

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: P630110

Luminaire Tested: GWS-SA1D-722-U-SL2-W-GRSWH

Issue Date: 1/10/2023

### Test Information

Test Method: LM-79-2019  
Report Number: P630110  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-29)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA1D-722-U-SL2-W-GRSWH  
Description: GALLEON WALL SLIM LUMINAIRE. (1) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II SPILL LIGHT ELIMINATOR OPTICS W/ FACTORY INSTALLED GLARE SHIELD, WH  
Light Source: (16) 2200K CCT, 70 CRI LEDS  
Ballast/Driver: -

### Summary

Lumens per Lamp: N/A  
Luminaire Lumens: 3804.2 lumens  
Efficiency: N/A  
Efficacy: 85.9 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B1 - U0 - G1

Input Watts (W): 44.3  
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



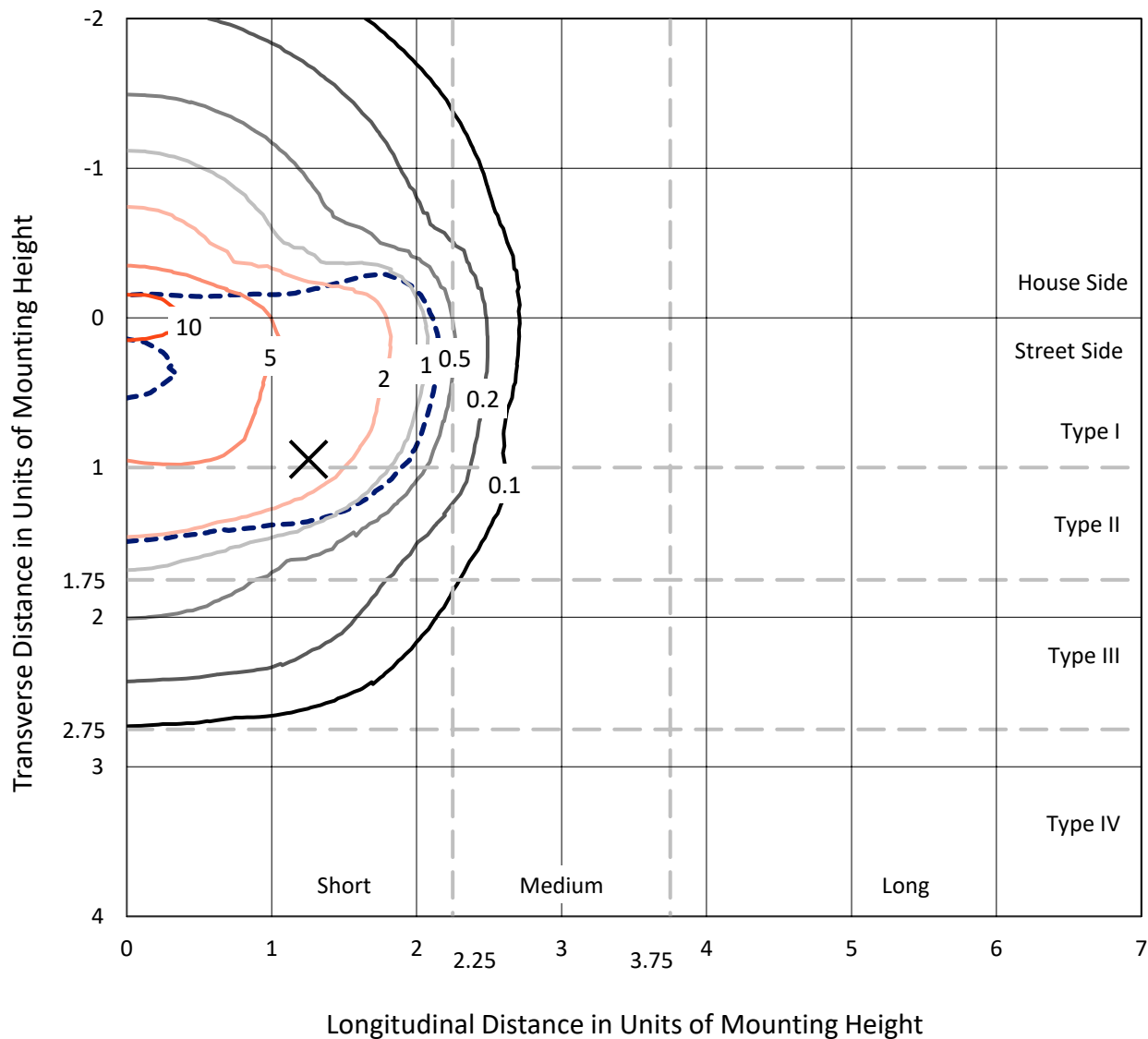
REPORT NUMBER: P630110

CATALOG NUMBER: GWS-SA1D-722-U-SL2-W-GRSWH

## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd

--- 1/2 Max cd

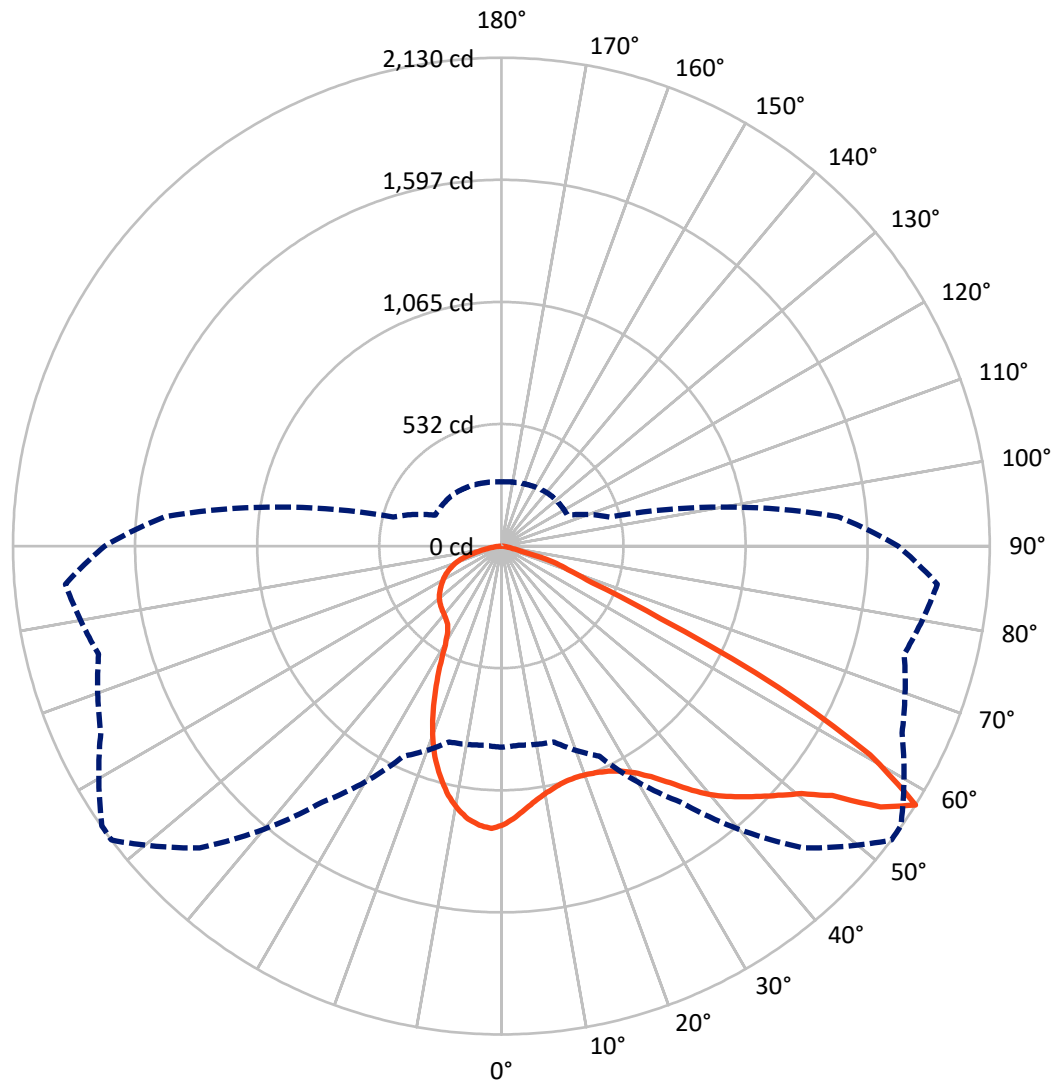


Based on 10 foot mounting height. Maximum calculated value = 12.1 fc  
 Type II - Short - N/A

REPORT NUMBER: P630110

CATALOG NUMBER: GWS-SA1D-722-U-SL2-W-GRSWH

## Luminous Intensity Polar Plot



— Vertical Plane Through 53-Deg Lateral    - - - Horizontal Cone Through 57.5-Deg Vertical

REPORT NUMBER: P630110

CATALOG NUMBER: GWS-SA1D-722-U-SL2-W-GRSWH

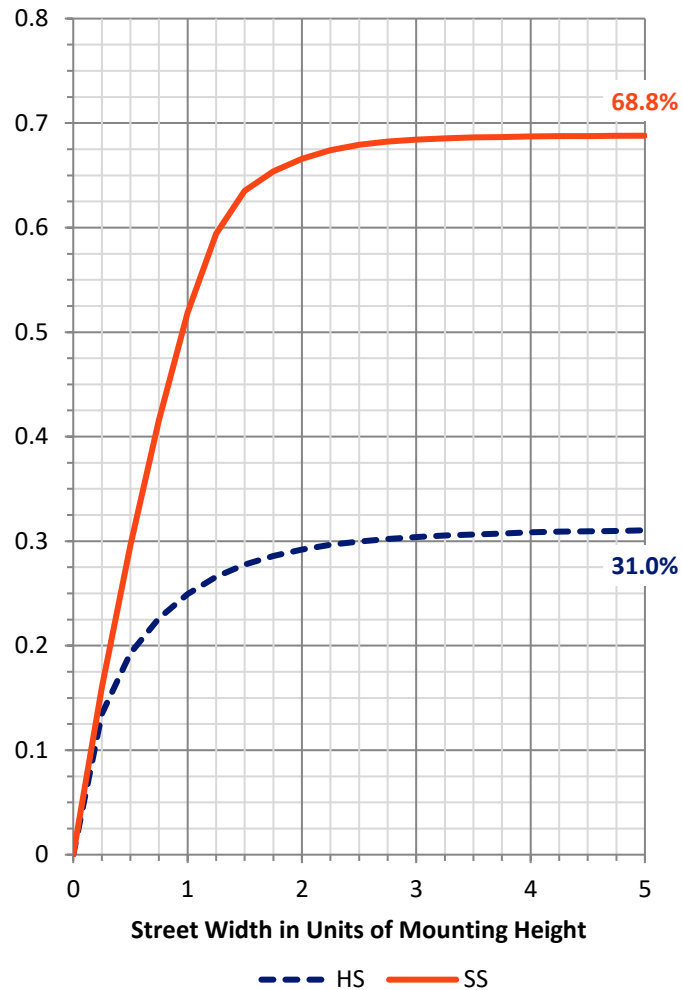
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1189.4   | 0.0    | 1189.4 |
|                    | % Fixture | 31.3     | 0.0    | 31.3   |
| <b>Street Side</b> | Lumens    | 2614.8   | 0.0    | 2614.8 |
|                    | % Fixture | 68.7     | 0.0    | 68.7   |
| <b>Total</b>       | Lumens    | 3804.2   | 0.0    | 3804.2 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 109.9  | 2.9       |
| 10°-20°   | 288.2  | 7.6       |
| 20°-30°   | 424.6  | 11.2      |
| 30°-40°   | 594.4  | 15.6      |
| 40°-50°   | 781.3  | 20.5      |
| 50°-60°   | 916.1  | 24.1      |
| 60°-70°   | 539.7  | 14.2      |
| 70°-80°   | 134.3  | 3.5       |
| 80°-90°   | 15.8   | 0.4       |
| 90°-100°  | 0.0    | 0.0       |
| 100°-110° | 0.0    | 0.0       |
| 110°-120° | 0.0    | 0.0       |
| 120°-130° | 0.0    | 0.0       |
| 130°-140° | 0.0    | 0.0       |
| 140°-150° | 0.0    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-90°    | 3804.2 | 100.0     |
| 0°-180°   | 3804.2 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P630110

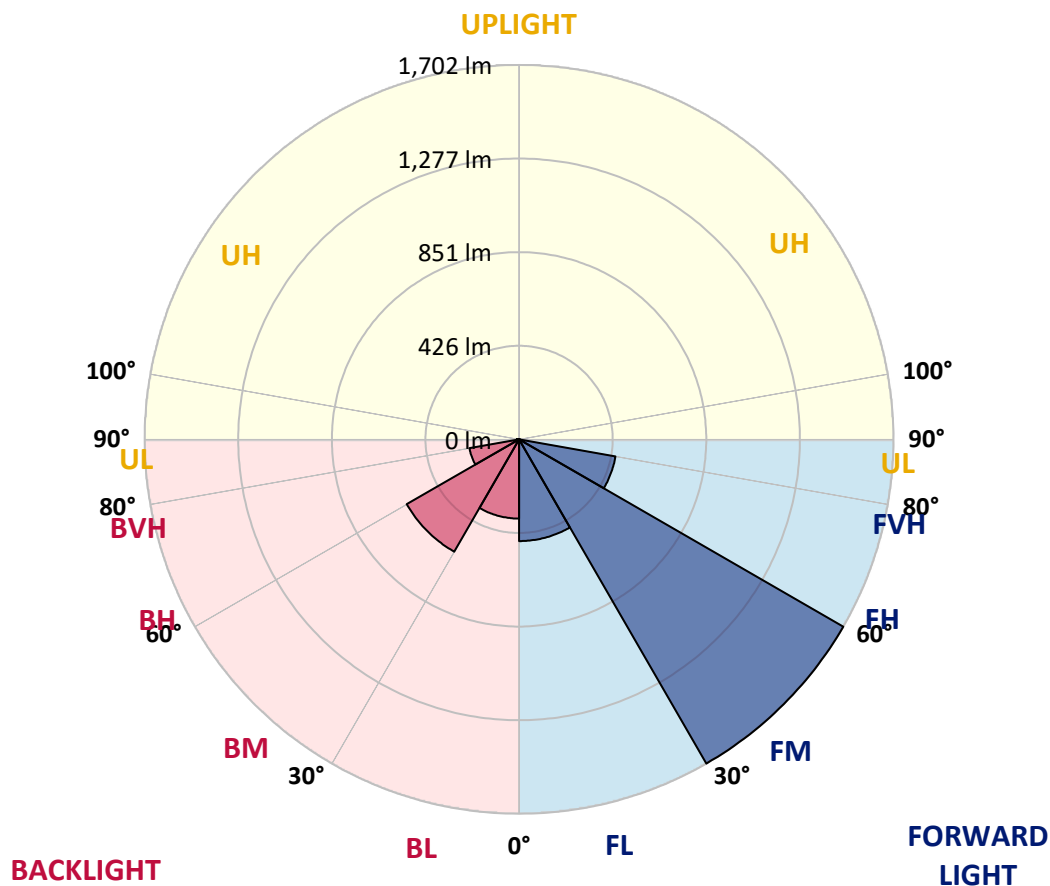
CATALOG NUMBER: GWS-SA1D-722-U-SL2-W-GRSWH

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |        |
|------|-------------|--------|-----------|-------------------------|------|--------|
|      |             |        |           | B                       | U    | G      |
| FL   | (0°-30°)    | 462.5  | 12.2      |                         |      |        |
| FM   | (30°-60°)   | 1702.0 | 44.7      |                         |      |        |
| FH   | (60°-80°)   | 444.9  | 11.7      |                         |      | G0/660 |
| FVH  | (80°-90°)   | 5.3    | 0.1       |                         |      | G0/10  |
| BL   | (0°-30°)    | 360.2  | 9.5       | B1/500                  |      |        |
| BM   | (30°-60°)   | 589.8  | 15.5      | B1/1000                 |      |        |
| BH   | (60°-80°)   | 229.0  | 6.0       | B1/500                  |      | G1/500 |
| BVH  | (80°-90°)   | 10.5   | 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-G1**

Type II Short



REPORT NUMBER: P630110

CATALOG NUMBER: GWS-SA1D-722-U-SL2-W-GRSWH

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 53°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1214.8 | 1214.8 | 1214.8 | 1214.8 | 1214.8 | 1214.8 | 1214.8 | 1214.8 | 1214.8 | 1214.8 | 1214.8 |
| 2.5°  | 1145.0 | 1148.2 | 1148.8 | 1158.8 | 1159.4 | 1173.8 | 1183.4 | 1181.5 | 1191.4 | 1203.6 | 1213.2 |
| 5°    | 1090.2 | 1090.6 | 1093.8 | 1105.6 | 1112.0 | 1130.9 | 1146.9 | 1146.9 | 1166.1 | 1191.1 | 1212.5 |
| 7.5°  | 1045.1 | 1044.8 | 1047.6 | 1060.8 | 1071.3 | 1094.1 | 1115.8 | 1118.4 | 1145.3 | 1181.8 | 1216.7 |
| 10°   | 1003.1 | 1005.4 | 1008.6 | 1024.6 | 1038.0 | 1066.2 | 1092.2 | 1096.3 | 1130.3 | 1175.4 | 1222.5 |
| 12.5° | 976.2  | 976.6  | 981.4  | 999.3  | 1016.6 | 1046.7 | 1073.9 | 1079.0 | 1118.1 | 1169.3 | 1226.6 |
| 15°   | 959.0  | 959.3  | 964.4  | 984.3  | 1004.4 | 1034.8 | 1062.7 | 1068.5 | 1111.0 | 1168.4 | 1234.6 |
| 17.5° | 951.3  | 951.0  | 955.8  | 975.6  | 997.7  | 1029.4 | 1059.2 | 1066.2 | 1114.2 | 1175.7 | 1248.7 |
| 20°   | 951.3  | 951.6  | 954.2  | 972.1  | 994.5  | 1028.1 | 1062.7 | 1071.3 | 1126.7 | 1192.4 | 1270.5 |
| 22.5° | 964.7  | 966.0  | 967.3  | 979.4  | 997.1  | 1030.0 | 1072.0 | 1083.5 | 1153.6 | 1220.2 | 1299.0 |
| 25°   | 991.0  | 991.3  | 992.6  | 1002.5 | 1010.5 | 1035.5 | 1087.4 | 1104.6 | 1195.6 | 1260.9 | 1334.9 |
| 27.5° | 1026.2 | 1030.7 | 1032.0 | 1038.4 | 1038.4 | 1048.9 | 1111.4 | 1136.3 | 1252.2 | 1319.5 | 1380.6 |
| 30°   | 1075.5 | 1077.1 | 1079.3 | 1086.4 | 1078.7 | 1074.2 | 1146.6 | 1178.6 | 1317.9 | 1390.2 | 1435.7 |
| 32.5° | 1118.7 | 1122.3 | 1134.4 | 1145.9 | 1132.2 | 1118.1 | 1198.5 | 1236.2 | 1381.0 | 1463.9 | 1494.3 |
| 35°   | 1155.5 | 1164.2 | 1187.6 | 1213.2 | 1203.6 | 1189.5 | 1267.3 | 1306.7 | 1432.8 | 1516.7 | 1546.2 |
| 37.5° | 1200.1 | 1206.8 | 1238.8 | 1280.4 | 1289.1 | 1282.3 | 1351.2 | 1379.4 | 1467.4 | 1530.2 | 1574.4 |
| 40°   | 1245.2 | 1255.4 | 1296.8 | 1354.4 | 1387.4 | 1392.2 | 1428.7 | 1447.6 | 1479.3 | 1503.9 | 1568.9 |
| 42.5° | 1291.3 | 1308.9 | 1365.6 | 1432.8 | 1491.4 | 1502.3 | 1494.0 | 1502.0 | 1475.4 | 1467.7 | 1543.6 |
| 45°   | 1347.7 | 1368.5 | 1432.5 | 1518.3 | 1595.5 | 1612.5 | 1558.0 | 1550.7 | 1474.8 | 1454.0 | 1527.9 |
| 47.5° | 1414.3 | 1435.1 | 1496.2 | 1596.1 | 1694.7 | 1707.2 | 1623.7 | 1610.2 | 1497.2 | 1475.1 | 1549.1 |
| 50°   | 1473.2 | 1487.6 | 1542.3 | 1654.1 | 1787.3 | 1794.6 | 1696.0 | 1679.7 | 1552.9 | 1533.7 | 1615.0 |
| 52.5° | 1413.3 | 1411.7 | 1469.3 | 1607.0 | 1835.3 | 1924.0 | 1807.4 | 1791.8 | 1660.5 | 1631.0 | 1717.2 |
| 55°   | 1199.1 | 1180.8 | 1232.4 | 1367.8 | 1701.1 | 2038.9 | 2007.2 | 1975.9 | 1803.9 | 1729.0 | 1812.9 |
| 57.5° | 876.7  | 871.5  | 884.0  | 1011.1 | 1362.7 | 1860.9 | 2129.6 | 2126.7 | 1927.8 | 1818.7 | 1908.3 |
| 60°   | 685.5  | 677.8  | 644.5  | 648.1  | 928.9  | 1453.6 | 1848.1 | 1933.0 | 2004.7 | 1872.4 | 1974.9 |
| 62.5° | 608.7  | 602.9  | 585.6  | 537.9  | 553.3  | 974.6  | 1354.7 | 1432.5 | 1751.7 | 1653.8 | 1696.3 |
| 65°   | 504.0  | 502.4  | 516.8  | 514.9  | 463.6  | 538.2  | 764.6  | 843.0  | 1101.4 | 1115.2 | 1101.4 |
| 67.5° | 366.3  | 363.4  | 399.9  | 472.0  | 446.3  | 406.3  | 426.2  | 453.4  | 564.8  | 507.2  | 456.6  |
| 70°   | 238.2  | 234.1  | 255.2  | 341.0  | 399.6  | 354.1  | 307.1  | 302.6  | 310.6  | 193.1  | 208.8  |
| 72.5° | 159.8  | 155.0  | 154.6  | 187.6  | 241.4  | 238.5  | 237.9  | 235.7  | 210.4  | 152.4  | 169.1  |
| 75°   | 89.0   | 85.2   | 84.2   | 81.0   | 86.5   | 88.1   | 93.8   | 97.0   | 105.0  | 115.6  | 128.1  |
| 77.5° | 15.0   | 14.7   | 18.6   | 23.7   | 32.7   | 41.9   | 51.9   | 54.8   | 67.6   | 80.0   | 88.1   |
| 80°   | 8.3    | 8.6    | 11.2   | 13.8   | 18.3   | 25.0   | 32.0   | 33.9   | 41.6   | 48.3   | 54.8   |
| 82.5° | 4.5    | 4.5    | 5.8    | 7.4    | 9.9    | 13.1   | 17.3   | 18.9   | 24.0   | 28.2   | 32.7   |
| 85°   | 1.6    | 1.6    | 2.2    | 2.9    | 4.2    | 5.4    | 6.7    | 7.7    | 10.6   | 14.4   | 16.3   |
| 87.5° | 0.0    | 0.0    | 0.0    | 0.0    | 0.3    | 0.6    | 1.3    | 1.3    | 1.6    | 2.9    | 4.2    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

REPORT NUMBER: P630110

CATALOG NUMBER: GWS-SA1D-722-U-SL2-W-GRSWH

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1214.8 | 1214.8 | 1214.8 | 1214.8 | 1214.8 | 1214.8 | 1214.8 | 1214.8 | 1214.8 | 1214.8 | 1214.8 |
| 2.5°  | 1221.2 | 1212.5 | 1224.4 | 1229.8 | 1231.8 | 1233.0 | 1224.7 | 1218.9 | 1217.0 | 1210.9 | 1207.4 |
| 5°    | 1225.7 | 1219.9 | 1231.1 | 1231.1 | 1223.1 | 1214.8 | 1197.8 | 1186.0 | 1177.6 | 1167.7 | 1166.1 |
| 7.5°  | 1233.4 | 1229.2 | 1235.3 | 1222.8 | 1202.6 | 1180.2 | 1150.7 | 1127.7 | 1109.1 | 1097.0 | 1097.3 |
| 10°   | 1243.6 | 1238.5 | 1233.7 | 1205.8 | 1169.0 | 1127.7 | 1082.5 | 1048.9 | 1018.2 | 1004.1 | 996.4  |
| 12.5° | 1250.3 | 1243.0 | 1222.8 | 1176.7 | 1122.6 | 1067.2 | 1003.5 | 953.5  | 909.0  | 888.8  | 887.2  |
| 15°   | 1258.6 | 1245.2 | 1204.9 | 1138.9 | 1063.7 | 988.1  | 906.1  | 836.6  | 776.4  | 745.1  | 743.5  |
| 17.5° | 1269.5 | 1247.4 | 1183.4 | 1095.7 | 1001.5 | 890.1  | 787.0  | 699.6  | 635.6  | 611.2  | 615.4  |
| 20°   | 1284.9 | 1250.0 | 1159.1 | 1047.6 | 924.4  | 778.7  | 650.3  | 569.9  | 545.3  | 543.7  | 540.5  |
| 22.5° | 1302.2 | 1251.6 | 1132.2 | 993.9  | 830.9  | 659.9  | 537.3  | 503.0  | 502.7  | 510.7  | 512.6  |
| 25°   | 1321.7 | 1252.9 | 1101.8 | 931.1  | 729.7  | 541.4  | 475.2  | 464.9  | 472.9  | 488.0  | 489.9  |
| 27.5° | 1346.7 | 1255.4 | 1064.9 | 862.3  | 622.1  | 467.8  | 440.9  | 438.3  | 447.9  | 462.0  | 461.4  |
| 30°   | 1383.5 | 1264.7 | 1025.9 | 783.2  | 511.7  | 432.9  | 420.1  | 420.4  | 424.2  | 431.0  | 431.9  |
| 32.5° | 1421.0 | 1279.1 | 987.8  | 694.2  | 448.3  | 413.0  | 407.3  | 406.6  | 406.6  | 409.5  | 410.2  |
| 35°   | 1456.5 | 1295.5 | 946.5  | 601.3  | 417.5  | 401.5  | 397.7  | 395.7  | 394.8  | 394.1  | 393.2  |
| 37.5° | 1476.4 | 1303.5 | 906.1  | 509.7  | 401.2  | 393.8  | 390.0  | 387.4  | 383.9  | 381.3  | 380.7  |
| 40°   | 1467.7 | 1294.2 | 859.4  | 441.2  | 391.3  | 386.5  | 382.0  | 378.5  | 373.7  | 371.4  | 370.1  |
| 42.5° | 1438.9 | 1265.4 | 808.5  | 408.9  | 383.3  | 378.5  | 373.0  | 367.3  | 364.1  | 362.1  | 361.8  |
| 45°   | 1408.5 | 1230.5 | 747.0  | 390.0  | 375.6  | 369.8  | 363.4  | 357.0  | 353.5  | 352.5  | 352.2  |
| 47.5° | 1407.5 | 1213.2 | 681.7  | 374.9  | 366.3  | 360.5  | 352.5  | 346.1  | 342.3  | 341.0  | 339.7  |
| 50°   | 1449.8 | 1230.8 | 608.0  | 361.8  | 356.7  | 350.6  | 341.6  | 334.6  | 329.8  | 328.2  | 327.9  |
| 52.5° | 1537.5 | 1297.1 | 542.1  | 348.7  | 343.9  | 336.8  | 329.5  | 322.4  | 316.7  | 313.8  | 313.5  |
| 55°   | 1632.3 | 1381.3 | 501.1  | 335.2  | 328.8  | 322.7  | 316.0  | 308.3  | 301.9  | 297.5  | 296.8  |
| 57.5° | 1730.3 | 1473.2 | 488.6  | 318.3  | 313.5  | 309.3  | 301.3  | 293.0  | 285.6  | 281.4  | 280.5  |
| 60°   | 1811.0 | 1552.3 | 512.0  | 300.3  | 297.8  | 292.3  | 285.0  | 277.0  | 271.8  | 268.6  | 268.0  |
| 62.5° | 1516.1 | 1263.8 | 413.4  | 280.8  | 280.8  | 275.0  | 266.7  | 261.0  | 257.4  | 255.2  | 254.5  |
| 65°   | 962.2  | 782.5  | 282.1  | 261.3  | 261.0  | 253.3  | 246.2  | 242.4  | 240.8  | 237.3  | 236.6  |
| 67.5° | 419.1  | 357.6  | 241.1  | 241.4  | 240.1  | 231.8  | 224.8  | 221.9  | 218.7  | 214.8  | 214.5  |
| 70°   | 217.4  | 221.6  | 215.8  | 219.3  | 217.1  | 207.2  | 200.4  | 196.0  | 189.2  | 185.4  | 185.7  |
| 72.5° | 175.5  | 179.9  | 186.3  | 191.8  | 187.0  | 179.0  | 168.4  | 163.0  | 154.3  | 150.2  | 150.5  |
| 75°   | 133.8  | 138.6  | 144.7  | 150.5  | 146.6  | 136.7  | 130.0  | 124.6  | 114.6  | 109.8  | 110.8  |
| 77.5° | 92.2   | 94.8   | 102.1  | 101.8  | 100.5  | 97.7   | 87.7   | 81.3   | 71.1   | 65.3   | 66.0   |
| 80°   | 57.3   | 58.9   | 62.4   | 64.0   | 63.4   | 59.6   | 51.5   | 46.7   | 40.7   | 37.1   | 37.5   |
| 82.5° | 34.6   | 35.5   | 38.7   | 39.1   | 38.7   | 35.9   | 29.8   | 26.3   | 22.4   | 20.5   | 20.5   |
| 85°   | 17.6   | 18.3   | 20.2   | 20.2   | 18.3   | 15.4   | 13.8   | 12.2   | 9.9    | 9.0    | 9.0    |
| 87.5° | 4.8    | 4.8    | 6.1    | 5.1    | 4.2    | 3.8    | 1.9    | 1.6    | 0.6    | 0.3    | 0.3    |
| 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

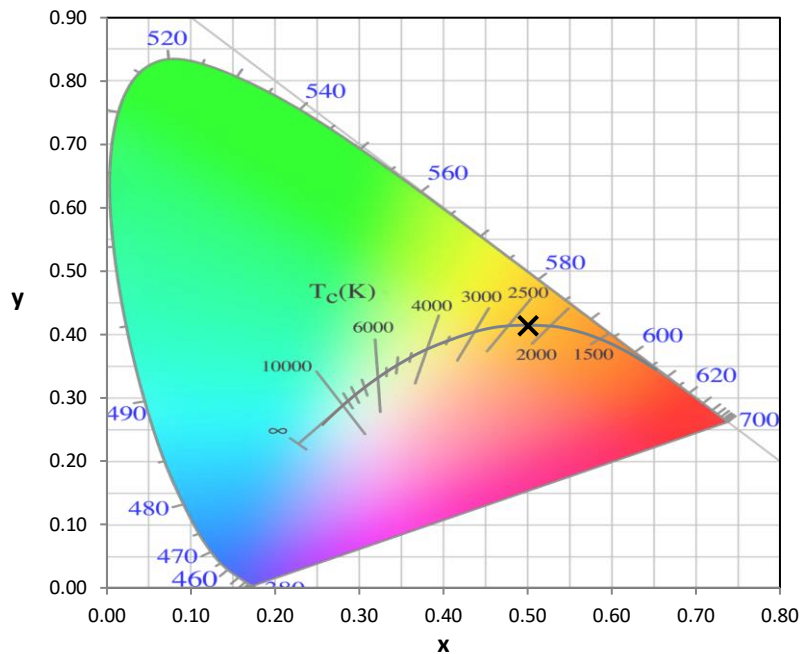
Stabilization Time: 71M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.7/41%  
 Sphere Temperature (°C): 25.6

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

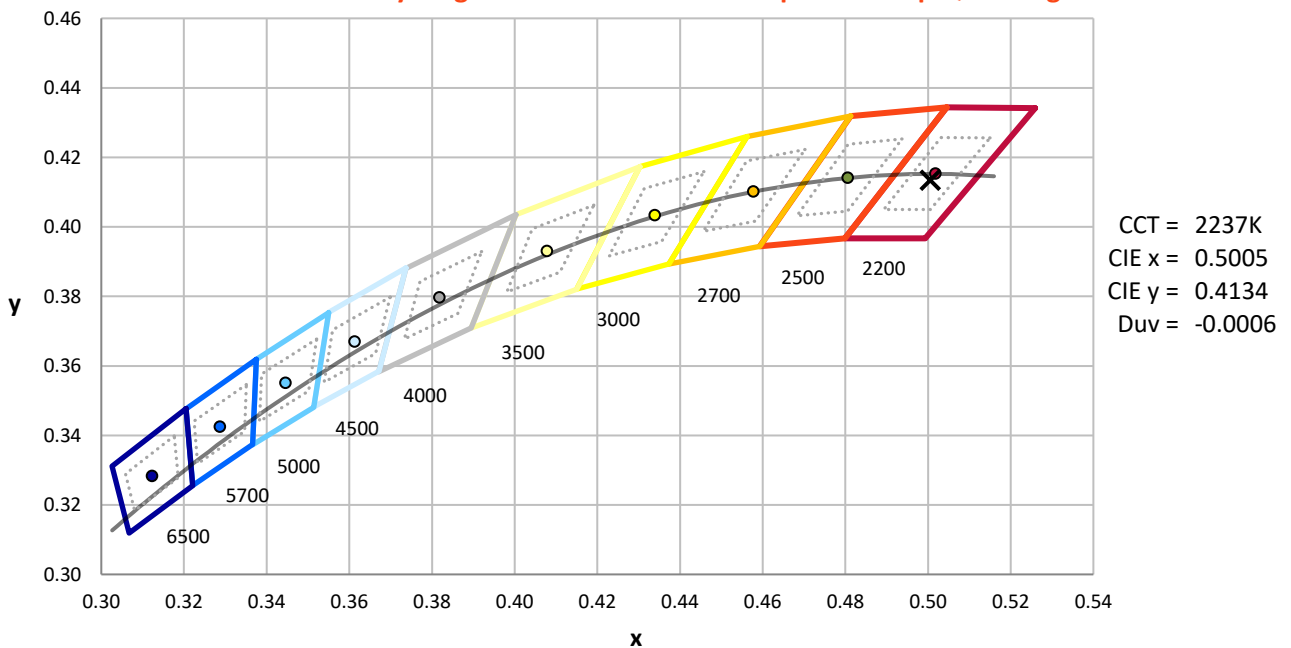
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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            |

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

**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

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

**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               |           |                  |                  |

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

**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               |           |                  |                  |

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

**Melanopic Flux vs. Wavelength**



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

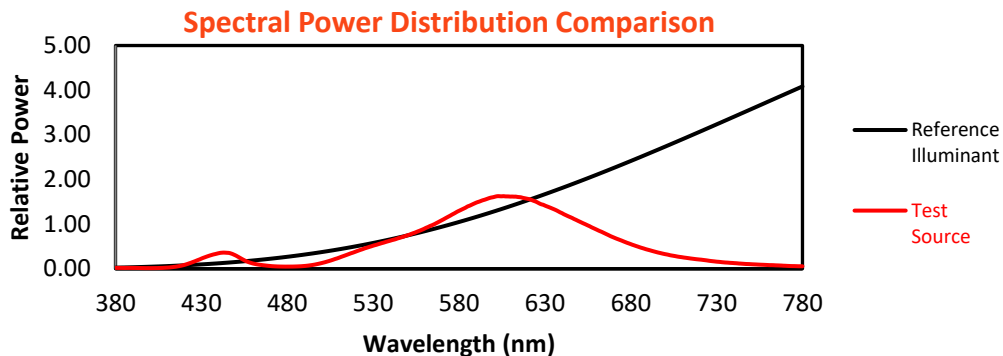
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------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

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

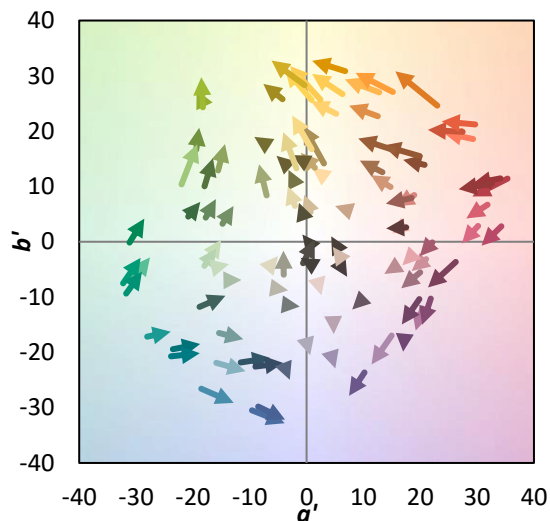
**TM-30-18**

### Summary

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



### Color Vector Graphics

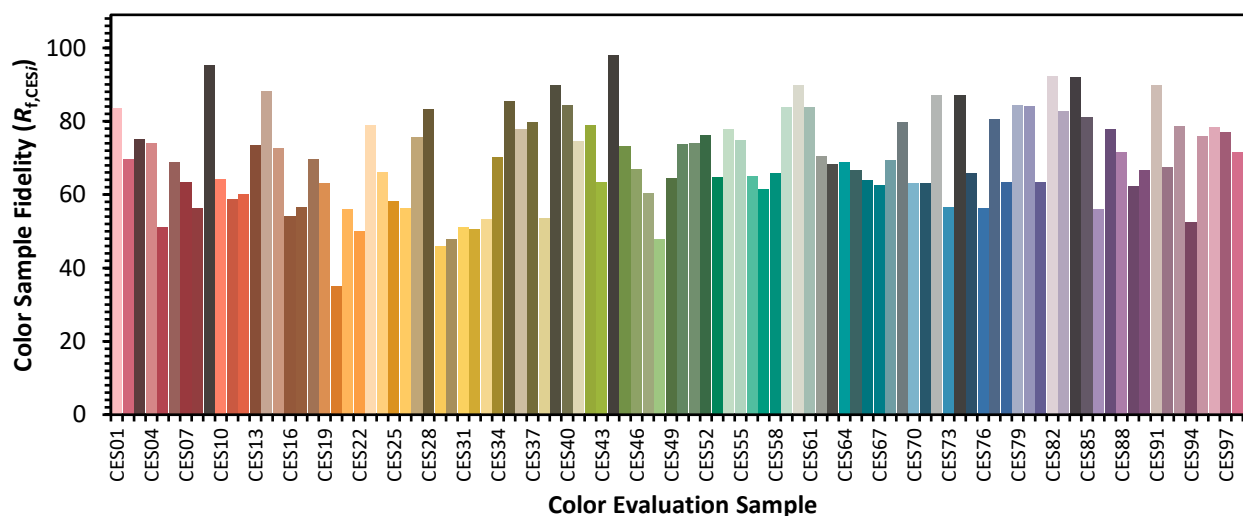


REPORT NUMBER: SP1-1908-441-10-R4

**TM-30-18**

**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 |            |



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

**TM-30-18**

Color Rendition by Hue-Angle Bin



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

**TM-30-18**

**Measure Comparisons**



(END OF REPORT)