |
| 55°   | 6302.1 | 2659.0 | 1595.4 | 1590.6 | 1585.9 | 1718.8 | 1775.8 | 1785.3 | 1836.4 | 1893.3 | 1900.5 |
| 57°   | 6312.7 | 2650.7 | 1508.7 | 1513.5 | 1512.3 | 1654.7 | 1739.0 | 1759.2 | 1785.3 | 1834.0 | 1842.3 |
| 57.5° | 6318.7 | 2656.6 | 1489.7 | 1492.1 | 1490.9 | 1636.9 | 1728.3 | 1750.9 | 1771.1 | 1822.1 | 1830.4 |
| 60°   | 6407.7 | 2672.1 | 1412.6 | 1386.5 | 1392.4 | 1542.0 | 1667.8 | 1696.3 | 1709.4 | 1777.0 | 1787.7 |
| 62.5° | 6275.9 | 2603.2 | 1350.9 | 1288.0 | 1288.0 | 1442.3 | 1583.5 | 1628.6 | 1648.8 | 1740.2 | 1758.0 |
| 65°   | 5893.7 | 2409.7 | 1278.5 | 1176.4 | 1188.2 | 1342.6 | 1482.6 | 1556.2 | 1587.1 | 1701.0 | 1720.0 |
| 67.5° | 5303.7 | 2185.4 | 1201.3 | 1076.7 | 1088.5 | 1238.1 | 1378.2 | 1457.7 | 1506.4 | 1658.3 | 1673.7 |
| 70°   | 4535.7 | 1911.2 | 1096.8 | 971.0  | 985.3  | 1124.1 | 1254.7 | 1344.9 | 1417.3 | 1618.0 | 1622.7 |
| 72.5° | 3343.9 | 1566.9 | 950.8  | 854.7  | 870.1  | 991.2  | 1130.1 | 1234.5 | 1331.9 | 1517.1 | 1514.7 |
| 75°   | 1988.3 | 1225.0 | 789.4  | 737.2  | 747.8  | 860.6  | 1017.3 | 1144.3 | 1290.3 | 1477.9 | 1500.4 |
| 77.5° | 1206.0 | 922.3  | 643.4  | 617.3  | 630.3  | 745.5  | 936.6  | 1071.9 | 1272.5 | 1393.6 | 1386.5 |
| 80°   | 728.8  | 658.8  | 514.0  | 497.4  | 510.4  | 637.4  | 866.5  | 1017.3 | 1112.3 | 1190.6 | 1190.6 |
| 82.5° | 381.0  | 402.4  | 377.5  | 364.4  | 382.2  | 517.6  | 788.2  | 887.9  | 982.9  | 844.0  | 788.2  |
| 85°   | 155.5  | 210.1  | 229.1  | 227.9  | 238.6  | 358.5  | 680.2  | 759.7  | 633.9  | 601.8  | 616.1  |
| 87.5° | 52.2   | 89.0   | 111.6  | 96.2   | 100.9  | 225.5  | 471.3  | 366.8  | 435.6  | 303.9  | 288.5  |
| 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)