

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: P319065

Luminaire Tested: **GLEON-SA1A-750-U-T4W**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P319065  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-18)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA1A-750-U-T4W  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(1) 70 CRI, 5000K, 615mA LIGHTSQUARE WITH 16 LEDS AND TYPE IV WIDE OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4845 lumens  
Efficiency: N/A  
Efficacy: 142.5 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

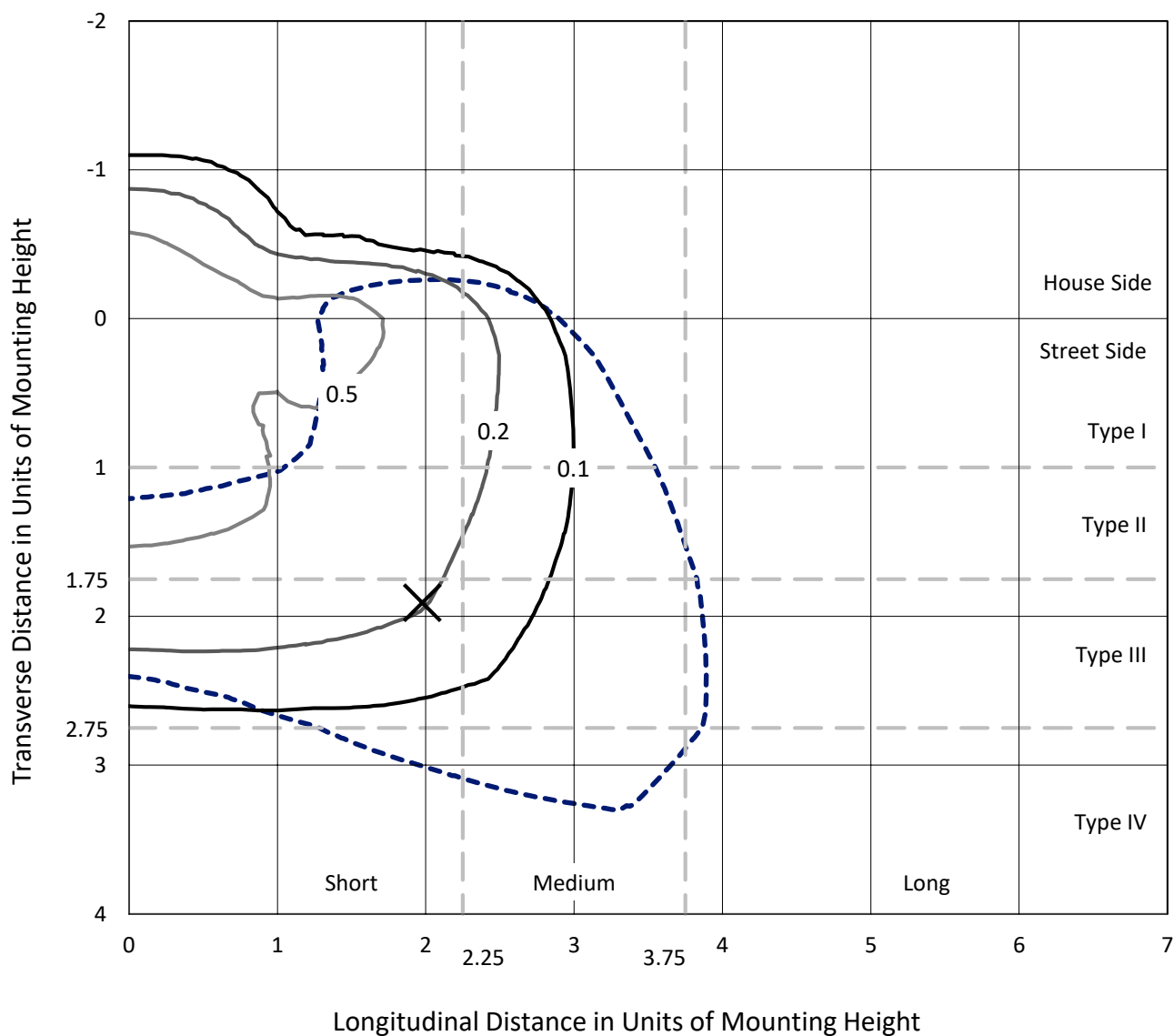
Input Watts (W): 34  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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## Iso-Footcandle Lines of Horizontal Illumination

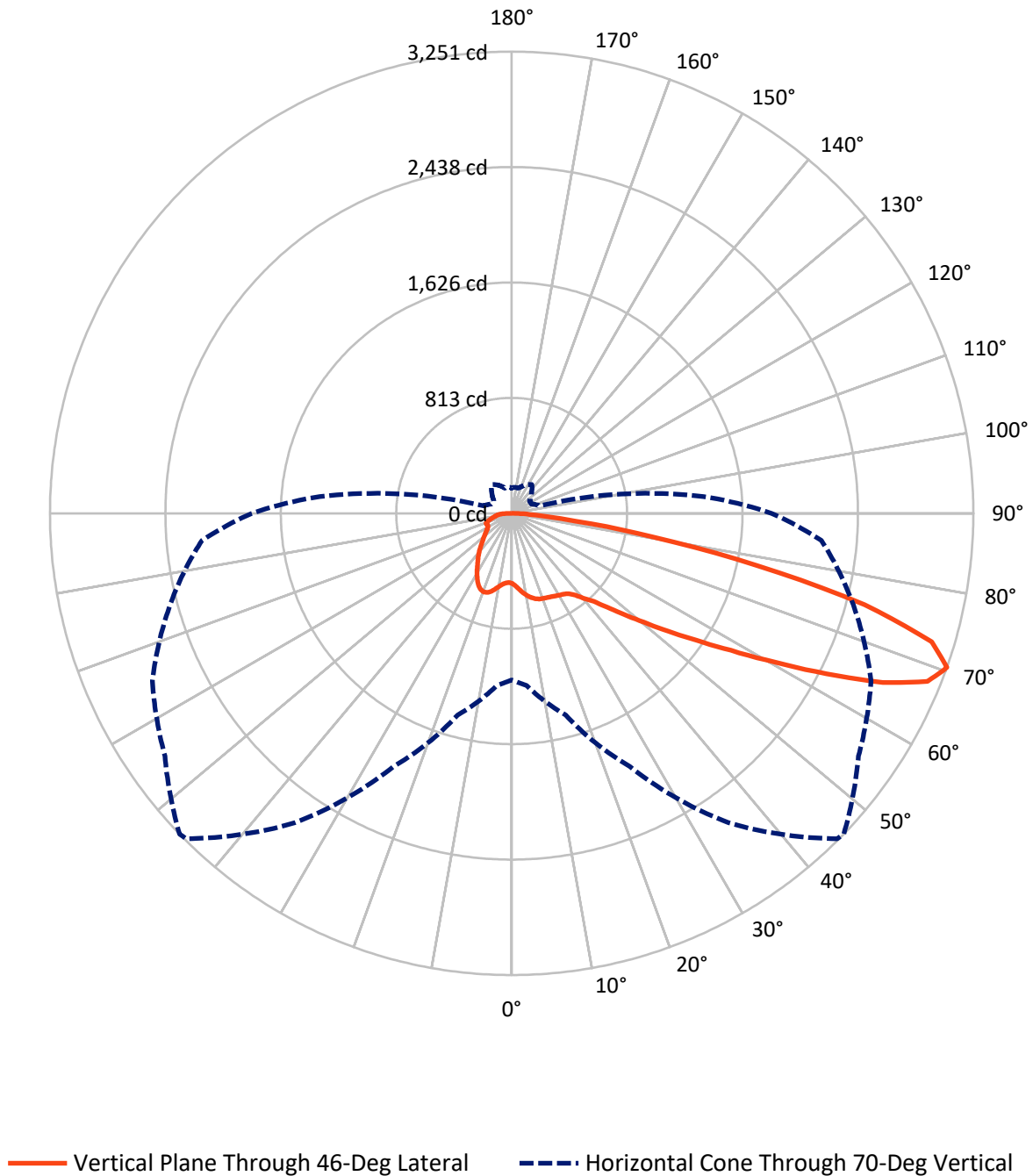
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 1 fc  
 Type IV - Short - N/A

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CATALOG NUMBER: GLEON-SA1A-750-U-T4W

## Luminous Intensity Polar Plot



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CATALOG NUMBER: GLEON-SA1A-750-U-T4W

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1110.5   | 0.0    | 1110.5 |
|                    | % Fixture | 22.9     | 0.0    | 22.9   |
| <b>Street Side</b> | Lumens    | 3734.5   | 0.0    | 3734.5 |
|                    | % Fixture | 77.1     | 0.0    | 77.1   |
| <b>Total</b>       | Lumens    | 4845.0   | 0.0    | 4845.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 50.3   | 1.0       |
| 10°-20°   | 167.7  | 3.5       |
| 20°-30°   | 279.5  | 5.8       |
| 30°-40°   | 396.7  | 8.2       |
| 40°-50°   | 583.5  | 12.0      |
| 50°-60°   | 988.2  | 20.4      |
| 60°-70°   | 1402.7 | 29.0      |
| 70°-80°   | 852.1  | 17.6      |
| 80°-90°   | 124.4  | 2.6       |
| 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°    | 4845.0 | 100.0     |
| 0°-180°   | 4845.0 | 100.0     |

**Coefficient of Utilization**



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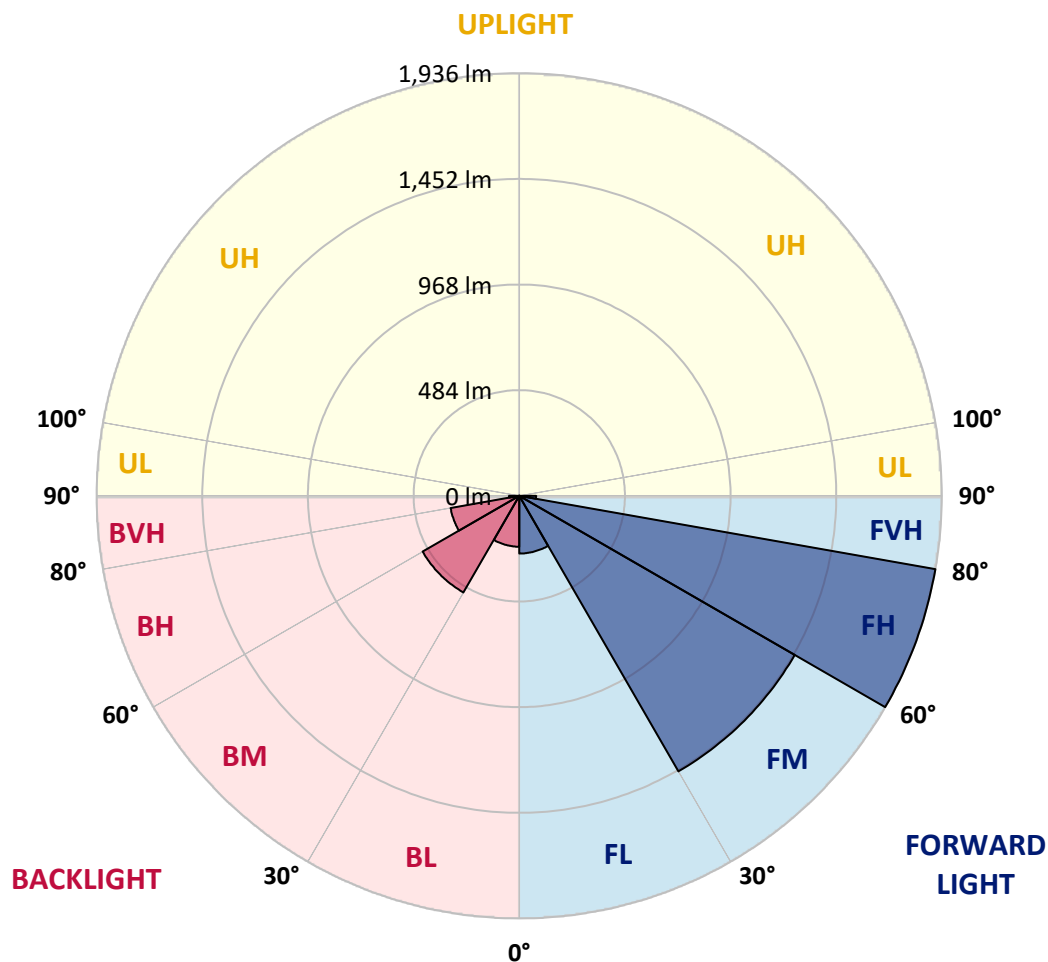
CATALOG NUMBER: GLEON-SA1A-750-U-T4W

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 264.4  | 5.5       |                         |      |         |
| FM   | (30°-60°)   | 1457.2 | 30.1      |                         |      |         |
| FH   | (60°-80°)   | 1935.6 | 39.9      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 77.5   | 1.6       |                         |      | G1/100  |
| BL   | (0°-30°)    | 233.1  | 4.8       | B1/500                  |      |         |
| BM   | (30°-60°)   | 511.2  | 10.6      | B1/1000                 |      |         |
| BH   | (60°-80°)   | 319.2  | 6.6       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 46.9   | 1.0       |                         |      | 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-750-U-T4W

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 46°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 493.6  | 493.6  | 493.6  | 493.6  | 493.6  | 493.6  | 493.6  | 493.6  | 493.6  | 493.6  | 493.6  |
| 2.5°  | 518.3  | 518.6  | 519.3  | 517.7  | 513.0  | 511.7  | 511.2  | 506.4  | 503.2  | 498.6  | 494.6  |
| 5°    | 559.8  | 560.1  | 559.1  | 554.5  | 544.2  | 536.6  | 535.9  | 524.9  | 515.0  | 504.4  | 496.4  |
| 7.5°  | 603.0  | 603.5  | 600.4  | 591.6  | 577.2  | 563.9  | 563.1  | 548.2  | 533.1  | 517.0  | 505.1  |
| 10°   | 641.3  | 639.4  | 634.2  | 621.9  | 604.9  | 588.6  | 588.0  | 572.4  | 555.0  | 535.6  | 519.6  |
| 12.5° | 666.9  | 665.2  | 658.6  | 643.7  | 624.9  | 610.0  | 608.7  | 594.3  | 577.3  | 556.1  | 537.1  |
| 15°   | 681.0  | 682.1  | 673.2  | 656.3  | 638.0  | 625.4  | 624.3  | 614.0  | 598.9  | 577.5  | 555.6  |
| 17.5° | 682.8  | 683.8  | 675.2  | 658.4  | 643.5  | 634.9  | 634.4  | 627.6  | 616.6  | 596.1  | 573.2  |
| 20°   | 672.2  | 672.8  | 665.7  | 652.0  | 642.2  | 639.5  | 639.4  | 636.4  | 628.2  | 610.0  | 587.8  |
| 22.5° | 656.8  | 657.3  | 652.1  | 642.2  | 638.9  | 643.0  | 644.2  | 643.0  | 637.2  | 620.1  | 599.2  |
| 25°   | 653.0  | 652.6  | 647.3  | 637.2  | 640.0  | 648.8  | 650.3  | 650.8  | 646.8  | 631.9  | 613.8  |
| 27.5° | 671.4  | 670.2  | 660.1  | 643.8  | 645.7  | 656.3  | 658.3  | 663.1  | 660.6  | 647.5  | 630.4  |
| 30°   | 724.6  | 722.6  | 701.9  | 669.0  | 660.1  | 665.6  | 668.0  | 675.7  | 676.2  | 665.2  | 652.5  |
| 32.5° | 814.4  | 812.0  | 774.8  | 716.1  | 684.5  | 675.0  | 677.3  | 688.8  | 694.9  | 686.4  | 672.7  |
| 35°   | 928.0  | 925.2  | 876.5  | 796.2  | 725.2  | 693.1  | 694.7  | 703.9  | 716.1  | 704.2  | 685.9  |
| 37.5° | 1046.4 | 1039.6 | 992.7  | 890.4  | 790.1  | 731.7  | 731.7  | 732.9  | 738.7  | 713.8  | 701.5  |
| 40°   | 1164.1 | 1157.3 | 1114.9 | 1001.1 | 874.0  | 792.6  | 788.7  | 763.0  | 758.4  | 737.0  | 732.9  |
| 42.5° | 1273.6 | 1271.6 | 1246.5 | 1126.3 | 972.5  | 852.4  | 847.1  | 803.5  | 804.5  | 791.2  | 791.4  |
| 45°   | 1390.0 | 1390.0 | 1369.6 | 1252.7 | 1087.2 | 948.6  | 943.3  | 879.1  | 889.1  | 882.9  | 897.7  |
| 47.5° | 1485.0 | 1488.0 | 1485.1 | 1384.3 | 1220.7 | 1070.8 | 1061.2 | 983.9  | 1011.8 | 1032.8 | 1075.8 |
| 50°   | 1582.0 | 1586.6 | 1587.1 | 1528.8 | 1382.0 | 1216.0 | 1205.1 | 1123.0 | 1185.2 | 1245.6 | 1329.9 |
| 52.5° | 1722.7 | 1733.2 | 1691.6 | 1672.8 | 1579.7 | 1388.5 | 1377.7 | 1301.9 | 1405.7 | 1490.4 | 1635.9 |
| 55°   | 1853.2 | 1844.1 | 1814.4 | 1826.0 | 1791.2 | 1584.8 | 1576.7 | 1510.2 | 1651.4 | 1761.5 | 1950.4 |
| 57.5° | 1923.9 | 1923.2 | 1953.1 | 2002.8 | 2019.4 | 1826.9 | 1820.1 | 1755.4 | 1928.5 | 2011.3 | 2245.7 |
| 60°   | 2006.8 | 2007.9 | 2081.9 | 2194.8 | 2263.1 | 2128.3 | 2125.3 | 2076.2 | 2197.6 | 2244.4 | 2477.3 |
| 62.5° | 2018.4 | 2039.3 | 2166.6 | 2360.9 | 2491.3 | 2480.5 | 2487.1 | 2365.3 | 2438.4 | 2430.4 | 2650.3 |
| 65°   | 1884.9 | 1912.4 | 2142.9 | 2411.2 | 2718.1 | 2865.7 | 2871.8 | 2655.9 | 2628.2 | 2589.4 | 2712.1 |
| 67.5° | 1611.3 | 1652.1 | 1902.5 | 2301.9 | 2792.9 | 3150.4 | 3159.0 | 2881.2 | 2785.7 | 2643.3 | 2563.2 |
| 70°   | 1172.6 | 1217.9 | 1469.9 | 1966.0 | 2659.6 | 3241.4 | 3251.2 | 2980.9 | 2791.7 | 2489.9 | 2188.2 |
| 72.5° | 708.3  | 743.8  | 951.6  | 1447.3 | 2244.7 | 3075.6 | 3093.0 | 2854.6 | 2548.8 | 2109.1 | 1615.8 |
| 75°   | 311.1  | 334.3  | 460.1  | 834.0  | 1607.0 | 2544.7 | 2566.4 | 2443.3 | 2070.9 | 1532.7 | 955.1  |
| 77.5° | 132.5  | 139.1  | 188.7  | 362.3  | 908.5  | 1738.8 | 1768.7 | 1785.3 | 1405.1 | 834.0  | 403.6  |
| 80°   | 82.6   | 85.2   | 106.8  | 164.0  | 425.1  | 976.6  | 1008.8 | 1050.4 | 697.7  | 306.6  | 140.9  |
| 82.5° | 50.2   | 53.2   | 71.0   | 99.2   | 221.4  | 442.7  | 458.1  | 487.5  | 270.8  | 132.5  | 73.0   |
| 85°   | 30.2   | 32.3   | 43.4   | 62.7   | 126.0  | 174.1  | 173.9  | 192.3  | 127.5  | 85.2   | 38.5   |
| 87.5° | 14.4   | 16.1   | 23.2   | 32.5   | 63.5   | 65.3   | 61.2   | 69.3   | 77.4   | 55.9   | 19.4   |
| 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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**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 493.6  | 493.6  | 493.6 | 493.6 | 493.6 | 493.6 | 493.6 | 493.6 | 493.6 | 493.6 | 493.6 |
| 2.5°  | 493.3  | 492.6  | 490.5 | 488.8 | 488.5 | 487.5 | 486.6 | 487.1 | 487.8 | 488.0 | 488.0 |
| 5°    | 493.1  | 491.3  | 488.5 | 487.3 | 488.8 | 490.8 | 493.3 | 496.6 | 498.6 | 500.1 | 501.1 |
| 7.5°  | 501.1  | 497.6  | 494.4 | 493.8 | 496.8 | 502.1 | 507.7 | 514.7 | 519.5 | 522.8 | 523.5 |
| 10°   | 514.3  | 510.0  | 506.9 | 507.5 | 512.8 | 520.5 | 528.4 | 537.4 | 544.7 | 549.2 | 549.5 |
| 12.5° | 529.6  | 525.4  | 522.5 | 525.3 | 534.1 | 543.4 | 551.6 | 559.4 | 566.1 | 570.5 | 570.5 |
| 15°   | 547.2  | 544.2  | 540.7 | 547.2 | 559.1 | 567.4 | 570.9 | 574.7 | 578.3 | 581.7 | 581.0 |
| 17.5° | 564.1  | 561.3  | 559.4 | 567.1 | 579.5 | 583.3 | 581.0 | 578.2 | 578.2 | 580.0 | 580.3 |
| 20°   | 578.7  | 576.2  | 577.3 | 584.8 | 591.3 | 587.3 | 578.7 | 569.7 | 566.1 | 567.1 | 568.1 |
| 22.5° | 591.4  | 590.3  | 593.8 | 597.2 | 592.6 | 578.7 | 562.8 | 550.6 | 546.2 | 545.8 | 546.2 |
| 25°   | 606.4  | 606.2  | 610.5 | 604.2 | 583.6 | 557.9 | 536.6 | 524.8 | 522.3 | 524.3 | 527.6 |
| 27.5° | 624.9  | 626.8  | 628.9 | 605.9 | 565.4 | 526.6 | 504.9 | 496.8 | 499.2 | 504.1 | 507.2 |
| 30°   | 648.6  | 653.6  | 649.0 | 601.7 | 539.2 | 490.8 | 470.1 | 467.7 | 474.5 | 481.3 | 484.7 |
| 32.5° | 671.7  | 679.5  | 668.2 | 590.9 | 505.4 | 452.8 | 436.7 | 436.1 | 444.4 | 451.0 | 455.6 |
| 35°   | 690.3  | 705.7  | 682.6 | 569.6 | 466.3 | 417.8 | 406.1 | 401.6 | 404.6 | 412.4 | 417.7 |
| 37.5° | 714.5  | 740.2  | 692.6 | 536.9 | 423.8 | 389.0 | 375.2 | 364.9 | 362.3 | 365.4 | 368.1 |
| 40°   | 758.7  | 792.7  | 697.2 | 491.3 | 382.4 | 360.1 | 346.2 | 331.1 | 320.7 | 313.0 | 313.2 |
| 42.5° | 831.0  | 861.2  | 694.2 | 435.9 | 344.1 | 331.9 | 316.2 | 298.8 | 281.9 | 264.6 | 263.3 |
| 45°   | 948.4  | 963.0  | 685.3 | 377.2 | 310.4 | 302.4 | 287.7 | 270.3 | 247.7 | 228.2 | 226.3 |
| 47.5° | 1136.3 | 1104.0 | 671.4 | 326.0 | 280.7 | 277.4 | 263.8 | 243.7 | 219.9 | 204.1 | 202.8 |
| 50°   | 1392.5 | 1307.4 | 664.6 | 285.2 | 254.5 | 255.5 | 244.4 | 223.2 | 200.6 | 189.0 | 187.7 |
| 52.5° | 1698.9 | 1544.3 | 677.7 | 253.7 | 233.5 | 236.9 | 228.6 | 208.8 | 189.9 | 180.7 | 179.4 |
| 55°   | 2016.7 | 1789.7 | 691.8 | 230.8 | 213.6 | 220.4 | 217.5 | 201.1 | 184.0 | 175.6 | 174.4 |
| 57.5° | 2288.8 | 1973.0 | 663.6 | 212.2 | 195.8 | 206.4 | 208.9 | 196.3 | 181.1 | 173.4 | 172.1 |
| 60°   | 2460.1 | 2046.7 | 589.6 | 194.8 | 181.7 | 195.3 | 203.9 | 195.0 | 182.2 | 181.6 | 180.6 |
| 62.5° | 2541.3 | 2040.3 | 478.7 | 181.1 | 172.9 | 190.5 | 207.6 | 202.5 | 195.5 | 201.5 | 202.0 |
| 65°   | 2504.9 | 1942.8 | 356.5 | 171.9 | 166.6 | 192.3 | 218.5 | 216.5 | 199.3 | 205.3 | 206.1 |
| 67.5° | 2264.8 | 1710.1 | 264.0 | 164.0 | 159.7 | 197.5 | 238.4 | 221.2 | 191.8 | 196.2 | 193.5 |
| 70°   | 1830.5 | 1355.8 | 203.6 | 155.0 | 152.5 | 196.8 | 247.4 | 218.4 | 183.7 | 184.7 | 177.6 |
| 72.5° | 1262.3 | 924.5  | 165.6 | 146.7 | 142.3 | 179.4 | 241.1 | 211.4 | 176.9 | 169.3 | 159.8 |
| 75°   | 686.4  | 496.3  | 140.8 | 138.1 | 124.2 | 157.5 | 229.5 | 206.4 | 170.8 | 160.7 | 155.4 |
| 77.5° | 270.1  | 205.9  | 122.2 | 126.3 | 108.6 | 139.1 | 216.5 | 197.0 | 162.3 | 149.1 | 146.4 |
| 80°   | 110.3  | 105.1  | 101.3 | 109.3 | 93.3  | 121.7 | 201.0 | 185.9 | 152.2 | 138.3 | 133.0 |
| 82.5° | 62.5   | 65.3   | 78.8  | 86.2  | 75.8  | 112.1 | 193.5 | 176.9 | 140.1 | 123.9 | 117.6 |
| 85°   | 32.0   | 38.3   | 54.9  | 61.8  | 55.7  | 95.3  | 178.2 | 154.9 | 112.4 | 94.8  | 95.3  |
| 87.5° | 15.4   | 21.4   | 34.7  | 38.8  | 36.1  | 69.0  | 133.1 | 112.3 | 87.5  | 69.3  | 67.2  |
| 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: SP1-1908-441-4-R4

Test Date: 10/02/2019

Luminaire Tested: SA1C-750-U-5WQ

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

### Test Information

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-4-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-750-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):                  | 4884   | CRI (Ra): | 73.5 |      |       |
| CIE u':                   | 0.2101 | R1:       | 70.5 | R9:  | -28.4 |
| CIE v':                   | 0.4904 | R2:       | 77.7 | R10: | 48.6  |
| Duv:                      | 0.0037 | R3:       | 84.6 | R11: | 73.2  |
| CIE x:                    | 0.3493 | R4:       | 74.7 | R12: | 50.7  |
| CIE y:                    | 0.3624 | R5:       | 71.9 | R13: | 71.2  |
| CIE z:                    | 0.2884 | R6:       | 70.7 | R14: | 91.4  |
| Peak Wavelength (nm):     | 444    | R7:       | 81.2 |      |       |
| Dominant Wavelength (nm): | 571    | R8:       | 56.9 |      |       |
| Purity:                   | 13.7   |           |      |      |       |
| Rf:                       | 74.9   |           |      |      |       |
| Rg:                       | 96.3   |           |      |      |       |



### Test Conditions

Stabilization Time: 240M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0./44%  
 Sphere Temperature (°C): 25.7

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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



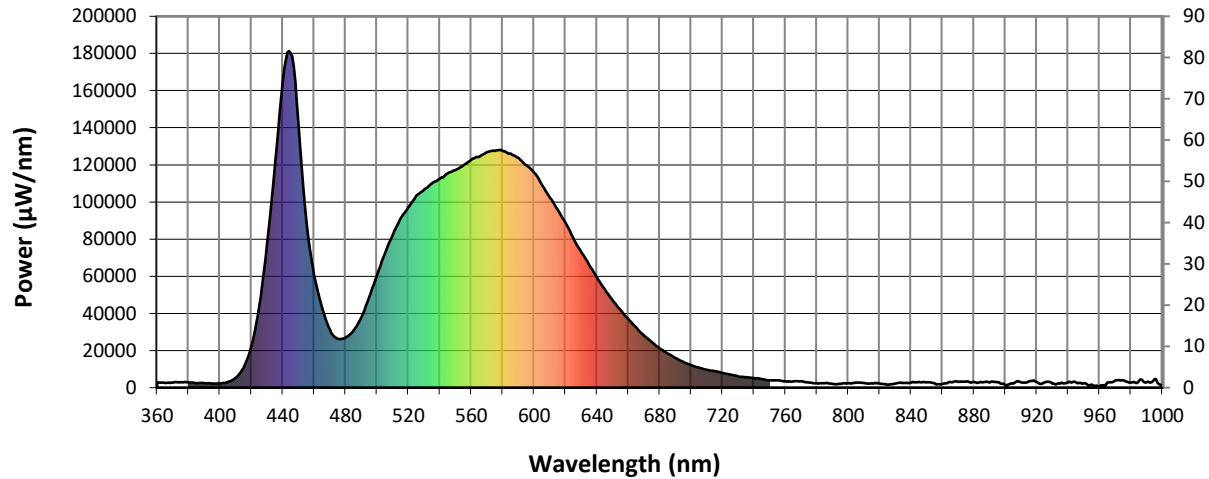
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 5000K 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       | 2945             | NR               | 490       | 37941            | NR               | 620       | 88803            | NR               | 750       | 3908             | NR               | 880       | 2997             | NR               |
| 365       | 2596             | NR               | 495       | 48525            | NR               | 625       | 80578            | NR               | 755       | 3988             | NR               | 885       | 2927             | NR               |
| 370       | 2732             | NR               | 500       | 60609            | NR               | 630       | 73127            | NR               | 760       | 3335             | NR               | 890       | 2649             | NR               |
| 375       | 2894             | NR               | 505       | 72036            | NR               | 635       | 66244            | NR               | 765       | 3438             | NR               | 895       | 2828             | NR               |
| 380       | 2822             | NR               | 510       | 82168            | NR               | 640       | 59440            | NR               | 770       | 3427             | NR               | 900       | 1407             | NR               |
| 385       | 2394             | NR               | 515       | 90898            | NR               | 645       | 52864            | NR               | 775       | 2759             | NR               | 905       | 2224             | NR               |
| 390       | 2370             | NR               | 520       | 97142            | NR               | 650       | 47085            | NR               | 780       | 2340             | NR               | 910       | 2905             | NR               |
| 395       | 2267             | NR               | 525       | 103255           | NR               | 655       | 41789            | NR               | 785       | 2412             | NR               | 915       | 3350             | NR               |
| 400       | 2262             | NR               | 530       | 106697           | NR               | 660       | 37064            | NR               | 790       | 1999             | NR               | 920       | 3114             | NR               |
| 405       | 3000             | NR               | 535       | 110081           | NR               | 665       | 32299            | NR               | 795       | 2054             | NR               | 925       | 2834             | NR               |
| 410       | 5324             | NR               | 540       | 112494           | NR               | 670       | 28142            | NR               | 800       | 2331             | NR               | 930       | 2271             | NR               |
| 415       | 10725            | NR               | 545       | 115513           | NR               | 675       | 24505            | NR               | 805       | 2648             | NR               | 935       | 2228             | NR               |
| 420       | 22128            | NR               | 550       | 117203           | NR               | 680       | 21162            | NR               | 810       | 2485             | NR               | 940       | 2833             | NR               |
| 425       | 44095            | NR               | 555       | 119753           | NR               | 685       | 18400            | NR               | 815       | 2409             | NR               | 945       | 2941             | NR               |
| 430       | 77002            | NR               | 560       | 122602           | NR               | 690       | 16065            | NR               | 820       | 2221             | NR               | 950       | 2323             | NR               |
| 435       | 119881           | NR               | 565       | 124314           | NR               | 695       | 13860            | NR               | 825       | 1562             | NR               | 955       | 1667             | NR               |
| 440       | 164454           | NR               | 570       | 126775           | NR               | 700       | 12177            | NR               | 830       | 2249             | NR               | 960       | 749              | NR               |
| 445       | 179997           | NR               | 575       | 127511           | NR               | 705       | 10757            | NR               | 835       | 2573             | NR               | 965       | 2669             | NR               |
| 450       | 142822           | NR               | 580       | 127577           | NR               | 710       | 9601             | NR               | 840       | 2764             | NR               | 970       | 3968             | NR               |
| 455       | 90008            | NR               | 585       | 126153           | NR               | 715       | 8944             | NR               | 845       | 3109             | NR               | 975       | 3886             | NR               |
| 460       | 60557            | NR               | 590       | 123678           | NR               | 720       | 7947             | NR               | 850       | 2963             | NR               | 980       | 2788             | NR               |
| 465       | 43305            | NR               | 595       | 119774           | NR               | 725       | 7062             | NR               | 855       | 2336             | NR               | 985       | 3496             | NR               |
| 470       | 31089            | NR               | 600       | 115733           | NR               | 730       | 6004             | NR               | 860       | 2118             | NR               | 990       | 2913             | NR               |
| 475       | 26278            | NR               | 605       | 109231           | NR               | 735       | 5594             | NR               | 865       | 3144             | NR               | 995       | 4659             | NR               |
| 480       | 27060            | NR               | 610       | 102408           | NR               | 740       | 5165             | NR               | 870       | 3069             | NR               | 1000      | 1308             | NR               |
| 485       | 30698            | NR               | 615       | 96015            | NR               | 745       | 4687             | NR               | 875       | 3311             | NR               |           |                  |                  |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 13493.5

S/P: 1.77

| 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       | 2945             | NR               | 490       | 37941            | NR               | 620       | 88803            | NR               | 750       | 3908             | NR               | 880       | 2997             | NR               |
| 365       | 2596             | NR               | 495       | 48525            | NR               | 625       | 80578            | NR               | 755       | 3988             | NR               | 885       | 2927             | NR               |
| 370       | 2732             | NR               | 500       | 60609            | NR               | 630       | 73127            | NR               | 760       | 3335             | NR               | 890       | 2649             | NR               |
| 375       | 2894             | NR               | 505       | 72036            | NR               | 635       | 66244            | NR               | 765       | 3438             | NR               | 895       | 2828             | NR               |
| 380       | 2822             | NR               | 510       | 82168            | NR               | 640       | 59440            | NR               | 770       | 3427             | NR               | 900       | 1407             | NR               |
| 385       | 2394             | NR               | 515       | 90898            | NR               | 645       | 52864            | NR               | 775       | 2759             | NR               | 905       | 2224             | NR               |
| 390       | 2370             | NR               | 520       | 97142            | NR               | 650       | 47085            | NR               | 780       | 2340             | NR               | 910       | 2905             | NR               |
| 395       | 2267             | NR               | 525       | 103255           | NR               | 655       | 41789            | NR               | 785       | 2412             | NR               | 915       | 3350             | NR               |
| 400       | 2262             | NR               | 530       | 106697           | NR               | 660       | 37064            | NR               | 790       | 1999             | NR               | 920       | 3114             | NR               |
| 405       | 3000             | NR               | 535       | 110081           | NR               | 665       | 32299            | NR               | 795       | 2054             | NR               | 925       | 2834             | NR               |
| 410       | 5324             | NR               | 540       | 112494           | NR               | 670       | 28142            | NR               | 800       | 2331             | NR               | 930       | 2271             | NR               |
| 415       | 10725            | NR               | 545       | 115513           | NR               | 675       | 24505            | NR               | 805       | 2648             | NR               | 935       | 2228             | NR               |
| 420       | 22128            | NR               | 550       | 117203           | NR               | 680       | 21162            | NR               | 810       | 2485             | NR               | 940       | 2833             | NR               |
| 425       | 44095            | NR               | 555       | 119753           | NR               | 685       | 18400            | NR               | 815       | 2409             | NR               | 945       | 2941             | NR               |
| 430       | 77002            | NR               | 560       | 122602           | NR               | 690       | 16065            | NR               | 820       | 2221             | NR               | 950       | 2323             | NR               |
| 435       | 119881           | NR               | 565       | 124314           | NR               | 695       | 13860            | NR               | 825       | 1562             | NR               | 955       | 1667             | NR               |
| 440       | 164454           | NR               | 570       | 126775           | NR               | 700       | 12177            | NR               | 830       | 2249             | NR               | 960       | 749              | NR               |
| 445       | 179997           | NR               | 575       | 127511           | NR               | 705       | 10757            | NR               | 835       | 2573             | NR               | 965       | 2669             | NR               |
| 450       | 142822           | NR               | 580       | 127577           | NR               | 710       | 9601             | NR               | 840       | 2764             | NR               | 970       | 3968             | NR               |
| 455       | 90008            | NR               | 585       | 126153           | NR               | 715       | 8944             | NR               | 845       | 3109             | NR               | 975       | 3886             | NR               |
| 460       | 60557            | NR               | 590       | 123678           | NR               | 720       | 7947             | NR               | 850       | 2963             | NR               | 980       | 2788             | NR               |
| 465       | 43305            | NR               | 595       | 119774           | NR               | 725       | 7062             | NR               | 855       | 2336             | NR               | 985       | 3496             | NR               |
| 470       | 31089            | NR               | 600       | 115733           | NR               | 730       | 6004             | NR               | 860       | 2118             | NR               | 990       | 2913             | NR               |
| 475       | 26278            | NR               | 605       | 109231           | NR               | 735       | 5594             | NR               | 865       | 3144             | NR               | 995       | 4659             | NR               |
| 480       | 27060            | NR               | 610       | 102408           | NR               | 740       | 5165             | NR               | 870       | 3069             | NR               | 1000      | 1308             | NR               |
| 485       | 30698            | NR               | 615       | 96015            | NR               | 745       | 4687             | NR               | 875       | 3311             | NR               |           |                  |                  |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 5378.9**

**M/P: 0.71**

| 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       | 2945             | NR               | 490       | 37941            | NR               | 620       | 88803            | NR               | 750       | 3908             | NR               | 880       | 2997             | NR               |
| 365       | 2596             | NR               | 495       | 48525            | NR               | 625       | 80578            | NR               | 755       | 3988             | NR               | 885       | 2927             | NR               |
| 370       | 2732             | NR               | 500       | 60609            | NR               | 630       | 73127            | NR               | 760       | 3335             | NR               | 890       | 2649             | NR               |
| 375       | 2894             | NR               | 505       | 72036            | NR               | 635       | 66244            | NR               | 765       | 3438             | NR               | 895       | 2828             | NR               |
| 380       | 2822             | NR               | 510       | 82168            | NR               | 640       | 59440            | NR               | 770       | 3427             | NR               | 900       | 1407             | NR               |
| 385       | 2394             | NR               | 515       | 90898            | NR               | 645       | 52864            | NR               | 775       | 2759             | NR               | 905       | 2224             | NR               |
| 390       | 2370             | NR               | 520       | 97142            | NR               | 650       | 47085            | NR               | 780       | 2340             | NR               | 910       | 2905             | NR               |
| 395       | 2267             | NR               | 525       | 103255           | NR               | 655       | 41789            | NR               | 785       | 2412             | NR               | 915       | 3350             | NR               |
| 400       | 2262             | NR               | 530       | 106697           | NR               | 660       | 37064            | NR               | 790       | 1999             | NR               | 920       | 3114             | NR               |
| 405       | 3000             | NR               | 535       | 110081           | NR               | 665       | 32299            | NR               | 795       | 2054             | NR               | 925       | 2834             | NR               |
| 410       | 5324             | NR               | 540       | 112494           | NR               | 670       | 28142            | NR               | 800       | 2331             | NR               | 930       | 2271             | NR               |
| 415       | 10725            | NR               | 545       | 115513           | NR               | 675       | 24505            | NR               | 805       | 2648             | NR               | 935       | 2228             | NR               |
| 420       | 22128            | NR               | 550       | 117203           | NR               | 680       | 21162            | NR               | 810       | 2485             | NR               | 940       | 2833             | NR               |
| 425       | 44095            | NR               | 555       | 119753           | NR               | 685       | 18400            | NR               | 815       | 2409             | NR               | 945       | 2941             | NR               |
| 430       | 77002            | NR               | 560       | 122602           | NR               | 690       | 16065            | NR               | 820       | 2221             | NR               | 950       | 2323             | NR               |
| 435       | 119881           | NR               | 565       | 124314           | NR               | 695       | 13860            | NR               | 825       | 1562             | NR               | 955       | 1667             | NR               |
| 440       | 164454           | NR               | 570       | 126775           | NR               | 700       | 12177            | NR               | 830       | 2249             | NR               | 960       | 749              | NR               |
| 445       | 179997           | NR               | 575       | 127511           | NR               | 705       | 10757            | NR               | 835       | 2573             | NR               | 965       | 2669             | NR               |
| 450       | 142822           | NR               | 580       | 127577           | NR               | 710       | 9601             | NR               | 840       | 2764             | NR               | 970       | 3968             | NR               |
| 455       | 90008            | NR               | 585       | 126153           | NR               | 715       | 8944             | NR               | 845       | 3109             | NR               | 975       | 3886             | NR               |
| 460       | 60557            | NR               | 590       | 123678           | NR               | 720       | 7947             | NR               | 850       | 2963             | NR               | 980       | 2788             | NR               |
| 465       | 43305            | NR               | 595       | 119774           | NR               | 725       | 7062             | NR               | 855       | 2336             | NR               | 985       | 3496             | NR               |
| 470       | 31089            | NR               | 600       | 115733           | NR               | 730       | 6004             | NR               | 860       | 2118             | NR               | 990       | 2913             | NR               |
| 475       | 26278            | NR               | 605       | 109231           | NR               | 735       | 5594             | NR               | 865       | 3144             | NR               | 995       | 4659             | NR               |
| 480       | 27060            | NR               | 610       | 102408           | NR               | 740       | 5165             | NR               | 870       | 3069             | NR               | 1000      | 1308             | NR               |
| 485       | 30698            | NR               | 615       | 96015            | NR               | 745       | 4687             | NR               | 875       | 3311             | NR               |           |                  |                  |

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**Summary**

$R_f = 74.9$   
 $R_g = 96.3$   
 CIE  $R_a = 73.5$   
 $R_g = -28.4$

**Spectral Power Distribution Comparison**



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 61 | CES51 = 90 | CES76 = 52 |
| CES02 = 60 | CES27 = 84 | CES52 = 91 | CES77 = 71 |
| CES03 = 30 | CES28 = 81 | CES53 = 79 | CES78 = 54 |
| CES04 = 69 | CES29 = 58 | CES54 = 83 | CES79 = 80 |
| CES05 = 46 | CES30 = 67 | CES55 = 83 | CES80 = 77 |
| CES06 = 50 | CES31 = 63 | CES56 = 73 | CES81 = 77 |
| CES07 = 39 | CES32 = 59 | CES57 = 72 | CES82 = 90 |
| CES08 = 38 | CES33 = 69 | CES58 = 73 | CES83 = 86 |
| CES09 = 29 | CES34 = 69 | CES59 = 88 | CES84 = 88 |
| CES10 = 73 | CES35 = 83 | CES60 = 93 | CES85 = 84 |
| CES11 = 56 | CES36 = 95 | CES61 = 88 | CES86 = 75 |
| CES12 = 61 | CES37 = 78 | CES62 = 85 | CES87 = 78 |
| CES13 = 41 | CES38 = 76 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 93 | CES64 = 74 | CES89 = 75 |
| CES15 = 70 | CES40 = 86 | CES65 = 67 | CES90 = 77 |
| CES16 = 46 | CES41 = 87 | CES66 = 69 | CES91 = 89 |
| CES17 = 49 | CES42 = 78 | CES67 = 67 | CES92 = 66 |
| CES18 = 55 | CES43 = 75 | CES68 = 73 | CES93 = 80 |
| CES19 = 71 | CES44 = 99 | CES69 = 81 | CES94 = 57 |
| CES20 = 64 | CES45 = 83 | CES70 = 63 | CES95 = 71 |
| CES21 = 85 | CES46 = 81 | CES71 = 60 | CES96 = 78 |
| CES22 = 77 | CES47 = 80 | CES72 = 86 | CES97 = 85 |
| CES23 = 91 | CES48 = 72 | CES73 = 53 | CES98 = 75 |
| CES24 = 90 | CES49 = 81 | CES74 = 96 | CES99 = 62 |
| CES25 = 71 | CES50 = 89 | CES75 = 58 |            |



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**Color Rendition by Hue-Angle Bin**



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**Measure Comparisons**



(END OF REPORT)