

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: P629588

Luminaire Tested: GWS-SA1B-830-U-T3-W-GRSBK

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P629588  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-24)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA1B-830-U-T3-W-GRSBK  
Description: GALLEON WALL SLIM LUMINAIRE. (1) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III OPTICS W/ FACTORY INSTALLED GLARE SHIELD, BK  
Light Source: (16) 3000K CCT, 80 CRI LEDS  
Ballast/Driver: -

**Summary**

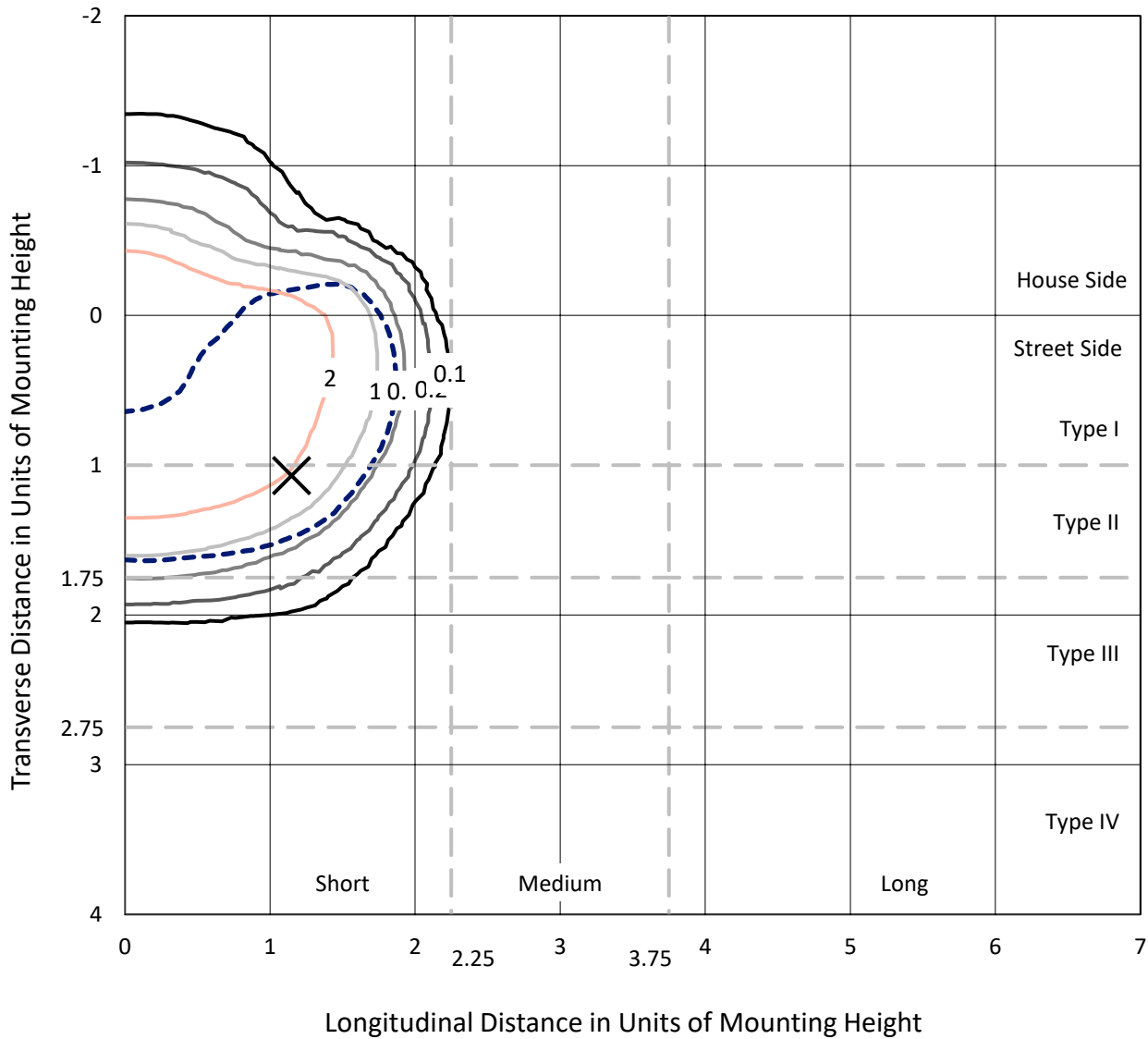
Lumens per Lamp: N/A  
Luminaire Lumens: 1758.1 lumens  
Efficiency: N/A  
Efficacy: 70.3 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B1 - U0 - G0  
  
Input Watts (W): 25  
Input Voltage (V): 120  
Input Current (Ain): NR  
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: P629588  
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### Iso-Footcandle Lines of Horizontal Illumination

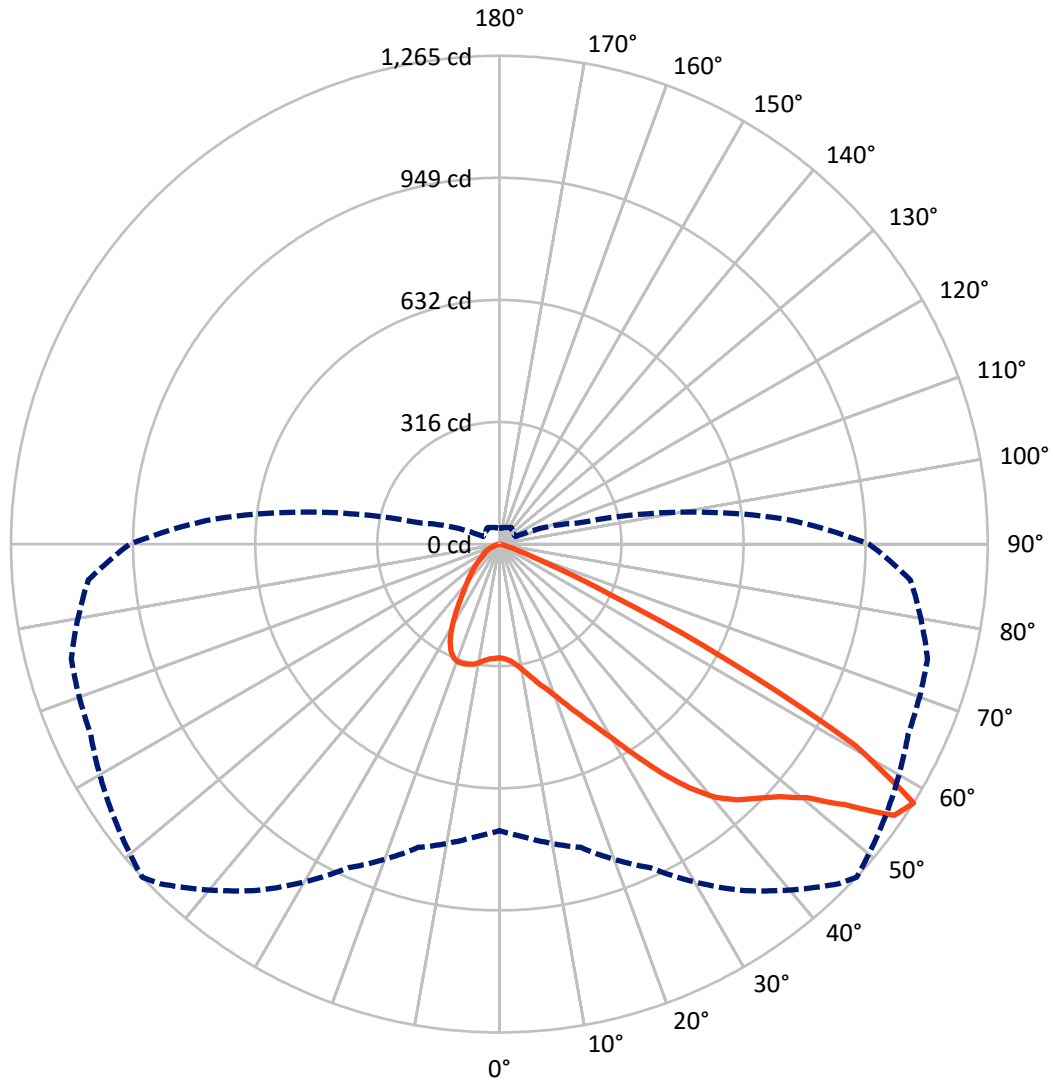
✕ Max cd  
 - - - 1/2 Max cd



Based on 10 foot mounting height. Maximum calculated value = 4.2 fc  
 Type II - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 47-Deg Lateral    - - - Horizontal Cone Through 57.5-Deg Vertical

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 381.4    | 0.0    | 381.4  |
|                    | % Fixture | 21.7     | 0.0    | 21.7   |
| <b>Street Side</b> | Lumens    | 1376.7   | 0.0    | 1376.7 |
|                    | % Fixture | 78.3     | 0.0    | 78.3   |
| <b>Total</b>       | Lumens    | 1758.1   | 0.0    | 1758.1 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 29.3   | 1.7       |
| 10°-20°   | 98.8   | 5.6       |
| 20°-30°   | 183.4  | 10.4      |
| 30°-40°   | 293.7  | 16.7      |
| 40°-50°   | 429.3  | 24.4      |
| 50°-60°   | 529.8  | 30.1      |
| 60°-70°   | 177.0  | 10.1      |
| 70°-80°   | 16.5   | 0.9       |
| 80°-90°   | 0.3    | 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°    | 1758.1 | 100.0     |
| 0°-180°   | 1758.1 | 100.0     |

**Coefficient of Utilization**



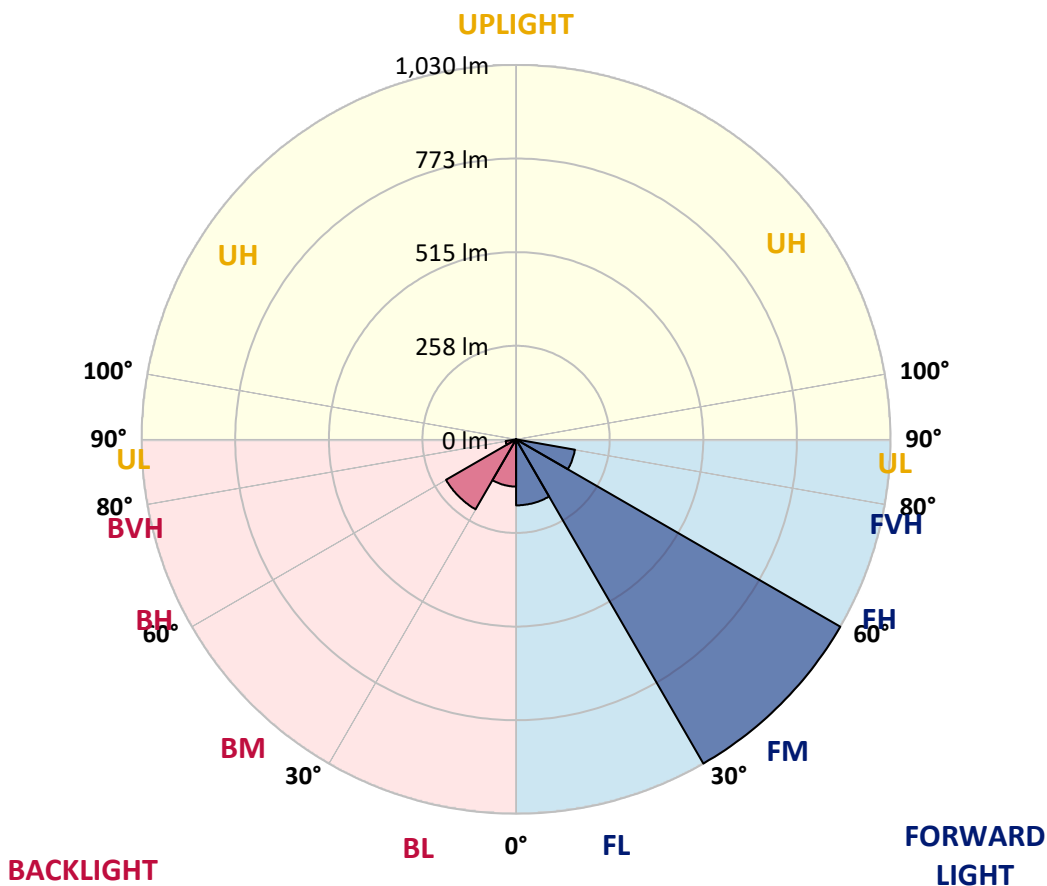
REPORT NUMBER: P629588

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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°)    | 181.7  | 10.3      |                         |      |        |
| FM (30°-60°)   | 1030.2 | 58.6      |                         |      |        |
| FH (60°-80°)   | 164.5  | 9.4       |                         |      | G0/660 |
| FVH (80°-90°)  | 0.2    | 0.0       |                         |      | G0/10  |
| BL (0°-30°)    | 129.8  | 7.4       | B1/500                  |      |        |
| BM (30°-60°)   | 222.5  | 12.7      | B1/1000                 |      |        |
| BH (60°-80°)   | 29.0   | 1.6       | B0/110                  |      | G0/110 |
| BVH (80°-90°)  | 0.1    | 0.0       |                         |      | G0/10  |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |        |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |        |

**BUG Rating: B1-U0-G0**  
 Type II Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°    | 5°    | 15°    | 25°    | 35°    | 45°    | 47°    | 55°    | 65°    | 75°    | 85°    |
|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 294.3 | 294.3 | 294.3  | 294.3  | 294.3  | 294.3  | 294.3  | 294.3  | 294.3  | 294.3  | 294.3  |
| 2.5°  | 297.4 | 297.2 | 297.0  | 298.2  | 297.8  | 297.6  | 298.0  | 298.0  | 298.0  | 296.8  | 294.3  |
| 5°    | 304.5 | 304.5 | 304.3  | 305.5  | 304.5  | 303.9  | 304.1  | 304.1  | 303.3  | 301.0  | 298.0  |
| 7.5°  | 315.7 | 315.3 | 314.9  | 316.1  | 315.1  | 314.9  | 315.3  | 314.1  | 312.7  | 309.0  | 304.7  |
| 10°   | 331.9 | 331.9 | 331.2  | 332.5  | 331.7  | 331.2  | 331.2  | 330.4  | 327.8  | 322.1  | 315.7  |
| 12.5° | 354.1 | 353.1 | 351.7  | 350.6  | 350.2  | 350.0  | 350.2  | 349.0  | 346.1  | 338.8  | 330.0  |
| 15°   | 378.4 | 377.6 | 375.3  | 373.7  | 371.5  | 371.0  | 372.3  | 371.3  | 368.4  | 358.4  | 345.9  |
| 17.5° | 409.0 | 410.0 | 404.3  | 400.8  | 394.3  | 393.9  | 394.3  | 395.9  | 393.9  | 381.0  | 362.9  |
| 20°   | 435.1 | 436.0 | 431.7  | 429.2  | 423.3  | 420.6  | 421.5  | 424.1  | 421.9  | 406.8  | 381.5  |
| 22.5° | 463.1 | 464.1 | 459.6  | 454.5  | 451.9  | 451.9  | 454.9  | 458.6  | 455.5  | 435.7  | 402.7  |
| 25°   | 496.6 | 497.4 | 493.7  | 487.0  | 482.3  | 488.2  | 492.7  | 502.5  | 497.4  | 470.4  | 427.8  |
| 27.5° | 534.9 | 535.1 | 529.8  | 522.9  | 520.4  | 531.5  | 536.0  | 551.1  | 549.0  | 509.4  | 454.3  |
| 30°   | 576.0 | 576.2 | 574.9  | 570.2  | 568.0  | 582.5  | 588.6  | 610.5  | 609.0  | 557.8  | 490.4  |
| 32.5° | 618.6 | 618.6 | 620.9  | 620.5  | 623.1  | 646.8  | 656.6  | 681.5  | 680.1  | 617.0  | 535.3  |
| 35°   | 661.5 | 661.7 | 665.6  | 675.4  | 686.4  | 717.8  | 730.7  | 760.9  | 757.6  | 687.8  | 592.7  |
| 37.5° | 710.3 | 708.2 | 713.5  | 728.2  | 752.7  | 789.0  | 801.3  | 830.1  | 826.4  | 760.3  | 667.6  |
| 40°   | 769.0 | 765.4 | 765.4  | 782.5  | 810.3  | 852.1  | 862.5  | 876.8  | 864.4  | 818.8  | 741.1  |
| 42.5° | 833.9 | 830.5 | 826.0  | 841.1  | 864.4  | 897.0  | 905.6  | 901.7  | 891.5  | 874.1  | 824.8  |
| 45°   | 899.7 | 894.4 | 897.4  | 906.6  | 920.1  | 935.6  | 938.8  | 920.9  | 916.2  | 921.1  | 893.9  |
| 47.5° | 949.7 | 946.0 | 953.5  | 966.4  | 977.4  | 979.7  | 977.4  | 952.5  | 952.1  | 969.5  | 941.9  |
| 50°   | 966.4 | 966.8 | 987.6  | 1015.8 | 1033.5 | 1035.4 | 1032.3 | 1003.7 | 999.9  | 1005.0 | 967.8  |
| 52.5° | 968.0 | 969.7 | 1000.1 | 1053.8 | 1102.1 | 1124.2 | 1121.7 | 1090.9 | 1052.9 | 1047.4 | 1007.0 |
| 55°   | 928.6 | 938.2 | 980.7  | 1059.1 | 1161.9 | 1232.3 | 1240.5 | 1181.5 | 1125.2 | 1120.5 | 1091.3 |
| 57.5° | 742.3 | 761.9 | 813.1  | 924.8  | 1095.2 | 1243.6 | 1264.8 | 1222.3 | 1167.8 | 1147.8 | 1068.7 |
| 60°   | 443.7 | 468.0 | 517.2  | 654.1  | 833.5  | 1022.1 | 1058.7 | 1064.6 | 1039.5 | 981.7  | 819.9  |
| 62.5° | 190.4 | 188.4 | 249.0  | 353.9  | 495.8  | 649.6  | 666.2  | 691.9  | 713.7  | 653.3  | 497.6  |
| 65°   | 65.3  | 71.0  | 98.8   | 159.6  | 248.2  | 301.7  | 316.4  | 339.4  | 370.4  | 305.7  | 182.3  |
| 67.5° | 40.4  | 42.9  | 56.9   | 94.3   | 133.9  | 131.8  | 125.3  | 121.6  | 118.4  | 81.0   | 50.0   |
| 70°   | 29.4  | 31.4  | 40.0   | 64.9   | 90.0   | 63.3   | 54.9   | 44.5   | 49.4   | 45.5   | 35.5   |
| 72.5° | 19.8  | 21.4  | 27.6   | 39.4   | 46.1   | 30.8   | 28.6   | 32.5   | 39.2   | 37.3   | 29.0   |
| 75°   | 11.8  | 12.9  | 15.7   | 19.2   | 18.8   | 15.9   | 16.1   | 22.9   | 30.0   | 28.0   | 20.6   |
| 77.5° | 8.2   | 8.6   | 10.4   | 12.4   | 9.2    | 4.9    | 4.5    | 6.3    | 10.2   | 10.2   | 6.9    |
| 80°   | 2.0   | 2.7   | 2.7    | 1.6    | 1.4    | 1.2    | 1.2    | 1.8    | 2.9    | 2.0    | 1.0    |
| 82.5° | 0.2   | 0.2   | 0.2    | 0.2    | 0.2    | 0.2    | 0.2    | 0.4    | 0.4    | 0.4    | 0.4    |
| 85°   | 0.0   | 0.0   | 0.2    | 0.2    | 0.2    | 0.2    | 0.2    | 0.2    | 0.4    | 0.4    | 0.4    |
| 87.5° | 0.0   | 0.0   | 0.2    | 0.2    | 0.2    | 0.2    | 0.2    | 0.2    | 0.2    | 0.4    | 0.4    |
| 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: P629588

CATALOG NUMBER: GWS-SA1B-830-U-T3-W-GRSBK

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 294.3  | 294.3 | 294.3 | 294.3 | 294.3 | 294.3 | 294.3 | 294.3 | 294.3 | 294.3 | 294.3 |
| 2.5°  | 295.7  | 293.3 | 294.9 | 294.5 | 295.7 | 296.1 | 294.3 | 293.9 | 294.1 | 291.7 | 290.8 |
| 5°    | 298.6  | 295.7 | 296.6 | 295.7 | 297.2 | 298.4 | 297.8 | 298.6 | 299.6 | 297.8 | 297.0 |
| 7.5°  | 304.7  | 301.9 | 301.7 | 300.4 | 302.5 | 303.3 | 303.1 | 305.3 | 307.4 | 306.1 | 304.9 |
| 10°   | 315.3  | 311.5 | 311.0 | 310.0 | 310.6 | 311.2 | 309.0 | 309.4 | 311.2 | 309.8 | 309.2 |
| 12.5° | 328.4  | 323.7 | 322.7 | 320.2 | 320.2 | 317.2 | 312.3 | 311.2 | 312.7 | 311.7 | 310.6 |
| 15°   | 342.5  | 336.1 | 334.5 | 330.2 | 326.1 | 320.4 | 315.3 | 314.1 | 315.1 | 313.9 | 313.1 |
| 17.5° | 358.2  | 351.0 | 345.7 | 338.2 | 329.2 | 322.5 | 316.8 | 314.1 | 312.5 | 310.0 | 309.8 |
| 20°   | 373.7  | 364.3 | 355.3 | 343.3 | 331.5 | 321.2 | 311.9 | 304.9 | 299.0 | 295.3 | 293.9 |
| 22.5° | 391.7  | 377.8 | 363.3 | 346.4 | 329.4 | 313.9 | 297.4 | 285.5 | 275.3 | 271.9 | 270.2 |
| 25°   | 410.8  | 392.9 | 371.3 | 349.2 | 322.5 | 297.6 | 275.1 | 257.6 | 244.1 | 239.6 | 237.8 |
| 27.5° | 432.1  | 407.4 | 379.4 | 348.6 | 308.2 | 274.3 | 244.5 | 222.7 | 209.4 | 205.3 | 206.8 |
| 30°   | 459.0  | 426.2 | 389.6 | 342.3 | 286.8 | 241.7 | 206.8 | 188.4 | 178.4 | 174.5 | 174.7 |
| 32.5° | 494.9  | 453.1 | 404.5 | 328.8 | 259.2 | 204.5 | 173.9 | 160.4 | 153.7 | 148.6 | 148.2 |
| 35°   | 546.4  | 494.1 | 418.4 | 307.2 | 225.7 | 171.4 | 149.2 | 138.6 | 129.2 | 123.3 | 124.3 |
| 37.5° | 608.0  | 545.8 | 426.0 | 278.0 | 188.2 | 145.7 | 130.6 | 119.8 | 109.2 | 100.4 | 101.4 |
| 40°   | 681.1  | 613.3 | 425.3 | 239.6 | 153.9 | 128.2 | 115.1 | 102.5 | 89.2  | 81.2  | 82.0  |
| 42.5° | 762.5  | 677.2 | 412.1 | 199.0 | 127.6 | 113.9 | 100.2 | 84.3  | 71.4  | 66.5  | 66.7  |
| 45°   | 833.1  | 729.0 | 388.8 | 157.0 | 107.4 | 100.0 | 84.7  | 68.4  | 62.7  | 59.2  | 59.0  |
| 47.5° | 885.4  | 767.0 | 355.5 | 123.5 | 91.0  | 87.4  | 69.6  | 61.2  | 56.7  | 53.9  | 53.5  |
| 50°   | 914.6  | 780.3 | 318.8 | 96.7  | 76.9  | 74.1  | 62.2  | 55.5  | 52.5  | 50.6  | 50.2  |
| 52.5° | 953.7  | 796.2 | 292.5 | 76.3  | 64.5  | 60.6  | 57.4  | 51.6  | 49.6  | 48.2  | 47.6  |
| 55°   | 1015.8 | 827.0 | 269.6 | 60.6  | 53.7  | 52.9  | 54.1  | 49.4  | 48.2  | 45.9  | 45.1  |
| 57.5° | 957.4  | 742.9 | 209.4 | 46.9  | 45.3  | 48.4  | 52.2  | 47.1  | 44.1  | 42.0  | 41.2  |
| 60°   | 673.7  | 493.9 | 105.3 | 37.8  | 40.4  | 45.3  | 49.2  | 42.7  | 39.6  | 40.0  | 39.6  |
| 62.5° | 371.5  | 247.2 | 47.4  | 31.6  | 35.1  | 40.0  | 42.0  | 36.9  | 34.9  | 38.4  | 39.0  |
| 65°   | 121.4  | 84.1  | 27.3  | 24.5  | 27.8  | 32.7  | 36.3  | 35.1  | 34.7  | 38.8  | 40.0  |
| 67.5° | 37.3   | 27.8  | 18.6  | 17.6  | 19.2  | 24.1  | 30.6  | 38.0  | 40.8  | 42.0  | 42.7  |
| 70°   | 28.0   | 21.8  | 15.9  | 14.9  | 15.7  | 18.4  | 25.9  | 31.6  | 29.8  | 30.0  | 29.6  |
| 72.5° | 22.5   | 17.3  | 13.7  | 13.1  | 13.1  | 12.7  | 13.7  | 17.1  | 19.4  | 20.4  | 20.4  |
| 75°   | 15.7   | 12.2  | 10.4  | 9.6   | 7.6   | 6.1   | 5.5   | 5.5   | 4.9   | 4.7   | 4.5   |
| 77.5° | 5.3    | 4.5   | 4.1   | 3.3   | 2.2   | 1.8   | 1.6   | 1.4   | 1.0   | 0.6   | 0.4   |
| 80°   | 0.8    | 0.6   | 0.4   | 0.4   | 0.4   | 0.2   | 0.2   | 0.2   | 0.0   | 0.0   | 0.0   |
| 82.5° | 0.4    | 0.4   | 0.4   | 0.4   | 0.4   | 0.2   | 0.2   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 0.4    | 0.4   | 0.4   | 0.4   | 0.4   | 0.2   | 0.2   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 0.4    | 0.4   | 0.4   | 0.4   | 0.2   | 0.2   | 0.2   | 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

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| 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           |

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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 3000K 4-step quadrangle

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**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**

| 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            |        |                          |               |

REPORT NUMBER: SP1-2408-195-9

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: NR**

**M/P: 2.32**

| $\lambda$<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                      |                   |                             |                         |

**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)