

Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

Brand: McGRAW-EDISON

Report Number: P632092

Luminaire Tested: GWS-SA2C-722-U-SL2-W

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P632092  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-27)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA2C-722-U-SL2-W  
Description: GALLEON WALL SLIM LUMINAIRE. (2) LIGHTSQUARES WITH 16 LEDS EACH AND  
TYPE II SPILL LIGHT ELIMINATOR OPTICS  
Light Source: (32) 2200K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 6699.4 lumens  
Efficiency: N/A  
Efficacy: 106.0 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 0.5' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B1 - U0 - G2

Input Watts (W): 63.2  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 0  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



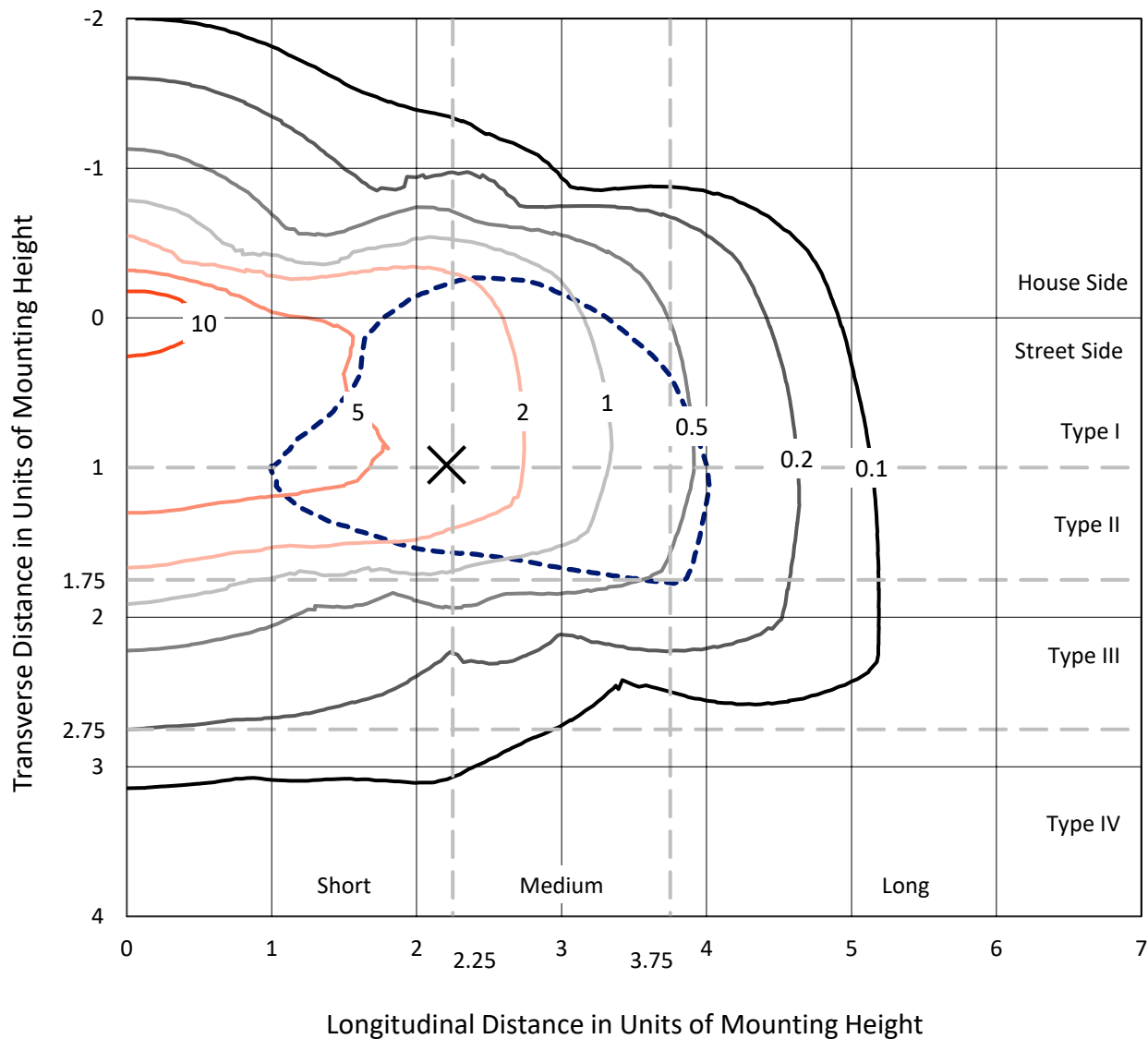
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## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd

--- 1/2 Max cd

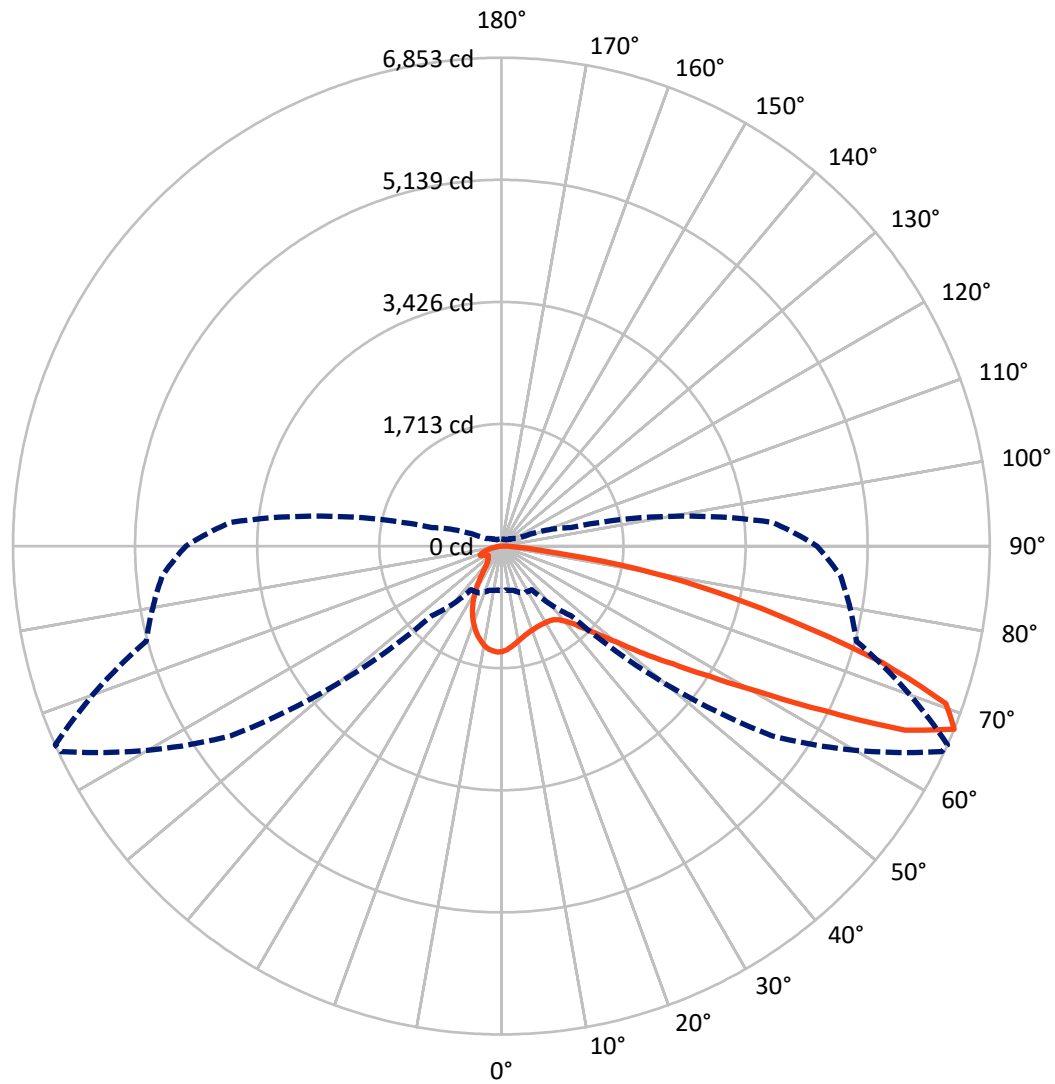


Based on 10 foot mounting height. Maximum calculated value = 14.8 fc  
 Type II - Short - N/A

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## Luminous Intensity Polar Plot



— Vertical Plane Through 66-Deg Lateral    - - - Horizontal Cone Through 67.5-Deg Vertical

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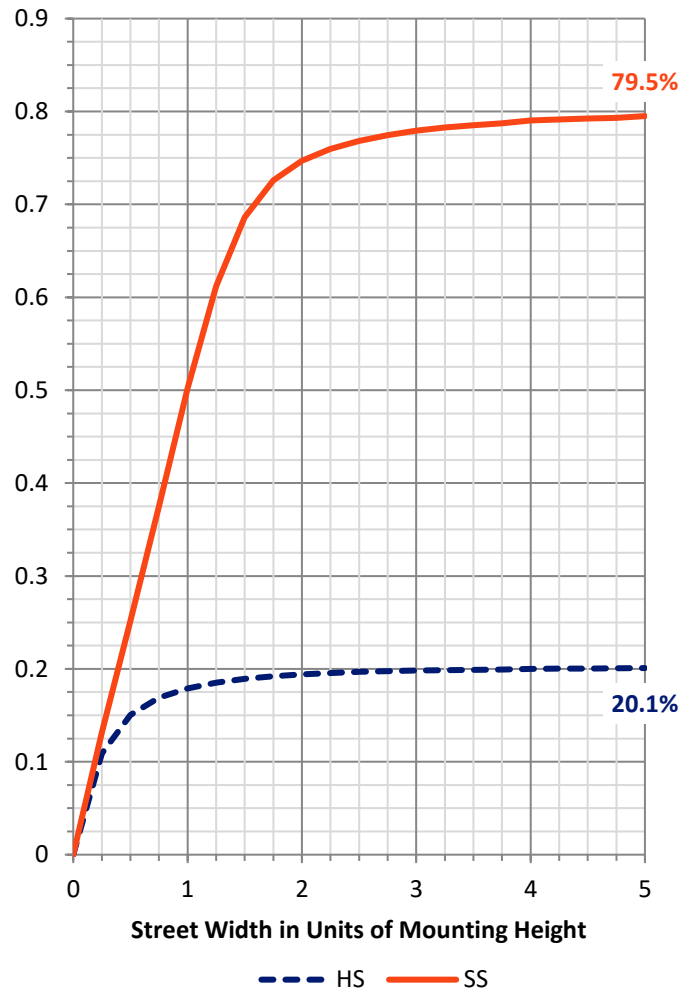
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1359.5   | 0.0    | 1359.5 |
|                    | % Fixture | 20.3     | 0.0    | 20.3   |
| <b>Street Side</b> | Lumens    | 5339.9   | 0.0    | 5339.9 |
|                    | % Fixture | 79.7     | 0.0    | 79.7   |
| <b>Total</b>       | Lumens    | 6699.4   | 0.0    | 6699.4 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 129.9  | 1.9       |
| 10°-20°   | 319.3  | 4.8       |
| 20°-30°   | 438.9  | 6.6       |
| 30°-40°   | 600.0  | 9.0       |
| 40°-50°   | 909.2  | 13.6      |
| 50°-60°   | 1413.4 | 21.1      |
| 60°-70°   | 1720.8 | 25.7      |
| 70°-80°   | 1048.2 | 15.6      |
| 80°-90°   | 119.7  | 1.8       |
| 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°    | 6699.4 | 100.0     |
| 0°-180°   | 6699.4 | 100.0     |

**Coefficient of Utilization**



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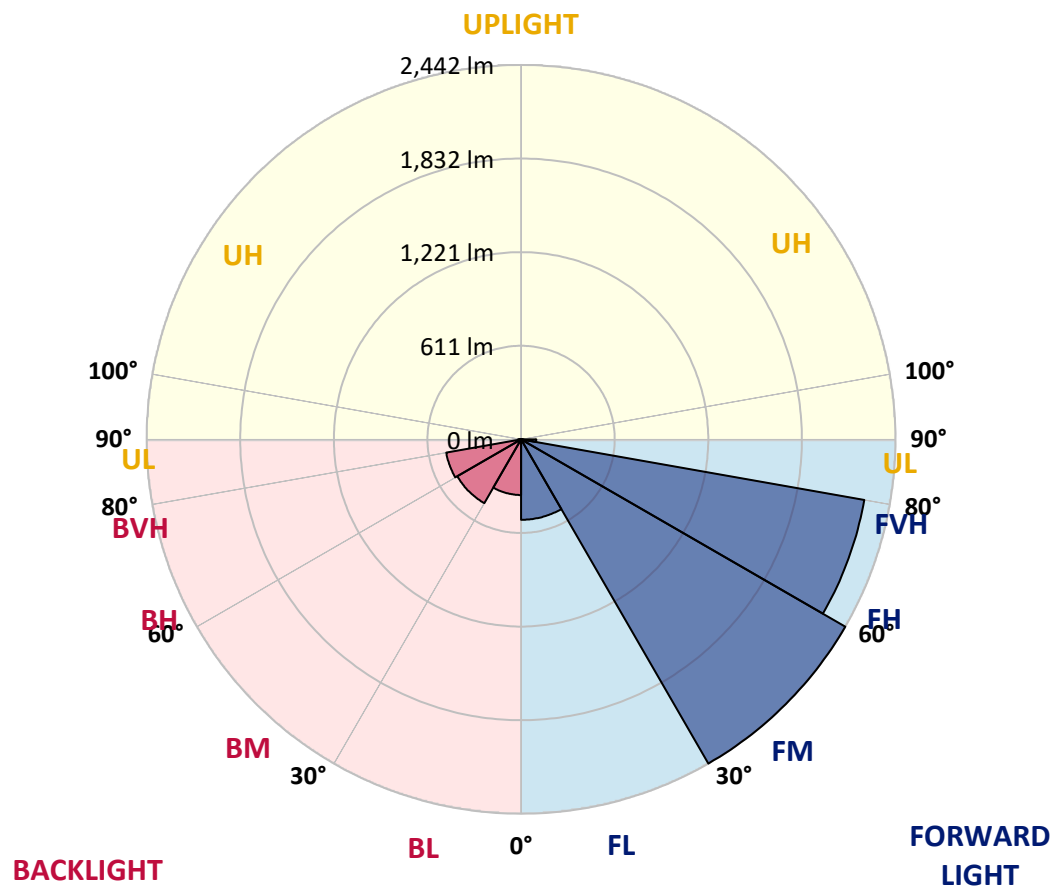
CATALOG NUMBER: GWS-SA2C-722-U-SL2-W

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 524.9  | 7.8       |                         |      |         |
| FM   | (30°-60°)   | 2442.2 | 36.5      |                         |      |         |
| FH   | (60°-80°)   | 2273.3 | 33.9      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 99.5   | 1.5       |                         |      | G1/100  |
| BL   | (0°-30°)    | 363.2  | 5.4       | B1/500                  |      |         |
| BM   | (30°-60°)   | 480.4  | 7.2       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 495.7  | 7.4       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 20.2   | 0.3       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G2**

Type II Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 66°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1480.4 | 1480.4 | 1480.4 | 1480.4 | 1480.4 | 1480.4 | 1480.4 | 1480.4 | 1480.4 | 1480.4 | 1480.4 |
| 2.5°  | 1386.5 | 1391.4 | 1388.5 | 1407.1 | 1408.0 | 1431.5 | 1444.7 | 1455.9 | 1456.9 | 1471.6 | 1481.4 |
| 5°    | 1291.7 | 1294.7 | 1294.7 | 1312.3 | 1324.0 | 1355.3 | 1385.6 | 1417.8 | 1420.3 | 1455.5 | 1482.3 |
| 7.5°  | 1215.0 | 1217.9 | 1216.0 | 1239.4 | 1254.6 | 1289.3 | 1327.9 | 1377.3 | 1382.1 | 1438.8 | 1485.8 |
| 10°   | 1154.9 | 1153.9 | 1158.8 | 1180.3 | 1199.8 | 1241.4 | 1284.4 | 1340.6 | 1347.9 | 1419.8 | 1489.7 |
| 12.5° | 1113.8 | 1114.8 | 1117.7 | 1140.2 | 1161.2 | 1202.3 | 1246.8 | 1307.9 | 1315.7 | 1397.8 | 1487.7 |
| 15°   | 1094.3 | 1092.3 | 1094.8 | 1115.3 | 1135.3 | 1171.5 | 1217.4 | 1280.5 | 1288.3 | 1378.2 | 1488.2 |
| 17.5° | 1089.9 | 1088.4 | 1087.9 | 1102.6 | 1117.7 | 1151.5 | 1195.4 | 1259.5 | 1267.8 | 1365.5 | 1491.1 |
| 20°   | 1103.6 | 1101.6 | 1096.2 | 1102.6 | 1108.9 | 1137.3 | 1179.8 | 1244.3 | 1253.6 | 1357.2 | 1497.0 |
| 22.5° | 1141.2 | 1137.8 | 1129.5 | 1121.6 | 1113.3 | 1130.4 | 1170.0 | 1233.1 | 1242.4 | 1351.8 | 1502.9 |
| 25°   | 1198.4 | 1195.4 | 1186.6 | 1169.1 | 1138.8 | 1135.8 | 1168.1 | 1228.2 | 1237.5 | 1347.9 | 1505.3 |
| 27.5° | 1277.1 | 1272.7 | 1263.9 | 1238.5 | 1189.1 | 1155.9 | 1175.4 | 1227.7 | 1236.5 | 1343.5 | 1502.9 |
| 30°   | 1370.4 | 1367.5 | 1362.6 | 1331.8 | 1265.8 | 1198.4 | 1192.0 | 1231.6 | 1238.5 | 1341.1 | 1498.0 |
| 32.5° | 1465.2 | 1462.3 | 1466.2 | 1451.5 | 1370.4 | 1268.8 | 1228.2 | 1242.4 | 1247.3 | 1340.6 | 1493.6 |
| 35°   | 1548.8 | 1552.2 | 1580.6 | 1583.0 | 1503.3 | 1364.1 | 1285.4 | 1267.3 | 1268.3 | 1350.4 | 1495.5 |
| 37.5° | 1636.3 | 1649.5 | 1686.6 | 1718.4 | 1651.9 | 1490.2 | 1370.4 | 1314.2 | 1313.2 | 1375.3 | 1507.7 |
| 40°   | 1752.1 | 1758.0 | 1805.4 | 1865.0 | 1823.5 | 1663.2 | 1491.1 | 1390.9 | 1384.1 | 1426.1 | 1540.5 |
| 42.5° | 1865.0 | 1879.2 | 1954.9 | 2023.4 | 2009.7 | 1858.2 | 1643.1 | 1505.8 | 1493.6 | 1516.1 | 1607.9 |
| 45°   | 2008.7 | 2022.4 | 2107.4 | 2195.4 | 2220.3 | 2078.6 | 1837.6 | 1669.0 | 1656.8 | 1651.4 | 1731.6 |
| 47.5° | 2152.4 | 2166.6 | 2242.8 | 2369.9 | 2457.4 | 2354.2 | 2090.8 | 1884.6 | 1864.5 | 1843.5 | 1918.3 |
| 50°   | 2249.2 | 2265.8 | 2338.6 | 2491.1 | 2696.3 | 2698.3 | 2390.9 | 2167.0 | 2141.6 | 2108.4 | 2181.2 |
| 52.5° | 2245.7 | 2256.5 | 2325.9 | 2501.8 | 2868.4 | 3093.7 | 2792.6 | 2526.8 | 2506.2 | 2433.9 | 2497.4 |
| 55°   | 2069.3 | 2085.4 | 2155.3 | 2375.3 | 2887.0 | 3468.5 | 3383.0 | 2951.0 | 2914.3 | 2784.8 | 2854.7 |
| 57.5° | 1715.0 | 1728.7 | 1799.0 | 2070.3 | 2722.3 | 3660.6 | 4132.7 | 3491.5 | 3441.2 | 3167.0 | 3247.6 |
| 60°   | 1294.7 | 1278.0 | 1311.3 | 1548.8 | 2328.3 | 3665.5 | 4794.5 | 4224.6 | 4140.6 | 3575.6 | 3643.0 |
| 62.5° | 971.6  | 955.0  | 962.3  | 1029.3 | 1578.6 | 3369.3 | 5171.8 | 5227.5 | 5088.7 | 4036.9 | 4023.8 |
| 65°   | 767.8  | 758.5  | 779.5  | 825.5  | 920.3  | 2565.9 | 5174.7 | 6312.0 | 6224.5 | 4571.6 | 4414.3 |
| 67.5° | 625.6  | 619.7  | 641.2  | 726.3  | 746.3  | 1378.7 | 4640.0 | 6818.3 | 6852.5 | 5157.1 | 4776.4 |
| 70°   | 503.9  | 495.1  | 528.8  | 640.7  | 694.0  | 834.3  | 3323.9 | 6560.3 | 6615.5 | 5506.1 | 4674.3 |
| 72.5° | 348.0  | 348.5  | 365.6  | 519.0  | 670.1  | 720.4  | 1880.2 | 5462.6 | 5582.3 | 5189.9 | 4109.3 |
| 75°   | 234.6  | 236.5  | 241.4  | 342.6  | 617.3  | 698.9  | 1001.9 | 4135.7 | 4220.2 | 4289.6 | 3396.7 |
| 77.5° | 141.7  | 142.7  | 154.0  | 207.2  | 425.7  | 652.5  | 678.9  | 2997.9 | 3064.4 | 2827.8 | 2105.5 |
| 80°   | 82.1   | 85.5   | 95.8   | 138.8  | 287.4  | 490.2  | 525.4  | 1838.1 | 1913.4 | 1257.0 | 669.1  |
| 82.5° | 36.2   | 38.6   | 52.3   | 80.6   | 167.6  | 416.9  | 410.0  | 726.3  | 715.5  | 350.4  | 232.1  |
| 85°   | 6.4    | 7.8    | 11.2   | 25.4   | 61.6   | 219.9  | 318.2  | 320.6  | 301.5  | 132.9  | 96.3   |
| 87.5° | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 1.5    | 47.9   | 86.0   | 85.5   | 37.6   | 33.2   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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CATALOG NUMBER: GWS-SA2C-722-U-SL2-W

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1480.4 | 1480.4 | 1480.4 | 1480.4 | 1480.4 | 1480.4 | 1480.4 | 1480.4 | 1480.4 | 1480.4 | 1480.4 |
| 2.5°  | 1487.7 | 1474.5 | 1486.2 | 1487.7 | 1485.3 | 1483.3 | 1468.6 | 1455.9 | 1454.5 | 1440.8 | 1440.8 |
| 5°    | 1493.1 | 1480.9 | 1486.7 | 1475.5 | 1457.9 | 1439.8 | 1408.5 | 1387.0 | 1377.3 | 1359.7 | 1359.7 |
| 7.5°  | 1500.4 | 1487.7 | 1480.9 | 1453.0 | 1412.0 | 1372.4 | 1322.0 | 1280.0 | 1262.9 | 1238.0 | 1237.0 |
| 10°   | 1507.3 | 1491.1 | 1467.7 | 1413.4 | 1347.9 | 1284.9 | 1211.6 | 1151.9 | 1111.4 | 1081.6 | 1081.6 |
| 12.5° | 1506.8 | 1485.8 | 1439.3 | 1359.2 | 1268.8 | 1177.4 | 1079.6 | 989.7  | 935.9  | 889.5  | 886.6  |
| 15°   | 1505.8 | 1477.0 | 1403.2 | 1296.1 | 1176.4 | 1049.8 | 916.9  | 799.6  | 719.9  | 674.5  | 670.5  |
| 17.5° | 1504.8 | 1465.7 | 1362.6 | 1224.3 | 1064.0 | 891.5  | 716.0  | 588.9  | 522.5  | 494.6  | 495.6  |
| 20°   | 1504.8 | 1453.0 | 1319.1 | 1141.7 | 934.5  | 701.8  | 525.4  | 433.0  | 416.4  | 417.9  | 419.3  |
| 22.5° | 1500.4 | 1437.4 | 1270.7 | 1051.8 | 790.3  | 516.1  | 387.6  | 356.3  | 365.1  | 378.8  | 380.7  |
| 25°   | 1490.2 | 1411.5 | 1214.5 | 952.1  | 618.7  | 375.8  | 316.2  | 310.3  | 326.5  | 343.6  | 348.5  |
| 27.5° | 1474.0 | 1381.7 | 1151.5 | 835.2  | 455.5  | 302.0  | 278.1  | 277.6  | 290.3  | 303.0  | 307.4  |
| 30°   | 1456.9 | 1348.4 | 1085.0 | 705.2  | 329.9  | 262.9  | 253.7  | 253.7  | 260.0  | 267.8  | 266.8  |
| 32.5° | 1436.9 | 1314.7 | 1013.6 | 569.9  | 268.8  | 240.9  | 238.0  | 236.5  | 237.5  | 240.5  | 240.5  |
| 35°   | 1419.8 | 1284.9 | 940.3  | 426.7  | 240.9  | 228.7  | 225.8  | 222.4  | 220.9  | 219.0  | 219.9  |
| 37.5° | 1413.4 | 1261.4 | 864.6  | 321.6  | 227.3  | 219.9  | 215.0  | 210.2  | 206.7  | 205.8  | 205.3  |
| 40°   | 1423.7 | 1251.6 | 788.8  | 264.9  | 217.5  | 210.6  | 205.3  | 198.9  | 196.0  | 196.0  | 196.0  |
| 42.5° | 1463.8 | 1259.0 | 711.6  | 239.5  | 210.6  | 202.8  | 195.0  | 189.1  | 188.2  | 189.1  | 189.6  |
| 45°   | 1537.1 | 1287.3 | 631.4  | 226.8  | 204.8  | 195.0  | 185.7  | 181.3  | 181.3  | 182.3  | 182.3  |
| 47.5° | 1668.1 | 1361.6 | 552.3  | 219.0  | 198.9  | 188.7  | 178.9  | 174.5  | 174.0  | 175.0  | 175.0  |
| 50°   | 1894.8 | 1495.5 | 480.9  | 213.6  | 194.5  | 183.8  | 174.0  | 168.1  | 166.7  | 166.2  | 166.2  |
| 52.5° | 2180.7 | 1727.7 | 435.5  | 209.7  | 189.1  | 178.4  | 168.6  | 160.8  | 157.9  | 156.4  | 156.4  |
| 55°   | 2526.3 | 2037.0 | 435.5  | 206.7  | 182.3  | 172.0  | 160.8  | 153.0  | 148.6  | 146.6  | 146.6  |
| 57.5° | 2917.7 | 2397.2 | 510.7  | 204.3  | 176.9  | 164.7  | 152.5  | 144.7  | 139.8  | 136.8  | 136.8  |
| 60°   | 3316.1 | 2778.0 | 696.9  | 200.9  | 172.0  | 155.4  | 143.2  | 135.9  | 129.5  | 126.1  | 125.6  |
| 62.5° | 3729.0 | 3197.3 | 942.3  | 202.8  | 168.6  | 146.6  | 133.4  | 125.1  | 119.7  | 116.3  | 115.8  |
| 65°   | 4107.3 | 3596.6 | 1156.8 | 218.0  | 169.1  | 138.8  | 122.2  | 114.9  | 110.5  | 106.1  | 105.6  |
| 67.5° | 4428.4 | 3817.0 | 1006.3 | 248.8  | 179.4  | 129.5  | 110.9  | 103.6  | 99.7   | 96.8   | 96.3   |
| 70°   | 4203.6 | 3480.8 | 570.8  | 267.8  | 193.5  | 119.7  | 98.2   | 93.3   | 89.4   | 87.5   | 87.0   |
| 72.5° | 3594.6 | 2947.1 | 381.7  | 236.5  | 176.4  | 107.0  | 86.5   | 82.6   | 79.7   | 77.2   | 76.7   |
| 75°   | 2911.9 | 2337.1 | 291.8  | 194.0  | 137.3  | 87.0   | 74.3   | 71.4   | 68.4   | 66.0   | 65.5   |
| 77.5° | 1722.8 | 1350.4 | 215.0  | 153.5  | 96.8   | 67.9   | 61.6   | 59.1   | 56.2   | 54.2   | 53.8   |
| 80°   | 549.8  | 469.2  | 136.4  | 105.6  | 64.0   | 52.3   | 47.4   | 45.5   | 42.5   | 40.1   | 39.6   |
| 82.5° | 209.7  | 181.3  | 72.3   | 53.8   | 42.5   | 35.7   | 31.8   | 29.8   | 27.9   | 25.4   | 24.9   |
| 85°   | 92.9   | 87.0   | 40.1   | 28.8   | 23.0   | 17.6   | 15.6   | 14.7   | 12.2   | 10.3   | 9.8    |
| 87.5° | 32.7   | 32.7   | 17.1   | 8.3    | 4.9    | 2.4    | 1.5    | 0.5    | 0.0    | 0.0    | 0.0    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



LM-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-10-R4

Test Date: 10/25/2019

Luminaire Tested: SA1C-722-U-5WQ

Data in this report applies to families of products SA1C-722-U-5WQ.

### Test Information

Test Method: LM-79-2008 Report  
 Number: SP1-1908-441-10-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **SA1C-722-U-5WQ**  
 Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-4-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. ROADWAY AND AREA LUMINAIRE. (1) 70 CRI, 5000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

### Spectral Parameters

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 2237    | CRI (Ra): | 72.0 |      |       |
| CIE u':                   | 0.2876  | R1:       | 68.9 | R9:  | -17.4 |
| CIE v':                   | 0.5346  | R2:       | 83.0 | R10: | 61.3  |
| Duv:                      | -0.0006 | R3:       | 95.2 | R11: | 59.8  |
| CIE x:                    | 0.5005  | R4:       | 66.2 | R12: | 50.5  |
| CIE y:                    | 0.4134  | R5:       | 65.9 | R13: | 71.1  |
| CIE z:                    | 0.0860  | R6:       | 76.3 | R14: | 96.9  |
| Peak Wavelength (nm):     | 603     | R7:       | 76.7 |      |       |
| Dominant Wavelength (nm): | 587     | R8:       | 43.8 |      |       |
| Purity:                   | 74.5    |           |      |      |       |
| Rf:                       | 69.8    |           |      |      |       |
| Rg:                       | 99.2    |           |      |      |       |



### Test Conditions

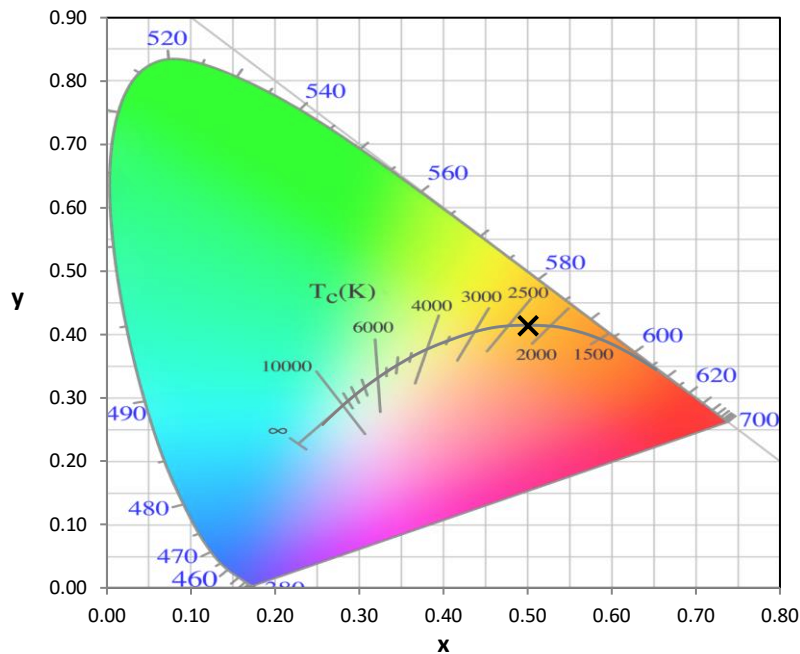
Stabilization Time: 71M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.7/41%  
 Sphere Temperature (°C): 25.6

REPORT NUMBER: SP1-1908-441-10-R4

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

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CIE 1931 Chromaticity Diagram



CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 2200K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 4696.9

S/P: 0.85

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 1470.8 M/P: 0.27**

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1768             | NR               | 490       | 5206             | NR               | 620       | 130919           | NR               | 750       | 8553             | NR               | 880       | 2713             | NR               |
| 365       | 1569             | NR               | 495       | 7286             | NR               | 625       | 125335           | NR               | 755       | 7696             | NR               | 885       | 2316             | NR               |
| 370       | 1594             | NR               | 500       | 10654            | NR               | 630       | 118388           | NR               | 760       | 6978             | NR               | 890       | 2539             | NR               |
| 375       | 1744             | NR               | 505       | 15189            | NR               | 635       | 111855           | NR               | 765       | 6377             | NR               | 895       | 1933             | NR               |
| 380       | 1659             | NR               | 510       | 20541            | NR               | 640       | 104062           | NR               | 770       | 5600             | NR               | 900       | 2216             | NR               |
| 385       | 1504             | NR               | 515       | 26492            | NR               | 645       | 96365            | NR               | 775       | 5000             | NR               | 905       | 2067             | NR               |
| 390       | 1541             | NR               | 520       | 32294            | NR               | 650       | 88651            | NR               | 780       | 4709             | NR               | 910       | 1959             | NR               |
| 395       | 1355             | NR               | 525       | 38123            | NR               | 655       | 81152            | NR               | 785       | 4305             | NR               | 915       | 1874             | NR               |
| 400       | 1243             | NR               | 530       | 43232            | NR               | 660       | 73523            | NR               | 790       | 4040             | NR               | 920       | 1484             | NR               |
| 405       | 1417             | NR               | 535       | 48012            | NR               | 665       | 66123            | NR               | 795       | 3642             | NR               | 925       | 1914             | NR               |
| 410       | 2147             | NR               | 540       | 52623            | NR               | 670       | 58677            | NR               | 800       | 3594             | NR               | 930       | 1948             | NR               |
| 415       | 3837             | NR               | 545       | 57516            | NR               | 675       | 52349            | NR               | 805       | 3190             | NR               | 935       | 2079             | NR               |
| 420       | 7159             | NR               | 550       | 62613            | NR               | 680       | 46159            | NR               | 810       | 3241             | NR               | 940       | 2263             | NR               |
| 425       | 12599            | NR               | 555       | 68554            | NR               | 685       | 40525            | NR               | 815       | 2732             | NR               | 945       | 1688             | NR               |
| 430       | 19019            | NR               | 560       | 75325            | NR               | 690       | 35615            | NR               | 820       | 2612             | NR               | 950       | 1560             | NR               |
| 435       | 24875            | NR               | 565       | 82533            | NR               | 695       | 31158            | NR               | 825       | 2966             | NR               | 955       | 2826             | NR               |
| 440       | 29103            | NR               | 570       | 90909            | NR               | 700       | 27409            | NR               | 830       | 2574             | NR               | 960       | 1477             | NR               |
| 445       | 29901            | NR               | 575       | 99621            | NR               | 705       | 24204            | NR               | 835       | 2633             | NR               | 965       | 1568             | NR               |
| 450       | 24862            | NR               | 580       | 108484           | NR               | 710       | 21558            | NR               | 840       | 2526             | NR               | 970       | 2030             | NR               |
| 455       | 15942            | NR               | 585       | 116679           | NR               | 715       | 19222            | NR               | 845       | 2631             | NR               | 975       | 1986             | NR               |
| 460       | 9916             | NR               | 590       | 123752           | NR               | 720       | 17310            | NR               | 850       | 2079             | NR               | 980       | 2540             | NR               |
| 465       | 7051             | NR               | 595       | 129324           | NR               | 725       | 15280            | NR               | 855       | 2309             | NR               | 985       | 1139             | NR               |
| 470       | 5227             | NR               | 600       | 134082           | NR               | 730       | 13282            | NR               | 860       | 2528             | NR               | 990       | 2018             | NR               |
| 475       | 4257             | NR               | 605       | 135698           | NR               | 735       | 11753            | NR               | 865       | 2121             | NR               | 995       | 3445             | NR               |
| 480       | 4052             | NR               | 610       | 135144           | NR               | 740       | 10654            | NR               | 870       | 2751             | NR               | 1000      | 3704             | NR               |
| 485       | 4298             | NR               | 615       | 134180           | NR               | 745       | 9451             | NR               | 875       | 2317             | NR               |           |                  |                  |

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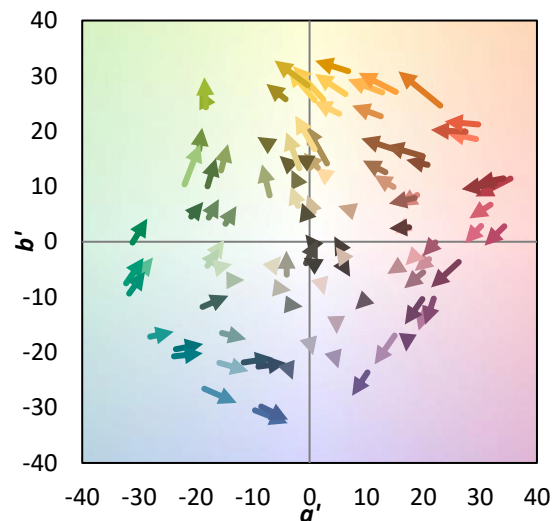
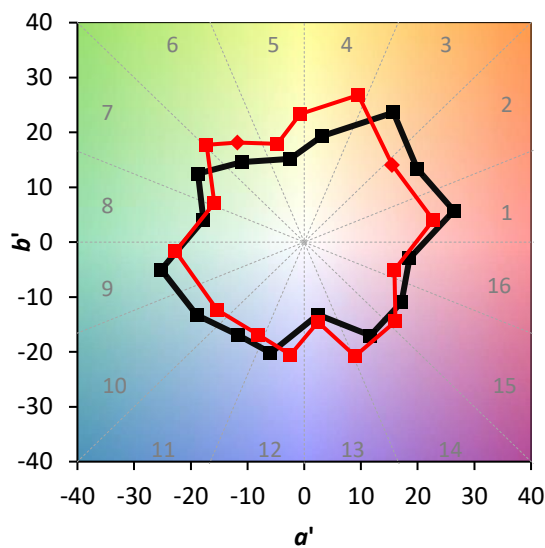
**TM-30-18**

### Summary

$R_f = 69.8$   
 $R_g = 99.2$   
 CIE  $R_a = 72.0$   
 $R_g = -17.4$



### Color Vector Graphics



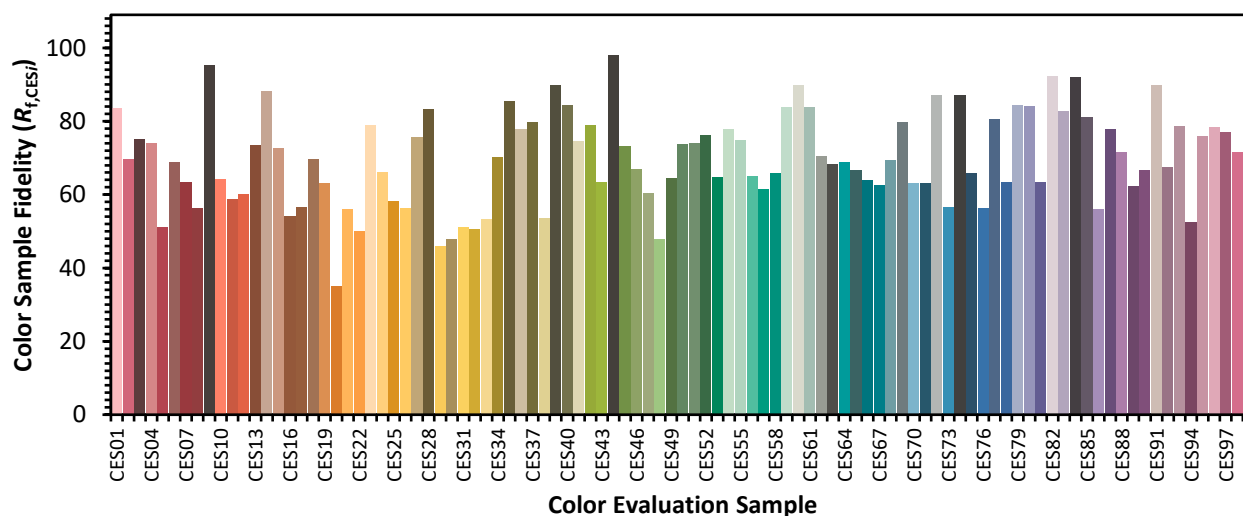


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**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| 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)