

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



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: P319582

Luminaire Tested: **GLEON-SA8D-722-U-SL2**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P319582  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-20)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA8D-722-U-SL2  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(8) 70 CRI, 2200K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II  
SPILL LIGHT ELIMINATOR OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 44783 lumens  
Efficiency: N/A  
Efficacy: 87.6 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B4 - U0 - G5

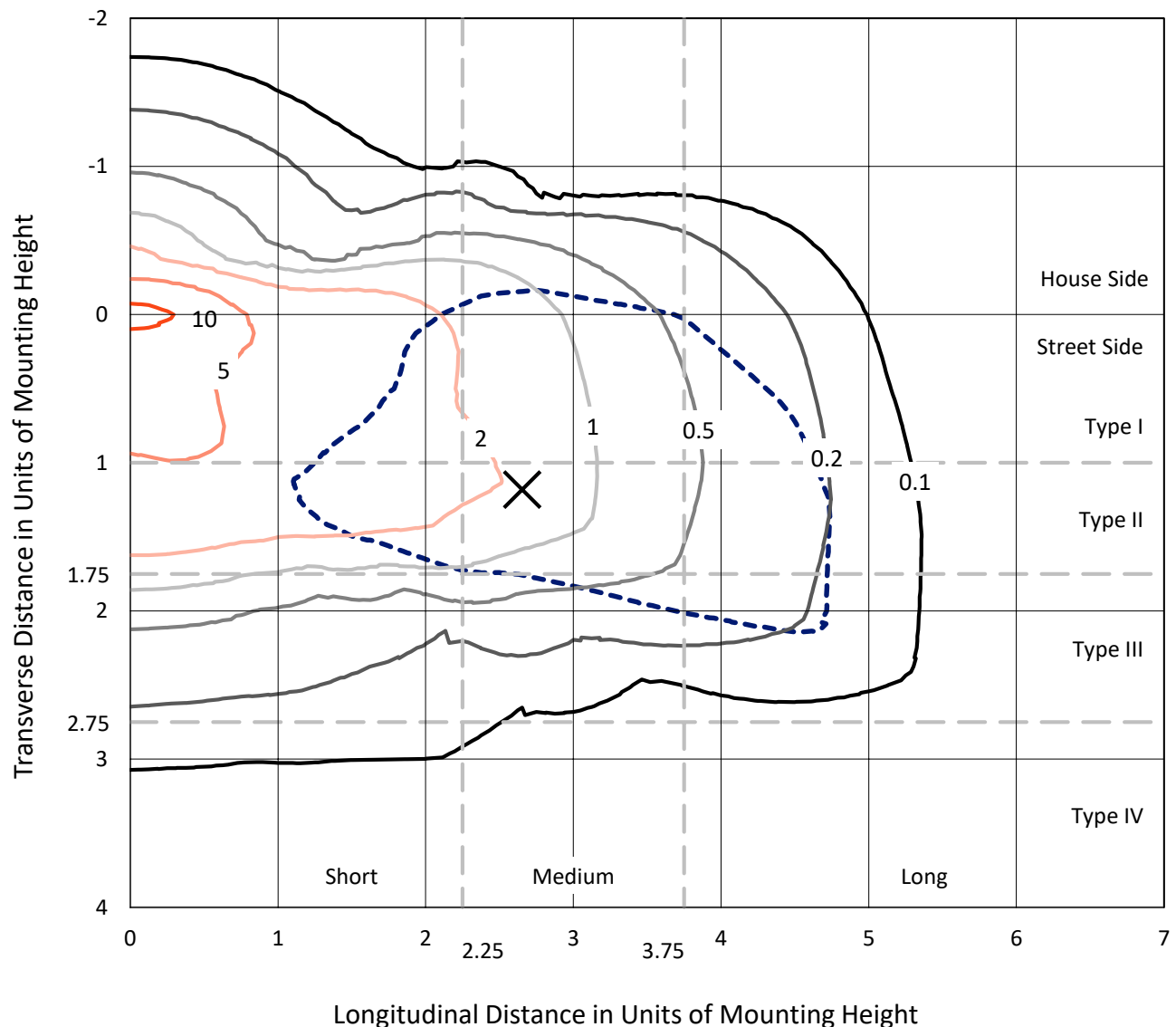
Input Watts (W): 511  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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 CATALOG NUMBER: GLEON-SA8D-722-U-SL2

## Iso-Footcandle Lines of Horizontal Illumination

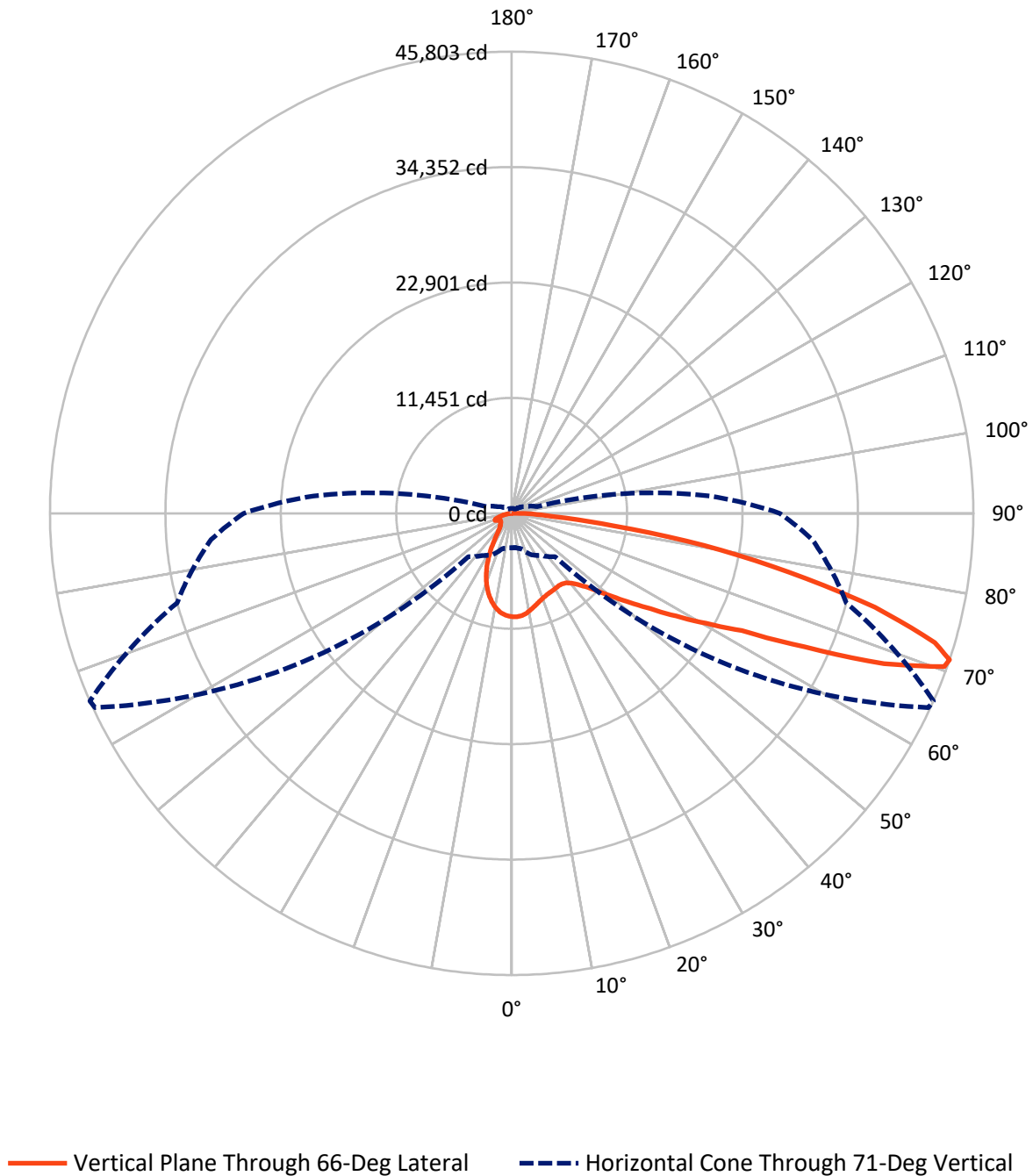
✕ Max cd  
 - - - 1/2 Max cd



Based on 30 foot mounting height. Maximum calculated value = 11.4 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    | 8299.5   | 0.0    | 8299.5  |
|                    | % Fixture | 18.5     | 0.0    | 18.5    |
| <b>Street Side</b> | Lumens    | 36483.5  | 0.0    | 36483.5 |
|                    | % Fixture | 81.5     | 0.0    | 81.5    |
| <b>Total</b>       | Lumens    | 44783.0  | 0.0    | 44783.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 903.0   | 2.0       |
| 10°-20°   | 2165.9  | 4.8       |
| 20°-30°   | 2909.3  | 6.5       |
| 30°-40°   | 3827.1  | 8.5       |
| 40°-50°   | 5567.5  | 12.4      |
| 50°-60°   | 8697.0  | 19.4      |
| 60°-70°   | 10894.4 | 24.3      |
| 70°-80°   | 8310.0  | 18.6      |
| 80°-90°   | 1509.0  | 3.4       |
| 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°    | 44783.0 | 100.0     |
| 0°-180°   | 44783.0 | 100.0     |

**Coefficient of Utilization**



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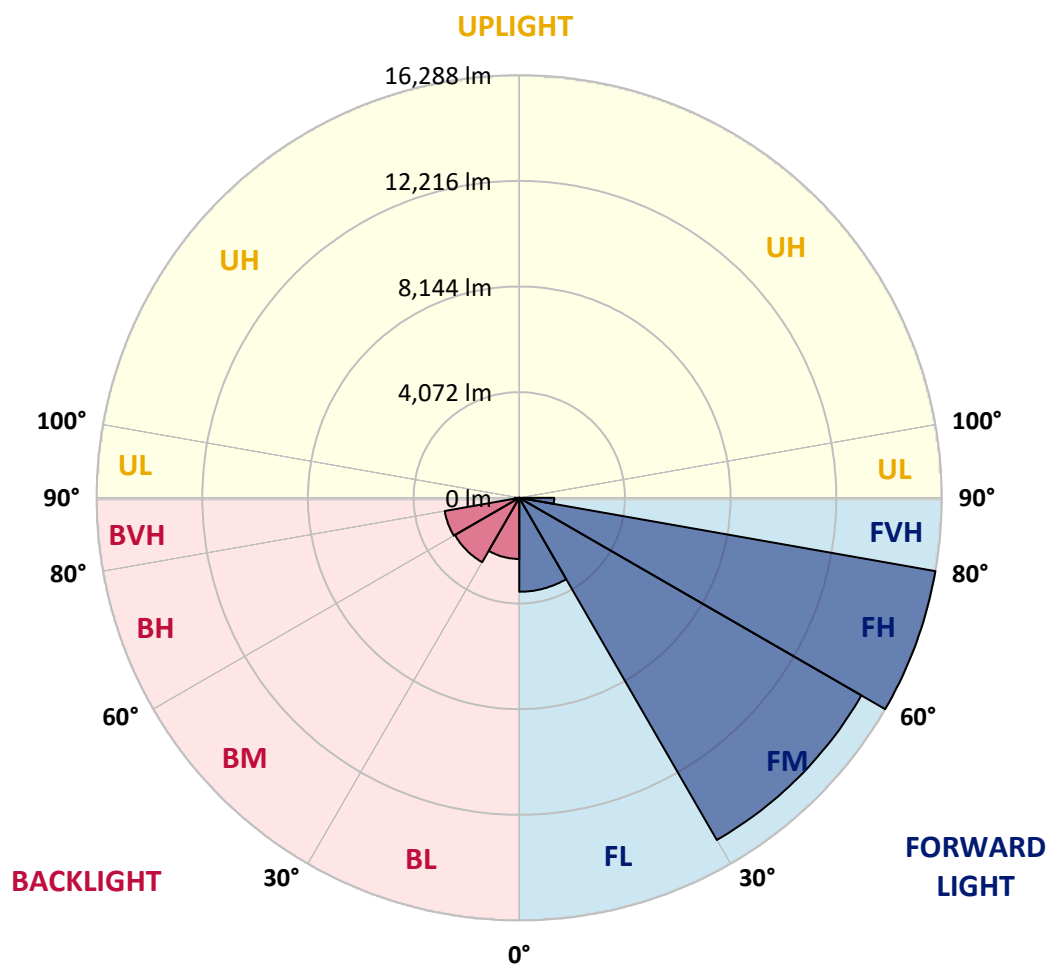
CATALOG NUMBER: GLEON-SA8D-722-U-SL2

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 3621.3  | 8.1       |                         |      |         |
| FM   | (30°-60°)   | 15228.5 | 34.0      |                         |      |         |
| FH   | (60°-80°)   | 16288.0 | 36.4      |                         |      | G5      |
| FVH  | (80°-90°)   | 1345.7  | 3.0       |                         |      | G5      |
| BL   | (0°-30°)    | 2356.8  | 5.3       | B3/2500                 |      |         |
| BM   | (30°-60°)   | 2863.1  | 6.4       | B3/5000                 |      |         |
| BH   | (60°-80°)   | 2916.3  | 6.5       | B4/5000                 |      | G4/5000 |
| BVH  | (80°-90°)   | 163.3   | 0.4       |                         |      | G2/225  |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B4-U0-G5**

Type III Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 65°     | 66°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 10258.9 | 10258.9 | 10258.9 | 10258.9 | 10258.9 | 10258.9 | 10258.9 | 10258.9 | 10258.9 | 10258.9 | 10258.9 |
| 2.5°  | 10068.7 | 10053.3 | 10099.7 | 10147.6 | 10166.1 | 10197.1 | 10243.5 | 10269.7 | 10268.2 | 10272.8 | 10257.4 |
| 5°    | 9400.8  | 9380.7  | 9473.5  | 9549.2  | 9694.6  | 9858.5  | 10057.9 | 10200.2 | 10203.3 | 10283.7 | 10305.3 |
| 7.5°  | 8768.4  | 8754.5  | 8861.2  | 8983.3  | 9151.9  | 9402.3  | 9725.5  | 10031.6 | 10050.2 | 10268.2 | 10344.0 |
| 10°   | 8261.3  | 8258.2  | 8361.8  | 8494.7  | 8691.1  | 8970.9  | 9342.0  | 9790.4  | 9818.3  | 10194.0 | 10350.1 |
| 12.5° | 7865.4  | 7871.6  | 7961.3  | 8112.8  | 8320.0  | 8612.2  | 9014.2  | 9519.8  | 9564.7  | 10076.5 | 10314.6 |
| 15°   | 7573.2  | 7597.9  | 7670.6  | 7823.7  | 8027.8  | 8324.6  | 8737.5  | 9269.4  | 9337.4  | 9945.0  | 10294.5 |
| 17.5° | 7406.2  | 7434.0  | 7485.1  | 7611.9  | 7803.6  | 8089.6  | 8480.8  | 9063.7  | 9125.6  | 9844.5  | 10296.0 |
| 20°   | 7356.7  | 7379.9  | 7409.3  | 7486.6  | 7649.0  | 7908.7  | 8278.3  | 8878.2  | 8944.7  | 9764.1  | 10311.5 |
| 22.5° | 7454.1  | 7471.2  | 7474.2  | 7468.1  | 7567.0  | 7778.8  | 8131.4  | 8742.1  | 8813.2  | 9711.6  | 10322.3 |
| 25°   | 7662.9  | 7686.1  | 7669.1  | 7611.9  | 7579.4  | 7709.3  | 8055.6  | 8652.4  | 8723.6  | 9672.9  | 10300.7 |
| 27.5° | 7976.8  | 7979.8  | 7965.9  | 7891.7  | 7738.6  | 7717.0  | 8032.4  | 8599.9  | 8667.9  | 9628.1  | 10255.8 |
| 30°   | 8403.5  | 8423.6  | 8398.9  | 8298.4  | 8047.9  | 7840.7  | 8060.2  | 8548.8  | 8610.7  | 9570.9  | 10183.2 |
| 32.5° | 8902.9  | 8952.4  | 8950.8  | 8845.7  | 8487.0  | 8117.5  | 8174.7  | 8517.9  | 8565.8  | 9510.6  | 10095.0 |
| 35°   | 9420.9  | 9488.9  | 9615.7  | 9570.9  | 9127.1  | 8555.0  | 8394.2  | 8567.4  | 8599.9  | 9502.8  | 10033.2 |
| 37.5° | 9959.0  | 10027.0 | 10288.3 | 10408.9 | 9889.4  | 9181.2  | 8740.6  | 8742.1  | 8757.6  | 9597.2  | 10028.5 |
| 40°   | 10521.8 | 10594.4 | 10987.2 | 11301.0 | 10877.4 | 9974.4  | 9298.7  | 9107.0  | 9090.0  | 9829.1  | 10119.8 |
| 42.5° | 11310.3 | 11375.3 | 11846.8 | 12247.3 | 11973.6 | 10990.3 | 10070.3 | 9669.8  | 9634.3  | 10283.7 | 10412.0 |
| 45°   | 12307.6 | 12363.3 | 12864.2 | 13292.5 | 13151.8 | 12149.9 | 11039.7 | 10444.5 | 10438.3 | 11041.3 | 11004.2 |
| 47.5° | 13493.5 | 13536.8 | 13986.8 | 14401.1 | 14452.2 | 13484.3 | 12258.1 | 11639.7 | 11539.2 | 12080.3 | 11921.1 |
| 50°   | 14728.9 | 14776.9 | 15083.0 | 15528.3 | 15907.1 | 15270.1 | 13826.0 | 13103.9 | 12969.4 | 13451.8 | 13219.9 |
| 52.5° | 15546.9 | 15610.3 | 15876.2 | 16440.6 | 17543.0 | 17227.6 | 15679.8 | 14878.9 | 14674.8 | 15113.9 | 14936.1 |
| 55°   | 15182.0 | 15324.2 | 15730.9 | 16635.4 | 18851.1 | 20217.9 | 17966.6 | 16949.2 | 16718.9 | 17083.8 | 16978.6 |
| 57.5° | 13522.9 | 13717.7 | 14272.8 | 15669.0 | 19035.0 | 22852.6 | 21423.9 | 19387.6 | 19225.2 | 19120.1 | 19168.0 |
| 60°   | 10490.8 | 10677.9 | 11366.0 | 13185.8 | 17753.3 | 24776.0 | 26626.8 | 22393.4 | 22158.3 | 21164.1 | 21207.4 |
| 62.5° | 7424.8  | 7330.4  | 7802.0  | 9133.3  | 14425.9 | 25001.8 | 32547.1 | 26413.4 | 25640.3 | 23322.6 | 23132.4 |
| 65°   | 5662.1  | 5640.5  | 5852.3  | 6276.0  | 8737.5  | 22300.6 | 36074.0 | 33170.2 | 31962.7 | 25861.4 | 25413.0 |
| 67.5° | 4652.5  | 4613.8  | 4822.5  | 5439.5  | 5626.6  | 14387.2 | 36151.3 | 41009.4 | 39823.5 | 29021.8 | 28050.8 |
| 70°   | 3825.3  | 3782.0  | 3976.8  | 4773.1  | 5199.8  | 7296.4  | 30425.8 | 45600.0 | 45536.6 | 33023.4 | 30042.3 |
| 71°   | 3429.4  | 3398.5  | 3632.0  | 4516.4  | 5108.6  | 6081.1  | 26269.6 | 45612.4 | 45802.6 | 34377.8 | 29924.8 |
| 72.5° | 2792.4  | 2803.2  | 3050.6  | 4020.1  | 5040.6  | 5369.9  | 19307.2 | 43486.4 | 43888.4 | 35668.9 | 28856.4 |
| 75°   | 1855.4  | 1864.7  | 2189.4  | 3092.4  | 4887.5  | 5253.9  | 10611.4 | 36489.9 | 37229.0 | 34895.8 | 26331.5 |
| 77.5° | 1246.2  | 1243.1  | 1464.2  | 2121.4  | 4258.2  | 5253.9  | 6221.8  | 27291.7 | 28103.4 | 27766.3 | 20299.8 |
| 80°   | 858.1   | 851.9   | 1008.1  | 1464.2  | 3223.8  | 5317.3  | 4810.2  | 19126.3 | 19372.1 | 14994.9 | 8250.4  |
| 82.5° | 525.7   | 530.3   | 658.7   | 1034.4  | 2194.0  | 4785.4  | 4541.1  | 10429.0 | 10161.5 | 4205.6  | 2061.1  |
| 85°   | 301.5   | 300.0   | 420.6   | 700.4   | 1408.6  | 4038.6  | 4428.3  | 4488.6  | 4117.5  | 1266.3  | 745.3   |
| 87.5° | 108.2   | 116.0   | 225.7   | 388.1   | 807.1   | 2812.5  | 3757.2  | 2334.7  | 2104.4  | 572.1   | 337.1   |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |

REPORT NUMBER: P319582

CATALOG NUMBER: GLEON-SA8D-722-U-SL2

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°    | 115°    | 125°    | 135°    | 145°    | 155°    | 165°    | 175°    | 180°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 10258.9 | 10258.9 | 10258.9 | 10258.9 | 10258.9 | 10258.9 | 10258.9 | 10258.9 | 10258.9 | 10258.9 | 10258.9 |
| 2.5°  | 10246.5 | 10255.8 | 10245.0 | 10183.2 | 10130.6 | 10045.5 | 9997.6  | 9931.1  | 9911.0  | 9901.8  | 9926.5  |
| 5°    | 10285.2 | 10288.3 | 10197.1 | 10034.7 | 9852.3  | 9637.4  | 9482.7  | 9292.6  | 9202.9  | 9164.2  | 9189.0  |
| 7.5°  | 10320.8 | 10306.8 | 10107.4 | 9796.6  | 9459.5  | 9085.4  | 8752.9  | 8448.3  | 8270.5  | 8197.9  | 8204.0  |
| 10°   | 10325.4 | 10266.6 | 9946.6  | 9465.7  | 8943.1  | 8394.2  | 7884.0  | 7413.9  | 7117.1  | 6923.8  | 6982.6  |
| 12.5° | 10277.5 | 10178.5 | 9710.0  | 9037.4  | 8312.3  | 7563.9  | 6874.3  | 6169.3  | 5745.6  | 5549.2  | 5555.4  |
| 15°   | 10240.4 | 10061.0 | 9419.3  | 8533.4  | 7559.3  | 6568.2  | 5626.6  | 4797.8  | 4346.3  | 4145.3  | 4051.0  |
| 17.5° | 10209.4 | 9934.2  | 9082.3  | 7965.9  | 6670.2  | 5413.2  | 4281.4  | 3542.3  | 3294.9  | 3236.2  | 3211.4  |
| 20°   | 10166.1 | 9799.7  | 8706.6  | 7308.8  | 5657.5  | 4120.6  | 3126.4  | 2761.5  | 2763.0  | 2831.1  | 2840.3  |
| 22.5° | 10105.8 | 9646.6  | 8306.1  | 6571.3  | 4570.5  | 3001.1  | 2450.7  | 2345.6  | 2452.2  | 2582.1  | 2605.3  |
| 25°   | 10016.2 | 9465.7  | 7860.8  | 5756.4  | 3485.1  | 2306.9  | 2093.5  | 2088.9  | 2218.8  | 2354.8  | 2374.9  |
| 27.5° | 9889.4  | 9229.2  | 7366.0  | 4881.3  | 2568.2  | 1960.6  | 1875.5  | 1908.0  | 2003.9  | 2102.8  | 2110.5  |
| 30°   | 9719.3  | 8953.9  | 6820.2  | 3958.2  | 2013.1  | 1745.6  | 1736.4  | 1765.7  | 1824.5  | 1894.1  | 1900.3  |
| 32.5° | 9532.2  | 8674.1  | 6237.3  | 3064.5  | 1724.0  | 1629.7  | 1639.0  | 1652.9  | 1680.7  | 1708.5  | 1714.7  |
| 35°   | 9362.1  | 8388.0  | 5640.5  | 2328.6  | 1586.4  | 1553.9  | 1547.7  | 1544.6  | 1547.7  | 1538.5  | 1540.0  |
| 37.5° | 9252.4  | 8151.5  | 5018.9  | 1853.9  | 1507.5  | 1487.4  | 1468.9  | 1445.7  | 1419.4  | 1403.9  | 1407.0  |
| 40°   | 9212.2  | 7975.2  | 4389.6  | 1601.8  | 1442.6  | 1428.7  | 1393.1  | 1343.6  | 1312.7  | 1303.4  | 1303.4  |
| 42.5° | 9320.4  | 7884.0  | 3782.0  | 1475.1  | 1388.5  | 1365.3  | 1306.5  | 1249.3  | 1226.1  | 1224.6  | 1223.0  |
| 45°   | 9651.3  | 7921.1  | 3203.7  | 1405.5  | 1339.0  | 1294.2  | 1216.8  | 1168.9  | 1153.5  | 1156.5  | 1155.0  |
| 47.5° | 10245.0 | 8154.6  | 2708.9  | 1359.1  | 1289.5  | 1230.8  | 1144.2  | 1105.5  | 1087.0  | 1087.0  | 1088.5  |
| 50°   | 11254.7 | 8700.4  | 2314.6  | 1320.4  | 1247.8  | 1172.0  | 1091.6  | 1043.7  | 1018.9  | 1017.4  | 1017.4  |
| 52.5° | 12725.1 | 9677.6  | 2068.8  | 1288.0  | 1201.4  | 1119.4  | 1039.0  | 978.7   | 949.4   | 943.2   | 940.1   |
| 55°   | 14568.1 | 11078.4 | 2000.8  | 1266.3  | 1139.5  | 1062.2  | 975.6   | 915.3   | 882.9   | 869.0   | 867.4   |
| 57.5° | 16629.2 | 12782.3 | 2135.3  | 1240.0  | 1076.1  | 994.2   | 906.1   | 848.9   | 814.8   | 797.8   | 796.3   |
| 60°   | 18715.0 | 14642.3 | 2684.2  | 1202.9  | 1023.6  | 920.0   | 834.9   | 782.4   | 748.4   | 729.8   | 726.7   |
| 62.5° | 20803.9 | 16602.9 | 3805.2  | 1199.8  | 986.5   | 848.9   | 762.3   | 717.4   | 685.0   | 664.9   | 660.2   |
| 65°   | 23160.3 | 18749.0 | 5079.2  | 1281.8  | 974.1   | 783.9   | 688.1   | 652.5   | 624.7   | 606.1   | 604.6   |
| 67.5° | 25866.1 | 21171.9 | 4957.1  | 1450.3  | 1015.8  | 725.2   | 618.5   | 590.6   | 570.5   | 555.1   | 553.5   |
| 70°   | 27135.5 | 20793.1 | 3081.5  | 1569.4  | 1074.6  | 668.0   | 552.0   | 531.9   | 516.4   | 505.6   | 501.0   |
| 71°   | 26603.6 | 19743.2 | 2583.7  | 1555.5  | 1068.4  | 643.2   | 525.7   | 510.2   | 494.8   | 485.5   | 480.9   |
| 72.5° | 25153.3 | 18005.3 | 2155.4  | 1447.2  | 998.8   | 598.4   | 491.7   | 476.2   | 462.3   | 451.5   | 448.4   |
| 75°   | 22571.2 | 16080.3 | 1725.5  | 1156.5  | 796.3   | 505.6   | 431.4   | 414.4   | 403.6   | 397.4   | 391.2   |
| 77.5° | 16592.1 | 11475.8 | 1334.4  | 913.8   | 586.0   | 412.8   | 368.0   | 355.6   | 344.8   | 335.5   | 330.9   |
| 80°   | 6356.4  | 4445.3  | 898.3   | 681.9   | 429.8   | 326.2   | 296.9   | 290.7   | 279.9   | 273.7   | 273.7   |
| 82.5° | 1711.6  | 1328.2  | 479.3   | 412.8   | 287.6   | 238.1   | 227.3   | 224.2   | 214.9   | 202.5   | 204.1   |
| 85°   | 692.7   | 586.0   | 269.0   | 227.3   | 176.3   | 140.7   | 153.1   | 154.6   | 143.8   | 128.3   | 129.9   |
| 87.5° | 304.6   | 248.9   | 150.0   | 100.5   | 77.3    | 54.1    | 69.6    | 69.6    | 63.4    | 52.6    | 47.9    |
| 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

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| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/28/2019        | 12/28/2019           |
| Power Meter                    | IN0071                | 12/5/2018        | 12/5/2019            |
| AC Power Source                | IN0063                | 12/5/2018        | 12/5/2019            |
| DC Power Source                | IN0208                | 12/5/2018        | 12/5/2019            |
| Sphere Thermometer             | IN0085                | 12/5/2018        | 12/5/2019            |
| Room Thermometer               | IN0046                | 12/5/2018        | 12/5/2019            |

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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)