

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



Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

Brand: McGRAW-EDISON

Report Number: P629089

Luminaire Tested: GWS-SA1A-830-U-T2R-W-GRSBK

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P629089  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-12)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA1A-830-U-T2R-W-GRSBK  
Description: GALLEON WALL SLIM LUMINAIRE. (1) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II ROADWAY OPTICS W/ FACTORY INSTALLED GLARE SHIELD, BK  
Light Source: (16) 3000K CCT, 80 CRI LEDS  
Ballast/Driver: -

**Summary**

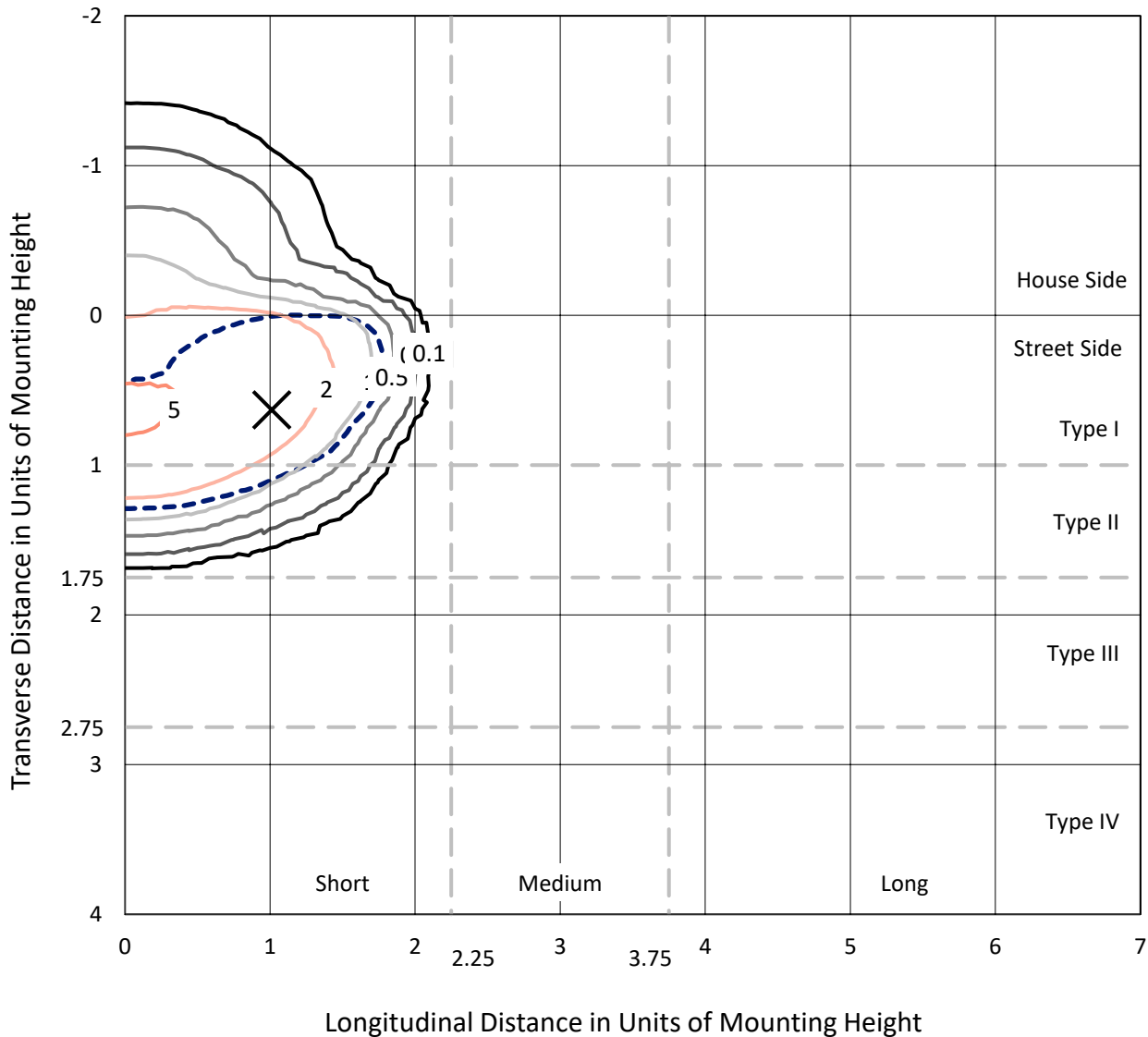
Lumens per Lamp: N/A  
Luminaire Lumens: 1514.3 lumens  
Efficiency: N/A  
Efficacy: 76.9 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B0 - U0 - G0  
  
Input Watts (W): 19.7  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 0  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



REPORT NUMBER: P629089  
 CATALOG NUMBER: GWS-SA1A-830-U-T2R-W-GRSBK

### Iso-Footcandle Lines of Horizontal Illumination

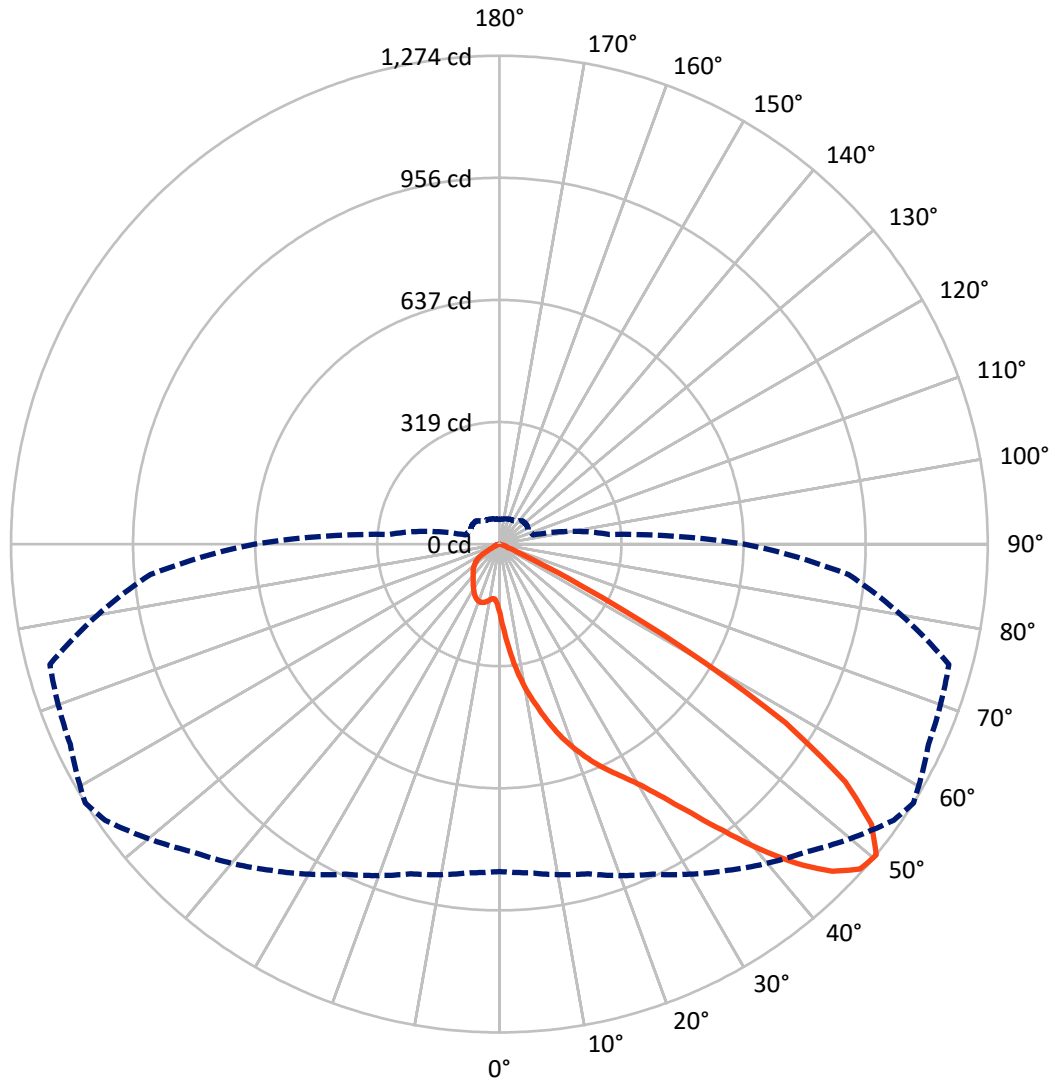
✕ Max cd  
 - - - 1/2 Max cd



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

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### Luminous Intensity Polar Plot



— Vertical Plane Through 58-Deg Lateral    - - - Horizontal Cone Through 50-Deg Vertical



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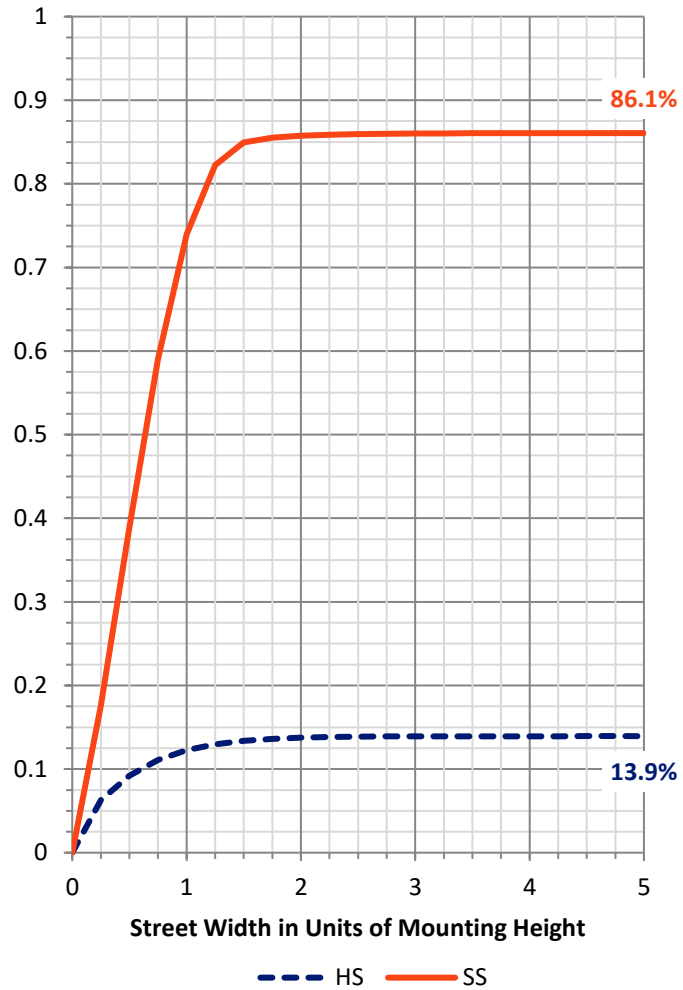
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 212.1    | 0.0    | 212.1  |
|                    | % Fixture | 14.0     | 0.0    | 14.0   |
| <b>Street Side</b> | Lumens    | 1302.2   | 0.0    | 1302.2 |
|                    | % Fixture | 86.0     | 0.0    | 86.0   |
| <b>Total</b>       | Lumens    | 1514.3   | 0.0    | 1514.3 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 22.4   | 1.5       |
| 10°-20°   | 88.7   | 5.9       |
| 20°-30°   | 179.5  | 11.9      |
| 30°-40°   | 317.6  | 21.0      |
| 40°-50°   | 462.9  | 30.6      |
| 50°-60°   | 371.1  | 24.5      |
| 60°-70°   | 66.9   | 4.4       |
| 70°-80°   | 5.3    | 0.3       |
| 80°-90°   | 0.0    | 0.0       |
| 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°    | 1514.3 | 100.0     |
| 0°-180°   | 1514.3 | 100.0     |

**Coefficient of Utilization**



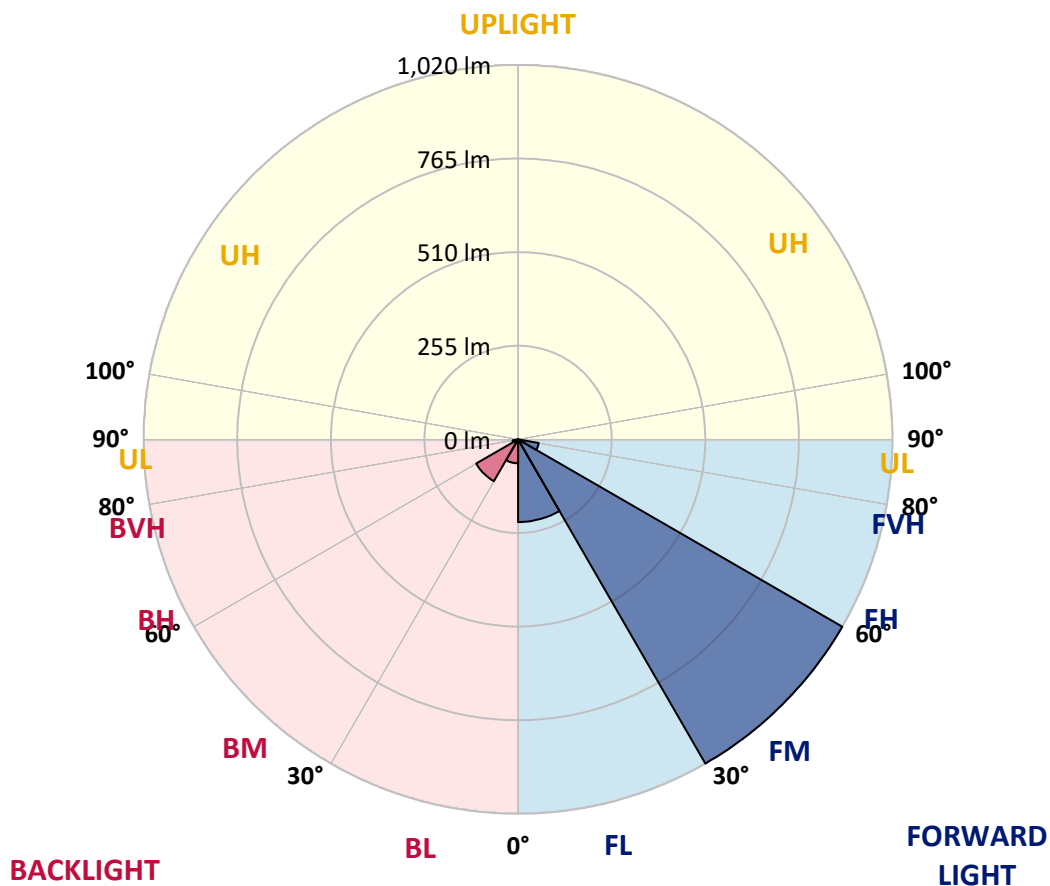
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |        |
|----------------|--------|-----------|-------------------------|------|--------|
|                |        |           | B                       | U    | G      |
| FL (0°-30°)    | 225.3  | 14.9      |                         |      |        |
| FM (30°-60°)   | 1019.8 | 67.3      |                         |      |        |
| FH (60°-80°)   | 57.0   | 3.8       |                         |      | G0/660 |
| FVH (80°-90°)  | 0.0    | 0.0       |                         |      | G0/10  |
| BL (0°-30°)    | 65.3   | 4.3       | B0/110                  |      |        |
| BM (30°-60°)   | 131.7  | 8.7       | B0/220                  |      |        |
| BH (60°-80°)   | 15.1   | 1.0       | B0/110                  |      | G0/110 |
| BVH (80°-90°)  | 0.0    | 0.0       |                         |      | G0/10  |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |        |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |        |

**BUG Rating: B0-U0-G0**  
 Type II Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 58°    | 65°    | 75°    | 85°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| 0°    | 180.9  | 180.9  | 180.9  | 180.9  | 180.9  | 180.9  | 180.9  | 180.9  | 180.9  | 180.9  | 180.9 |
| 2.5°  | 267.7  | 263.5  | 261.0  | 259.1  | 250.5  | 236.9  | 228.0  | 223.3  | 215.5  | 202.4  | 191.1 |
| 5°    | 349.3  | 346.2  | 340.5  | 336.7  | 325.6  | 306.4  | 286.5  | 278.5  | 260.9  | 231.2  | 204.7 |
| 7.5°  | 403.4  | 401.1  | 399.0  | 393.8  | 383.5  | 366.0  | 343.9  | 335.7  | 308.5  | 266.4  | 222.8 |
| 10°   | 445.0  | 443.2  | 440.8  | 440.6  | 432.5  | 416.8  | 395.3  | 386.7  | 357.2  | 304.6  | 244.2 |
| 12.5° | 481.6  | 480.1  | 479.6  | 484.2  | 479.0  | 467.3  | 444.0  | 433.3  | 402.1  | 343.6  | 267.8 |
| 15°   | 506.7  | 506.4  | 508.5  | 517.4  | 520.3  | 515.0  | 495.4  | 483.9  | 447.9  | 382.8  | 293.9 |
| 17.5° | 518.2  | 519.2  | 523.2  | 538.6  | 551.5  | 556.1  | 541.0  | 531.3  | 493.4  | 422.5  | 321.8 |
| 20°   | 537.8  | 537.5  | 539.9  | 554.5  | 570.3  | 586.5  | 582.0  | 573.7  | 539.4  | 464.4  | 352.7 |
| 22.5° | 593.0  | 588.3  | 583.1  | 585.4  | 591.1  | 610.0  | 618.4  | 614.2  | 586.8  | 507.5  | 384.6 |
| 25°   | 677.9  | 673.0  | 656.3  | 640.1  | 629.4  | 638.0  | 649.5  | 651.6  | 634.0  | 551.7  | 418.0 |
| 27.5° | 767.9  | 763.5  | 744.7  | 720.4  | 689.8  | 674.9  | 683.5  | 687.7  | 680.3  | 604.3  | 453.4 |
| 30°   | 852.3  | 846.4  | 825.9  | 795.7  | 760.3  | 737.4  | 727.7  | 730.6  | 735.0  | 666.7  | 495.0 |
| 32.5° | 925.5  | 921.1  | 896.5  | 864.7  | 830.6  | 806.8  | 784.1  | 788.9  | 799.6  | 743.0  | 548.3 |
| 35°   | 987.5  | 985.2  | 959.1  | 927.6  | 891.4  | 879.3  | 859.9  | 860.8  | 871.5  | 835.1  | 613.2 |
| 37.5° | 1041.4 | 1037.5 | 1013.9 | 984.6  | 955.9  | 954.0  | 948.6  | 949.1  | 954.6  | 942.5  | 687.9 |
| 40°   | 1075.4 | 1071.8 | 1055.0 | 1036.9 | 1016.5 | 1016.8 | 1044.5 | 1046.6 | 1040.3 | 1047.9 | 766.8 |
| 42.5° | 1088.2 | 1085.6 | 1076.5 | 1076.7 | 1074.6 | 1084.1 | 1136.1 | 1140.0 | 1117.3 | 1130.6 | 834.1 |
| 45°   | 1066.0 | 1064.9 | 1065.5 | 1088.8 | 1114.1 | 1143.6 | 1211.1 | 1217.9 | 1185.8 | 1185.5 | 886.8 |
| 47.5° | 994.4  | 992.2  | 1011.1 | 1050.8 | 1109.2 | 1166.6 | 1256.4 | 1267.0 | 1233.8 | 1216.9 | 919.8 |
| 50°   | 854.2  | 860.7  | 890.6  | 950.2  | 1039.1 | 1135.0 | 1256.0 | 1274.3 | 1235.6 | 1214.2 | 914.3 |
| 52.5° | 618.8  | 617.5  | 683.0  | 765.0  | 873.1  | 1034.0 | 1189.2 | 1216.0 | 1192.3 | 1187.1 | 902.0 |
| 55°   | 336.7  | 348.5  | 392.7  | 501.2  | 636.2  | 842.7  | 1036.9 | 1095.2 | 1122.5 | 1177.3 | 924.2 |
| 57.5° | 123.7  | 128.9  | 156.6  | 233.3  | 336.8  | 524.0  | 792.0  | 880.0  | 964.5  | 1149.7 | 920.4 |
| 60°   | 49.9   | 50.8   | 61.9   | 85.8   | 141.5  | 266.7  | 475.1  | 553.2  | 632.8  | 880.1  | 706.4 |
| 62.5° | 36.3   | 37.6   | 41.9   | 50.2   | 71.6   | 116.6  | 204.8  | 238.2  | 260.4  | 435.9  | 348.0 |
| 65°   | 29.3   | 30.3   | 33.8   | 37.6   | 47.3   | 62.7   | 66.1   | 63.6   | 63.3   | 112.7  | 79.8  |
| 67.5° | 24.3   | 25.3   | 27.9   | 30.4   | 34.0   | 31.3   | 22.7   | 23.8   | 19.4   | 19.3   | 15.7  |
| 70°   | 17.8   | 18.9   | 21.5   | 24.3   | 20.4   | 8.4    | 13.1   | 19.4   | 14.7   | 12.3   | 12.0  |
| 72.5° | 13.4   | 14.3   | 16.7   | 15.9   | 6.0    | 3.2    | 8.7    | 14.1   | 11.3   | 9.1    | 8.9   |
| 75°   | 10.0   | 10.5   | 8.4    | 2.6    | 0.6    | 0.8    | 3.2    | 5.8    | 6.3    | 5.2    | 5.2   |
| 77.5° | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.3    | 0.5    | 0.6    | 0.8    | 1.0   |
| 80°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   |
| 82.5° | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   |
| 85°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   |
| 87.5° | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   |



REPORT NUMBER: P629089  
 CATALOG NUMBER: GWS-SA1A-830-U-T2R-W-GRSBK

**CANDELA DISTRIBUTION (continued):**

|       | 90°   | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 180.9 | 180.9 | 180.9 | 180.9 | 180.9 | 180.9 | 180.9 | 180.9 | 180.9 | 180.9 | 180.9 |
| 2.5°  | 184.6 | 177.8 | 168.1 | 160.0 | 153.8 | 147.8 | 143.3 | 138.8 | 138.6 | 136.3 | 135.9 |
| 5°    | 192.4 | 180.1 | 162.3 | 149.5 | 141.7 | 137.0 | 133.8 | 132.1 | 131.3 | 130.5 | 130.2 |
| 7.5°  | 203.6 | 185.9 | 161.3 | 147.7 | 141.2 | 138.1 | 135.9 | 134.9 | 134.4 | 133.8 | 133.6 |
| 10°   | 217.3 | 194.3 | 164.8 | 151.1 | 145.4 | 142.5 | 140.1 | 138.6 | 137.8 | 136.7 | 136.3 |
| 12.5° | 233.8 | 204.7 | 170.5 | 156.8 | 150.8 | 146.9 | 143.6 | 141.5 | 140.4 | 138.9 | 138.6 |
| 15°   | 251.6 | 215.9 | 176.8 | 161.9 | 154.8 | 149.8 | 145.7 | 142.5 | 140.4 | 138.6 | 138.1 |
| 17.5° | 270.1 | 227.2 | 182.5 | 165.5 | 156.8 | 150.8 | 144.9 | 140.6 | 138.0 | 135.7 | 135.1 |
| 20°   | 290.8 | 238.9 | 186.2 | 166.1 | 156.1 | 148.2 | 141.4 | 135.9 | 133.3 | 130.2 | 129.5 |
| 22.5° | 312.5 | 249.7 | 187.8 | 164.7 | 152.5 | 143.3 | 136.0 | 130.4 | 126.6 | 123.4 | 122.4 |
| 25°   | 333.6 | 259.4 | 187.0 | 160.6 | 147.2 | 136.5 | 129.1 | 123.2 | 119.2 | 115.9 | 115.1 |
| 27.5° | 355.9 | 267.5 | 184.1 | 154.6 | 139.9 | 129.1 | 121.9 | 116.9 | 113.2 | 109.6 | 108.8 |
| 30°   | 381.0 | 275.0 | 179.4 | 147.4 | 131.3 | 121.5 | 115.9 | 112.5 | 108.5 | 104.8 | 103.6 |
| 32.5° | 411.3 | 281.6 | 172.6 | 138.6 | 123.7 | 114.8 | 111.7 | 109.1 | 104.4 | 100.6 | 99.8  |
| 35°   | 446.0 | 287.1 | 164.0 | 129.5 | 116.3 | 110.6 | 110.0 | 106.6 | 100.4 | 95.9  | 94.9  |
| 37.5° | 486.1 | 292.5 | 153.8 | 120.6 | 110.8 | 108.7 | 108.8 | 103.0 | 95.5  | 90.0  | 89.4  |
| 40°   | 529.4 | 297.8 | 142.5 | 112.9 | 105.7 | 107.5 | 106.1 | 97.8  | 85.7  | 80.3  | 79.7  |
| 42.5° | 574.4 | 303.6 | 131.0 | 105.6 | 101.5 | 103.2 | 101.0 | 87.4  | 78.7  | 75.9  | 75.6  |
| 45°   | 615.0 | 310.6 | 118.5 | 98.3  | 97.3  | 96.8  | 93.3  | 79.2  | 75.5  | 73.5  | 73.4  |
| 47.5° | 644.3 | 309.5 | 105.3 | 91.3  | 92.8  | 91.2  | 80.3  | 75.3  | 72.2  | 69.6  | 69.0  |
| 50°   | 639.0 | 289.7 | 91.5  | 83.6  | 87.0  | 85.5  | 72.2  | 70.8  | 68.0  | 65.3  | 64.3  |
| 52.5° | 625.4 | 262.8 | 79.5  | 75.3  | 80.6  | 77.2  | 66.7  | 65.3  | 62.8  | 59.3  | 58.1  |
| 55°   | 632.7 | 237.6 | 70.1  | 68.7  | 74.2  | 64.0  | 60.6  | 58.3  | 55.7  | 51.8  | 51.3  |
| 57.5° | 609.2 | 193.8 | 56.4  | 57.3  | 65.6  | 54.6  | 53.1  | 49.6  | 45.2  | 42.6  | 42.3  |
| 60°   | 421.7 | 104.1 | 35.3  | 36.4  | 47.4  | 45.8  | 47.6  | 44.4  | 39.0  | 36.6  | 36.1  |
| 62.5° | 193.7 | 41.8  | 19.3  | 18.5  | 24.9  | 31.1  | 40.8  | 40.5  | 33.8  | 30.0  | 29.6  |
| 65°   | 47.0  | 19.1  | 13.8  | 13.0  | 14.1  | 18.6  | 26.6  | 31.9  | 27.4  | 22.8  | 22.3  |
| 67.5° | 15.2  | 15.5  | 12.6  | 11.8  | 12.5  | 13.9  | 15.9  | 17.7  | 17.5  | 16.0  | 15.7  |
| 70°   | 12.1  | 14.1  | 11.7  | 10.7  | 10.7  | 11.2  | 10.7  | 8.6   | 7.4   | 8.1   | 8.4   |
| 72.5° | 9.1   | 10.7  | 9.2   | 8.3   | 7.9   | 7.8   | 6.6   | 4.9   | 3.4   | 3.1   | 2.9   |
| 75°   | 5.3   | 6.0   | 5.7   | 4.9   | 4.5   | 4.0   | 3.2   | 2.1   | 1.1   | 0.8   | 0.5   |
| 77.5° | 1.0   | 1.1   | 1.3   | 1.0   | 0.8   | 0.6   | 0.5   | 0.2   | 0.0   | 0.0   | 0.0   |
| 80°   | 0.0   | 0.2   | 0.2   | 0.2   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 90°   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |



Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

MCGRAW EDISON

Report Number: SP1-2408-195-9

Test Date: 08/07/2024

Luminaire Tested: GALN-SB1A-830-U-5WQ

Data in this report applies to families of products including GALN-SB1A-830-U-5WQ.

**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2408-195-9  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 08/07/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW EDISON  
 Catalog Number: **GALN-SB1A-830-U-5WQ**  
 Description: GALLEON AREA AND ROADWAY LUMINAIRE. (1) 80 CRI, 3000K, 350MA HIGH DENSITY LIGHTSQUARE WITH 26 LEDS AND TYPE V WIDE OPTICS

**Spectral Parameters**

CCT (K): 3050  
 CIE u': 0.2476  
 CIE v': 0.5251  
 Duv: 0.0034  
 CIE x: 0.4383  
 CIE y: 0.4131  
 CIE z: 0.1487  
 Peak Wavelength (nm): 603  
 Dominant Wavelength (nm): 581  
 Purity: 55.55201  
 Rf: 81.5  
 Rg: 99.2

|           |      |      |      |
|-----------|------|------|------|
| CRI (Ra): | 81.0 |      |      |
| R1:       | 79.6 | R9:  | 7.1  |
| R2:       | 85.6 | R10: | 67.0 |
| R3:       | 92.0 | R11: | 82.7 |
| R4:       | 82.6 | R12: | 63.2 |
| R5:       | 78.9 | R13: | 80.3 |
| R6:       | 81.7 | R14: | 95.0 |
| R7:       | 85.2 | R15: | 71.7 |
| R8:       | 62.0 |      |      |



**Test Conditions**

Stabilization Time: 20M  
 Operation Time: 1H 20M  
 Sphere Temperature (°C): 24.2

REPORT NUMBER: SP1-2408-195-9

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/18/2024        | 12/18/2024           |
| Power Meter                    | INXT2011004           | 2/8/2024         | 2/8/2025             |
| AC Power Source                | IN0063                | 10/24/2023       | 10/24/2024           |
| DC Power Source                | IN0208                | 10/24/2023       | 10/24/2024           |
| Sphere Thermometer             | IN0085                | 10/24/2023       | 10/24/2024           |
| Room Thermometer               | IN0046                | 10/24/2023       | 10/24/2024           |

REPORT NUMBER: SP1-2408-195-9

**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-2408-195-9

**Photopic Flux vs. Wavelength**



**Photopic Lumens: NR**

| $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) |
|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|
| 360               | 0                           | NR                      | 490               | 168                         | NR                      | 620               | 940                         | NR                      | 750               | 35                          | NR                      | 880               | 1                           | NR                      |
| 365               | 0                           | NR                      | 495               | 233                         | NR                      | 625               | 897                         | NR                      | 755               | 30                          | NR                      | 885               | 1                           | NR                      |
| 370               | 0                           | NR                      | 500               | 300                         | NR                      | 630               | 847                         | NR                      | 760               | 26                          | NR                      | 890               | 1                           | NR                      |
| 375               | 0                           | NR                      | 505               | 372                         | NR                      | 635               | 790                         | NR                      | 765               | 22                          | NR                      | 895               | 1                           | NR                      |
| 380               | 0                           | NR                      | 510               | 430                         | NR                      | 640               | 730                         | NR                      | 770               | 19                          | NR                      | 900               | 1                           | NR                      |
| 385               | 0                           | NR                      | 515               | 483                         | NR                      | 645               | 668                         | NR                      | 775               | 16                          | NR                      | 905               | 1                           | NR                      |
| 390               | 0                           | NR                      | 520               | 524                         | NR                      | 650               | 605                         | NR                      | 780               | 14                          | NR                      | 910               | 0                           | NR                      |
| 395               | 2                           | NR                      | 525               | 555                         | NR                      | 655               | 545                         | NR                      | 785               | 12                          | NR                      | 915               | 0                           | NR                      |
| 400               | 4                           | NR                      | 530               | 581                         | NR                      | 660               | 485                         | NR                      | 790               | 10                          | NR                      | 920               | 0                           | NR                      |
| 405               | 7                           | NR                      | 535               | 604                         | NR                      | 665               | 430                         | NR                      | 795               | 9                           | NR                      | 925               | 0                           | NR                      |
| 410               | 17                          | NR                      | 540               | 623                         | NR                      | 670               | 378                         | NR                      | 800               | 8                           | NR                      | 930               | 0                           | NR                      |
| 415               | 34                          | NR                      | 545               | 645                         | NR                      | 675               | 331                         | NR                      | 805               | 7                           | NR                      | 935               | 0                           | NR                      |
| 420               | 68                          | NR                      | 550               | 667                         | NR                      | 680               | 290                         | NR                      | 810               | 6                           | NR                      | 940               | 0                           | NR                      |
| 425               | 128                         | NR                      | 555               | 693                         | NR                      | 685               | 251                         | NR                      | 815               | 5                           | NR                      | 945               | 0                           | NR                      |
| 430               | 214                         | NR                      | 560               | 719                         | NR                      | 690               | 218                         | NR                      | 820               | 4                           | NR                      | 950               | 0                           | NR                      |
| 435               | 339                         | NR                      | 565               | 754                         | NR                      | 695               | 188                         | NR                      | 825               | 4                           | NR                      | 955               | 0                           | NR                      |
| 440               | 507                         | NR                      | 570               | 791                         | NR                      | 700               | 162                         | NR                      | 830               | 3                           | NR                      | 960               | 0                           | NR                      |
| 445               | 573                         | NR                      | 575               | 830                         | NR                      | 705               | 139                         | NR                      | 835               | 3                           | NR                      | 965               | 0                           | NR                      |
| 450               | 356                         | NR                      | 580               | 873                         | NR                      | 710               | 119                         | NR                      | 840               | 3                           | NR                      | 970               | 0                           | NR                      |
| 455               | 217                         | NR                      | 585               | 913                         | NR                      | 715               | 102                         | NR                      | 845               | 2                           | NR                      | 975               | 0                           | NR                      |
| 460               | 168                         | NR                      | 590               | 948                         | NR                      | 720               | 88                          | NR                      | 850               | 2                           | NR                      | 980               | 0                           | NR                      |
| 465               | 113                         | NR                      | 595               | 974                         | NR                      | 725               | 76                          | NR                      | 855               | 2                           | NR                      | 985               | 0                           | NR                      |
| 470               | 85                          | NR                      | 600               | 994                         | NR                      | 730               | 65                          | NR                      | 860               | 1                           | NR                      | 990               | 0                           | NR                      |
| 475               | 85                          | NR                      | 605               | 998                         | NR                      | 735               | 55                          | NR                      | 865               | 1                           | NR                      | 995               | 0                           | NR                      |
| 480               | 94                          | NR                      | 610               | 994                         | NR                      | 740               | 47                          | NR                      | 870               | 1                           | NR                      | 1000              | 0                           | NR                      |
| 485               | 120                         | NR                      | 615               | 973                         | NR                      | 745               | 41                          | NR                      | 875               | 1                           | NR                      |                   |                             |                         |

REPORT NUMBER: SP1-2408-195-9

**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: NR**

**S/P: 1.27**

| $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) | $\lambda$<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>( $\phi$ /nm) |
|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|-------------------|-----------------------------|-------------------------|
| 360               | 0                           | NR                      | 490               | 168                         | NR                      | 620               | 940                         | NR                      | 750               | 35                          | NR                      | 880               | 1                           | NR                      |
| 365               | 0                           | NR                      | 495               | 233                         | NR                      | 625               | 897                         | NR                      | 755               | 30                          | NR                      | 885               | 1                           | NR                      |
| 370               | 0                           | NR                      | 500               | 300                         | NR                      | 630               | 847                         | NR                      | 760               | 26                          | NR                      | 890               | 1                           | NR                      |
| 375               | 0                           | NR                      | 505               | 372                         | NR                      | 635               | 790                         | NR                      | 765               | 22                          | NR                      | 895               | 1                           | NR                      |
| 380               | 0                           | NR                      | 510               | 430                         | NR                      | 640               | 730                         | NR                      | 770               | 19                          | NR                      | 900               | 1                           | NR                      |
| 385               | 0                           | NR                      | 515               | 483                         | NR                      | 645               | 668                         | NR                      | 775               | 16                          | NR                      | 905               | 1                           | NR                      |
| 390               | 0                           | NR                      | 520               | 524                         | NR                      | 650               | 605                         | NR                      | 780               | 14                          | NR                      | 910               | 0                           | NR                      |
| 395               | 2                           | NR                      | 525               | 555                         | NR                      | 655               | 545                         | NR                      | 785               | 12                          | NR                      | 915               | 0                           | NR                      |
| 400               | 4                           | NR                      | 530               | 581                         | NR                      | 660               | 485                         | NR                      | 790               | 10                          | NR                      | 920               | 0                           | NR                      |
| 405               | 7                           | NR                      | 535               | 604                         | NR                      | 665               | 430                         | NR                      | 795               | 9                           | NR                      | 925               | 0                           | NR                      |
| 410               | 17                          | NR                      | 540               | 623                         | NR                      | 670               | 378                         | NR                      | 800               | 8                           | NR                      | 930               | 0                           | NR                      |
| 415               | 34                          | NR                      | 545               | 645                         | NR                      | 675               | 331                         | NR                      | 805               | 7                           | NR                      | 935               | 0                           | NR                      |
| 420               | 68                          | NR                      | 550               | 667                         | NR                      | 680               | 290                         | NR                      | 810               | 6                           | NR                      | 940               | 0                           | NR                      |
| 425               | 128                         | NR                      | 555               | 693                         | NR                      | 685               | 251                         | NR                      | 815               | 5                           | NR                      | 945               | 0                           | NR                      |
| 430               | 214                         | NR                      | 560               | 719                         | NR                      | 690               | 218                         | NR                      | 820               | 4                           | NR                      | 950               | 0                           | NR                      |
| 435               | 339                         | NR                      | 565               | 754                         | NR                      | 695               | 188                         | NR                      | 825               | 4                           | NR                      | 955               | 0                           | NR                      |
| 440               | 507                         | NR                      | 570               | 791                         | NR                      | 700               | 162                         | NR                      | 830               | 3                           | NR                      | 960               | 0                           | NR                      |
| 445               | 573                         | NR                      | 575               | 830                         | NR                      | 705               | 139                         | NR                      | 835               | 3                           | NR                      | 965               | 0                           | NR                      |
| 450               | 356                         | NR                      | 580               | 873                         | NR                      | 710               | 119                         | NR                      | 840               | 3                           | NR                      | 970               | 0                           | NR                      |
| 455               | 217                         | NR                      | 585               | 913                         | NR                      | 715               | 102                         | NR                      | 845               | 2                           | NR                      | 975               | 0                           | NR                      |
| 460               | 168                         | NR                      | 590               | 948                         | NR                      | 720               | 88                          | NR                      | 850               | 2                           | NR                      | 980               | 0                           | NR                      |
| 465               | 113                         | NR                      | 595               | 974                         | NR                      | 725               | 76                          | NR                      | 855               | 2                           | NR                      | 985               | 0                           | NR                      |
| 470               | 85                          | NR                      | 600               | 994                         | NR                      | 730               | 65                          | NR                      | 860               | 1                           | NR                      | 990               | 0                           | NR                      |
| 475               | 85                          | NR                      | 605               | 998                         | NR                      | 735               | 55                          | NR                      | 865               | 1                           | NR                      | 995               | 0                           | NR                      |
| 480               | 94                          | NR                      | 610               | 994                         | NR                      | 740               | 47                          | NR                      | 870               | 1                           | NR                      | 1000              | 0                           | NR                      |
| 485               | 120                         | NR                      | 615               | 973                         | NR                      | 745               | 41                          | NR                      | 875               | 1                           | NR                      |                   |                             |                         |

REPORT NUMBER: SP1-2408-195-9

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: NR**

**M/P: 2.32**

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 168                      | NR            | 620    | 940                      | NR            | 750    | 35                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 233                      | NR            | 625    | 897                      | NR            | 755    | 30                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 300                      | NR            | 630    | 847                      | NR            | 760    | 26                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 372                      | NR            | 635    | 790                      | NR            | 765    | 22                       | NR            | 895    | 1                        | NR            |
| 380    | 0                        | NR            | 510    | 430                      | NR            | 640    | 730                      | NR            | 770    | 19                       | NR            | 900    | 1                        | NR            |
| 385    | 0                        | NR            | 515    | 483                      | NR            | 645    | 668                      | NR            | 775    | 16                       | NR            | 905    | 1                        | NR            |
| 390    | 0                        | NR            | 520    | 524                      | NR            | 650    | 605                      | NR            | 780    | 14                       | NR            | 910    | 0                        | NR            |
| 395    | 2                        | NR            | 525    | 555                      | NR            | 655    | 545                      | NR            | 785    | 12                       | NR            | 915    | 0                        | NR            |
| 400    | 4                        | NR            | 530    | 581                      | NR            | 660    | 485                      | NR            | 790    | 10                       | NR            | 920    | 0                        | NR            |
| 405    | 7                        | NR            | 535    | 604                      | NR            | 665    | 430                      | NR            | 795    | 9                        | NR            | 925    | 0                        | NR            |
| 410    | 17                       | NR            | 540    | 623                      | NR            | 670    | 378                      | NR            | 800    | 8                        | NR            | 930    | 0                        | NR            |
| 415    | 34                       | NR            | 545    | 645                      | NR            | 675    | 331                      | NR            | 805    | 7                        | NR            | 935    | 0                        | NR            |
| 420    | 68                       | NR            | 550    | 667                      | NR            | 680    | 290                      | NR            | 810    | 6                        | NR            | 940    | 0                        | NR            |
| 425    | 128                      | NR            | 555    | 693                      | NR            | 685    | 251                      | NR            | 815    | 5                        | NR            | 945    | 0                        | NR            |
| 430    | 214                      | NR            | 560    | 719                      | NR            | 690    | 218                      | NR            | 820    | 4                        | NR            | 950    | 0                        | NR            |
| 435    | 339                      | NR            | 565    | 754                      | NR            | 695    | 188                      | NR            | 825    | 4                        | NR            | 955    | 0                        | NR            |
| 440    | 507                      | NR            | 570    | 791                      | NR            | 700    | 162                      | NR            | 830    | 3                        | NR            | 960    | 0                        | NR            |
| 445    | 573                      | NR            | 575    | 830                      | NR            | 705    | 139                      | NR            | 835    | 3                        | NR            | 965    | 0                        | NR            |
| 450    | 356                      | NR            | 580    | 873                      | NR            | 710    | 119                      | NR            | 840    | 3                        | NR            | 970    | 0                        | NR            |
| 455    | 217                      | NR            | 585    | 913                      | NR            | 715    | 102                      | NR            | 845    | 2                        | NR            | 975    | 0                        | NR            |
| 460    | 168                      | NR            | 590    | 948                      | NR            | 720    | 88                       | NR            | 850    | 2                        | NR            | 980    | 0                        | NR            |
| 465    | 113                      | NR            | 595    | 974                      | NR            | 725    | 76                       | NR            | 855    | 2                        | NR            | 985    | 0                        | NR            |
| 470    | 85                       | NR            | 600    | 994                      | NR            | 730    | 65                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 85                       | NR            | 605    | 998                      | NR            | 735    | 55                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 94                       | NR            | 610    | 994                      | NR            | 740    | 47                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 120                      | NR            | 615    | 973                      | NR            | 745    | 41                       | NR            | 875    | 1                        | NR            |        |                          |               |

**Summary**

$R_f = 81.5$   
 $R_g = 99.2$   
 $CIE R_a = 81.0$   
 $R_9 = 7.1$



**Color Vector Graphics**



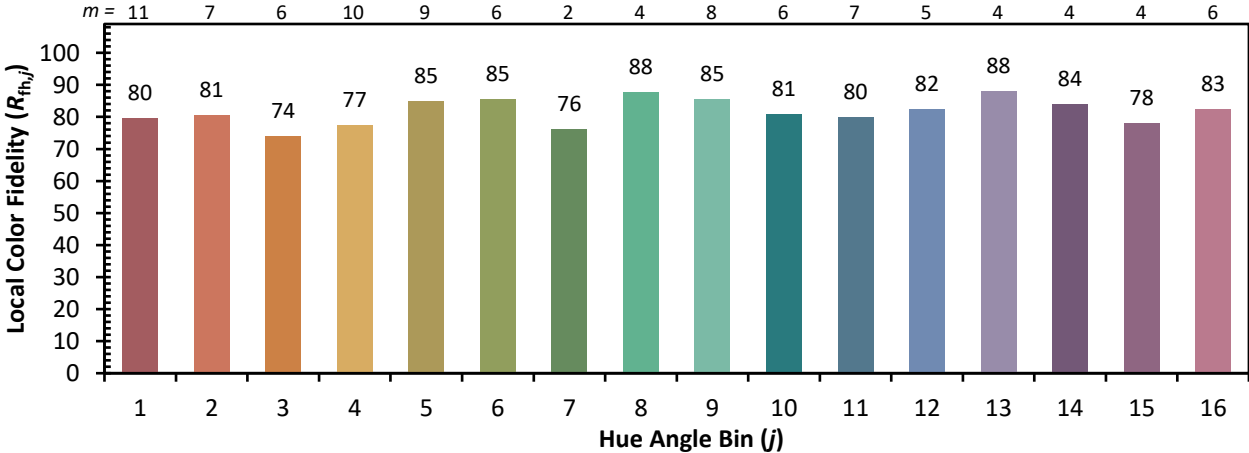


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 74 | CES51 = 89 | CES76 = 70 |
| CES02 = 63 | CES27 = 88 | CES52 = 92 | CES77 = 86 |
| CES03 = 31 | CES28 = 89 | CES53 = 81 | CES78 = 72 |
| CES04 = 70 | CES29 = 67 | CES54 = 87 | CES79 = 90 |
| CES05 = 50 | CES30 = 68 | CES55 = 85 | CES80 = 88 |
| CES06 = 51 | CES31 = 71 | CES56 = 78 | CES81 = 78 |
| CES07 = 42 | CES32 = 70 | CES57 = 76 | CES82 = 95 |
| CES08 = 41 | CES33 = 71 | CES58 = 78 | CES83 = 90 |
| CES09 = 29 | CES34 = 82 | CES59 = 92 | CES84 = 94 |
| CES10 = 76 | CES35 = 90 | CES60 = 95 | CES85 = 86 |
| CES11 = 59 | CES36 = 93 | CES61 = 93 | CES86 = 72 |
| CES12 = 65 | CES37 = 87 | CES62 = 83 | CES87 = 85 |
| CES13 = 43 | CES38 = 75 | CES63 = 77 | CES88 = 83 |
| CES14 = 74 | CES39 = 94 | CES64 = 83 | CES89 = 75 |
| CES15 = 71 | CES40 = 89 | CES65 = 77 | CES90 = 81 |
| CES16 = 47 | CES41 = 85 | CES66 = 80 | CES91 = 96 |
| CES17 = 50 | CES42 = 86 | CES67 = 79 | CES92 = 73 |
| CES18 = 56 | CES43 = 81 | CES68 = 84 | CES93 = 84 |
| CES19 = 72 | CES44 = 99 | CES69 = 91 | CES94 = 64 |
| CES20 = 66 | CES45 = 87 | CES70 = 78 | CES95 = 80 |
| CES21 = 87 | CES46 = 82 | CES71 = 76 | CES96 = 84 |
| CES22 = 79 | CES47 = 77 | CES72 = 92 | CES97 = 87 |
| CES23 = 92 | CES48 = 71 | CES73 = 71 | CES98 = 81 |
| CES24 = 91 | CES49 = 81 | CES74 = 93 | CES99 = 74 |
| CES25 = 72 | CES50 = 89 | CES75 = 74 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)