

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: P318905

Luminaire Tested: **GLEON-SA1A-722-U-T4FT**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P318905  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-16)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA1A-722-U-T4FT  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(1) 70 CRI, 2200K, 615mA LIGHTSQUARE WITH 16 LEDS AND TYPE IV FORWARD  
THROW OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 3609 lumens  
Efficiency: N/A  
Efficacy: 106.1 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B1 - U0 - G2

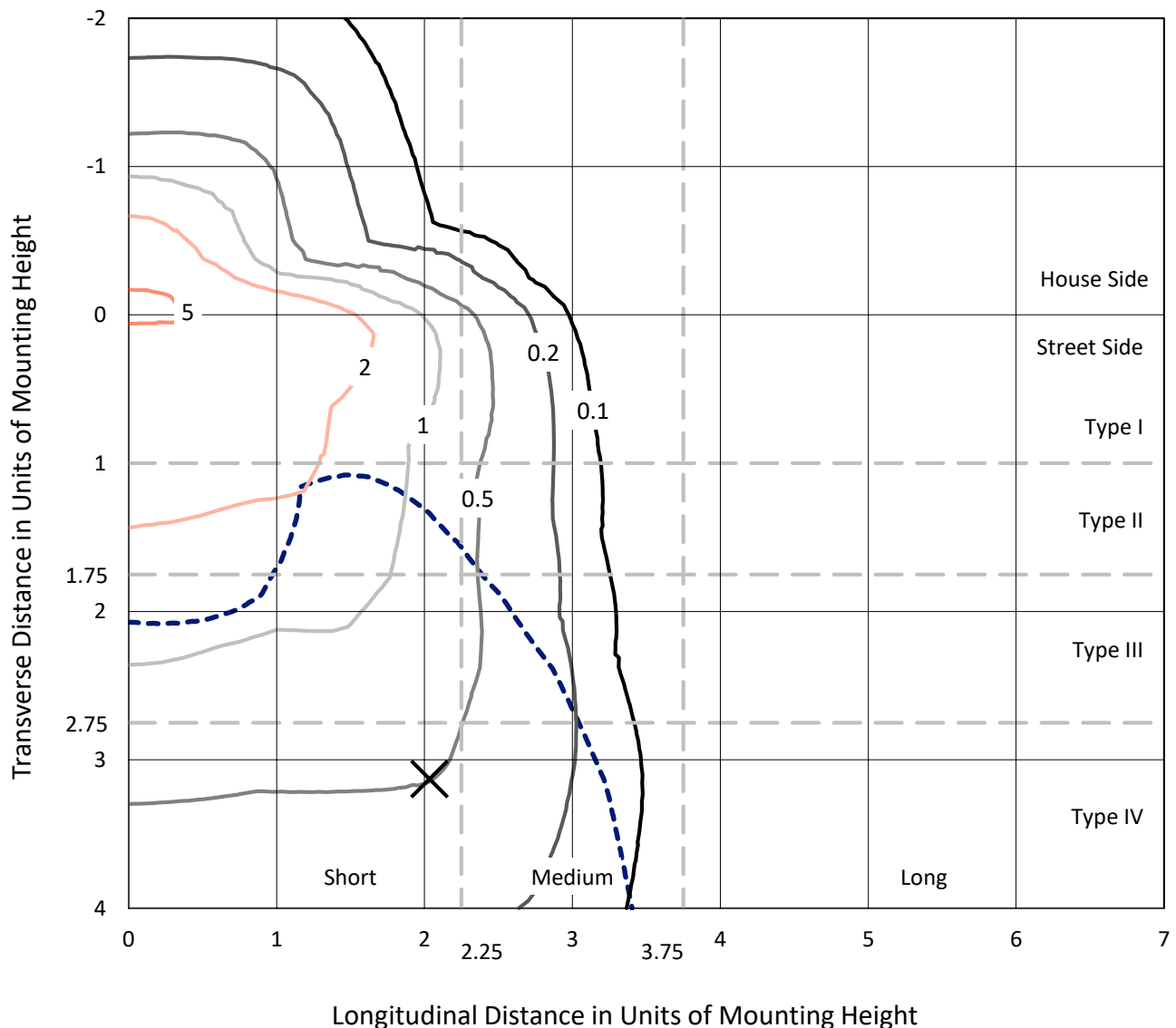
Input Watts (W): 34  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

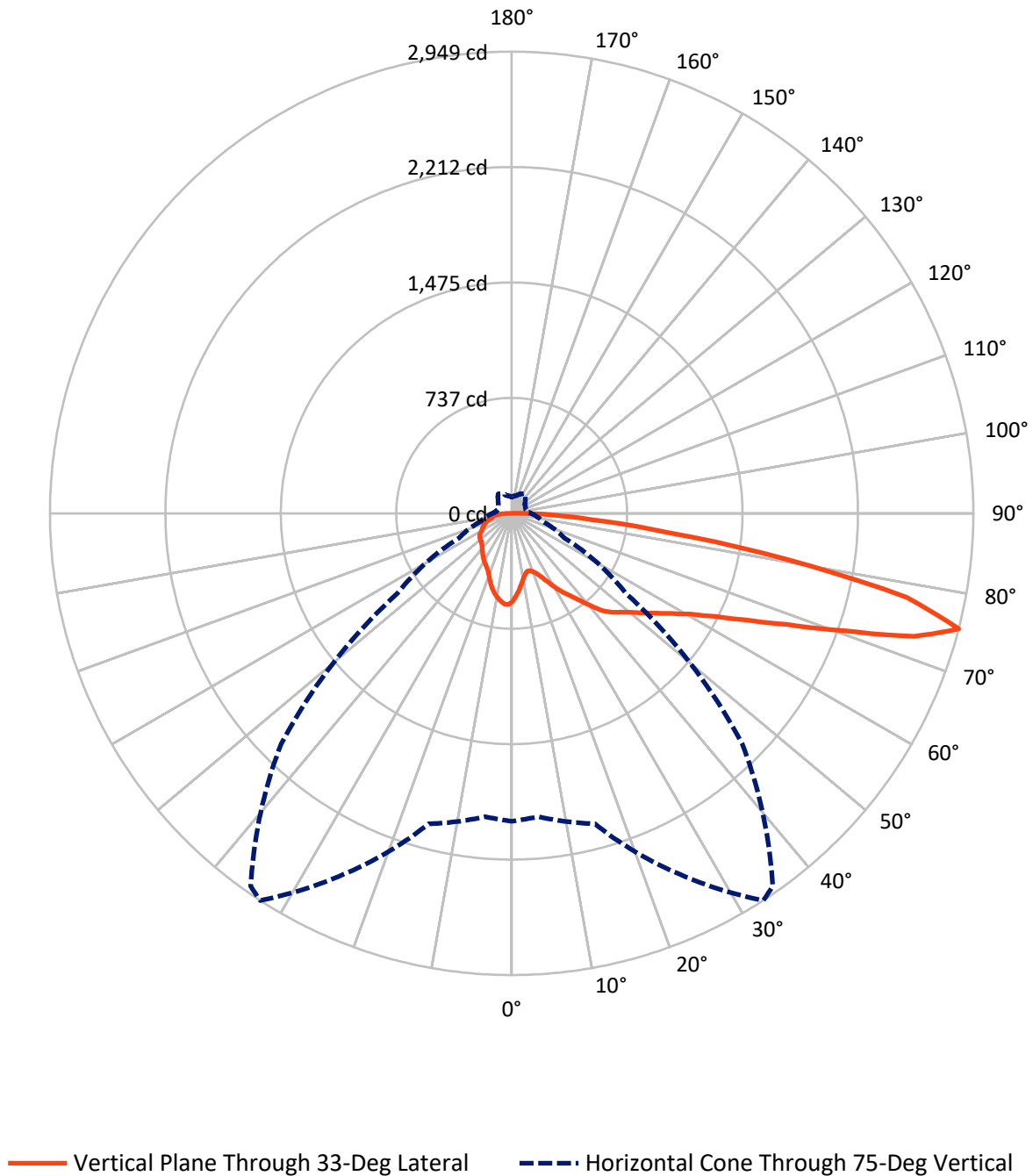
× Max cd  
 - - - 1/2 Max cd



Based on 10 foot mounting height. Maximum calculated value = 5.6 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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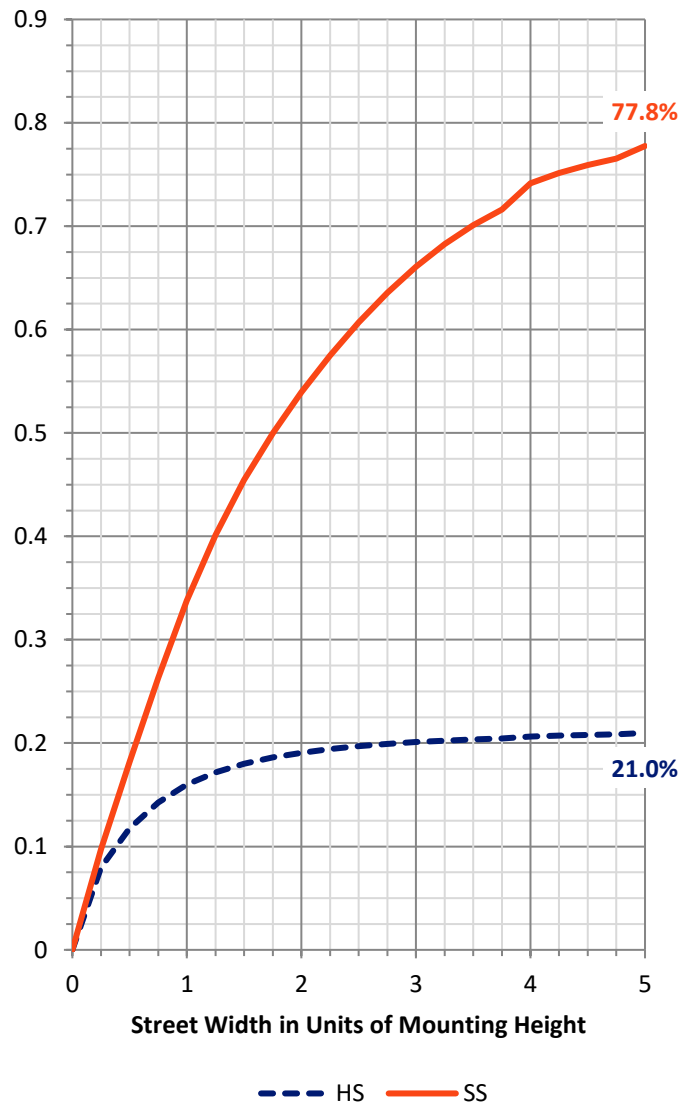
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 774.9    | 0.0    | 774.9  |
|                    | % Fixture | 21.5     | 0.0    | 21.5   |
| <b>Street Side</b> | Lumens    | 2834.1   | 0.0    | 2834.1 |
|                    | % Fixture | 78.5     | 0.0    | 78.5   |
| <b>Total</b>       | Lumens    | 3609.0   | 0.0    | 3609.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 51.0   | 1.4       |
| 10°-20°   | 138.2  | 3.8       |
| 20°-30°   | 225.7  | 6.3       |
| 30°-40°   | 336.1  | 9.3       |
| 40°-50°   | 482.0  | 13.4      |
| 50°-60°   | 661.7  | 18.3      |
| 60°-70°   | 828.4  | 23.0      |
| 70°-80°   | 749.4  | 20.8      |
| 80°-90°   | 136.5  | 3.8       |
| 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°    | 3609.0 | 100.0     |
| 0°-180°   | 3609.0 | 100.0     |

**Coefficient of Utilization**



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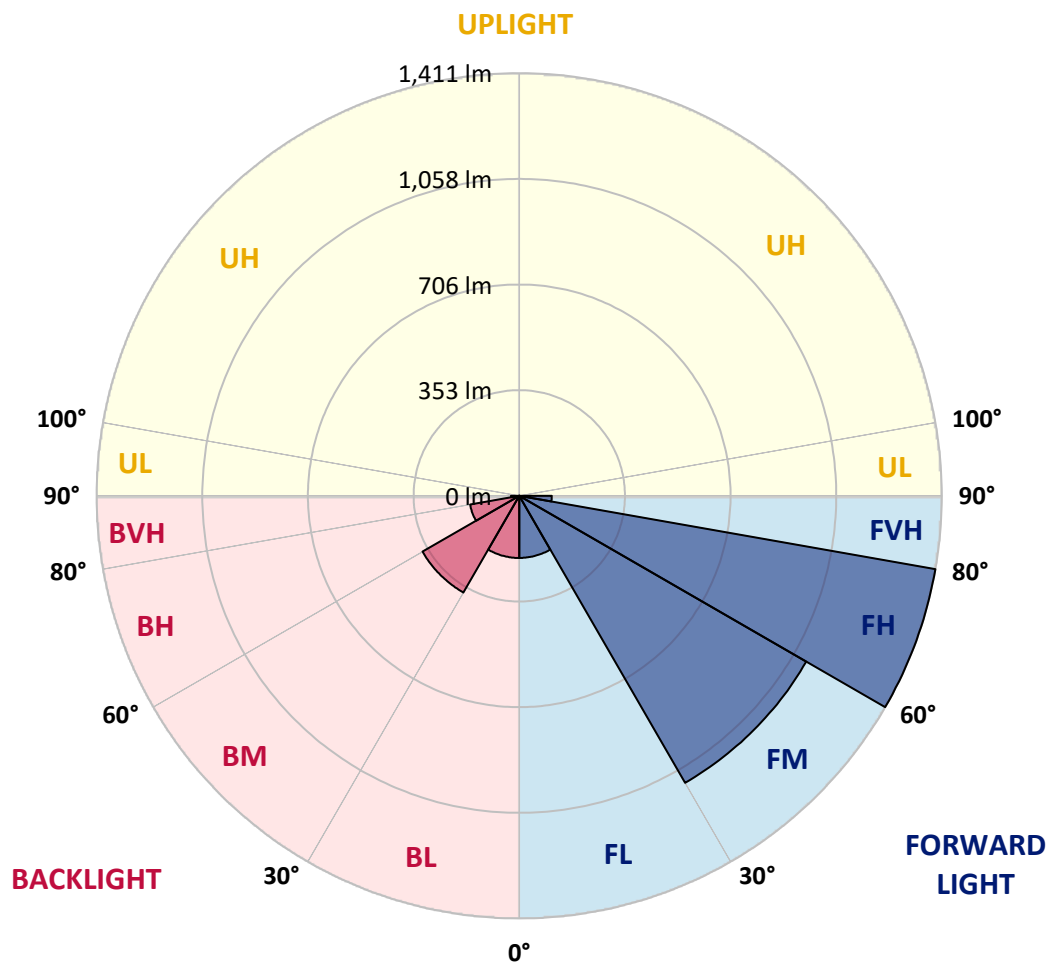
CATALOG NUMBER: GLEON-SA1A-722-U-T4FT

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 207.3  | 5.7       |                         |      |         |
| FM   | (30°-60°)   | 1106.8 | 30.7      |                         |      |         |
| FH   | (60°-80°)   | 1411.2 | 39.1      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 108.7  | 3.0       |                         |      | G2/225  |
| BL   | (0°-30°)    | 207.6  | 5.8       | B1/500                  |      |         |
| BM   | (30°-60°)   | 373.0  | 10.3      | B1/1000                 |      |         |
| BH   | (60°-80°)   | 166.6  | 4.6       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 27.8   | 0.8       |                         |      | 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 IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 33°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 564.1  | 564.1  | 564.1  | 564.1  | 564.1  | 564.1  | 564.1  | 564.1  | 564.1  | 564.1  | 564.1  |
| 2.5°  | 523.8  | 521.8  | 525.6  | 526.1  | 529.3  | 530.6  | 535.1  | 542.0  | 547.8  | 554.4  | 560.4  |
| 5°    | 476.3  | 475.0  | 480.2  | 483.9  | 491.1  | 494.0  | 504.6  | 519.5  | 532.7  | 547.7  | 561.2  |
| 7.5°  | 431.2  | 430.5  | 436.3  | 444.8  | 453.0  | 457.1  | 475.5  | 497.0  | 519.1  | 543.3  | 564.1  |
| 10°   | 393.2  | 392.9  | 398.6  | 406.9  | 419.0  | 423.6  | 447.3  | 475.7  | 506.6  | 539.9  | 569.0  |
| 12.5° | 371.9  | 372.7  | 375.4  | 382.3  | 393.6  | 398.2  | 424.5  | 457.9  | 496.2  | 538.8  | 576.1  |
| 15°   | 377.1  | 378.5  | 374.0  | 373.7  | 381.7  | 385.3  | 410.0  | 445.2  | 488.7  | 540.7  | 586.4  |
| 17.5° | 399.4  | 399.7  | 387.8  | 380.4  | 385.2  | 387.1  | 405.5  | 437.9  | 484.3  | 544.9  | 599.4  |
| 20°   | 430.8  | 430.2  | 409.3  | 396.8  | 399.4  | 399.9  | 411.9  | 438.1  | 483.9  | 552.3  | 616.2  |
| 22.5° | 472.5  | 467.9  | 439.7  | 422.7  | 422.1  | 421.4  | 428.2  | 447.3  | 489.4  | 564.2  | 636.3  |
| 25°   | 526.8  | 522.5  | 483.7  | 460.5  | 455.5  | 453.7  | 454.7  | 467.0  | 500.3  | 577.1  | 658.7  |
| 27.5° | 587.3  | 579.7  | 542.3  | 509.5  | 499.2  | 496.5  | 490.6  | 494.8  | 512.1  | 589.4  | 685.4  |
| 30°   | 637.9  | 633.8  | 601.1  | 562.2  | 550.0  | 546.3  | 530.6  | 526.0  | 529.2  | 606.2  | 719.1  |
| 32.5° | 666.2  | 663.5  | 643.6  | 612.2  | 600.9  | 595.6  | 573.5  | 564.2  | 556.6  | 632.8  | 764.7  |
| 35°   | 700.5  | 698.7  | 686.8  | 664.0  | 647.1  | 641.6  | 624.4  | 614.8  | 595.3  | 669.3  | 823.7  |
| 37.5° | 744.1  | 742.3  | 742.5  | 724.1  | 704.0  | 698.9  | 687.5  | 677.4  | 645.4  | 717.3  | 887.7  |
| 40°   | 793.5  | 789.9  | 788.5  | 787.6  | 774.9  | 772.0  | 766.1  | 752.4  | 708.2  | 774.7  | 950.9  |
| 42.5° | 867.8  | 854.9  | 827.5  | 837.9  | 850.5  | 849.0  | 853.8  | 834.1  | 778.0  | 842.5  | 1012.6 |
| 45°   | 939.5  | 918.4  | 871.0  | 873.3  | 900.8  | 909.2  | 945.6  | 931.6  | 853.7  | 916.8  | 1076.5 |
| 47.5° | 972.1  | 956.2  | 915.9  | 916.0  | 943.3  | 960.7  | 1040.5 | 1030.5 | 933.2  | 1001.2 | 1154.4 |
| 50°   | 1008.7 | 992.7  | 956.6  | 970.1  | 994.0  | 1012.4 | 1132.1 | 1127.0 | 1008.9 | 1093.6 | 1247.8 |
| 52.5° | 1048.6 | 1021.5 | 998.6  | 1022.9 | 1056.3 | 1077.7 | 1223.8 | 1209.9 | 1078.3 | 1186.6 | 1355.1 |
| 55°   | 1049.1 | 1041.7 | 1059.1 | 1077.0 | 1127.0 | 1153.3 | 1319.9 | 1283.0 | 1134.9 | 1277.9 | 1442.5 |
| 57.5° | 1108.8 | 1096.8 | 1133.8 | 1142.1 | 1207.4 | 1237.0 | 1415.6 | 1346.8 | 1192.5 | 1348.0 | 1489.6 |
| 60°   | 1187.8 | 1177.6 | 1207.9 | 1229.6 | 1306.9 | 1346.5 | 1517.7 | 1412.2 | 1237.8 | 1400.9 | 1487.4 |
| 62.5° | 1324.3 | 1312.7 | 1312.3 | 1342.8 | 1446.9 | 1493.0 | 1632.2 | 1476.4 | 1255.7 | 1411.3 | 1423.9 |
| 65°   | 1524.1 | 1505.7 | 1470.9 | 1485.4 | 1640.2 | 1686.2 | 1760.3 | 1522.9 | 1232.1 | 1355.2 | 1260.5 |
| 67.5° | 1718.6 | 1718.0 | 1675.2 | 1704.9 | 1895.5 | 1932.4 | 1906.1 | 1527.5 | 1158.1 | 1159.9 | 970.5  |
| 70°   | 1912.5 | 1915.0 | 1907.7 | 2011.0 | 2240.5 | 2278.9 | 2061.5 | 1465.6 | 992.0  | 837.6  | 581.4  |
| 72.5° | 2066.1 | 2065.4 | 2101.8 | 2368.0 | 2688.1 | 2679.5 | 2192.4 | 1277.8 | 712.2  | 452.2  | 277.9  |
| 75°   | 1966.6 | 1944.9 | 2053.3 | 2544.8 | 2949.1 | 2907.1 | 2081.0 | 891.4  | 369.6  | 205.8  | 149.6  |
| 77.5° | 1282.7 | 1303.2 | 1462.4 | 2102.2 | 2579.6 | 2528.4 | 1526.8 | 415.9  | 174.2  | 135.0  | 108.5  |
| 80°   | 464.5  | 486.2  | 684.8  | 1190.8 | 1777.2 | 1768.9 | 751.9  | 170.9  | 117.8  | 102.0  | 79.0   |
| 82.5° | 159.8  | 167.8  | 270.1  | 528.8  | 1003.4 | 1040.8 | 282.9  | 97.1   | 85.6   | 72.3   | 54.1   |
| 85°   | 62.7   | 71.8   | 123.5  | 254.4  | 506.1  | 509.9  | 114.6  | 58.1   | 59.6   | 47.4   | 29.7   |
| 87.5° | 23.8   | 28.9   | 59.1   | 118.2  | 231.1  | 212.3  | 41.0   | 27.7   | 33.9   | 28.2   | 14.1   |
| 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: GLEON-SA1A-722-U-T4FT

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 564.1  | 564.1 | 564.1 | 564.1 | 564.1 | 564.1 | 564.1 | 564.1 | 564.1 | 564.1 | 564.1 |
| 2.5°  | 565.0  | 567.6 | 573.1 | 576.8 | 580.8 | 581.9 | 582.4 | 583.4 | 584.4 | 584.1 | 584.2 |
| 5°    | 568.5  | 573.6 | 582.4 | 586.2 | 587.9 | 585.9 | 582.1 | 578.9 | 576.7 | 575.5 | 575.1 |
| 7.5°  | 574.2  | 581.4 | 590.9 | 590.3 | 586.3 | 577.4 | 567.5 | 560.0 | 553.8 | 551.5 | 550.3 |
| 10°   | 581.8  | 590.3 | 596.9 | 589.8 | 578.2 | 562.9 | 547.9 | 536.3 | 527.0 | 523.3 | 522.7 |
| 12.5° | 591.5  | 600.1 | 601.4 | 586.3 | 567.1 | 546.2 | 525.8 | 510.5 | 496.5 | 492.1 | 491.1 |
| 15°   | 604.1  | 612.2 | 604.5 | 580.2 | 553.4 | 525.2 | 498.9 | 478.1 | 463.4 | 457.9 | 455.9 |
| 17.5° | 617.3  | 625.1 | 605.1 | 570.1 | 535.4 | 500.4 | 467.4 | 446.0 | 429.2 | 422.9 | 422.1 |
| 20°   | 633.2  | 636.7 | 602.5 | 555.6 | 510.8 | 468.2 | 433.5 | 413.4 | 404.4 | 399.9 | 399.4 |
| 22.5° | 652.7  | 649.0 | 596.5 | 536.1 | 479.5 | 431.1 | 402.8 | 393.4 | 391.2 | 390.2 | 390.6 |
| 25°   | 673.4  | 662.0 | 587.7 | 510.5 | 439.9 | 393.9 | 380.4 | 383.0 | 386.0 | 385.6 | 385.6 |
| 27.5° | 696.3  | 675.2 | 574.1 | 476.6 | 396.2 | 363.5 | 365.1 | 374.7 | 379.2 | 379.1 | 379.0 |
| 30°   | 725.5  | 690.1 | 556.8 | 435.8 | 355.3 | 342.1 | 351.9 | 363.6 | 369.8 | 369.5 | 369.6 |
| 32.5° | 761.6  | 706.6 | 533.2 | 390.3 | 325.7 | 326.2 | 337.6 | 349.2 | 356.3 | 355.7 | 355.8 |
| 35°   | 803.7  | 725.0 | 501.3 | 345.4 | 306.2 | 313.7 | 322.6 | 330.7 | 337.5 | 336.6 | 335.7 |
| 37.5° | 849.6  | 743.1 | 458.9 | 305.3 | 290.2 | 301.9 | 309.4 | 310.8 | 313.9 | 311.7 | 310.0 |
| 40°   | 893.2  | 757.0 | 404.3 | 272.4 | 274.1 | 292.0 | 296.8 | 291.3 | 285.7 | 285.0 | 282.7 |
| 42.5° | 931.2  | 761.6 | 349.1 | 246.1 | 257.2 | 281.5 | 284.5 | 273.0 | 262.9 | 258.2 | 256.2 |
| 45°   | 971.4  | 763.2 | 297.6 | 224.0 | 240.9 | 272.1 | 275.4 | 260.1 | 245.8 | 235.6 | 232.2 |
| 47.5° | 1023.9 | 774.9 | 257.6 | 207.7 | 228.4 | 265.9 | 270.5 | 249.7 | 231.3 | 216.7 | 213.6 |
| 50°   | 1092.6 | 798.1 | 225.0 | 195.2 | 220.3 | 261.8 | 267.0 | 239.6 | 219.3 | 201.7 | 198.6 |
| 52.5° | 1168.9 | 819.4 | 198.7 | 185.1 | 212.4 | 254.6 | 262.5 | 232.4 | 208.1 | 187.9 | 184.5 |
| 55°   | 1222.2 | 803.1 | 177.5 | 174.7 | 202.2 | 244.2 | 256.3 | 226.3 | 192.0 | 174.4 | 171.4 |
| 57.5° | 1232.4 | 747.2 | 161.4 | 163.8 | 189.9 | 231.3 | 246.7 | 212.7 | 183.3 | 168.5 | 165.4 |
| 60°   | 1204.5 | 669.4 | 149.5 | 153.8 | 176.6 | 214.9 | 228.8 | 203.1 | 174.9 | 162.3 | 159.7 |
| 62.5° | 1134.3 | 589.8 | 140.6 | 144.9 | 164.3 | 198.3 | 217.5 | 193.0 | 166.4 | 155.2 | 152.6 |
| 65°   | 992.6  | 495.2 | 132.1 | 136.9 | 152.8 | 184.0 | 207.4 | 183.6 | 158.1 | 149.5 | 147.0 |
| 67.5° | 749.2  | 370.9 | 124.2 | 128.4 | 142.6 | 171.5 | 196.5 | 174.4 | 150.0 | 144.5 | 141.5 |
| 70°   | 441.2  | 232.2 | 115.1 | 119.6 | 131.9 | 158.6 | 184.8 | 164.3 | 139.9 | 137.4 | 133.5 |
| 72.5° | 205.3  | 139.7 | 104.7 | 109.1 | 118.4 | 141.2 | 169.7 | 151.1 | 127.9 | 122.4 | 117.2 |
| 75°   | 122.5  | 102.2 | 92.5  | 96.4  | 103.0 | 122.8 | 150.7 | 137.6 | 116.6 | 109.3 | 103.8 |
| 77.5° | 91.6   | 78.2  | 79.0  | 83.2  | 88.5  | 107.5 | 133.5 | 127.0 | 107.8 | 102.2 | 98.5  |
| 80°   | 65.9   | 59.3  | 64.5  | 68.9  | 74.5  | 97.7  | 127.9 | 117.4 | 97.5  | 90.0  | 86.5  |
| 82.5° | 44.0   | 42.6  | 48.5  | 53.1  | 58.6  | 85.5  | 120.2 | 102.8 | 83.3  | 73.8  | 66.1  |
| 85°   | 24.3   | 25.7  | 32.7  | 34.7  | 39.4  | 60.2  | 98.5  | 82.7  | 62.7  | 50.5  | 48.2  |
| 87.5° | 10.1   | 11.8  | 17.6  | 17.0  | 20.9  | 35.9  | 64.8  | 49.9  | 39.9  | 29.8  | 23.2  |
| 90°   | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |

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

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

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

Test Date: 10/25/2019

Luminaire Tested: SA1C-722-U-5WQ

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

### Test Information

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

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

### Spectral Parameters

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



### Test Conditions

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

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

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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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### 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)