

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: P385537

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

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P385537  
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: GPC-SA1A-750-U-T4W  
Description: GALLEON PEDESTRIAN 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: 4942 lumens  
Efficiency: N/A  
Efficacy: 145.4 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: 28.75 FT

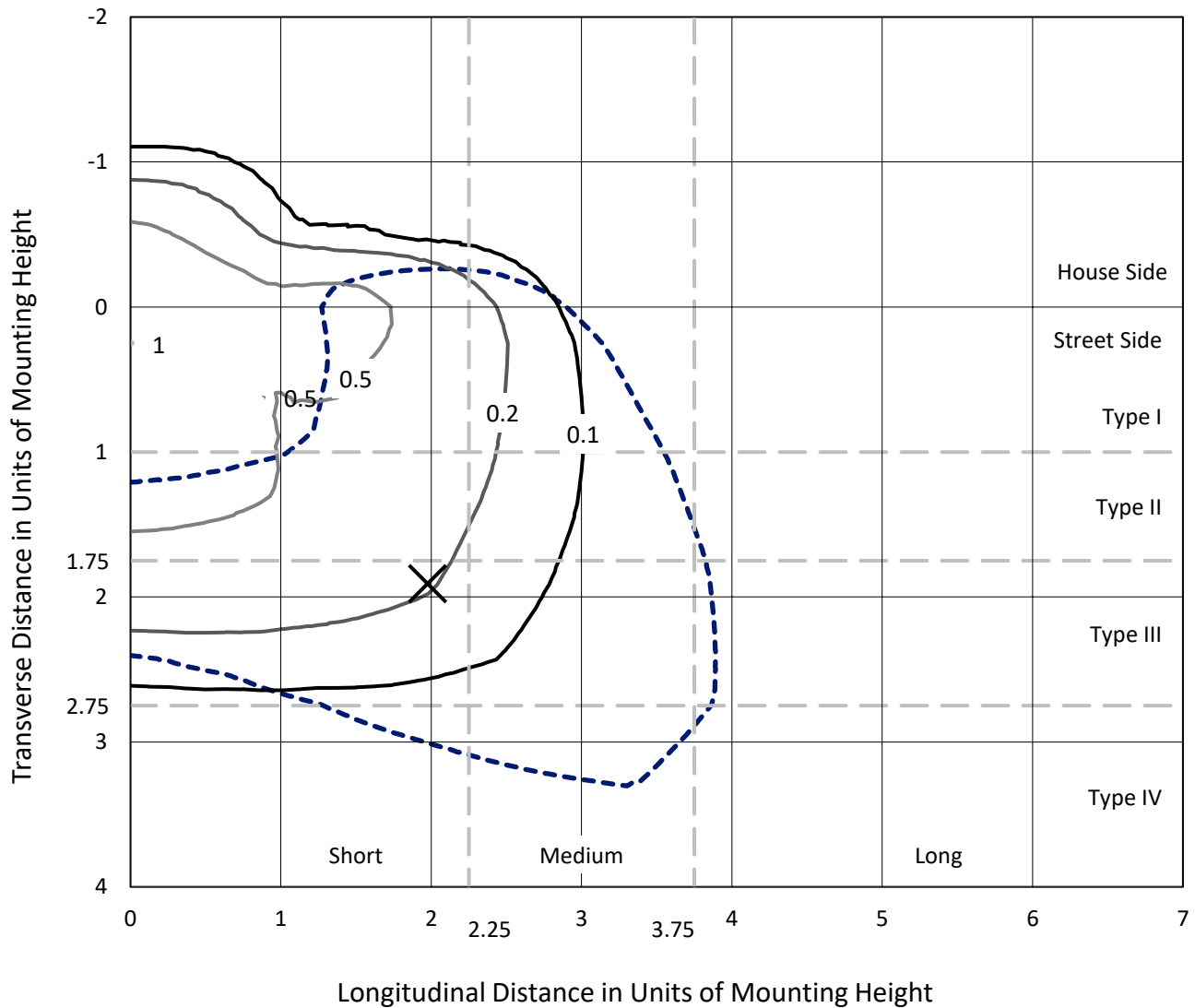


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## Iso-Footcandle Lines of Horizontal Illumination

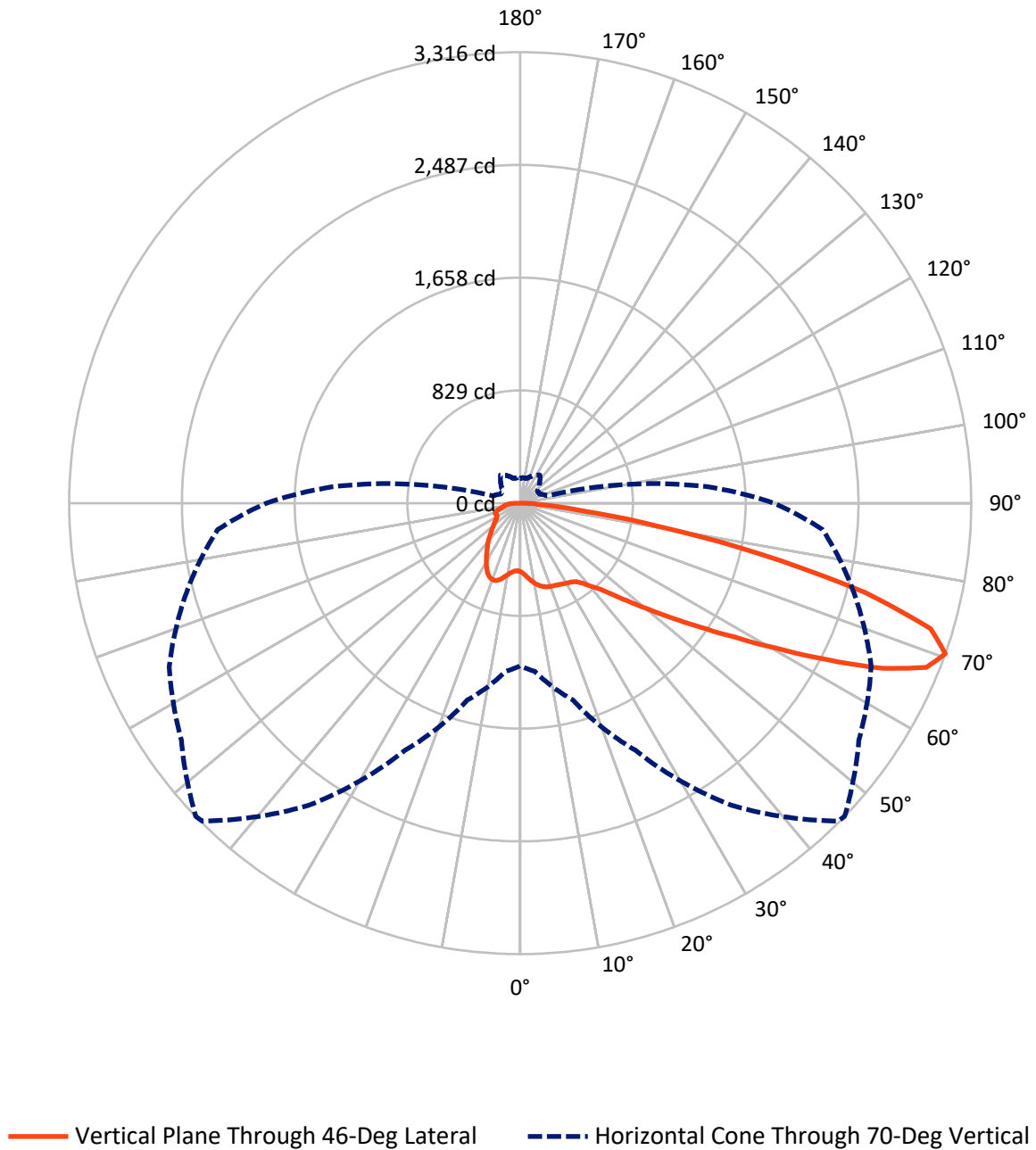
✕ Max cd  
 - - - 1/2 Max cd



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

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## Luminous Intensity Polar Plot



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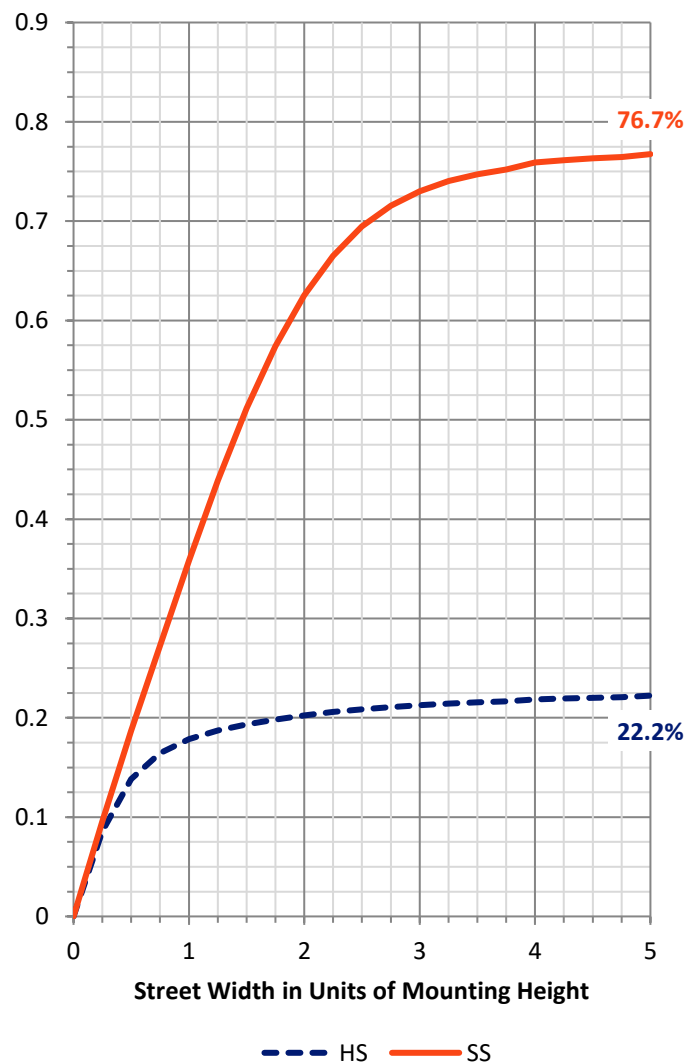
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1132.7   | 0.0    | 1132.7 |
|                    | % Fixture | 22.9     | 0.0    | 22.9   |
| <b>Street Side</b> | Lumens    | 3809.3   | 0.0    | 3809.3 |
|                    | % Fixture | 77.1     | 0.0    | 77.1   |
| <b>Total</b>       | Lumens    | 4942.0   | 0.0    | 4942.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 51.3   | 1.0       |
| 10°-20°   | 171.0  | 3.5       |
| 20°-30°   | 285.1  | 5.8       |
| 30°-40°   | 404.6  | 8.2       |
| 40°-50°   | 595.2  | 12.0      |
| 50°-60°   | 1007.9 | 20.4      |
| 60°-70°   | 1430.7 | 29.0      |
| 70°-80°   | 869.2  | 17.6      |
| 80°-90°   | 126.8  | 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°    | 4942.0 | 100.0     |
| 0°-180°   | 4942.0 | 100.0     |

**Coefficient of Utilization**



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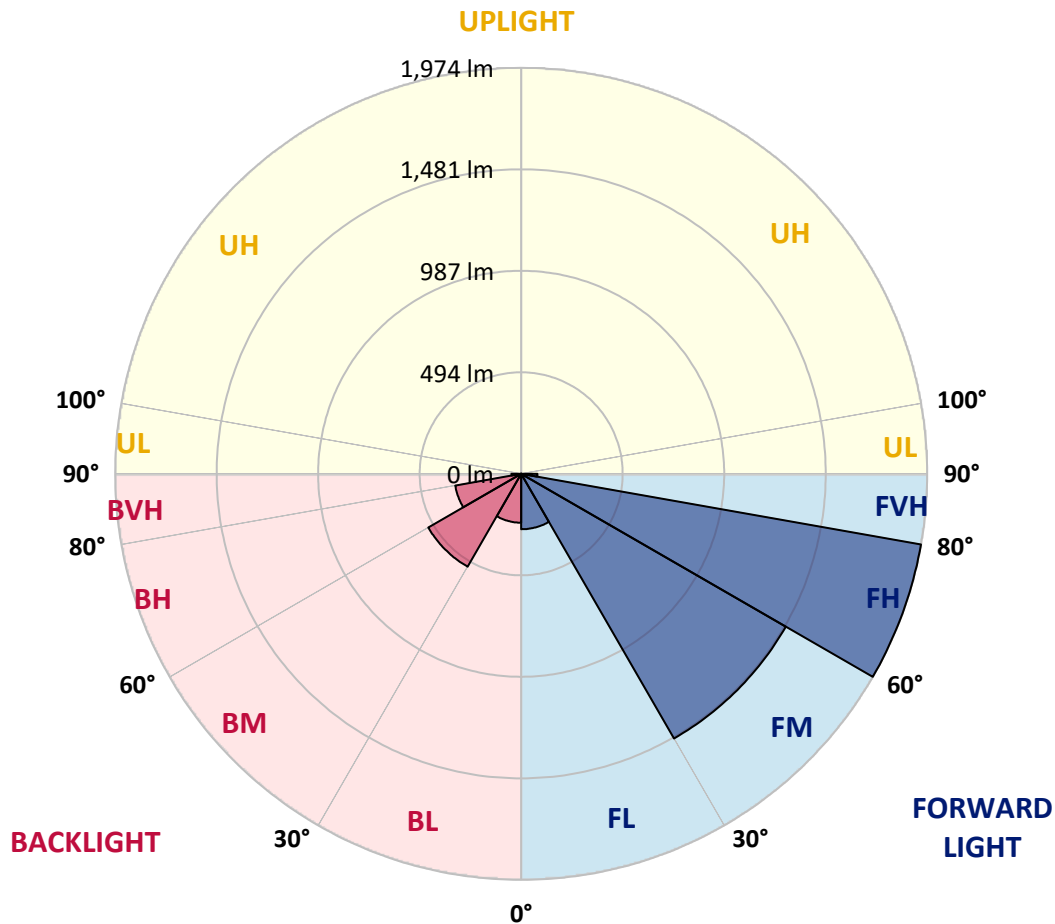
CATALOG NUMBER: GPC-SA1A-750-U-T4W

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 269.7  | 5.5       |                         |      |         |
| FM   | (30°-60°)   | 1486.3 | 30.1      |                         |      |         |
| FH   | (60°-80°)   | 1974.3 | 39.9      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 79.0   | 1.6       |                         |      | G1/100  |
| BL   | (0°-30°)    | 237.8  | 4.8       | B1/500                  |      |         |
| BM   | (30°-60°)   | 521.4  | 10.6      | B1/1000                 |      |         |
| BH   | (60°-80°)   | 325.6  | 6.6       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 47.8   | 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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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 46°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 503.5  | 503.5  | 503.5  | 503.5  | 503.5  | 503.5  | 503.5  | 503.5  | 503.5  | 503.5  | 503.5  |
| 2.5°  | 528.7  | 529.0  | 529.7  | 528.0  | 523.3  | 521.9  | 521.4  | 516.5  | 513.3  | 508.6  | 504.5  |
| 5°    | 571.0  | 571.3  | 570.3  | 565.6  | 555.1  | 547.3  | 546.6  | 535.5  | 525.3  | 514.5  | 506.4  |
| 7.5°  | 615.1  | 615.6  | 612.4  | 603.4  | 588.7  | 575.2  | 574.4  | 559.1  | 543.7  | 527.3  | 515.2  |
| 10°   | 654.2  | 652.2  | 646.9  | 634.4  | 617.0  | 600.4  | 599.7  | 583.8  | 566.1  | 546.3  | 530.0  |
| 12.5° | 680.2  | 678.5  | 671.8  | 656.6  | 637.4  | 622.2  | 620.9  | 606.2  | 588.9  | 567.3  | 547.8  |
| 15°   | 694.6  | 695.8  | 686.7  | 669.4  | 650.8  | 637.9  | 636.8  | 626.3  | 610.9  | 589.1  | 566.7  |
| 17.5° | 696.5  | 697.5  | 688.7  | 671.6  | 656.4  | 647.6  | 647.1  | 640.1  | 629.0  | 608.0  | 584.7  |
| 20°   | 685.6  | 686.3  | 679.0  | 665.0  | 655.0  | 652.3  | 652.2  | 649.1  | 640.8  | 622.2  | 599.6  |
| 22.5° | 669.9  | 670.4  | 665.2  | 655.0  | 651.6  | 655.9  | 657.1  | 655.9  | 650.0  | 632.5  | 611.2  |
| 25°   | 666.0  | 665.7  | 660.3  | 650.0  | 652.8  | 661.8  | 663.3  | 663.8  | 659.8  | 644.5  | 626.1  |
| 27.5° | 684.8  | 683.6  | 673.3  | 656.7  | 658.6  | 669.4  | 671.4  | 676.3  | 673.8  | 660.4  | 643.0  |
| 30°   | 739.1  | 737.1  | 715.9  | 682.4  | 673.3  | 678.9  | 681.4  | 689.2  | 689.7  | 678.5  | 665.5  |
| 32.5° | 830.8  | 828.2  | 790.3  | 730.5  | 698.2  | 688.5  | 690.9  | 702.6  | 708.8  | 700.2  | 686.2  |
| 35°   | 946.6  | 943.7  | 894.0  | 812.2  | 739.8  | 707.0  | 708.6  | 717.9  | 730.5  | 718.3  | 699.7  |
| 37.5° | 1067.4 | 1060.4 | 1012.6 | 908.2  | 805.9  | 746.4  | 746.4  | 747.5  | 753.5  | 728.1  | 715.6  |
| 40°   | 1187.4 | 1180.5 | 1137.2 | 1021.2 | 891.5  | 808.4  | 804.5  | 778.3  | 773.6  | 751.8  | 747.5  |
| 42.5° | 1299.1 | 1297.0 | 1271.5 | 1148.9 | 991.9  | 869.5  | 864.1  | 819.6  | 820.6  | 807.1  | 807.2  |
| 45°   | 1417.8 | 1417.8 | 1397.0 | 1277.8 | 1109.0 | 967.6  | 962.2  | 896.7  | 906.9  | 900.6  | 915.7  |
| 47.5° | 1514.7 | 1517.8 | 1514.9 | 1412.0 | 1245.1 | 1092.2 | 1082.4 | 1003.6 | 1032.0 | 1053.5 | 1097.3 |
| 50°   | 1613.6 | 1618.4 | 1618.9 | 1559.4 | 1409.7 | 1240.4 | 1229.2 | 1145.5 | 1208.9 | 1270.5 | 1356.6 |
| 52.5° | 1757.2 | 1767.9 | 1725.4 | 1706.3 | 1611.3 | 1416.3 | 1405.3 | 1328.0 | 1433.9 | 1520.3 | 1668.6 |
| 55°   | 1890.3 | 1881.0 | 1850.8 | 1862.6 | 1827.1 | 1616.5 | 1608.2 | 1540.4 | 1684.5 | 1796.8 | 1989.4 |
| 57.5° | 1962.4 | 1961.7 | 1992.2 | 2042.9 | 2059.8 | 1863.4 | 1856.5 | 1790.6 | 1967.1 | 2051.5 | 2290.7 |
| 60°   | 2047.0 | 2048.1 | 2123.6 | 2238.7 | 2308.4 | 2170.9 | 2167.9 | 2117.8 | 2241.6 | 2289.3 | 2526.9 |
| 62.5° | 2058.8 | 2080.1 | 2210.0 | 2408.2 | 2541.1 | 2530.1 | 2536.9 | 2412.6 | 2487.2 | 2479.1 | 2703.3 |
| 65°   | 1922.6 | 1950.7 | 2185.8 | 2459.5 | 2772.5 | 2923.0 | 2929.3 | 2709.1 | 2680.8 | 2641.3 | 2766.4 |
| 67.5° | 1643.6 | 1685.2 | 1940.6 | 2348.0 | 2848.8 | 3213.4 | 3222.2 | 2938.9 | 2841.5 | 2696.2 | 2614.5 |
| 70°   | 1196.1 | 1242.2 | 1499.3 | 2005.3 | 2712.8 | 3306.3 | 3316.3 | 3040.6 | 2847.6 | 2539.8 | 2232.0 |
| 72.5° | 722.5  | 758.7  | 970.6  | 1476.3 | 2289.7 | 3137.1 | 3154.9 | 2911.7 | 2599.8 | 2151.3 | 1648.1 |
| 75°   | 317.3  | 341.0  | 469.3  | 850.7  | 1639.2 | 2595.6 | 2617.8 | 2492.3 | 2112.4 | 1563.4 | 974.2  |
| 77.5° | 135.1  | 141.9  | 192.5  | 369.5  | 926.7  | 1773.6 | 1804.1 | 1821.0 | 1433.2 | 850.7  | 411.7  |
| 80°   | 84.2   | 86.9   | 108.9  | 167.3  | 433.6  | 996.2  | 1029.0 | 1071.4 | 711.7  | 312.7  | 143.8  |
| 82.5° | 51.2   | 54.3   | 72.4   | 101.1  | 225.8  | 451.6  | 467.3  | 497.2  | 276.2  | 135.1  | 74.4   |
| 85°   | 30.8   | 33.0   | 44.3   | 63.9   | 128.5  | 177.6  | 177.4  | 196.2  | 130.1  | 86.9   | 39.2   |
| 87.5° | 14.7   | 16.4   | 23.7   | 33.1   | 64.8   | 66.6   | 62.4   | 70.7   | 79.0   | 57.0   | 19.8   |
| 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°    | 503.5  | 503.5  | 503.5 | 503.5 | 503.5 | 503.5 | 503.5 | 503.5 | 503.5 | 503.5 | 503.5 |
| 2.5°  | 503.2  | 502.5  | 500.3 | 498.6 | 498.3 | 497.2 | 496.4 | 496.9 | 497.6 | 497.7 | 497.7 |
| 5°    | 503.0  | 501.1  | 498.3 | 497.1 | 498.6 | 500.6 | 503.2 | 506.5 | 508.6 | 510.1 | 511.1 |
| 7.5°  | 511.1  | 507.6  | 504.3 | 503.7 | 506.7 | 512.1 | 517.9 | 525.0 | 529.9 | 533.3 | 533.9 |
| 10°   | 524.6  | 520.2  | 517.0 | 517.7 | 523.1 | 530.9 | 539.0 | 548.1 | 555.6 | 560.2 | 560.5 |
| 12.5° | 540.2  | 536.0  | 532.9 | 535.8 | 544.8 | 554.2 | 562.7 | 570.6 | 577.4 | 582.0 | 582.0 |
| 15°   | 558.1  | 555.1  | 551.5 | 558.1 | 570.3 | 578.8 | 582.3 | 586.2 | 589.9 | 593.3 | 592.6 |
| 17.5° | 575.4  | 572.5  | 570.6 | 578.4 | 591.1 | 595.0 | 592.6 | 589.7 | 589.7 | 591.6 | 591.9 |
| 20°   | 590.3  | 587.7  | 588.9 | 596.5 | 603.1 | 599.1 | 590.3 | 581.1 | 577.4 | 578.4 | 579.4 |
| 22.5° | 603.3  | 602.1  | 605.6 | 609.2 | 604.5 | 590.3 | 574.0 | 561.7 | 557.1 | 556.8 | 557.1 |
| 25°   | 618.5  | 618.3  | 622.7 | 616.3 | 595.3 | 569.1 | 547.3 | 535.3 | 532.8 | 534.8 | 538.2 |
| 27.5° | 637.4  | 639.3  | 641.5 | 618.0 | 576.7 | 537.1 | 515.0 | 506.7 | 509.2 | 514.1 | 517.4 |
| 30°   | 661.6  | 666.7  | 662.0 | 613.8 | 550.0 | 500.6 | 479.5 | 477.1 | 484.0 | 491.0 | 494.4 |
| 32.5° | 685.1  | 693.1  | 681.6 | 602.8 | 515.5 | 461.9 | 445.5 | 444.8 | 453.3 | 460.0 | 464.8 |
| 35°   | 704.1  | 719.8  | 696.3 | 581.0 | 475.6 | 426.2 | 414.2 | 409.6 | 412.7 | 420.6 | 426.0 |
| 37.5° | 728.8  | 755.0  | 706.4 | 547.6 | 432.3 | 396.8 | 382.7 | 372.2 | 369.5 | 372.8 | 375.5 |
| 40°   | 773.9  | 808.6  | 711.2 | 501.1 | 390.0 | 367.3 | 353.1 | 337.7 | 327.1 | 319.3 | 319.5 |
| 42.5° | 847.7  | 878.4  | 708.1 | 444.6 | 350.9 | 338.6 | 322.5 | 304.8 | 287.5 | 269.9 | 268.6 |
| 45°   | 967.4  | 982.3  | 699.0 | 384.8 | 316.6 | 308.5 | 293.4 | 275.7 | 252.7 | 232.7 | 230.9 |
| 47.5° | 1159.0 | 1126.1 | 684.8 | 332.5 | 286.3 | 283.0 | 269.1 | 248.6 | 224.3 | 208.2 | 206.8 |
| 50°   | 1420.3 | 1333.6 | 677.9 | 290.9 | 259.6 | 260.6 | 249.3 | 227.6 | 204.6 | 192.8 | 191.5 |
| 52.5° | 1732.9 | 1575.3 | 691.2 | 258.8 | 238.1 | 241.7 | 233.2 | 212.9 | 193.7 | 184.3 | 183.0 |
| 55°   | 2057.1 | 1825.6 | 705.6 | 235.4 | 217.8 | 224.8 | 221.9 | 205.2 | 187.7 | 179.1 | 177.9 |
| 57.5° | 2334.6 | 2012.5 | 676.8 | 216.5 | 199.7 | 210.6 | 213.1 | 200.2 | 184.7 | 176.9 | 175.6 |
| 60°   | 2509.3 | 2087.7 | 601.4 | 198.7 | 185.4 | 199.2 | 208.0 | 198.9 | 185.9 | 185.2 | 184.2 |
| 62.5° | 2592.2 | 2081.1 | 488.3 | 184.7 | 176.4 | 194.3 | 211.7 | 206.5 | 199.4 | 205.5 | 206.0 |
| 65°   | 2555.0 | 1981.7 | 363.6 | 175.4 | 170.0 | 196.2 | 222.9 | 220.9 | 203.3 | 209.4 | 210.2 |
| 67.5° | 2310.1 | 1744.4 | 269.3 | 167.3 | 162.9 | 201.4 | 243.2 | 225.6 | 195.7 | 200.1 | 197.4 |
| 70°   | 1867.2 | 1383.0 | 207.7 | 158.1 | 155.6 | 200.8 | 252.3 | 222.7 | 187.4 | 188.4 | 181.1 |
| 72.5° | 1287.6 | 943.1  | 169.0 | 149.7 | 145.1 | 183.0 | 245.9 | 215.6 | 180.5 | 172.7 | 163.0 |
| 75°   | 700.2  | 506.2  | 143.6 | 140.9 | 126.7 | 160.7 | 234.1 | 210.6 | 174.2 | 163.9 | 158.5 |
| 77.5° | 275.5  | 210.1  | 124.6 | 128.9 | 110.8 | 141.9 | 220.9 | 200.9 | 165.6 | 152.0 | 149.3 |
| 80°   | 112.5  | 107.2  | 103.3 | 111.5 | 95.2  | 124.1 | 205.0 | 189.6 | 155.3 | 141.1 | 135.6 |
| 82.5° | 63.8   | 66.6   | 80.3  | 87.9  | 77.3  | 114.3 | 197.4 | 180.5 | 142.9 | 126.3 | 119.9 |
| 85°   | 32.6   | 39.1   | 56.0  | 63.1  | 56.8  | 97.2  | 181.8 | 158.0 | 114.7 | 96.7  | 97.2  |
| 87.5° | 15.7   | 21.8   | 35.3  | 39.6  | 36.9  | 70.4  | 135.8 | 114.5 | 89.3  | 70.7  | 68.5  |
| 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: SP1-1908-441-4-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 .

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### 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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**TM-30-18**

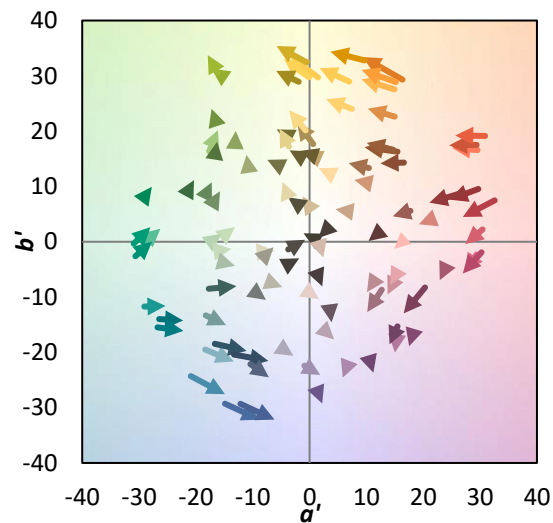
**Summary**

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

**Spectral Power Distribution Comparison**



**Color Vector Graphics**



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**TM-30-18**

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

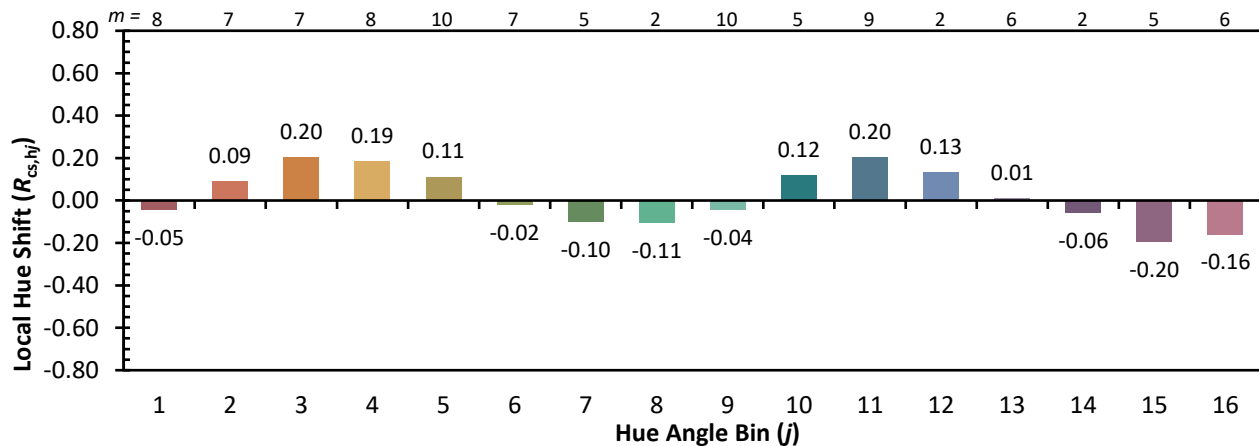
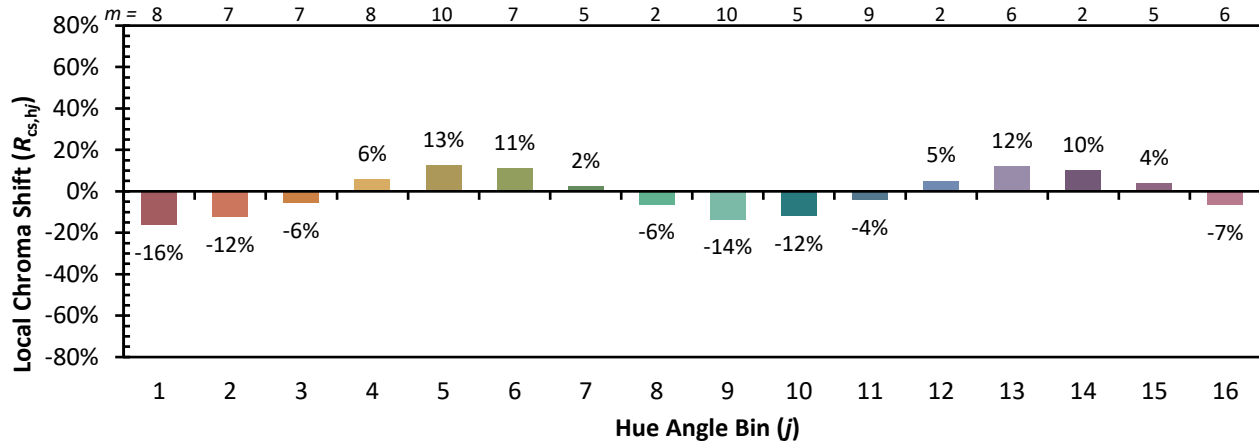
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 61 | CES51 = 90 | CES76 = 52 |
| CES02 = 60 | CES27 = 84 | CES52 = 91 | CES77 = 71 |
| CES03 = 30 | CES28 = 81 | CES53 = 79 | CES78 = 54 |
| CES04 = 69 | CES29 = 58 | CES54 = 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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**TM-30-18**

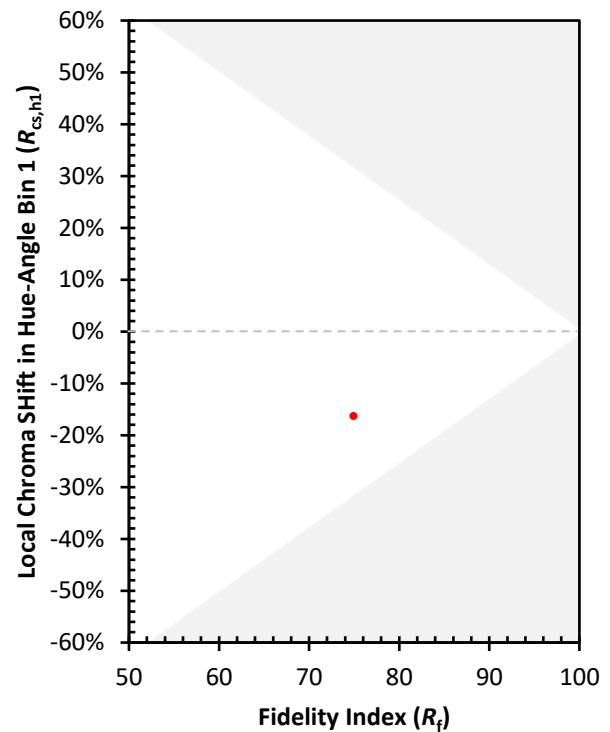
Color Rendition by Hue-Angle Bin



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**TM-30-18**

**Measure Comparisons**



(END OF REPORT)