

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: P319246

Luminaire Tested: **GLEON-SA2C-722-U-T4W**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P319246  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-18)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA2C-722-U-T4W  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(2) 70 CRI, 2200K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV WIDE OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 10564 lumens  
Efficiency: N/A  
Efficacy: 93.5 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B2 - U0 - G2

Input Watts (W): 113  
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

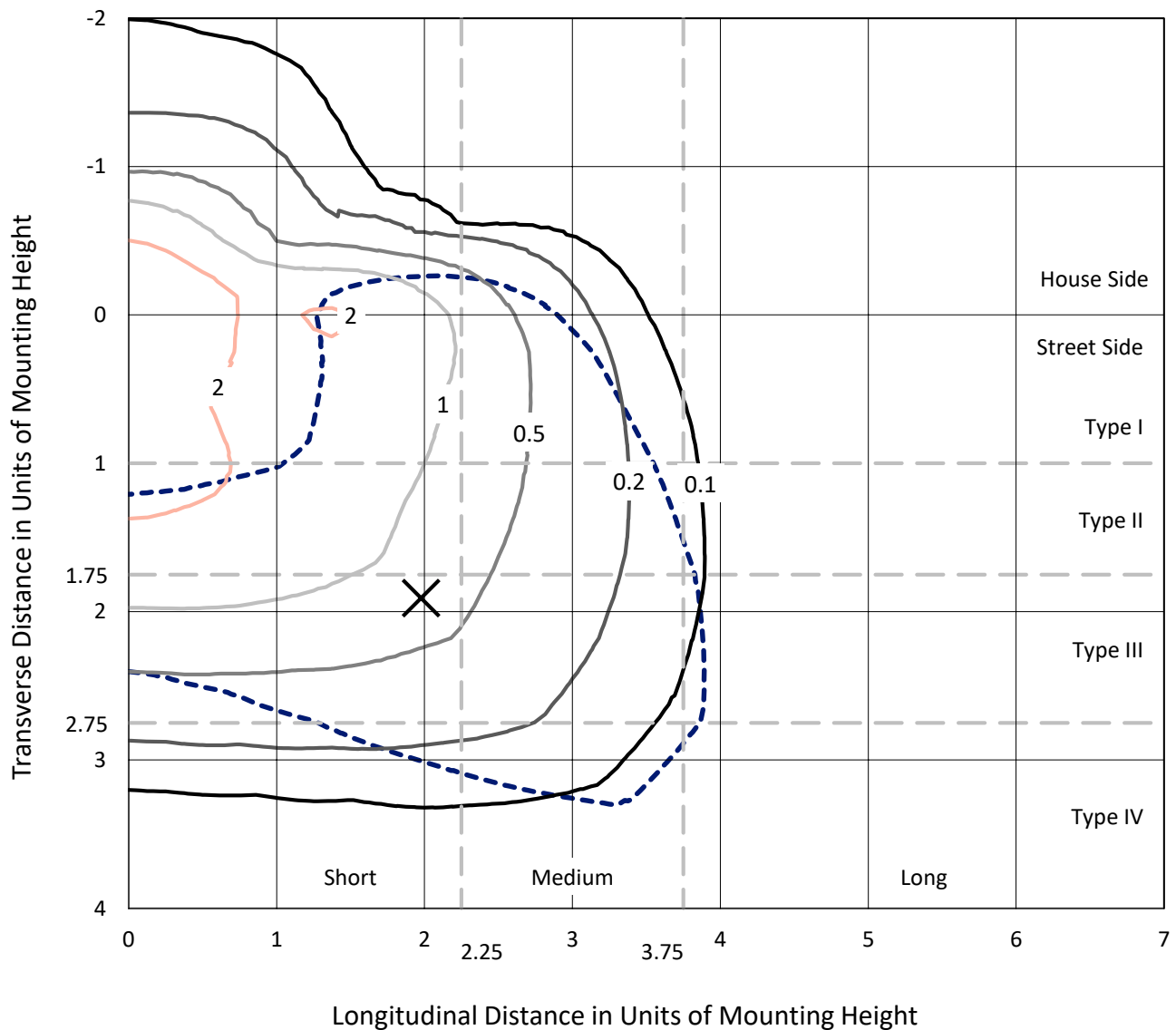


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## Iso-Footcandle Lines of Horizontal Illumination

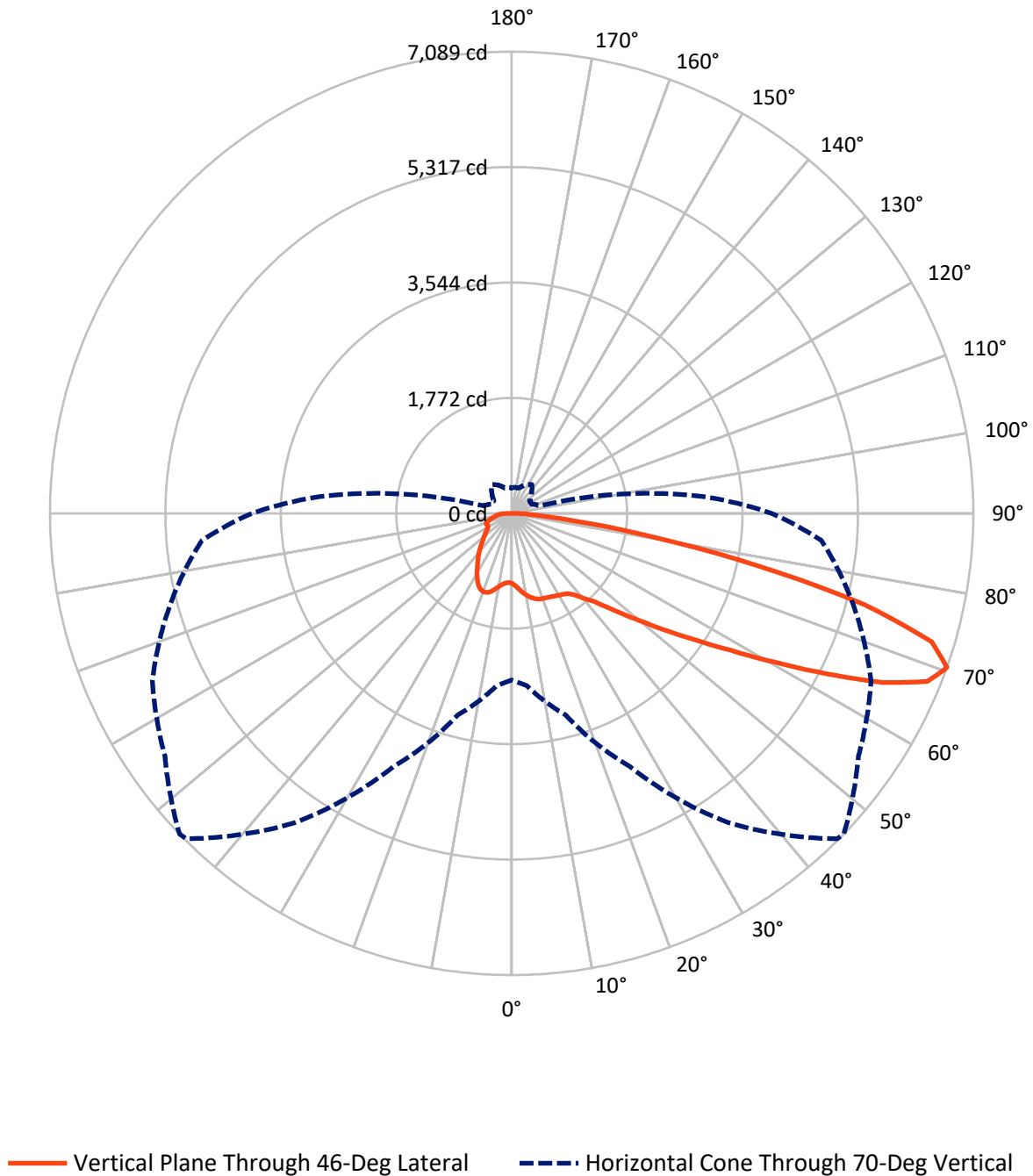
✕ Max cd  
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 3.4 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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CATALOG NUMBER: GLEON-SA2C-722-U-T4W

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2421.2   | 0.0    | 2421.2  |
|                    | % Fixture | 22.9     | 0.0    | 22.9    |
| <b>Street Side</b> | Lumens    | 8142.8   | 0.0    | 8142.8  |
|                    | % Fixture | 77.1     | 0.0    | 77.1    |
| <b>Total</b>       | Lumens    | 10564.0  | 0.0    | 10564.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 109.7   | 1.0       |
| 10°-20°   | 365.5   | 3.5       |
| 20°-30°   | 609.5   | 5.8       |
| 30°-40°   | 864.9   | 8.2       |
| 40°-50°   | 1272.3  | 12.0      |
| 50°-60°   | 2154.6  | 20.4      |
| 60°-70°   | 3058.4  | 29.0      |
| 70°-80°   | 1858.0  | 17.6      |
| 80°-90°   | 271.2   | 2.6       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 10564.0 | 100.0     |
| 0°-180°   | 10564.0 | 100.0     |

**Coefficient of Utilization**



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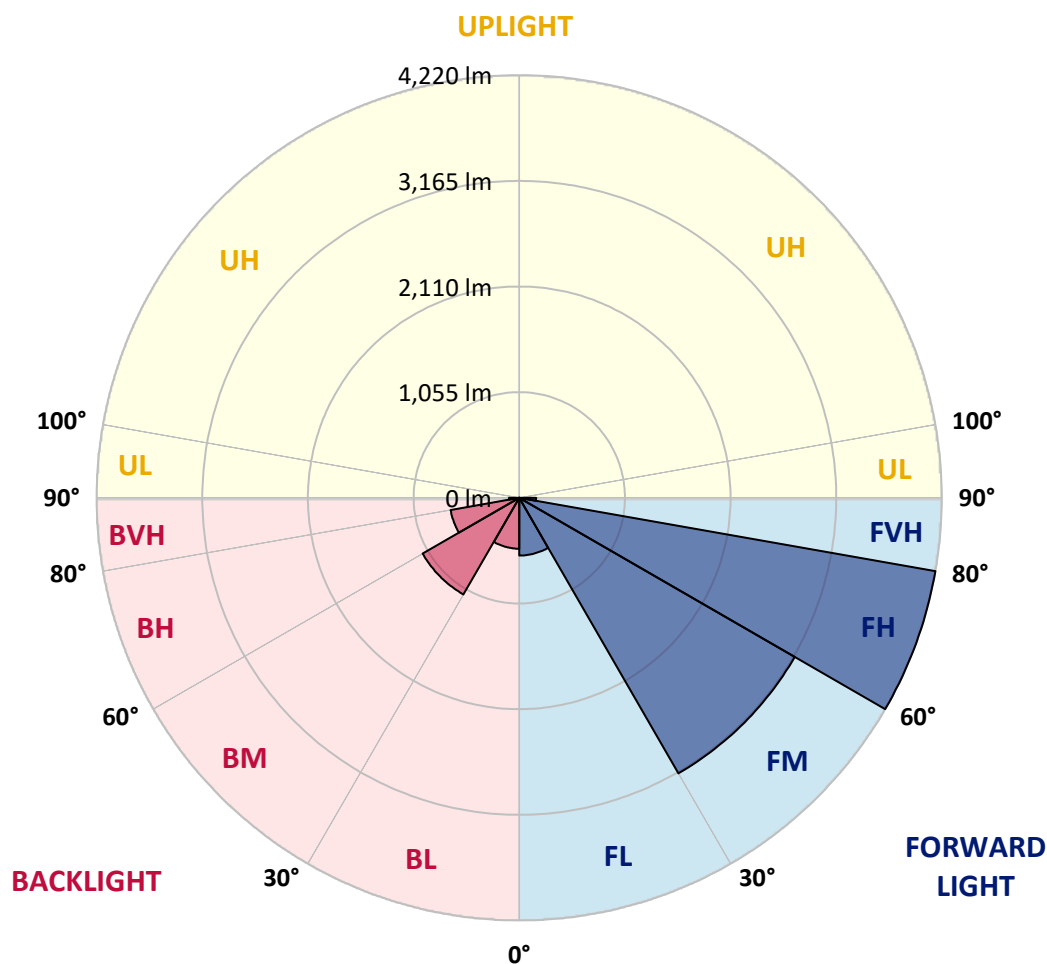
CATALOG NUMBER: GLEON-SA2C-722-U-T4W

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 576.4  | 5.5       |                         |      |         |
| FM   | (30°-60°)   | 3177.2 | 30.1      |                         |      |         |
| FH   | (60°-80°)   | 4220.3 | 39.9      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 168.9  | 1.6       |                         |      | G2/225  |
| BL   | (0°-30°)    | 508.3  | 4.8       | B2/1000                 |      |         |
| BM   | (30°-60°)   | 1114.6 | 10.6      | B2/2500                 |      |         |
| BH   | (60°-80°)   | 696.1  | 6.6       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 102.2  | 1.0       |                         |      | G2/225  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

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

Type IV Short



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CATALOG NUMBER: GLEON-SA2C-722-U-T4W

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 46°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1076.3 | 1076.3 | 1076.3 | 1076.3 | 1076.3 | 1076.3 | 1076.3 | 1076.3 | 1076.3 | 1076.3 | 1076.3 |
| 2.5°  | 1130.1 | 1130.9 | 1132.3 | 1128.7 | 1118.6 | 1115.7 | 1114.6 | 1104.1 | 1097.2 | 1087.1 | 1078.4 |
| 5°    | 1220.5 | 1221.2 | 1219.1 | 1208.9 | 1186.5 | 1169.9 | 1168.5 | 1144.6 | 1122.9 | 1099.8 | 1082.4 |
| 7.5°  | 1314.9 | 1316.0 | 1309.1 | 1289.9 | 1258.5 | 1229.6 | 1227.7 | 1195.2 | 1162.3 | 1127.2 | 1101.2 |
| 10°   | 1398.4 | 1394.0 | 1382.8 | 1356.1 | 1318.8 | 1283.4 | 1282.0 | 1248.0 | 1210.0 | 1167.7 | 1133.0 |
| 12.5° | 1454.1 | 1450.4 | 1436.0 | 1403.4 | 1362.6 | 1330.1 | 1327.2 | 1295.7 | 1258.8 | 1212.6 | 1171.0 |
| 15°   | 1484.8 | 1487.3 | 1467.8 | 1430.9 | 1391.2 | 1363.7 | 1361.1 | 1338.7 | 1305.8 | 1259.2 | 1211.5 |
| 17.5° | 1488.8 | 1490.9 | 1472.1 | 1435.6 | 1403.1 | 1384.3 | 1383.2 | 1368.4 | 1344.5 | 1299.7 | 1249.8 |
| 20°   | 1465.6 | 1467.1 | 1451.5 | 1421.5 | 1400.2 | 1394.4 | 1394.0 | 1387.5 | 1369.8 | 1330.1 | 1281.6 |
| 22.5° | 1432.0 | 1433.1 | 1421.9 | 1400.2 | 1393.0 | 1402.0 | 1404.5 | 1402.0 | 1389.3 | 1352.1 | 1306.6 |
| 25°   | 1423.7 | 1423.0 | 1411.4 | 1389.3 | 1395.5 | 1414.7 | 1417.9 | 1419.0 | 1410.3 | 1377.8 | 1338.4 |
| 27.5° | 1463.8 | 1461.3 | 1439.2 | 1403.8 | 1407.8 | 1430.9 | 1435.3 | 1445.7 | 1440.3 | 1411.8 | 1374.5 |
| 30°   | 1579.9 | 1575.5 | 1530.3 | 1458.8 | 1439.2 | 1451.2 | 1456.6 | 1473.2 | 1474.3 | 1450.4 | 1422.6 |
| 32.5° | 1775.8 | 1770.4 | 1689.4 | 1561.4 | 1492.4 | 1471.8 | 1476.8 | 1501.8 | 1515.2 | 1496.7 | 1466.7 |
| 35°   | 2023.5 | 2017.3 | 1911.0 | 1736.1 | 1581.3 | 1511.2 | 1514.8 | 1534.7 | 1561.4 | 1535.4 | 1495.6 |
| 37.5° | 2281.6 | 2266.8 | 2164.5 | 1941.4 | 1722.7 | 1595.4 | 1595.4 | 1597.9 | 1610.6 | 1556.4 | 1529.6 |
| 40°   | 2538.3 | 2523.5 | 2430.9 | 2182.9 | 1905.6 | 1728.1 | 1719.8 | 1663.7 | 1653.6 | 1607.0 | 1597.9 |
| 42.5° | 2776.9 | 2772.5 | 2718.0 | 2455.9 | 2120.4 | 1858.6 | 1847.0 | 1752.0 | 1754.1 | 1725.2 | 1725.6 |
| 45°   | 3030.7 | 3030.7 | 2986.2 | 2731.3 | 2370.5 | 2068.3 | 2056.7 | 1916.8 | 1938.5 | 1925.1 | 1957.3 |
| 47.5° | 3237.8 | 3244.3 | 3238.2 | 3018.4 | 2661.6 | 2334.7 | 2313.8 | 2145.3 | 2206.0 | 2251.9 | 2345.6 |
| 50°   | 3449.3 | 3459.4 | 3460.5 | 3333.3 | 3013.3 | 2651.4 | 2627.6 | 2448.6 | 2584.2 | 2715.8 | 2899.8 |
| 52.5° | 3756.3 | 3779.0 | 3688.3 | 3647.4 | 3444.3 | 3027.4 | 3003.9 | 2838.7 | 3065.0 | 3249.8 | 3566.8 |
| 55°   | 4040.8 | 4020.9 | 3956.2 | 3981.5 | 3905.6 | 3455.5 | 3437.8 | 3292.8 | 3600.8 | 3840.9 | 4252.6 |
| 57.5° | 4194.8 | 4193.3 | 4258.4 | 4366.9 | 4403.0 | 3983.3 | 3968.5 | 3827.5 | 4204.9 | 4385.3 | 4896.5 |
| 60°   | 4375.6 | 4378.1 | 4539.3 | 4785.5 | 4934.5 | 4640.6 | 4634.0 | 4527.0 | 4791.7 | 4893.6 | 5401.6 |
| 62.5° | 4400.9 | 4446.4 | 4724.1 | 5147.8 | 5431.9 | 5408.4 | 5422.9 | 5157.2 | 5316.6 | 5299.3 | 5778.6 |
| 65°   | 4109.8 | 4169.8 | 4672.4 | 5257.3 | 5926.5 | 6248.3 | 6261.6 | 5790.9 | 5730.6 | 5646.0 | 5913.5 |
| 67.5° | 3513.3 | 3602.3 | 4148.2 | 5019.1 | 6089.6 | 6869.0 | 6887.8 | 6282.2 | 6074.0 | 5763.5 | 5588.8 |
| 70°   | 2556.7 | 2655.4 | 3204.9 | 4286.6 | 5798.9 | 7067.5 | 7088.8 | 6499.5 | 6087.0 | 5429.0 | 4771.1 |
| 72.5° | 1544.4 | 1621.8 | 2074.8 | 3155.8 | 4894.3 | 6706.0 | 6743.9 | 6224.0 | 5557.4 | 4598.6 | 3523.1 |
| 75°   | 678.2  | 728.8  | 1003.2 | 1818.5 | 3503.9 | 5548.3 | 5595.7 | 5327.5 | 4515.5 | 3342.0 | 2082.4 |
| 77.5° | 288.9  | 303.3  | 411.4  | 789.9  | 1980.8 | 3791.3 | 3856.4 | 3892.6 | 3063.6 | 1818.5 | 880.0  |
| 80°   | 180.0  | 185.8  | 232.8  | 357.5  | 927.0  | 2129.4 | 2199.5 | 2290.3 | 1521.3 | 668.5  | 307.3  |
| 82.5° | 109.5  | 116.1  | 154.7  | 216.2  | 482.6  | 965.3  | 998.9  | 1062.9 | 590.4  | 288.9  | 159.1  |
| 85°   | 65.8   | 70.5   | 94.7   | 136.7  | 274.8  | 379.6  | 379.2  | 419.4  | 278.0  | 185.8  | 83.9   |
| 87.5° | 31.5   | 35.1   | 50.6   | 70.9   | 138.5  | 142.4  | 133.4  | 151.1  | 168.8  | 121.8  | 42.3   |
| 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°    | 1076.3 | 1076.3 | 1076.3 | 1076.3 | 1076.3 | 1076.3 | 1076.3 | 1076.3 | 1076.3 | 1076.3 | 1076.3 |
| 2.5°  | 1075.5 | 1074.1 | 1069.4 | 1065.8 | 1065.1 | 1062.9 | 1061.1 | 1062.2 | 1063.6 | 1064.0 | 1064.0 |
| 5°    | 1075.2 | 1071.2 | 1065.1 | 1062.5 | 1065.8 | 1070.1 | 1075.5 | 1082.8 | 1087.1 | 1090.4 | 1092.5 |
| 7.5°  | 1092.5 | 1084.9 | 1078.1 | 1076.6 | 1083.1 | 1094.7 | 1107.0 | 1122.2 | 1132.7 | 1139.9 | 1141.3 |
| 10°   | 1121.5 | 1112.1 | 1105.2 | 1106.6 | 1118.2 | 1134.8 | 1152.2 | 1171.7 | 1187.6 | 1197.4 | 1198.1 |
| 12.5° | 1154.7 | 1145.7 | 1139.2 | 1145.3 | 1164.5 | 1184.7 | 1202.8 | 1219.8 | 1234.3 | 1244.0 | 1244.0 |
| 15°   | 1193.0 | 1186.5 | 1178.9 | 1193.0 | 1219.1 | 1237.1 | 1244.7 | 1253.1 | 1261.0 | 1268.2 | 1266.8 |
| 17.5° | 1229.9 | 1223.8 | 1219.8 | 1236.4 | 1263.5 | 1271.9 | 1266.8 | 1260.6 | 1260.6 | 1264.6 | 1265.3 |
| 20°   | 1261.7 | 1256.3 | 1258.8 | 1275.1 | 1289.2 | 1280.5 | 1261.7 | 1242.2 | 1234.3 | 1236.4 | 1238.6 |
| 22.5° | 1289.6 | 1287.0 | 1294.6 | 1302.2 | 1292.1 | 1261.7 | 1227.0 | 1200.6 | 1190.9 | 1190.1 | 1190.9 |
| 25°   | 1322.1 | 1321.7 | 1331.1 | 1317.4 | 1272.6 | 1216.5 | 1169.9 | 1144.2 | 1138.8 | 1143.1 | 1150.4 |
| 27.5° | 1362.6 | 1366.6 | 1371.3 | 1321.0 | 1232.8 | 1148.2 | 1100.8 | 1083.1 | 1088.6 | 1099.0 | 1105.9 |
| 30°   | 1414.3 | 1425.1 | 1415.0 | 1312.0 | 1175.7 | 1070.1 | 1024.9 | 1019.9 | 1034.7 | 1049.5 | 1056.7 |
| 32.5° | 1464.5 | 1481.5 | 1457.0 | 1288.5 | 1101.9 | 987.3  | 952.3  | 950.8  | 968.9  | 983.4  | 993.5  |
| 35°   | 1505.0 | 1538.7 | 1488.4 | 1241.8 | 1016.6 | 911.0  | 885.4  | 875.6  | 882.1  | 899.1  | 910.7  |
| 37.5° | 1557.8 | 1613.9 | 1510.1 | 1170.6 | 924.1  | 848.1  | 818.1  | 795.7  | 789.9  | 796.8  | 802.6  |
| 40°   | 1654.3 | 1728.5 | 1520.2 | 1071.2 | 833.7  | 785.2  | 754.9  | 722.0  | 699.2  | 682.6  | 682.9  |
| 42.5° | 1812.0 | 1877.8 | 1513.7 | 950.5  | 750.2  | 723.8  | 689.4  | 651.5  | 614.6  | 577.0  | 574.1  |
| 45°   | 2067.9 | 2099.7 | 1494.2 | 822.5  | 676.8  | 659.4  | 627.2  | 589.3  | 540.1  | 497.5  | 493.5  |
| 47.5° | 2477.5 | 2407.0 | 1463.8 | 710.8  | 612.1  | 604.8  | 575.2  | 531.4  | 479.4  | 445.0  | 442.1  |
| 50°   | 3036.1 | 2850.6 | 1449.0 | 621.8  | 554.9  | 557.1  | 532.9  | 486.6  | 437.4  | 412.1  | 409.2  |
| 52.5° | 3704.2 | 3367.3 | 1477.6 | 553.1  | 509.0  | 516.6  | 498.5  | 455.2  | 413.9  | 394.1  | 391.2  |
| 55°   | 4397.2 | 3902.3 | 1508.3 | 503.2  | 465.6  | 480.5  | 474.3  | 438.5  | 401.3  | 382.9  | 380.3  |
| 57.5° | 4990.5 | 4301.8 | 1446.8 | 462.8  | 427.0  | 450.1  | 455.5  | 428.0  | 394.8  | 378.2  | 375.3  |
| 60°   | 5364.0 | 4462.7 | 1285.6 | 424.8  | 396.2  | 425.9  | 444.7  | 425.2  | 397.3  | 395.9  | 393.7  |
| 62.5° | 5541.1 | 4448.6 | 1043.7 | 394.8  | 377.1  | 415.4  | 452.6  | 441.4  | 426.2  | 439.3  | 440.3  |
| 65°   | 5461.6 | 4236.0 | 777.3  | 374.9  | 363.3  | 419.4  | 476.5  | 472.2  | 434.6  | 447.6  | 449.4  |
| 67.5° | 4938.1 | 3728.8 | 575.6  | 357.5  | 348.2  | 430.6  | 519.9  | 482.3  | 418.3  | 427.7  | 421.9  |
| 70°   | 3991.3 | 2956.2 | 444.0  | 338.0  | 332.6  | 429.1  | 539.4  | 476.1  | 400.6  | 402.7  | 387.2  |
| 72.5° | 2752.3 | 2015.9 | 361.2  | 320.0  | 310.2  | 391.2  | 525.7  | 460.9  | 385.7  | 369.1  | 348.5  |
| 75°   | 1496.7 | 1082.0 | 306.9  | 301.2  | 270.8  | 343.5  | 500.4  | 450.1  | 372.4  | 350.3  | 338.8  |
| 77.5° | 588.9  | 449.0  | 266.4  | 275.5  | 236.8  | 303.3  | 472.2  | 429.5  | 353.9  | 325.0  | 319.2  |
| 80°   | 240.4  | 229.2  | 220.9  | 238.2  | 203.5  | 265.4  | 438.2  | 405.3  | 331.9  | 301.5  | 289.9  |
| 82.5° | 136.3  | 142.4  | 171.7  | 188.0  | 165.2  | 244.4  | 421.9  | 385.7  | 305.5  | 270.1  | 256.3  |
| 85°   | 69.8   | 83.5   | 119.7  | 134.8  | 121.5  | 207.9  | 388.6  | 337.7  | 245.1  | 206.8  | 207.9  |
| 87.5° | 33.6   | 46.6   | 75.6   | 84.6   | 78.8   | 150.4  | 290.3  | 244.8  | 190.9  | 151.1  | 146.4  |
| 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)