

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: P317645

Luminaire Tested: **GLEON-SA1C-722-U-T2R**

Issue Date: 3/3/2020

### Test Information

Test Method: LM-79-08  
Report Number: P317645  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-8)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GLEON-SA1C-722-U-T2R  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(1) 70 CRI, 2200K, 1050mA LIGHTSQUARE WITH 16 LEDS AND TYPE II ROADWAY OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

### Summary

Lumens per Lamp: N/A  
Luminaire Lumens: 5671 lumens  
Efficiency: N/A  
Efficacy: 96.1 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

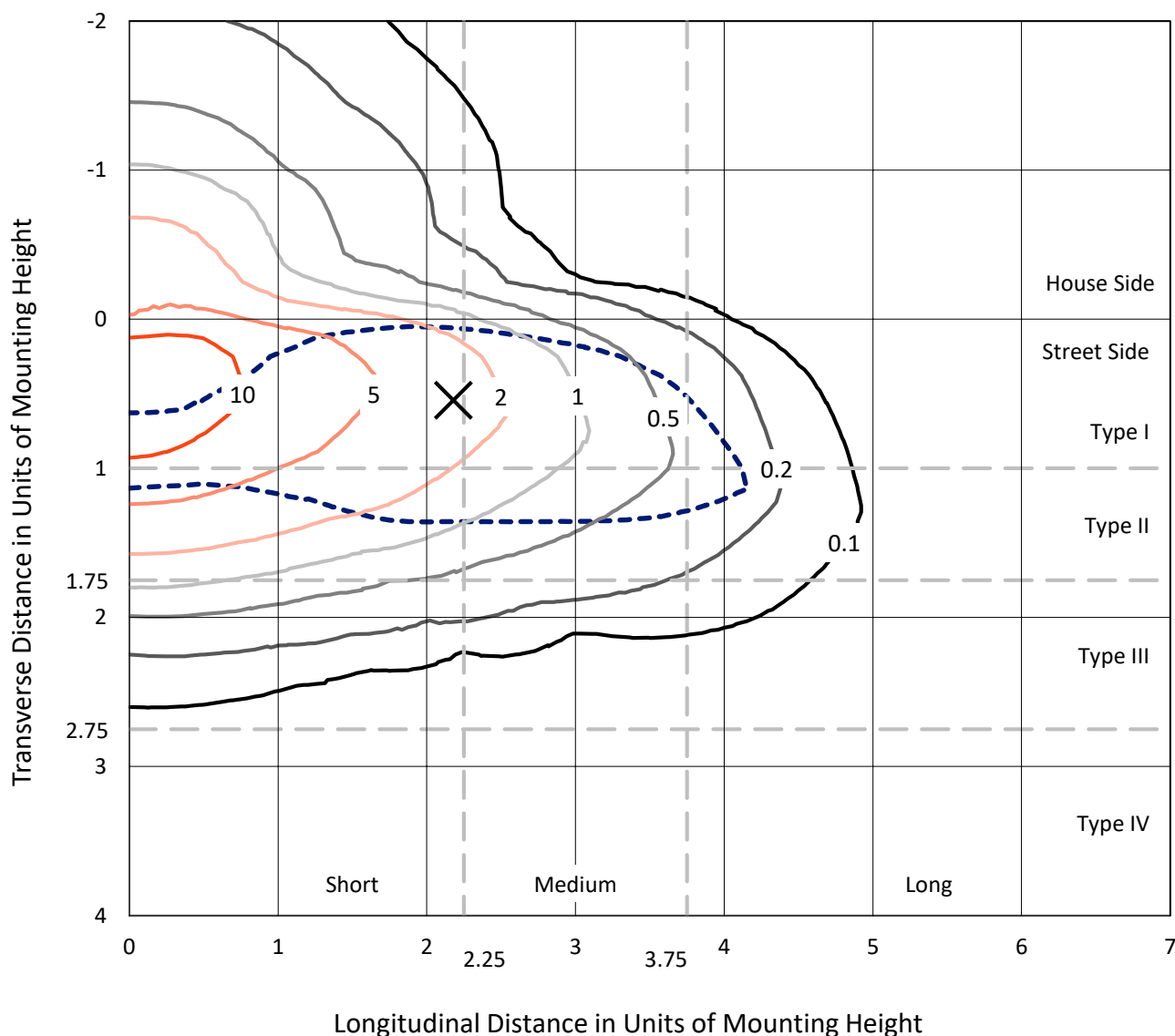
Input Watts (W): 59  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P317645  
 CATALOG NUMBER: GLEON-SA1C-722-U-T2R

## Iso-Footcandle Lines of Horizontal Illumination

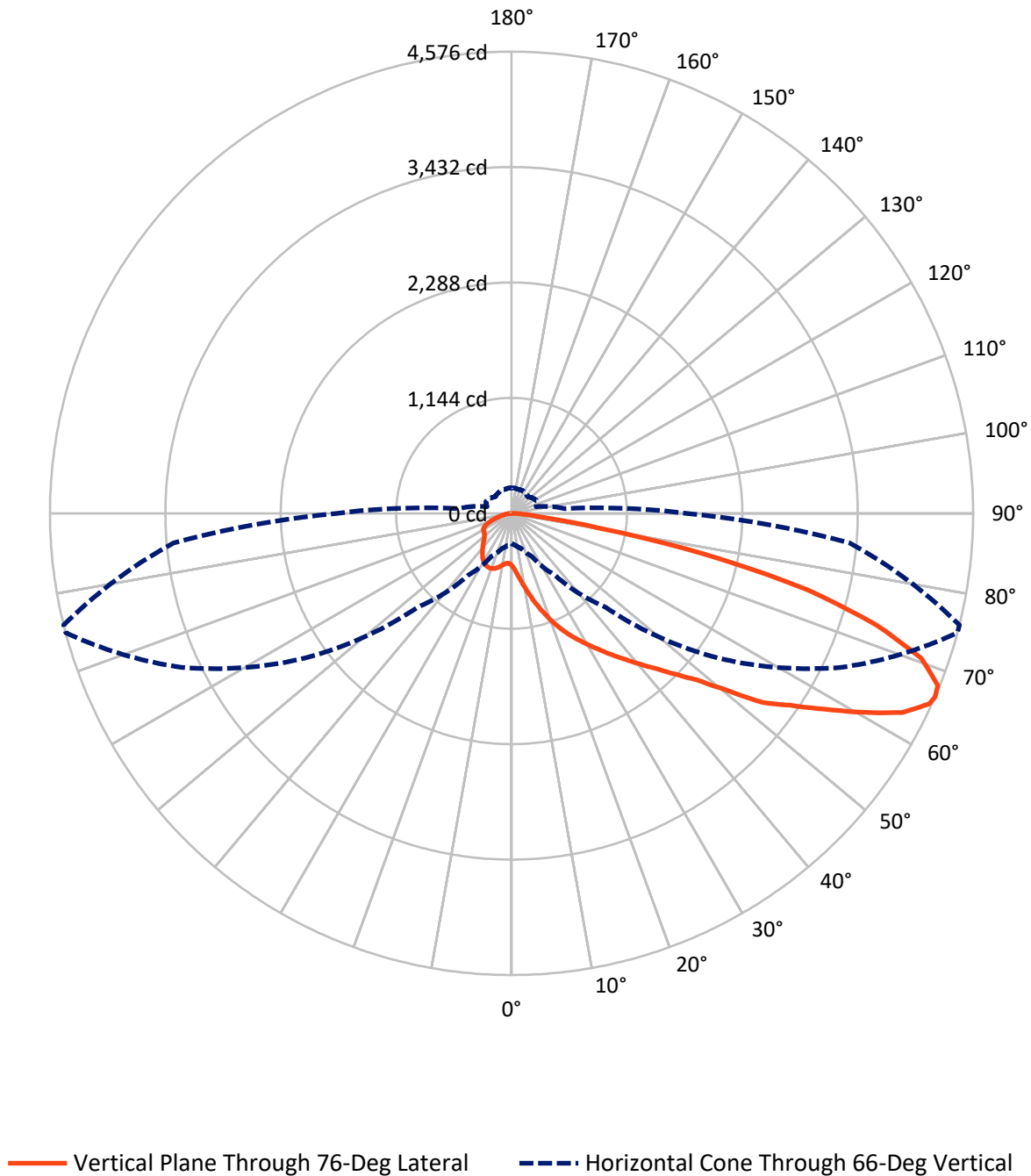
✕ Max cd  
 - - - 1/2 Max cd



Based on 10 foot mounting height. Maximum calculated value = 13.7 fc  
 Type II - Short - N/A

REPORT NUMBER: P317645  
CATALOG NUMBER: GLEON-SA1C-722-U-T2R

## Luminous Intensity Polar Plot



REPORT NUMBER: P317645

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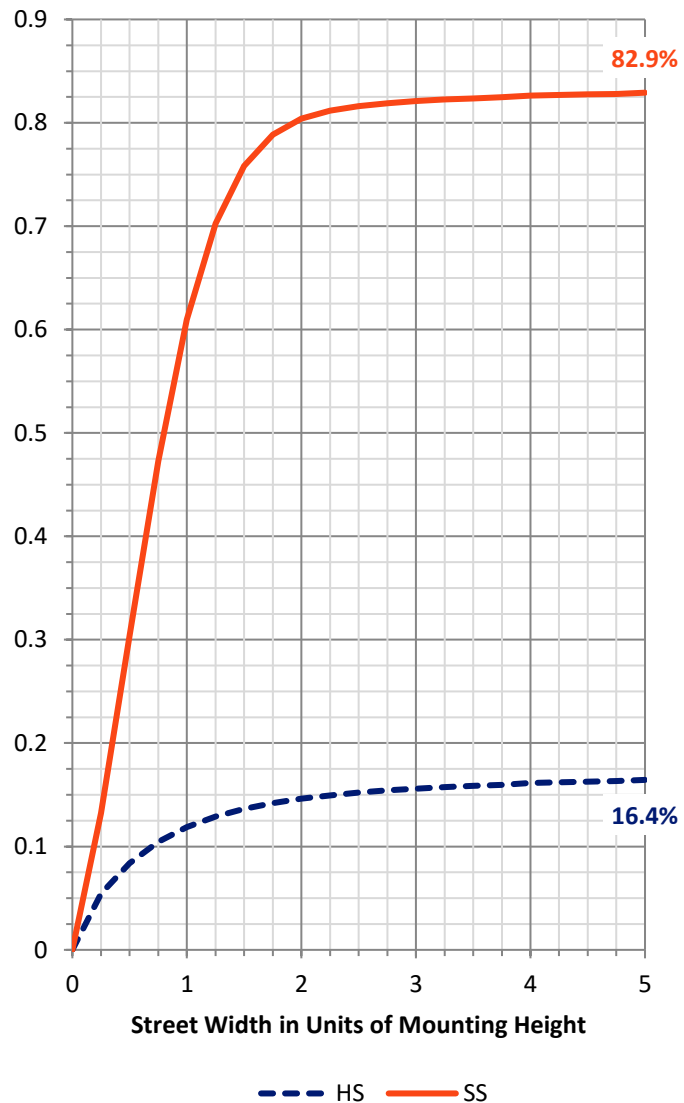
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 954.2    | 0.0    | 954.2  |
|                    | % Fixture | 16.8     | 0.0    | 16.8   |
| <b>Street Side</b> | Lumens    | 4716.8   | 0.0    | 4716.8 |
|                    | % Fixture | 83.2     | 0.0    | 83.2   |
| <b>Total</b>       | Lumens    | 5671.0   | 0.0    | 5671.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 62.6   | 1.1       |
| 10°-20°   | 247.3  | 4.4       |
| 20°-30°   | 480.6  | 8.5       |
| 30°-40°   | 784.4  | 13.8      |
| 40°-50°   | 1071.7 | 18.9      |
| 50°-60°   | 1248.3 | 22.0      |
| 60°-70°   | 1119.1 | 19.7      |
| 70°-80°   | 565.6  | 10.0      |
| 80°-90°   | 91.3   | 1.6       |
| 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°    | 5671.0 | 100.0     |
| 0°-180°   | 5671.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P317645

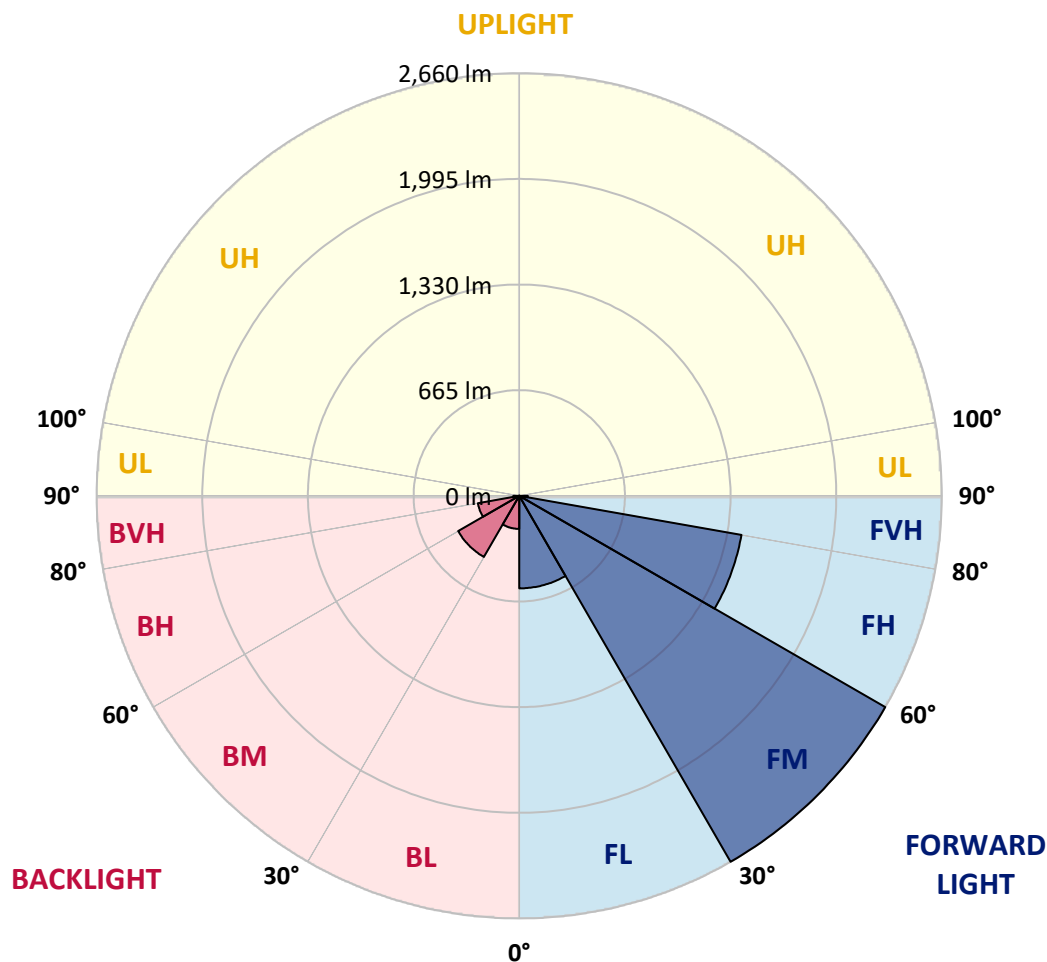
CATALOG NUMBER: GLEON-SA1C-722-U-T2R

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 582.4  | 10.3      |                         |      |         |
| FM   | (30°-60°)   | 2660.1 | 46.9      |                         |      |         |
| FH   | (60°-80°)   | 1420.3 | 25.0      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 53.9   | 1.0       |                         |      | G1/100  |
| BL   | (0°-30°)    | 208.1  | 3.7       | B1/500                  |      |         |
| BM   | (30°-60°)   | 444.3  | 7.8       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 264.4  | 4.7       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 37.4   | 0.7       |                         |      | 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: P317645

CATALOG NUMBER: GLEON-SA1C-722-U-T2R

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 76°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 517.9  | 517.9  | 517.9  | 517.9  | 517.9  | 517.9  | 517.9  | 517.9  | 517.9  | 517.9  | 517.9  |
| 2.5°  | 687.5  | 677.1  | 676.1  | 660.9  | 657.5  | 628.4  | 607.0  | 584.7  | 559.3  | 554.3  | 534.3  |
| 5°    | 883.1  | 882.1  | 868.9  | 844.0  | 824.6  | 774.9  | 725.8  | 673.8  | 616.8  | 607.6  | 562.6  |
| 7.5°  | 1059.1 | 1057.5 | 1047.3 | 1020.6 | 992.5  | 931.4  | 861.4  | 781.6  | 689.2  | 675.6  | 600.9  |
| 10°   | 1192.7 | 1192.1 | 1188.6 | 1169.0 | 1145.1 | 1086.6 | 1009.2 | 900.4  | 773.4  | 754.7  | 648.8  |
| 12.5° | 1295.9 | 1297.0 | 1299.3 | 1292.4 | 1281.1 | 1231.2 | 1151.9 | 1026.3 | 863.1  | 844.6  | 702.1  |
| 15°   | 1365.8 | 1369.2 | 1381.2 | 1391.0 | 1397.0 | 1366.3 | 1289.5 | 1155.1 | 963.6  | 941.4  | 761.2  |
| 17.5° | 1401.0 | 1404.8 | 1425.4 | 1455.1 | 1482.4 | 1479.4 | 1418.3 | 1278.0 | 1060.0 | 1038.7 | 824.8  |
| 20°   | 1431.4 | 1434.3 | 1457.4 | 1493.0 | 1541.3 | 1562.7 | 1528.4 | 1396.2 | 1165.7 | 1140.3 | 892.2  |
| 22.5° | 1519.6 | 1523.3 | 1530.2 | 1550.4 | 1593.1 | 1632.4 | 1615.9 | 1508.0 | 1262.6 | 1238.9 | 956.1  |
| 25°   | 1689.8 | 1694.2 | 1679.2 | 1662.1 | 1670.1 | 1697.5 | 1700.6 | 1610.1 | 1360.8 | 1334.0 | 1024.8 |
| 27.5° | 1894.8 | 1901.2 | 1875.6 | 1831.5 | 1793.0 | 1782.4 | 1778.7 | 1693.6 | 1454.5 | 1423.5 | 1092.8 |
| 30°   | 2095.6 | 2106.6 | 2073.3 | 2016.1 | 1945.5 | 1895.8 | 1859.0 | 1775.5 | 1546.9 | 1517.3 | 1156.9 |
| 32.5° | 2291.8 | 2287.4 | 2239.1 | 2183.2 | 2100.4 | 2038.3 | 1949.3 | 1863.2 | 1650.9 | 1616.8 | 1220.6 |
| 35°   | 2426.2 | 2427.7 | 2382.9 | 2316.6 | 2237.7 | 2190.0 | 2070.2 | 1958.0 | 1757.0 | 1725.6 | 1293.0 |
| 37.5° | 2540.5 | 2533.4 | 2482.6 | 2420.8 | 2352.8 | 2332.4 | 2211.7 | 2062.3 | 1871.9 | 1837.6 | 1370.0 |
| 40°   | 2578.7 | 2570.4 | 2537.1 | 2492.6 | 2438.1 | 2436.4 | 2367.9 | 2180.5 | 2001.9 | 1968.0 | 1456.8 |
| 42.5° | 2555.6 | 2545.0 | 2531.3 | 2519.2 | 2502.4 | 2510.1 | 2514.6 | 2319.1 | 2144.7 | 2106.8 | 1557.3 |
| 45°   | 2470.3 | 2454.3 | 2463.9 | 2490.3 | 2526.7 | 2570.2 | 2647.0 | 2472.6 | 2304.7 | 2272.9 | 1675.3 |
| 47.5° | 2339.2 | 2324.7 | 2354.8 | 2411.2 | 2510.1 | 2620.3 | 2772.3 | 2642.0 | 2495.7 | 2464.1 | 1843.4 |
| 50°   | 2154.7 | 2159.0 | 2201.9 | 2304.5 | 2454.1 | 2643.4 | 2926.8 | 2866.3 | 2773.3 | 2743.9 | 2072.7 |
| 52.5° | 1852.1 | 1852.9 | 1973.8 | 2142.2 | 2354.8 | 2631.4 | 3012.4 | 3153.0 | 3152.4 | 3116.8 | 2291.0 |
| 55°   | 1571.0 | 1588.1 | 1683.8 | 1907.7 | 2193.8 | 2583.7 | 3072.3 | 3292.4 | 3401.3 | 3359.5 | 2494.5 |
| 57.5° | 1296.5 | 1306.5 | 1397.1 | 1622.0 | 1964.1 | 2456.4 | 3133.7 | 3459.7 | 3688.2 | 3661.8 | 2747.5 |
| 60°   | 984.2  | 999.6  | 1093.3 | 1301.1 | 1670.3 | 2230.6 | 3139.5 | 3634.3 | 4031.1 | 4004.5 | 3029.9 |
| 62.5° | 638.8  | 665.4  | 753.2  | 947.8  | 1314.9 | 1905.8 | 3005.5 | 3748.4 | 4356.1 | 4346.6 | 3280.6 |
| 65°   | 367.1  | 387.2  | 448.2  | 598.4  | 907.2  | 1498.0 | 2686.9 | 3704.6 | 4556.1 | 4550.7 | 3374.4 |
| 66°   | 300.0  | 312.5  | 359.3  | 467.6  | 748.5  | 1315.5 | 2501.7 | 3611.9 | 4575.9 | 4576.1 | 3363.6 |
| 67.5° | 239.9  | 245.5  | 266.5  | 334.8  | 552.4  | 1042.7 | 2170.7 | 3407.7 | 4551.3 | 4558.0 | 3294.1 |
| 70°   | 198.5  | 201.4  | 207.9  | 224.5  | 301.5  | 628.8  | 1540.8 | 2876.9 | 4303.9 | 4309.1 | 3022.8 |
| 72.5° | 178.1  | 179.8  | 182.3  | 184.6  | 212.7  | 351.4  | 941.1  | 2301.4 | 3773.5 | 3780.2 | 2609.5 |
| 75°   | 161.3  | 162.3  | 161.9  | 162.1  | 178.5  | 223.9  | 486.3  | 1718.3 | 3051.1 | 3037.6 | 1999.0 |
| 77.5° | 141.7  | 142.7  | 140.7  | 141.1  | 157.9  | 172.1  | 242.0  | 1202.9 | 2059.0 | 1963.9 | 1126.3 |
| 80°   | 119.8  | 120.5  | 119.8  | 121.1  | 137.5  | 130.0  | 140.7  | 676.7  | 910.4  | 861.2  | 400.5  |
| 82.5° | 90.5   | 93.8   | 96.1   | 101.5  | 113.2  | 92.4   | 94.1   | 263.6  | 277.2  | 264.0  | 122.8  |
| 85°   | 39.7   | 48.3   | 72.4   | 77.6   | 85.1   | 55.4   | 61.8   | 107.4  | 112.8  | 109.4  | 44.7   |
| 87.5° | 10.4   | 11.4   | 35.8   | 45.1   | 47.2   | 25.0   | 32.2   | 48.9   | 51.6   | 48.9   | 14.8   |
| 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: P317645

CATALOG NUMBER: GLEON-SA1C-722-U-T2R

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 517.9  | 517.9 | 517.9 | 517.9 | 517.9 | 517.9 | 517.9 | 517.9 | 517.9 | 517.9 | 517.9 |
| 2.5°  | 523.7  | 514.2 | 497.3 | 482.3 | 470.9 | 463.2 | 455.5 | 451.7 | 449.4 | 447.0 | 447.4 |
| 5°    | 540.4  | 521.4 | 492.3 | 471.7 | 460.1 | 452.8 | 449.0 | 447.4 | 446.5 | 444.2 | 444.2 |
| 7.5°  | 565.6  | 538.7 | 498.6 | 477.5 | 468.4 | 462.8 | 460.5 | 459.7 | 458.6 | 455.9 | 456.3 |
| 10°   | 597.4  | 559.7 | 511.9 | 491.3 | 483.0 | 476.9 | 473.6 | 472.5 | 470.3 | 467.3 | 467.6 |
| 12.5° | 634.8  | 585.7 | 529.4 | 507.9 | 497.9 | 489.6 | 484.2 | 480.9 | 477.3 | 473.2 | 473.4 |
| 15°   | 675.6  | 614.0 | 548.3 | 522.7 | 509.0 | 497.5 | 488.8 | 483.2 | 477.5 | 472.5 | 472.3 |
| 17.5° | 717.0  | 641.3 | 562.7 | 530.8 | 512.3 | 497.1 | 485.4 | 476.7 | 469.6 | 463.4 | 462.8 |
| 20°   | 761.6  | 665.9 | 570.8 | 530.0 | 506.1 | 488.0 | 472.5 | 461.7 | 453.8 | 447.6 | 446.7 |
| 22.5° | 807.1  | 689.0 | 572.2 | 522.1 | 492.5 | 470.3 | 454.0 | 442.0 | 433.9 | 427.6 | 425.3 |
| 25°   | 848.6  | 706.9 | 566.6 | 506.9 | 473.4 | 449.5 | 433.6 | 421.4 | 414.9 | 407.4 | 405.1 |
| 27.5° | 886.6  | 719.5 | 555.4 | 487.5 | 452.0 | 428.6 | 413.5 | 403.1 | 396.0 | 390.2 | 388.3 |
| 30°   | 920.7  | 726.2 | 537.1 | 464.4 | 430.1 | 408.7 | 396.0 | 388.9 | 382.7 | 375.4 | 374.1 |
| 32.5° | 953.0  | 726.2 | 513.7 | 439.1 | 408.3 | 391.2 | 383.7 | 379.3 | 372.3 | 365.2 | 363.3 |
| 35°   | 985.3  | 721.8 | 485.9 | 412.8 | 388.3 | 378.7 | 378.3 | 373.1 | 362.5 | 352.9 | 350.4 |
| 37.5° | 1019.4 | 712.7 | 454.7 | 388.1 | 372.0 | 373.1 | 376.4 | 364.8 | 349.8 | 336.1 | 332.5 |
| 40°   | 1057.9 | 700.2 | 422.4 | 366.8 | 358.3 | 370.6 | 371.2 | 352.9 | 323.6 | 311.1 | 307.8 |
| 42.5° | 1103.2 | 687.7 | 392.4 | 347.9 | 347.5 | 363.1 | 361.4 | 327.1 | 309.6 | 303.2 | 301.5 |
| 45°   | 1162.7 | 680.6 | 363.9 | 330.0 | 339.0 | 351.0 | 344.6 | 312.9 | 305.5 | 301.9 | 300.3 |
| 47.5° | 1256.4 | 684.2 | 337.7 | 315.7 | 330.6 | 338.8 | 313.4 | 307.1 | 301.9 | 297.4 | 295.9 |
| 50°   | 1373.9 | 682.1 | 316.5 | 305.9 | 320.9 | 326.1 | 299.4 | 299.6 | 296.9 | 291.9 | 289.6 |
| 52.5° | 1462.2 | 665.6 | 302.8 | 300.3 | 312.5 | 303.6 | 290.5 | 292.3 | 290.9 | 283.6 | 281.1 |
| 55°   | 1547.5 | 651.3 | 295.9 | 298.2 | 306.3 | 275.5 | 280.1 | 284.4 | 283.0 | 275.9 | 274.7 |
| 57.5° | 1653.6 | 648.6 | 291.7 | 298.8 | 301.1 | 261.4 | 270.1 | 275.7 | 274.7 | 271.7 | 271.1 |
| 60°   | 1783.5 | 649.4 | 287.8 | 299.8 | 295.3 | 251.1 | 260.7 | 267.8 | 268.4 | 267.8 | 267.4 |
| 62.5° | 1855.0 | 628.4 | 278.2 | 297.1 | 285.1 | 242.0 | 250.9 | 261.3 | 261.4 | 262.6 | 262.4 |
| 65°   | 1794.3 | 565.6 | 260.3 | 287.6 | 268.0 | 234.5 | 242.4 | 253.7 | 250.9 | 256.1 | 256.1 |
| 66°   | 1735.4 | 529.4 | 251.4 | 281.5 | 260.7 | 231.6 | 239.7 | 249.9 | 246.2 | 253.4 | 253.4 |
| 67.5° | 1615.1 | 468.4 | 235.5 | 268.4 | 250.3 | 227.6 | 236.6 | 243.5 | 238.5 | 249.1 | 248.4 |
| 70°   | 1395.2 | 362.3 | 203.3 | 238.7 | 233.1 | 221.6 | 232.4 | 230.8 | 223.5 | 239.7 | 236.6 |
| 72.5° | 1176.3 | 275.3 | 163.3 | 199.8 | 207.2 | 214.1 | 226.4 | 214.7 | 205.4 | 216.8 | 210.0 |
| 75°   | 912.8  | 207.0 | 129.0 | 155.4 | 175.0 | 202.3 | 219.3 | 196.0 | 182.7 | 181.6 | 177.9 |
| 77.5° | 493.4  | 142.1 | 102.2 | 118.6 | 139.0 | 187.7 | 214.5 | 176.0 | 155.9 | 151.3 | 148.4 |
| 80°   | 195.4  | 92.4  | 74.3  | 89.9  | 97.2  | 166.5 | 202.9 | 152.7 | 128.6 | 124.0 | 119.6 |
| 82.5° | 80.7   | 54.7  | 47.9  | 60.3  | 63.3  | 142.5 | 182.1 | 125.1 | 99.3  | 137.5 | 145.9 |
| 85°   | 34.7   | 30.0  | 28.5  | 31.2  | 35.8  | 99.9  | 145.0 | 95.5  | 107.2 | 95.7  | 76.0  |
| 87.5° | 10.4   | 12.7  | 12.1  | 11.9  | 13.1  | 23.9  | 77.2  | 53.1  | 78.7  | 29.8  | 22.3  |
| 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**

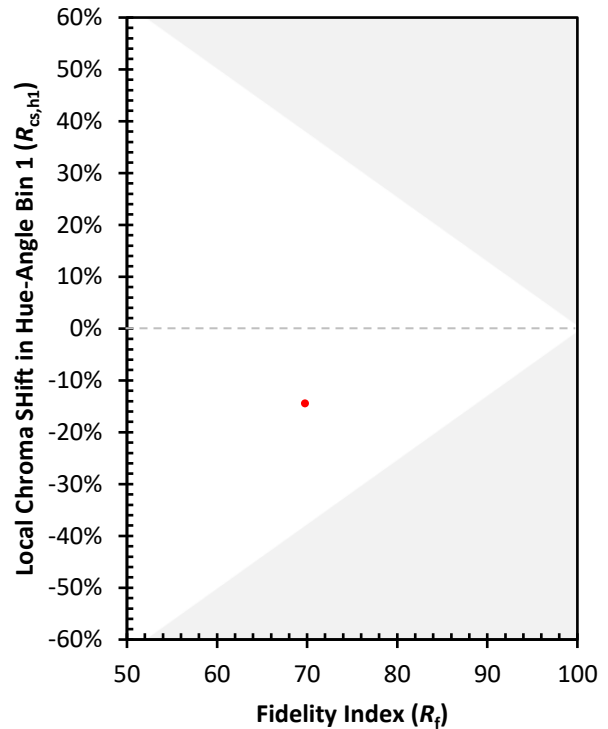
Color Rendition by Hue-Angle Bin



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

**TM-30-18**

**Measure Comparisons**



(END OF REPORT)