

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: P321465

Luminaire Tested: **GLEON-SA1A-722-U-T2R-HSS**

Issue Date: 3/3/2020

### Test Information

Test Method: LM-79-08  
Report Number: P321465  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-9)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA1A-722-U-T2R-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(1) 70 CRI, 2200K, 615mA LIGHTSQUARE WITH 16 LEDS AND TYPE II ROADWAY  
OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

### Summary

Lumens per Lamp: N/A  
Luminaire Lumens: 2896 lumens  
Efficiency: N/A  
Efficacy: 85.2 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B0 - U0 - G1

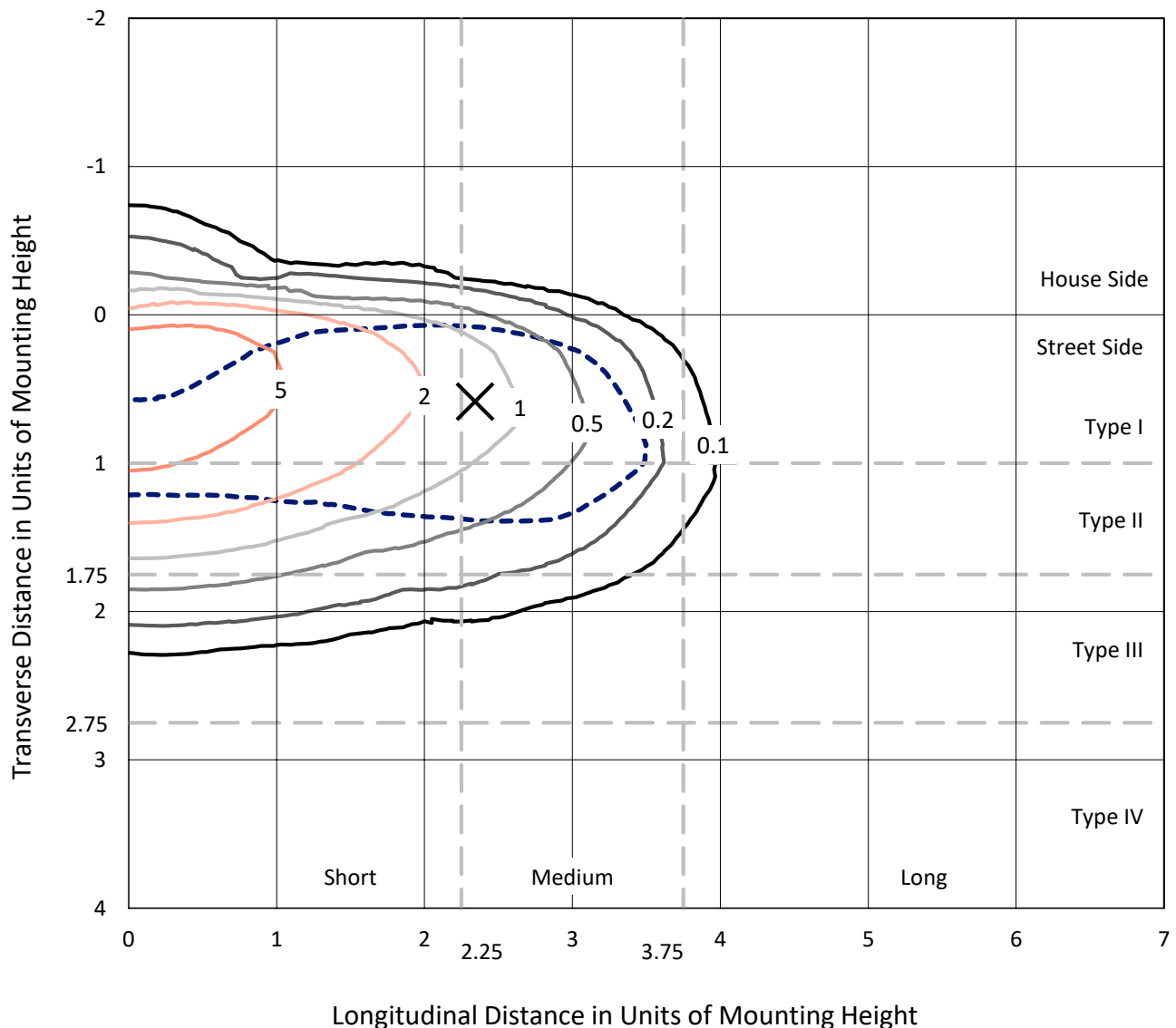
Input Watts (W): 34  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

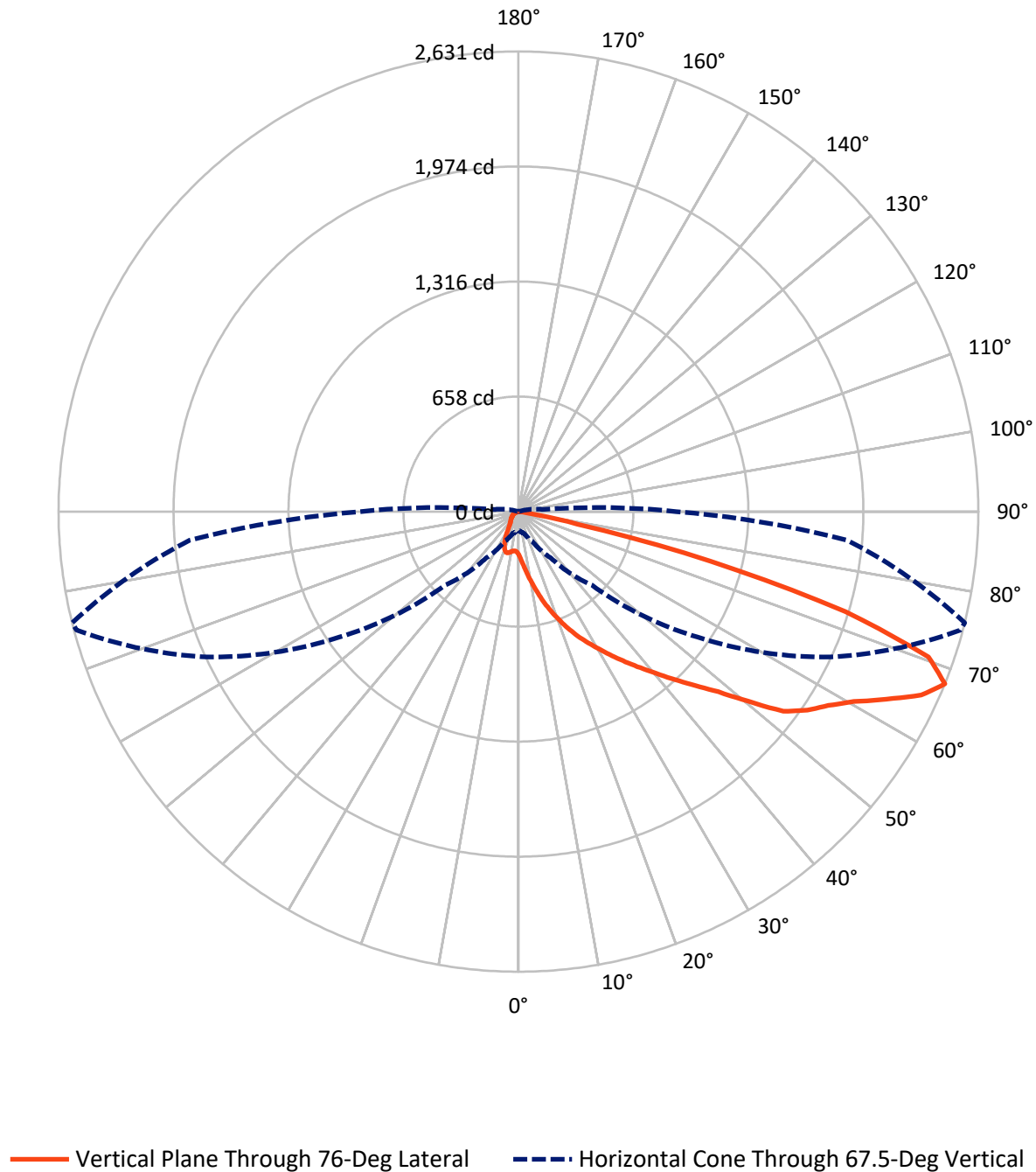
✕ Max cd  
 - - - 1/2 Max cd



Based on 10 foot mounting height. Maximum calculated value = 8.6 fc  
 Type II - 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    | 143.8    | 0.0    | 143.8  |
|                    | % Fixture | 5.0      | 0.0    | 5.0    |
| <b>Street Side</b> | Lumens    | 2752.2   | 0.0    | 2752.2 |
|                    | % Fixture | 95.0     | 0.0    | 95.0   |
| <b>Total</b>       | Lumens    | 2896.0   | 0.0    | 2896.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 30.5   | 1.1       |
| 10°-20°   | 121.1  | 4.2       |
| 20°-30°   | 246.4  | 8.5       |
| 30°-40°   | 427.7  | 14.8      |
| 40°-50°   | 604.2  | 20.9      |
| 50°-60°   | 685.2  | 23.7      |
| 60°-70°   | 568.3  | 19.6      |
| 70°-80°   | 205.9  | 7.1       |
| 80°-90°   | 6.7    | 0.2       |
| 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°    | 2896.0 | 100.0     |
| 0°-180°   | 2896.0 | 100.0     |

**Coefficient of Utilization**



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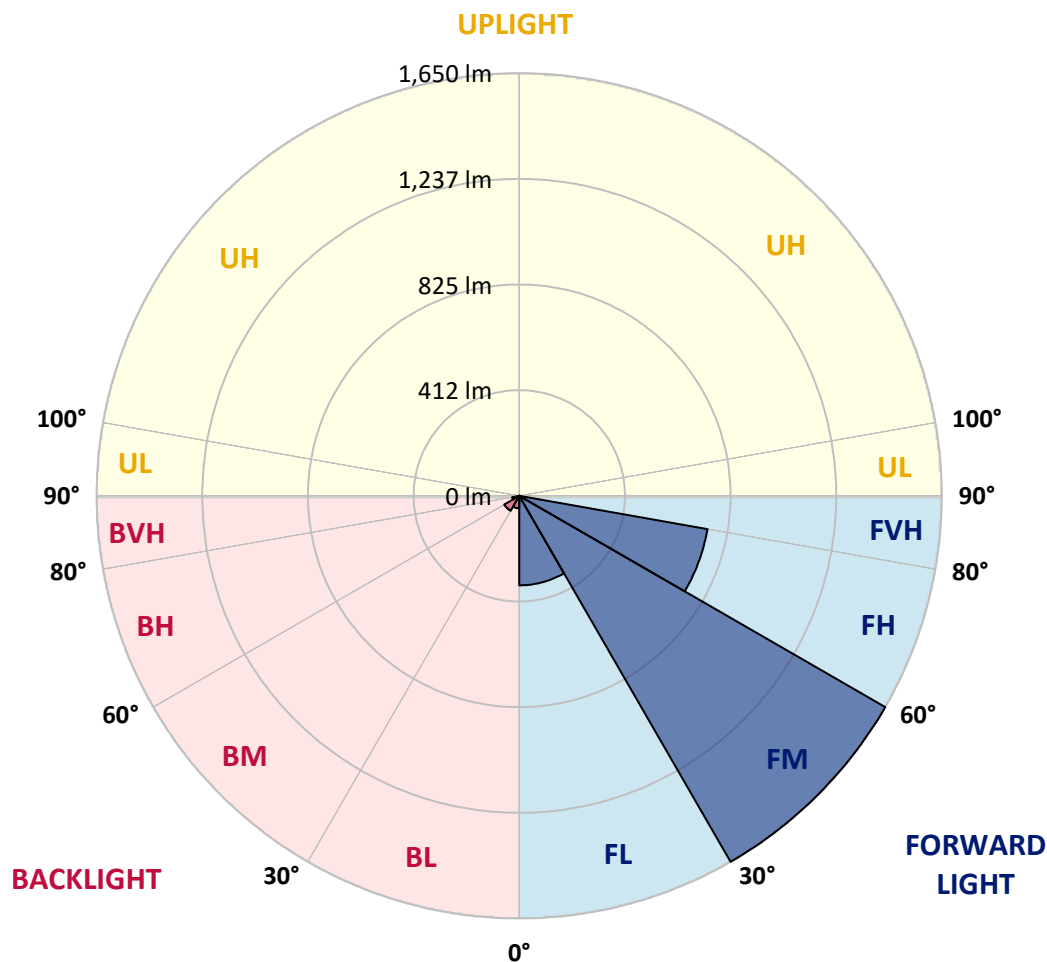
CATALOG NUMBER: GLEON-SA1A-722-U-T2R-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 349.5  | 12.1      |                         |      |         |
| FM   | (30°-60°)   | 1649.8 | 57.0      |                         |      |         |
| FH   | (60°-80°)   | 746.4  | 25.8      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 6.5    | 0.2       |                         |      | G0/10   |
| BL   | (0°-30°)    | 48.5   | 1.7       | B0/110                  |      |         |
| BM   | (30°-60°)   | 67.3   | 2.3       | B0/220                  |      |         |
| BH   | (60°-80°)   | 27.8   | 1.0       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 0.2    | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B0-U0-G1**

Type II Medium



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 76°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 245.7  | 245.7  | 245.7  | 245.7  | 245.7  | 245.7  | 245.7  | 245.7  | 245.7  | 245.7  | 245.7  |
| 2.5°  | 366.7  | 358.5  | 360.4  | 355.0  | 345.4  | 325.6  | 308.7  | 292.7  | 274.1  | 273.5  | 258.1  |
| 5°    | 494.5  | 487.5  | 486.6  | 475.8  | 458.3  | 424.7  | 392.0  | 354.7  | 313.0  | 310.0  | 277.4  |
| 7.5°  | 610.5  | 604.9  | 602.9  | 590.1  | 557.4  | 524.7  | 482.1  | 427.2  | 362.2  | 356.6  | 303.4  |
| 10°   | 699.6  | 696.9  | 697.4  | 688.3  | 660.4  | 629.9  | 573.9  | 504.0  | 417.9  | 409.2  | 334.6  |
| 12.5° | 767.1  | 767.7  | 772.3  | 766.7  | 751.1  | 728.5  | 668.7  | 585.9  | 479.5  | 467.7  | 370.3  |
| 15°   | 816.7  | 819.9  | 828.2  | 835.2  | 834.1  | 814.5  | 759.7  | 669.0  | 545.0  | 531.9  | 410.0  |
| 17.5° | 848.8  | 852.3  | 864.5  | 880.0  | 894.2  | 889.6  | 847.5  | 749.2  | 611.2  | 596.1  | 452.5  |
| 20°   | 877.0  | 881.1  | 894.2  | 914.6  | 941.2  | 946.9  | 919.2  | 827.0  | 677.4  | 659.0  | 496.4  |
| 22.5° | 938.0  | 937.9  | 945.9  | 957.8  | 983.0  | 997.8  | 980.2  | 899.2  | 742.7  | 723.5  | 541.2  |
| 25°   | 1048.4 | 1044.2 | 1041.4 | 1032.0 | 1037.6 | 1046.7 | 1037.0 | 966.7  | 808.4  | 789.0  | 586.6  |
| 27.5° | 1179.6 | 1182.1 | 1159.5 | 1134.3 | 1114.8 | 1105.4 | 1089.4 | 1029.2 | 871.6  | 850.3  | 631.0  |
| 30°   | 1318.0 | 1318.8 | 1292.2 | 1259.9 | 1216.9 | 1181.2 | 1153.6 | 1089.0 | 936.6  | 913.4  | 674.2  |
| 32.5° | 1442.9 | 1438.0 | 1411.6 | 1367.7 | 1313.3 | 1273.2 | 1215.8 | 1155.7 | 1005.4 | 982.9  | 722.1  |
| 35°   | 1541.9 | 1536.0 | 1503.9 | 1464.0 | 1407.6 | 1367.3 | 1298.1 | 1222.4 | 1077.7 | 1055.7 | 770.2  |
| 37.5° | 1614.2 | 1607.4 | 1574.4 | 1533.2 | 1484.6 | 1461.2 | 1393.7 | 1294.8 | 1156.6 | 1133.0 | 820.9  |
| 40°   | 1639.3 | 1633.4 | 1612.7 | 1582.6 | 1543.5 | 1538.2 | 1495.1 | 1378.2 | 1242.5 | 1217.4 | 878.2  |
| 42.5° | 1624.4 | 1618.5 | 1611.2 | 1601.0 | 1584.8 | 1589.8 | 1590.7 | 1473.2 | 1338.0 | 1313.2 | 941.5  |
| 45°   | 1565.0 | 1559.8 | 1567.4 | 1582.2 | 1602.4 | 1627.5 | 1678.0 | 1575.4 | 1444.5 | 1418.2 | 1014.8 |
| 47.5° | 1477.5 | 1473.7 | 1494.8 | 1531.9 | 1590.9 | 1660.1 | 1757.8 | 1682.7 | 1564.2 | 1539.7 | 1106.1 |
| 50°   | 1353.2 | 1352.6 | 1394.7 | 1462.3 | 1553.0 | 1675.9 | 1840.3 | 1804.8 | 1730.4 | 1704.7 | 1233.1 |
| 52.5° | 1159.5 | 1160.8 | 1243.7 | 1351.9 | 1486.7 | 1665.2 | 1893.4 | 1961.6 | 1923.8 | 1897.0 | 1343.2 |
| 55°   | 975.2  | 982.8  | 1041.5 | 1197.6 | 1384.9 | 1625.6 | 1911.6 | 2034.9 | 2030.5 | 2005.2 | 1404.3 |
| 57.5° | 794.6  | 808.4  | 865.0  | 1010.8 | 1236.3 | 1534.4 | 1901.6 | 2066.6 | 2110.0 | 2090.6 | 1485.0 |
| 60°   | 598.9  | 605.3  | 670.5  | 806.8  | 1045.6 | 1367.9 | 1828.9 | 2083.8 | 2218.6 | 2205.1 | 1602.1 |
| 62.5° | 381.1  | 396.9  | 454.8  | 586.2  | 814.1  | 1136.7 | 1706.3 | 2083.6 | 2354.5 | 2361.9 | 1753.3 |
| 65°   | 200.7  | 219.3  | 250.0  | 363.3  | 559.5  | 878.5  | 1522.0 | 2064.0 | 2521.2 | 2531.5 | 1871.4 |
| 67.5° | 108.2  | 113.6  | 129.8  | 188.6  | 324.5  | 595.1  | 1251.0 | 1967.6 | 2617.8 | 2631.4 | 1887.9 |
| 70°   | 79.2   | 82.1   | 88.2   | 104.3  | 163.3  | 345.7  | 912.9  | 1749.0 | 2493.3 | 2488.2 | 1677.4 |
| 72.5° | 60.8   | 65.3   | 69.9   | 76.4   | 93.9   | 184.5  | 568.4  | 1369.6 | 1989.4 | 1955.9 | 1253.8 |
| 75°   | 48.0   | 48.7   | 55.2   | 61.0   | 70.4   | 105.1  | 252.4  | 797.6  | 1214.2 | 1134.9 | 650.2  |
| 77.5° | 38.3   | 38.8   | 42.6   | 47.7   | 56.6   | 69.0   | 78.2   | 313.8  | 387.7  | 345.9  | 141.1  |
| 80°   | 22.7   | 24.0   | 31.7   | 36.8   | 47.0   | 43.5   | 28.6   | 68.1   | 60.5   | 54.8   | 23.7   |
| 82.5° | 12.7   | 13.7   | 17.9   | 29.1   | 32.7   | 20.8   | 14.2   | 18.4   | 14.2   | 13.8   | 6.7    |
| 85°   | 0.0    | 0.6    | 11.5   | 18.0   | 13.3   | 4.6    | 6.0    | 6.1    | 4.2    | 3.9    | 2.7    |
| 87.5° | 0.0    | 0.0    | 3.6    | 3.4    | 0.5    | 0.8    | 1.4    | 2.0    | 1.6    | 1.6    | 1.4    |
| 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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**CANDELA DISTRIBUTION (continued):**

|       | 90°   | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 245.7 | 245.7 | 245.7 | 245.7 | 245.7 | 245.7 | 245.7 | 245.7 | 245.7 | 245.7 | 245.7 |
| 2.5°  | 250.5 | 243.6 | 230.7 | 218.0 | 207.3 | 198.6 | 190.7 | 187.5 | 185.0 | 184.6 | 182.6 |
| 5°    | 261.7 | 247.8 | 223.1 | 202.8 | 189.2 | 179.6 | 171.3 | 166.2 | 162.3 | 160.8 | 159.4 |
| 7.5°  | 278.5 | 257.6 | 222.1 | 198.7 | 182.5 | 166.2 | 151.0 | 134.5 | 124.2 | 120.3 | 118.0 |
| 10°   | 299.1 | 270.5 | 225.9 | 197.6 | 169.1 | 134.9 | 109.6 | 88.7  | 80.2  | 77.4  | 76.6  |
| 12.5° | 323.1 | 286.7 | 232.5 | 190.5 | 140.7 | 95.8  | 75.6  | 68.5  | 66.6  | 65.7  | 65.7  |
| 15°   | 350.6 | 304.3 | 237.2 | 169.9 | 104.1 | 72.5  | 65.5  | 62.2  | 60.1  | 59.0  | 59.1  |
| 17.5° | 378.8 | 321.5 | 234.9 | 140.1 | 76.8  | 64.5  | 59.3  | 55.7  | 52.9  | 51.8  | 51.5  |
| 20°   | 407.2 | 337.5 | 222.2 | 104.3 | 65.0  | 58.5  | 52.7  | 48.7  | 45.9  | 44.8  | 44.5  |
| 22.5° | 436.6 | 351.1 | 199.9 | 76.5  | 58.4  | 51.9  | 46.2  | 42.3  | 39.6  | 38.6  | 38.1  |
| 25°   | 465.3 | 362.2 | 168.6 | 61.9  | 52.2  | 45.7  | 40.2  | 36.5  | 34.1  | 33.1  | 33.0  |
| 27.5° | 492.1 | 369.1 | 132.5 | 54.7  | 46.7  | 40.1  | 35.1  | 31.9  | 29.8  | 29.1  | 28.9  |
| 30°   | 516.2 | 369.8 | 98.0  | 49.4  | 41.9  | 35.3  | 30.7  | 27.8  | 26.0  | 25.3  | 25.0  |
| 32.5° | 540.6 | 364.4 | 71.3  | 44.5  | 37.4  | 31.1  | 26.6  | 24.4  | 23.1  | 22.5  | 22.5  |
| 35°   | 563.5 | 352.1 | 55.6  | 40.4  | 33.1  | 27.0  | 23.5  | 21.8  | 21.1  | 20.4  | 20.4  |
| 37.5° | 586.0 | 334.5 | 47.2  | 36.7  | 29.1  | 23.6  | 20.7  | 19.7  | 19.0  | 18.4  | 18.4  |
| 40°   | 608.8 | 312.3 | 42.9  | 33.2  | 25.8  | 20.9  | 18.4  | 17.5  | 16.9  | 16.4  | 16.2  |
| 42.5° | 636.9 | 286.7 | 40.1  | 30.1  | 22.8  | 18.5  | 16.2  | 15.2  | 14.7  | 14.2  | 14.0  |
| 45°   | 669.4 | 264.6 | 37.8  | 26.9  | 20.4  | 16.5  | 14.1  | 13.1  | 12.3  | 11.7  | 11.5  |
| 47.5° | 716.2 | 248.6 | 34.8  | 23.5  | 18.1  | 14.3  | 12.2  | 11.0  | 9.9   | 9.3   | 9.1   |
| 50°   | 776.0 | 235.4 | 30.8  | 20.4  | 15.9  | 12.2  | 10.2  | 8.8   | 7.7   | 7.1   | 7.1   |
| 52.5° | 805.6 | 218.1 | 27.3  | 17.8  | 13.3  | 10.3  | 8.2   | 6.6   | 6.1   | 5.5   | 5.5   |
| 55°   | 817.6 | 204.9 | 23.7  | 15.1  | 11.0  | 8.5   | 6.5   | 5.1   | 4.7   | 4.3   | 4.2   |
| 57.5° | 851.1 | 201.1 | 20.7  | 12.8  | 9.1   | 6.7   | 4.9   | 3.8   | 3.6   | 3.0   | 3.0   |
| 60°   | 905.0 | 203.0 | 17.9  | 10.9  | 7.4   | 5.2   | 3.7   | 2.9   | 2.7   | 2.2   | 2.2   |
| 62.5° | 963.2 | 200.6 | 15.1  | 9.4   | 5.7   | 3.8   | 2.5   | 2.2   | 2.2   | 1.3   | 1.1   |
| 65°   | 974.4 | 178.7 | 12.9  | 7.7   | 4.4   | 2.8   | 1.6   | 1.4   | 1.9   | 0.3   | 0.0   |
| 67.5° | 904.4 | 138.6 | 11.2  | 6.0   | 3.3   | 2.2   | 1.3   | 0.6   | 1.6   | 0.0   | 0.0   |
| 70°   | 723.2 | 88.1  | 9.0   | 4.3   | 2.5   | 1.8   | 1.0   | 0.3   | 1.3   | 0.0   | 0.0   |
| 72.5° | 511.4 | 51.1  | 7.1   | 3.0   | 2.2   | 1.4   | 0.8   | 0.0   | 0.8   | 0.0   | 0.0   |
| 75°   | 258.6 | 27.3  | 4.4   | 2.3   | 1.6   | 1.0   | 0.5   | 0.0   | 0.1   | 0.0   | 0.0   |
| 77.5° | 56.0  | 12.7  | 2.8   | 1.6   | 1.1   | 0.6   | 0.3   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80°   | 12.2  | 5.6   | 1.8   | 1.0   | 0.6   | 0.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 4.4   | 2.9   | 0.9   | 0.5   | 0.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 2.4   | 1.5   | 0.5   | 0.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 1.3   | 0.5   | 0.1   | 0.1   | 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

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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**



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| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 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)