

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



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: P318785

Luminaire Tested: **GLEON-SA1A-760-U-T4FT**

Issue Date: 3/3/2020

### Test Information

Test Method: LM-79-08  
Report Number: P318785  
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-760-U-T4FT  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(1) 70 CRI, 5700K, 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: 4909 lumens  
Efficiency: N/A  
Efficacy: 144.4 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

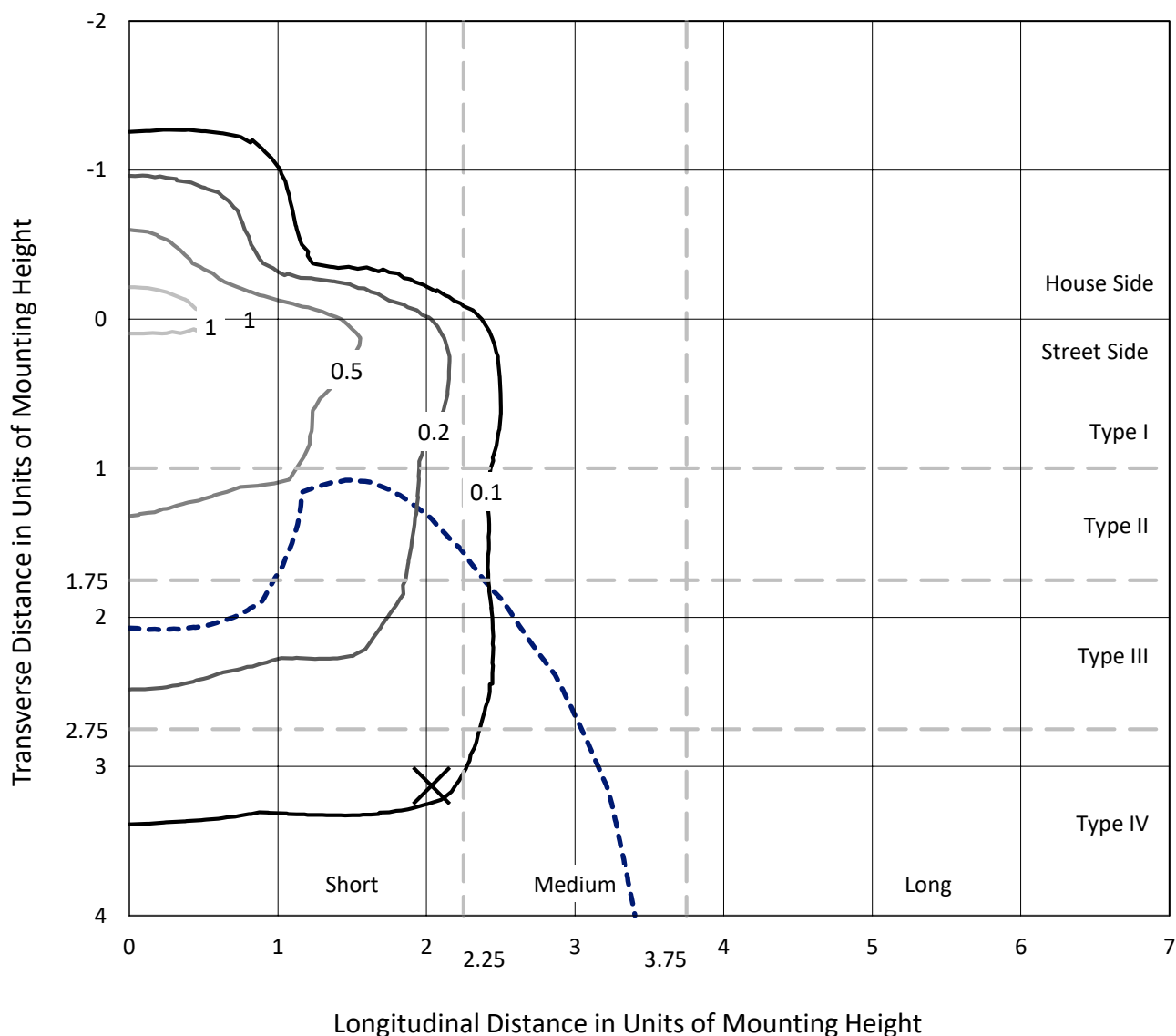
Input Watts (W): 34  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

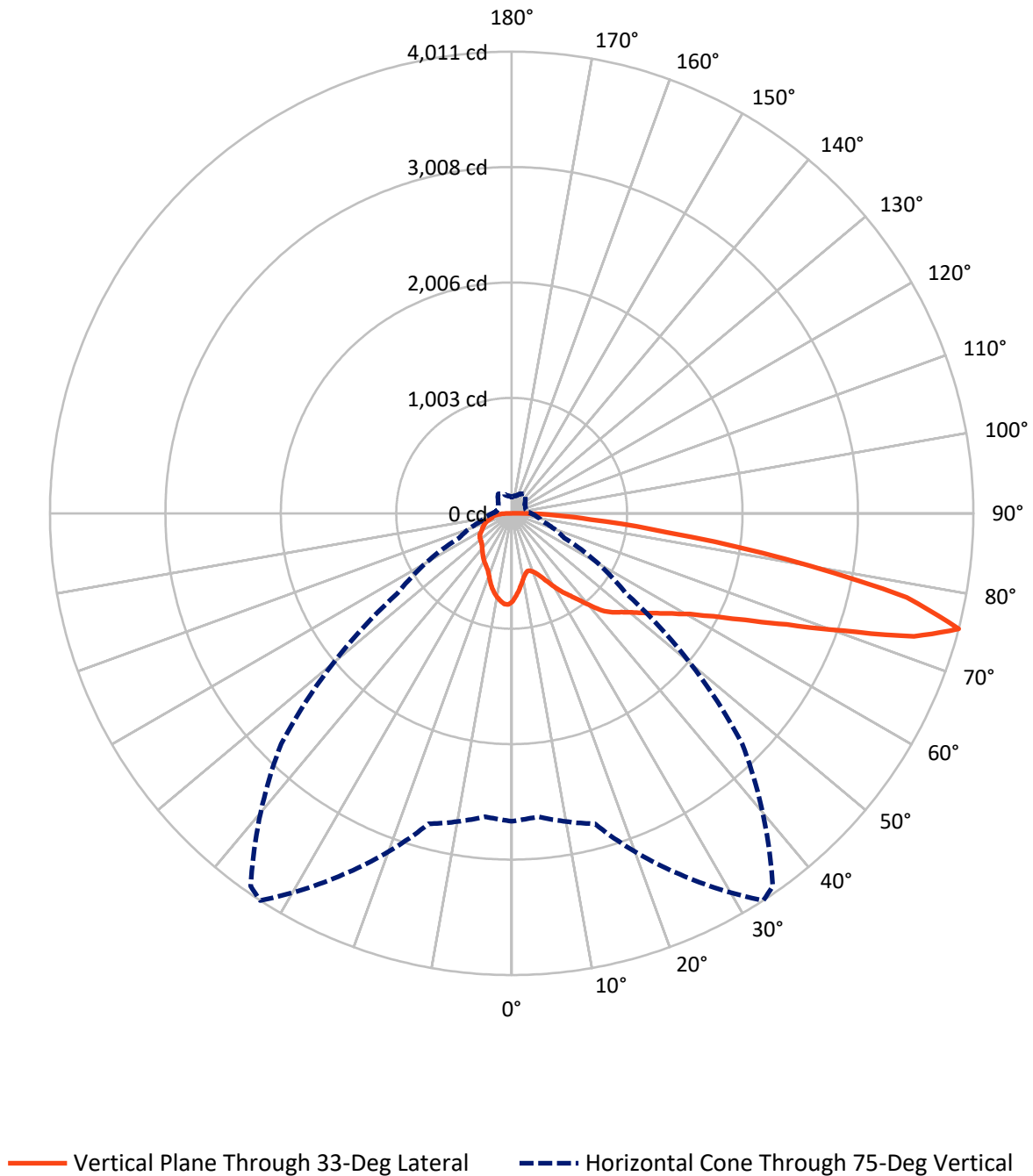
× Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 1.2 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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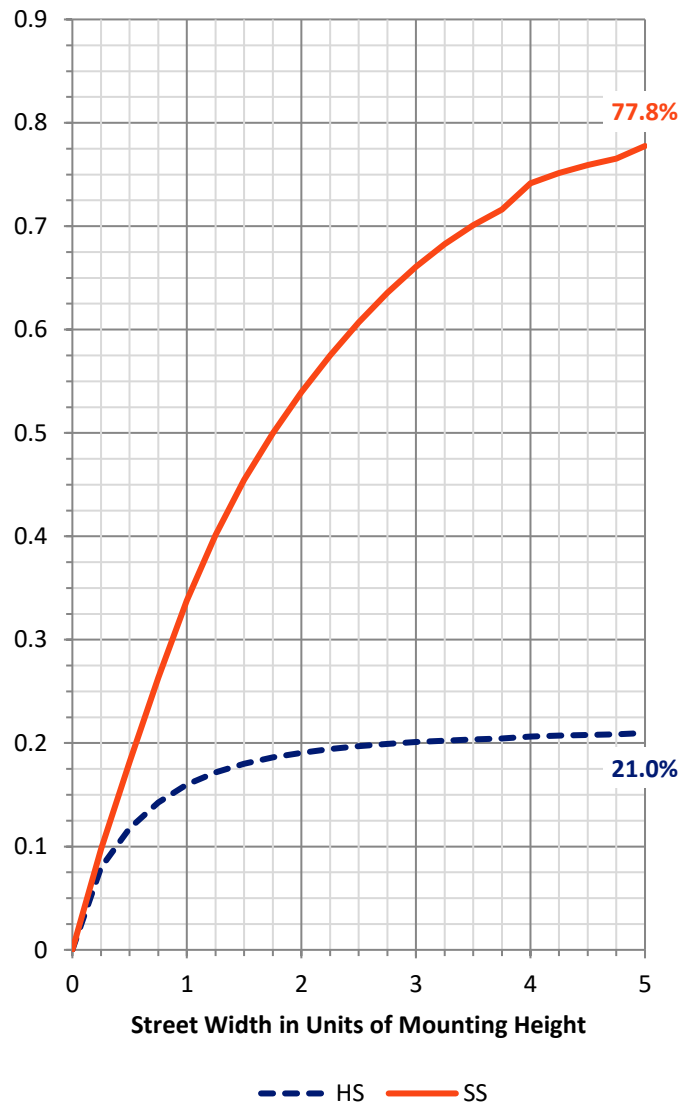
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1054.1   | 0.0    | 1054.1 |
|                    | % Fixture | 21.5     | 0.0    | 21.5   |
| <b>Street Side</b> | Lumens    | 3854.9   | 0.0    | 3854.9 |
|                    | % Fixture | 78.5     | 0.0    | 78.5   |
| <b>Total</b>       | Lumens    | 4909.0   | 0.0    | 4909.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 69.4   | 1.4       |
| 10°-20°   | 187.9  | 3.8       |
| 20°-30°   | 306.9  | 6.3       |
| 30°-40°   | 457.1  | 9.3       |
| 40°-50°   | 655.6  | 13.4      |
| 50°-60°   | 900.1  | 18.3      |
| 60°-70°   | 1126.8 | 23.0      |
| 70°-80°   | 1019.4 | 20.8      |
| 80°-90°   | 185.7  | 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°    | 4909.0 | 100.0     |
| 0°-180°   | 4909.0 | 100.0     |

**Coefficient of Utilization**



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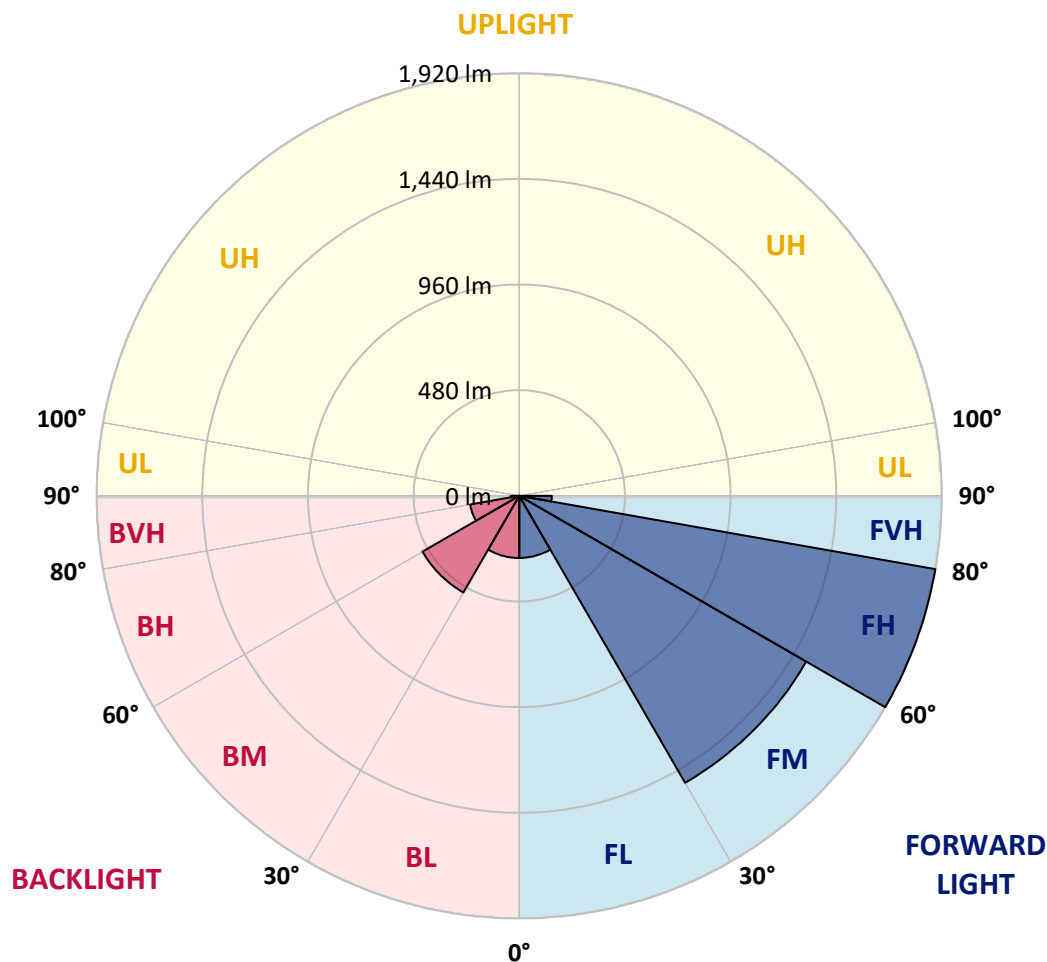
CATALOG NUMBER: GLEON-SA1A-760-U-T4FT

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 281.9  | 5.7       |                         |      |         |
| FM   | (30°-60°)   | 1505.5 | 30.7      |                         |      |         |
| FH   | (60°-80°)   | 1919.6 | 39.1      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 147.9  | 3.0       |                         |      | G2/225  |
| BL   | (0°-30°)    | 282.3  | 5.8       | B1/500                  |      |         |
| BM   | (30°-60°)   | 507.3  | 10.3      | B1/1000                 |      |         |
| BH   | (60°-80°)   | 226.6  | 4.6       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 37.8   | 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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CATALOG NUMBER: GLEON-SA1A-760-U-T4FT

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 33°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 767.3  | 767.3  | 767.3  | 767.3  | 767.3  | 767.3  | 767.3  | 767.3  | 767.3  | 767.3  | 767.3  |
| 2.5°  | 712.5  | 709.8  | 714.9  | 715.6  | 720.0  | 721.7  | 727.8  | 737.3  | 745.1  | 754.1  | 762.2  |
| 5°    | 647.9  | 646.1  | 653.2  | 658.3  | 667.9  | 672.0  | 686.4  | 706.6  | 724.6  | 744.9  | 763.4  |
| 7.5°  | 586.5  | 585.5  | 593.5  | 605.0  | 616.2  | 621.8  | 646.7  | 676.1  | 706.1  | 739.0  | 767.3  |
| 10°   | 534.8  | 534.5  | 542.1  | 553.5  | 569.9  | 576.2  | 608.4  | 647.1  | 689.1  | 734.4  | 773.9  |
| 12.5° | 505.8  | 507.0  | 510.6  | 520.1  | 535.3  | 541.6  | 577.4  | 622.8  | 674.9  | 732.9  | 783.6  |
| 15°   | 512.9  | 514.8  | 508.7  | 508.4  | 519.2  | 524.1  | 557.7  | 605.5  | 664.7  | 735.4  | 797.7  |
| 17.5° | 543.3  | 543.6  | 527.5  | 517.4  | 524.0  | 526.5  | 551.6  | 595.7  | 658.8  | 741.2  | 815.3  |
| 20°   | 586.0  | 585.2  | 556.7  | 539.7  | 543.3  | 544.0  | 560.3  | 595.9  | 658.3  | 751.2  | 838.2  |
| 22.5° | 642.7  | 636.4  | 598.1  | 575.0  | 574.2  | 573.1  | 582.5  | 608.4  | 665.7  | 767.5  | 865.5  |
| 25°   | 716.6  | 710.7  | 657.9  | 626.4  | 619.6  | 617.1  | 618.4  | 635.2  | 680.5  | 784.9  | 896.0  |
| 27.5° | 798.8  | 788.5  | 737.6  | 693.0  | 679.0  | 675.4  | 667.3  | 673.0  | 696.6  | 801.7  | 932.3  |
| 30°   | 867.7  | 862.1  | 817.7  | 764.8  | 748.1  | 743.1  | 721.7  | 715.4  | 719.8  | 824.6  | 978.1  |
| 32.5° | 906.2  | 902.5  | 875.5  | 832.8  | 817.3  | 810.2  | 780.0  | 767.5  | 757.1  | 860.7  | 1040.1 |
| 35°   | 952.8  | 950.4  | 934.2  | 903.1  | 880.2  | 872.8  | 849.4  | 836.3  | 809.7  | 910.4  | 1120.3 |
| 37.5° | 1012.2 | 1009.6 | 1010.0 | 984.9  | 957.6  | 950.6  | 935.2  | 921.4  | 877.9  | 975.7  | 1207.5 |
| 40°   | 1079.3 | 1074.4 | 1072.5 | 1071.3 | 1054.0 | 1050.1 | 1042.0 | 1023.4 | 963.3  | 1053.7 | 1293.5 |
| 42.5° | 1180.4 | 1162.9 | 1125.6 | 1139.7 | 1156.8 | 1154.8 | 1161.4 | 1134.6 | 1058.3 | 1146.0 | 1377.4 |
| 45°   | 1277.9 | 1249.2 | 1184.8 | 1187.8 | 1225.3 | 1236.7 | 1286.2 | 1267.2 | 1161.2 | 1247.0 | 1464.2 |
| 47.5° | 1322.3 | 1300.6 | 1245.8 | 1246.0 | 1283.1 | 1306.7 | 1415.2 | 1401.7 | 1269.4 | 1361.8 | 1570.2 |
| 50°   | 1372.0 | 1350.3 | 1301.1 | 1319.6 | 1352.0 | 1377.1 | 1539.9 | 1532.9 | 1372.3 | 1487.5 | 1697.2 |
| 52.5° | 1426.3 | 1389.5 | 1358.3 | 1391.3 | 1436.8 | 1465.9 | 1664.7 | 1645.7 | 1466.8 | 1614.0 | 1843.2 |
| 55°   | 1426.9 | 1416.9 | 1440.7 | 1464.9 | 1532.9 | 1568.7 | 1795.4 | 1745.2 | 1543.8 | 1738.3 | 1962.1 |
| 57.5° | 1508.2 | 1491.9 | 1542.2 | 1553.4 | 1642.3 | 1682.6 | 1925.5 | 1831.9 | 1622.1 | 1833.6 | 2026.2 |
| 60°   | 1615.7 | 1601.8 | 1643.0 | 1672.5 | 1777.6 | 1831.5 | 2064.3 | 1920.9 | 1683.7 | 1905.5 | 2023.1 |
| 62.5° | 1801.3 | 1785.6 | 1785.1 | 1826.4 | 1968.0 | 2030.8 | 2220.2 | 2008.2 | 1708.1 | 1919.7 | 1936.8 |
| 65°   | 2073.2 | 2048.1 | 2000.8 | 2020.4 | 2231.0 | 2293.6 | 2394.3 | 2071.5 | 1675.9 | 1843.4 | 1714.5 |
| 67.5° | 2337.7 | 2336.8 | 2278.7 | 2319.0 | 2578.3 | 2628.5 | 2592.7 | 2077.7 | 1575.3 | 1577.7 | 1320.1 |
| 70°   | 2601.4 | 2604.8 | 2594.9 | 2735.3 | 3047.5 | 3099.7 | 2804.0 | 1993.5 | 1349.3 | 1139.3 | 790.9  |
| 72.5° | 2810.3 | 2809.4 | 2859.0 | 3221.0 | 3656.4 | 3644.7 | 2982.1 | 1738.1 | 968.8  | 615.0  | 378.0  |
| 75°   | 2675.0 | 2645.5 | 2793.0 | 3461.4 | 4011.3 | 3954.2 | 2830.6 | 1212.4 | 502.8  | 280.0  | 203.5  |
| 77.5° | 1744.7 | 1772.7 | 1989.2 | 2859.5 | 3508.7 | 3439.2 | 2076.7 | 565.7  | 236.9  | 183.6  | 147.5  |
| 80°   | 631.8  | 661.3  | 931.4  | 1619.7 | 2417.4 | 2406.0 | 1022.7 | 232.5  | 160.2  | 138.7  | 107.5  |
| 82.5° | 217.4  | 228.2  | 367.5  | 719.3  | 1364.9 | 1415.7 | 384.8  | 132.1  | 116.5  | 98.4   | 73.6   |
| 85°   | 85.3   | 97.7   | 168.0  | 346.1  | 688.5  | 693.5  | 155.8  | 79.0   | 81.1   | 64.4   | 40.4   |
| 87.5° | 32.4   | 39.3   | 80.4   | 160.8  | 314.4  | 288.8  | 55.8   | 37.6   | 46.1   | 38.3   | 19.2   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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CATALOG NUMBER: GLEON-SA1A-760-U-T4FT

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 767.3  | 767.3  | 767.3 | 767.3 | 767.3 | 767.3 | 767.3 | 767.3 | 767.3 | 767.3 | 767.3 |
| 2.5°  | 768.5  | 772.1  | 779.5 | 784.6 | 790.0 | 791.6 | 792.2 | 793.6 | 794.9 | 794.4 | 794.6 |
| 5°    | 773.2  | 780.2  | 792.2 | 797.3 | 799.7 | 797.0 | 791.7 | 787.5 | 784.4 | 782.7 | 782.2 |
| 7.5°  | 781.0  | 790.9  | 803.8 | 802.9 | 797.5 | 785.4 | 771.9 | 761.7 | 753.2 | 750.2 | 748.5 |
| 10°   | 791.4  | 802.9  | 811.9 | 802.2 | 786.5 | 765.6 | 745.3 | 729.5 | 716.8 | 711.9 | 711.0 |
| 12.5° | 804.6  | 816.3  | 818.0 | 797.5 | 771.4 | 742.9 | 715.2 | 694.4 | 675.4 | 669.3 | 667.9 |
| 15°   | 821.7  | 832.8  | 822.2 | 789.2 | 752.7 | 714.4 | 678.6 | 650.3 | 630.3 | 622.8 | 620.1 |
| 17.5° | 839.7  | 850.2  | 823.1 | 775.4 | 728.3 | 680.7 | 635.7 | 606.7 | 583.8 | 575.2 | 574.2 |
| 20°   | 861.2  | 866.0  | 819.5 | 755.8 | 694.7 | 636.9 | 589.6 | 562.3 | 550.1 | 544.0 | 543.3 |
| 22.5° | 887.9  | 882.8  | 811.4 | 729.2 | 652.2 | 586.4 | 547.9 | 535.2 | 532.1 | 530.8 | 531.3 |
| 25°   | 916.0  | 900.4  | 799.4 | 694.4 | 598.4 | 535.8 | 517.4 | 520.9 | 525.0 | 524.5 | 524.5 |
| 27.5° | 947.0  | 918.4  | 780.9 | 648.3 | 538.9 | 494.5 | 496.7 | 509.7 | 515.8 | 515.7 | 515.5 |
| 30°   | 986.9  | 938.7  | 757.3 | 592.8 | 483.3 | 465.3 | 478.7 | 494.6 | 502.9 | 502.6 | 502.8 |
| 32.5° | 1035.9 | 961.1  | 725.3 | 530.9 | 443.1 | 443.8 | 459.2 | 475.0 | 484.6 | 483.8 | 484.0 |
| 35°   | 1093.2 | 986.2  | 681.8 | 469.9 | 416.5 | 426.6 | 438.8 | 449.9 | 459.0 | 457.8 | 456.7 |
| 37.5° | 1155.6 | 1010.8 | 624.2 | 415.3 | 394.8 | 410.7 | 420.9 | 422.7 | 427.0 | 423.9 | 421.7 |
| 40°   | 1215.0 | 1029.6 | 549.9 | 370.5 | 372.9 | 397.1 | 403.7 | 396.3 | 388.7 | 387.6 | 384.6 |
| 42.5° | 1266.7 | 1035.9 | 474.8 | 334.7 | 349.8 | 382.9 | 387.0 | 371.4 | 357.6 | 351.2 | 348.5 |
| 45°   | 1321.3 | 1038.1 | 404.8 | 304.7 | 327.6 | 370.2 | 374.6 | 353.7 | 334.4 | 320.5 | 315.9 |
| 47.5° | 1392.7 | 1054.0 | 350.3 | 282.5 | 310.7 | 361.7 | 368.0 | 339.6 | 314.6 | 294.7 | 290.5 |
| 50°   | 1486.1 | 1085.6 | 306.1 | 265.5 | 299.6 | 356.1 | 363.2 | 325.9 | 298.3 | 274.4 | 270.1 |
| 52.5° | 1589.9 | 1114.6 | 270.3 | 251.8 | 288.9 | 346.3 | 357.1 | 316.1 | 283.0 | 255.5 | 251.0 |
| 55°   | 1662.5 | 1092.4 | 241.5 | 237.6 | 275.0 | 332.2 | 348.6 | 307.8 | 261.1 | 237.2 | 233.2 |
| 57.5° | 1676.4 | 1016.4 | 219.6 | 222.8 | 258.3 | 314.6 | 335.6 | 289.3 | 249.3 | 229.3 | 225.0 |
| 60°   | 1638.4 | 910.6  | 203.3 | 209.2 | 240.3 | 292.3 | 311.2 | 276.2 | 237.9 | 220.8 | 217.2 |
| 62.5° | 1542.9 | 802.2  | 191.3 | 197.0 | 223.5 | 269.8 | 295.9 | 262.5 | 226.4 | 211.1 | 207.6 |
| 65°   | 1350.1 | 673.5  | 179.7 | 186.2 | 207.9 | 250.3 | 282.2 | 249.8 | 215.0 | 203.3 | 199.9 |
| 67.5° | 1019.1 | 504.5  | 168.9 | 174.7 | 194.0 | 233.3 | 267.2 | 237.2 | 204.0 | 196.5 | 192.5 |
| 70°   | 600.1  | 315.9  | 156.5 | 162.6 | 179.4 | 215.7 | 251.3 | 223.5 | 190.3 | 186.9 | 181.6 |
| 72.5° | 279.3  | 190.1  | 142.4 | 148.4 | 161.1 | 192.1 | 230.8 | 205.5 | 174.0 | 166.5 | 159.4 |
| 75°   | 166.7  | 139.0  | 125.8 | 131.1 | 140.1 | 167.0 | 205.0 | 187.2 | 158.5 | 148.7 | 141.3 |
| 77.5° | 124.6  | 106.3  | 107.5 | 113.1 | 120.4 | 146.2 | 181.6 | 172.8 | 146.7 | 139.0 | 134.0 |
| 80°   | 89.7   | 80.7   | 87.7  | 93.8  | 101.4 | 132.9 | 174.0 | 159.7 | 132.6 | 122.4 | 117.7 |
| 82.5° | 59.9   | 58.0   | 66.0  | 72.2  | 79.7  | 116.3 | 163.5 | 139.9 | 113.3 | 100.4 | 89.9  |
| 85°   | 33.1   | 34.9   | 44.4  | 47.1  | 53.6  | 81.9  | 134.0 | 112.4 | 85.3  | 68.7  | 65.6  |
| 87.5° | 13.7   | 16.1   | 23.9  | 23.1  | 28.5  | 48.8  | 88.2  | 67.8  | 54.3  | 40.5  | 31.5  |
| 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: SP1-1908-441-9-R4

Test Date: 10/23/2019

Luminaire Tested: SA1C-760-U-5WQ

Data in this report applies to families of products SA1C-760-U-5WQ .

### Test Information

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-9-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-760-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):                  | 5474   | CRI (Ra): | 71.7 |      |       |
| CIE u':                   | 0.2052 | R1:       | 70.6 | R9:  | -27.1 |
| CIE v':                   | 0.4804 | R2:       | 74.6 | R10: | 40.8  |
| Duv:                      | 0.0025 | R3:       | 78.3 | R11: | 74.6  |
| CIE x:                    | 0.3330 | R4:       | 73.8 | R12: | 50.4  |
| CIE y:                    | 0.3466 | R5:       | 72.4 | R13: | 70.0  |
| CIE z:                    | 0.3204 | R6:       | 67.5 | R14: | 87.8  |
| Peak Wavelength (nm):     | 442    | R7:       | 77.5 |      |       |
| Dominant Wavelength (nm): | 554    | R8:       | 58.9 |      |       |
| Purity:                   | 4.1    |           |      |      |       |
| Rf:                       | 72.1   |           |      |      |       |
| Rg:                       | 97.2   |           |      |      |       |



### Test Conditions

Stabilization Time: 240M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.6/31%  
 Sphere Temperature (°C): 25.9

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

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CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 5700K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



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| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

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**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 13759.3**

**S/P: 1.85**

| 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       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 5527.6 M/P: 0.74**

| 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       | 3540             | NR               | 490       | 33363            | NR               | 620       | 80193            | NR               | 750       | 4663             | NR               | 880       | 4678             | NR               |
| 365       | 2862             | NR               | 495       | 44177            | NR               | 625       | 73091            | NR               | 755       | 4147             | NR               | 885       | 4128             | NR               |
| 370       | 2865             | NR               | 500       | 57019            | NR               | 630       | 66269            | NR               | 760       | 4040             | NR               | 890       | 4504             | NR               |
| 375       | 3254             | NR               | 505       | 70030            | NR               | 635       | 60012            | NR               | 765       | 3474             | NR               | 895       | 4371             | NR               |
| 380       | 3076             | NR               | 510       | 81972            | NR               | 640       | 53914            | NR               | 770       | 3469             | NR               | 900       | 4082             | NR               |
| 385       | 2904             | NR               | 515       | 92590            | NR               | 645       | 48385            | NR               | 775       | 3181             | NR               | 905       | 2982             | NR               |
| 390       | 2689             | NR               | 520       | 100305           | NR               | 650       | 43219            | NR               | 780       | 2969             | NR               | 910       | 4351             | NR               |
| 395       | 2619             | NR               | 525       | 107452           | NR               | 655       | 38562            | NR               | 785       | 3132             | NR               | 915       | 3365             | NR               |
| 400       | 2679             | NR               | 530       | 111373           | NR               | 660       | 34110            | NR               | 790       | 2507             | NR               | 920       | 3430             | NR               |
| 405       | 3515             | NR               | 535       | 114505           | NR               | 665       | 30085            | NR               | 795       | 2968             | NR               | 925       | 4264             | NR               |
| 410       | 6934             | NR               | 540       | 116408           | NR               | 670       | 26205            | NR               | 800       | 2758             | NR               | 930       | 4095             | NR               |
| 415       | 14943            | NR               | 545       | 118700           | NR               | 675       | 22906            | NR               | 805       | 2872             | NR               | 935       | 5048             | NR               |
| 420       | 31939            | NR               | 550       | 119209           | NR               | 680       | 20058            | NR               | 810       | 3094             | NR               | 940       | 4074             | NR               |
| 425       | 64701            | NR               | 555       | 120742           | NR               | 685       | 17413            | NR               | 815       | 3222             | NR               | 945       | 4949             | NR               |
| 430       | 110939           | NR               | 560       | 121594           | NR               | 690       | 15447            | NR               | 820       | 3238             | NR               | 950       | 4387             | NR               |
| 435       | 164597           | NR               | 565       | 121913           | NR               | 695       | 13398            | NR               | 825       | 3524             | NR               | 955       | 4978             | NR               |
| 440       | 207696           | NR               | 570       | 122147           | NR               | 700       | 11777            | NR               | 830       | 2921             | NR               | 960       | 4706             | NR               |
| 445       | 201830           | NR               | 575       | 121605           | NR               | 705       | 10412            | NR               | 835       | 3595             | NR               | 965       | 5083             | NR               |
| 450       | 145410           | NR               | 580       | 120248           | NR               | 710       | 9544             | NR               | 840       | 3016             | NR               | 970       | 4522             | NR               |
| 455       | 89594            | NR               | 585       | 117717           | NR               | 715       | 8940             | NR               | 845       | 4032             | NR               | 975       | 4740             | NR               |
| 460       | 58321            | NR               | 590       | 114359           | NR               | 720       | 7897             | NR               | 850       | 3579             | NR               | 980       | 6122             | NR               |
| 465       | 39318            | NR               | 595       | 109974           | NR               | 725       | 7045             | NR               | 855       | 4571             | NR               | 985       | 6450             | NR               |
| 470       | 27693            | NR               | 600       | 105269           | NR               | 730       | 6483             | NR               | 860       | 4485             | NR               | 990       | 4875             | NR               |
| 475       | 23081            | NR               | 605       | 99453            | NR               | 735       | 5838             | NR               | 865       | 3978             | NR               | 995       | 4764             | NR               |
| 480       | 23002            | NR               | 610       | 92921            | NR               | 740       | 5261             | NR               | 870       | 4298             | NR               | 1000      | 3640             | NR               |
| 485       | 26201            | NR               | 615       | 86989            | NR               | 745       | 4760             | NR               | 875       | 4356             | NR               |           |                  |                  |

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**TM-30-18**

**Summary**

$R_f = 72.1$   
 $R_g = 97.2$   
 CIE  $R_a = 71.7$   
 $R_g = -27.1$



**Color Vector Graphics**





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

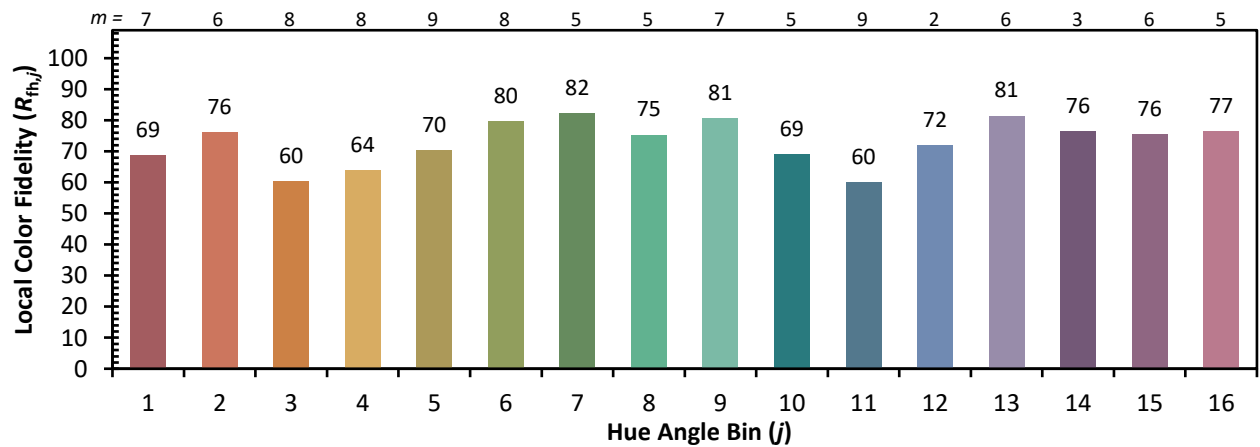
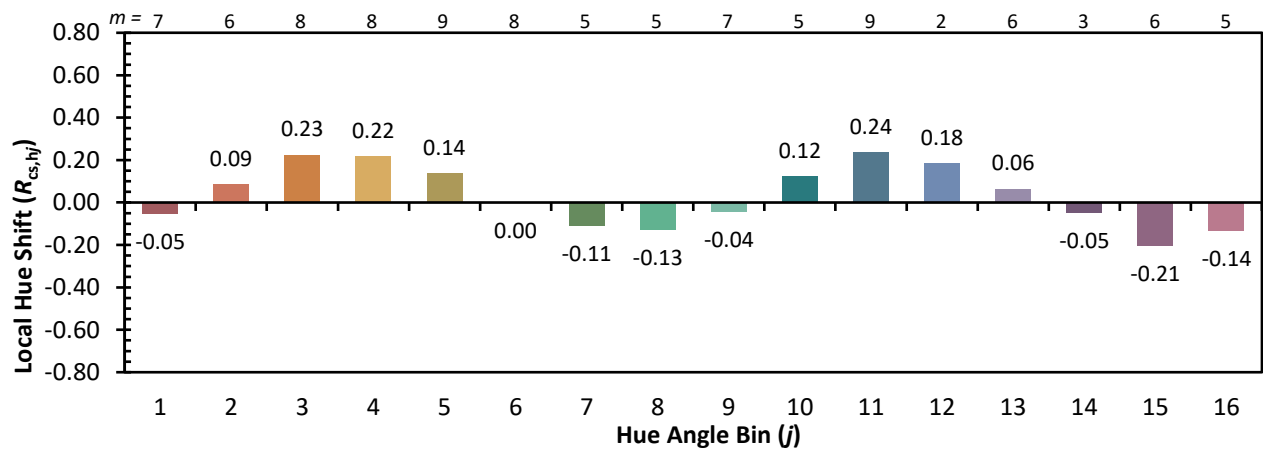
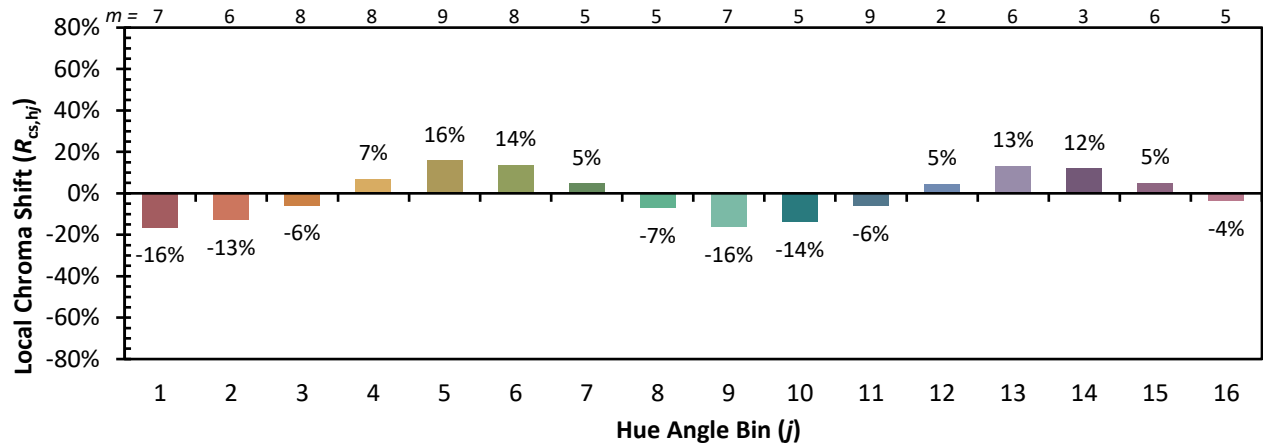
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 54 | CES51 = 88 | CES76 = 43 |
| CES02 = 59 | CES27 = 79 | CES52 = 90 | CES77 = 64 |
| CES03 = 30 | CES28 = 77 | CES53 = 77 | CES78 = 46 |
| CES04 = 69 | CES29 = 50 | CES54 = 81 | CES79 = 74 |
| CES05 = 46 | CES30 = 59 | CES55 = 80 | CES80 = 70 |
| CES06 = 50 | CES31 = 55 | CES56 = 70 | CES81 = 71 |
| CES07 = 38 | CES32 = 52 | CES57 = 68 | CES82 = 88 |
| CES08 = 38 | CES33 = 63 | CES58 = 70 | CES83 = 82 |
| CES09 = 29 | CES34 = 63 | CES59 = 88 | CES84 = 87 |
| CES10 = 72 | CES35 = 79 | CES60 = 92 | CES85 = 84 |
| CES11 = 55 | CES36 = 90 | CES61 = 88 | CES86 = 76 |
| CES12 = 61 | CES37 = 72 | CES62 = 81 | CES87 = 75 |
| CES13 = 41 | CES38 = 68 | CES63 = 75 | CES88 = 77 |
| CES14 = 74 | CES39 = 91 | CES64 = 72 | CES89 = 76 |
| CES15 = 70 | CES40 = 83 | CES65 = 65 | CES90 = 76 |
| CES16 = 46 | CES41 = 84 | CES66 = 66 | CES91 = 92 |
| CES17 = 48 | CES42 = 70 | CES67 = 64 | CES92 = 70 |
| CES18 = 55 | CES43 = 69 | CES68 = 71 | CES93 = 83 |
| CES19 = 70 | CES44 = 98 | CES69 = 80 | CES94 = 60 |
| CES20 = 64 | CES45 = 79 | CES70 = 58 | CES95 = 73 |
| CES21 = 85 | CES46 = 78 | CES71 = 55 | CES96 = 79 |
| CES22 = 77 | CES47 = 76 | CES72 = 84 | CES97 = 84 |
| CES23 = 91 | CES48 = 68 | CES73 = 47 | CES98 = 73 |
| CES24 = 90 | CES49 = 78 | CES74 = 94 | CES99 = 62 |
| CES25 = 71 | CES50 = 87 | CES75 = 51 |            |



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Color Rendition by Hue-Angle Bin



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**Measure Comparisons**



(END OF REPORT)