

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: P641934

Luminaire Tested: GWS-SA6B-830-U-SL2-W-GRSBK

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P641934  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-28)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA6B-830-U-SL2-W-GRSBK  
Description: GALLEON WALL SLIM LUMINAIRE. (6) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II SPILL LIGHT ELIMINATOR OPTICS W/ FACTORY INSTALLED GLARE SHIELD, BK  
Light Source: (96) 3000K CCT, 80 CRI LEDS  
Ballast/Driver: -

**Summary**

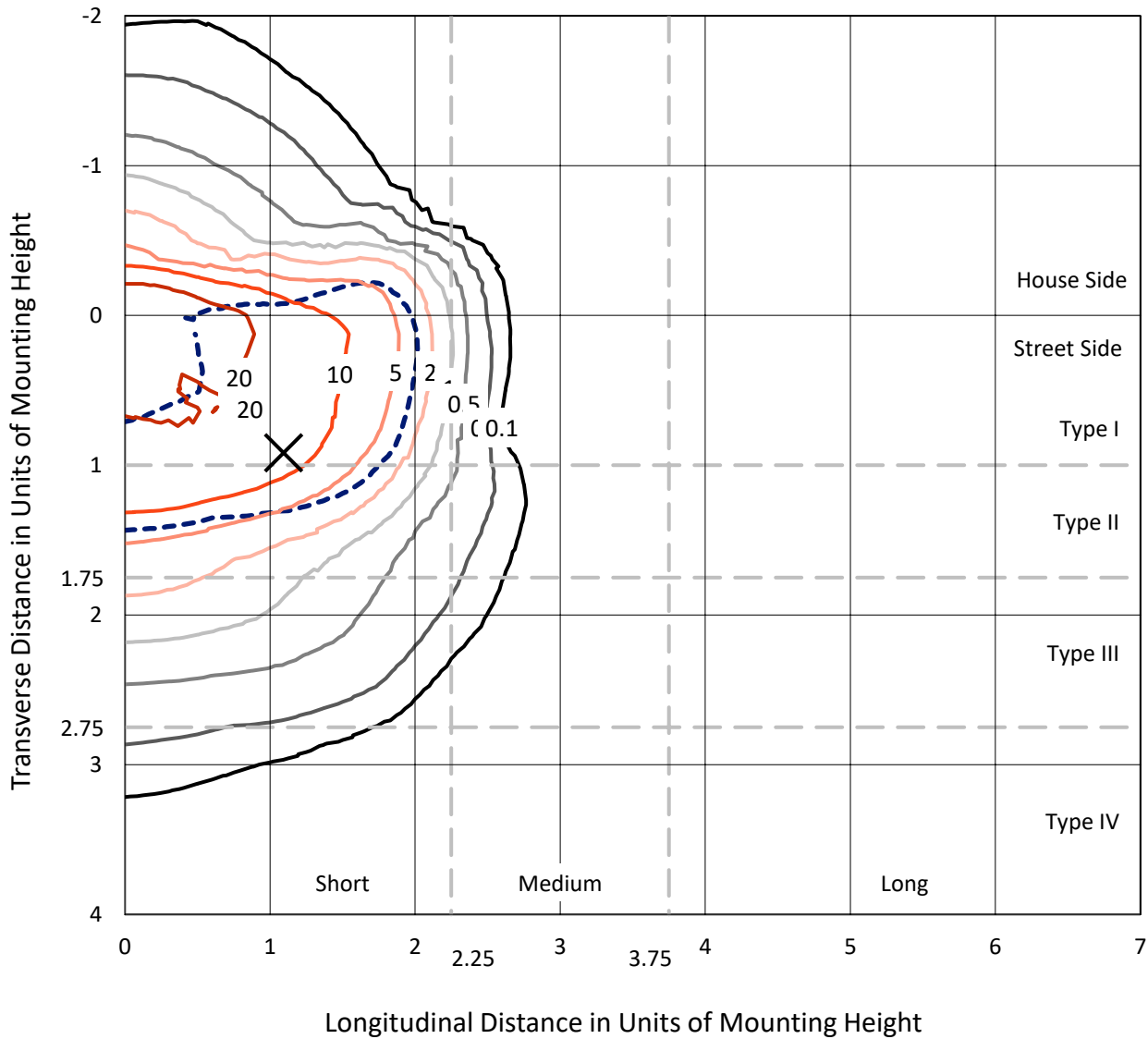
Lumens per Lamp: N/A  
Luminaire Lumens: 9876.1 lumens  
Efficiency: N/A  
Efficacy: 71.1 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B2 - U0 - G1  
  
Input Watts (W): 138.9  
Input Voltage (V): 120  
Input Current (Ain): NR  
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: P641934  
 CATALOG NUMBER: GWS-SA6B-830-U-SL2-W-GRSBK

### Iso-Footcandle Lines of Horizontal Illumination

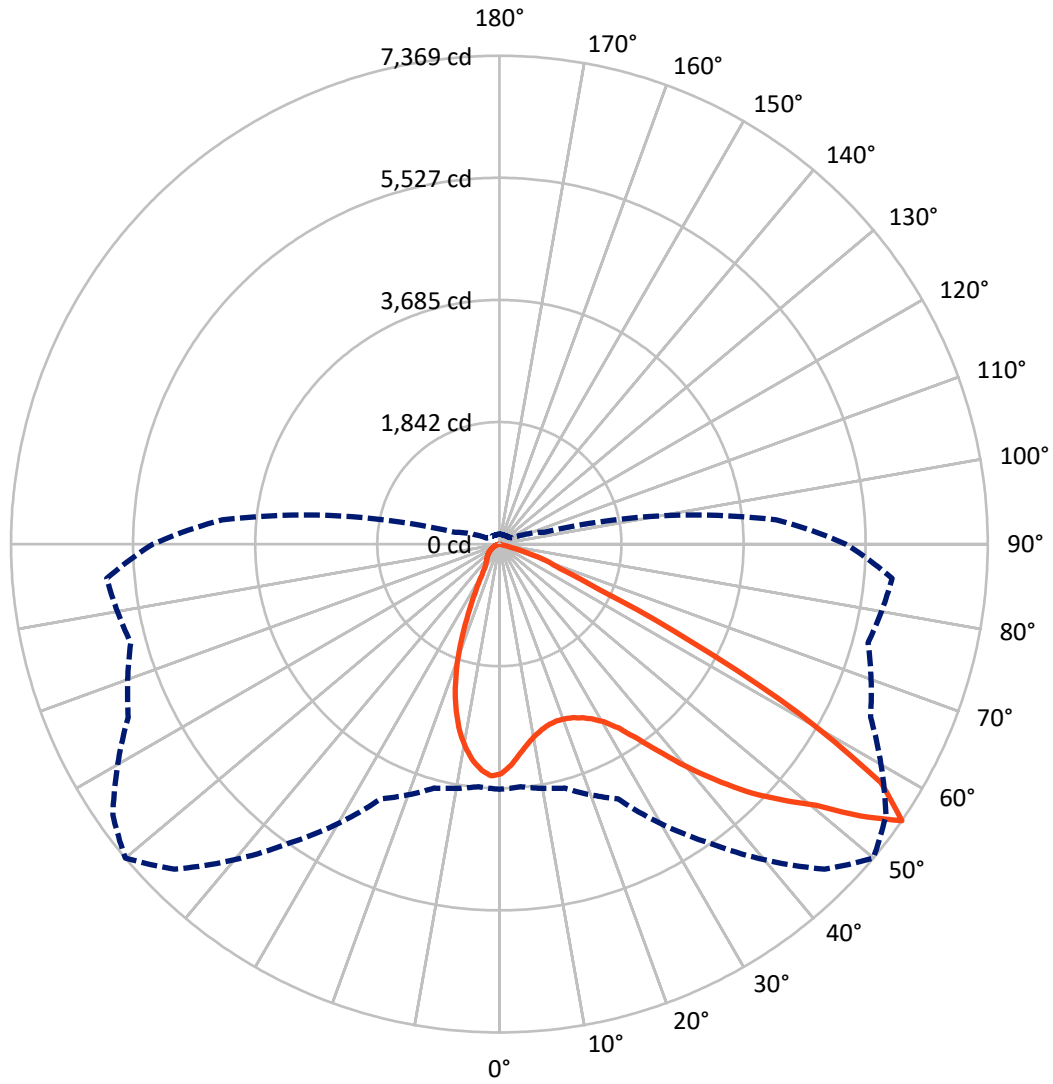
✕ Max cd  
 - - - 1/2 Max cd



Based on 10 foot mounting height. Maximum calculated value = 34.7 fc  
 Type II - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 50-Deg Lateral    - - - Horizontal Cone Through 55-Deg Vertical

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1946.1   | 0.0    | 1946.1 |
|                    | % Fixture | 19.7     | 0.0    | 19.7   |
| <b>Street Side</b> | Lumens    | 7930.0   | 0.0    | 7930.0 |
|                    | % Fixture | 80.3     | 0.0    | 80.3   |
| <b>Total</b>       | Lumens    | 9876.1   | 0.0    | 9876.1 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 304.3  | 3.1       |
| 10°-20°   | 748.8  | 7.6       |
| 20°-30°   | 1056.3 | 10.7      |
| 30°-40°   | 1563.1 | 15.8      |
| 40°-50°   | 2255.0 | 22.8      |
| 50°-60°   | 2660.0 | 26.9      |
| 60°-70°   | 1186.6 | 12.0      |
| 70°-80°   | 102.0  | 1.0       |
| 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°    | 9876.1 | 100.0     |
| 0°-180°   | 9876.1 | 100.0     |

**Coefficient of Utilization**



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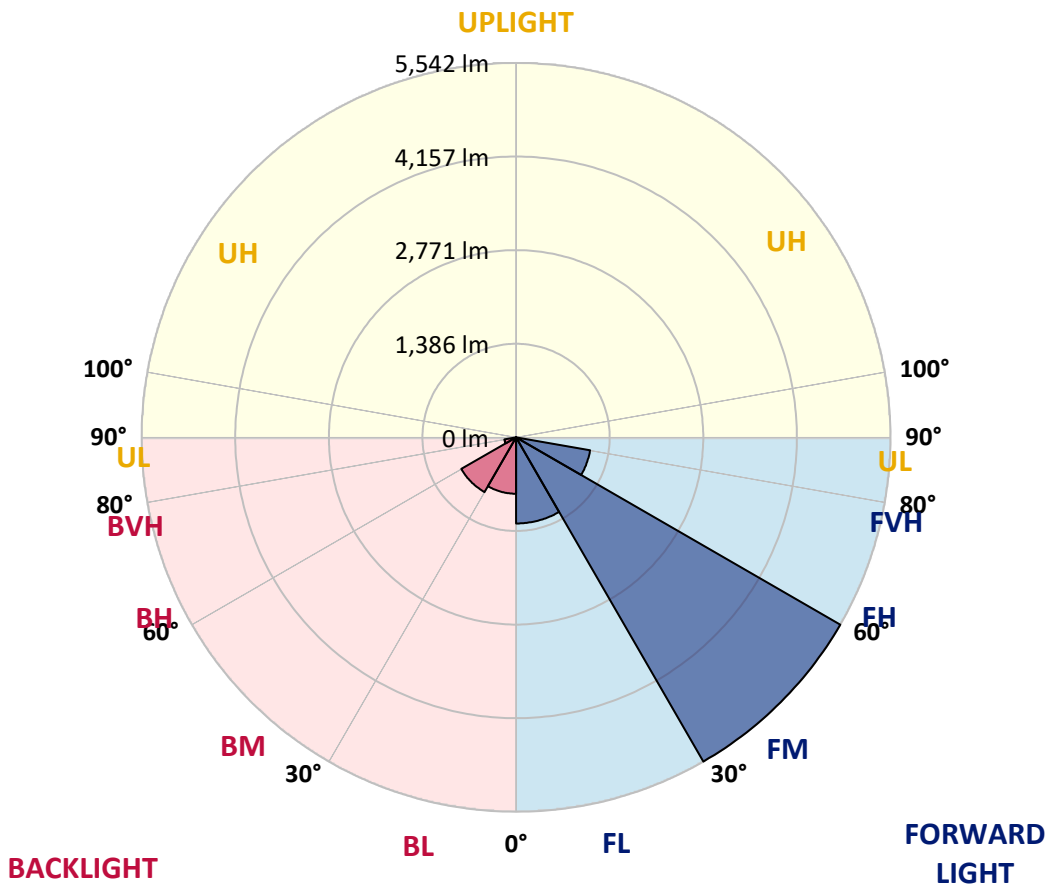
CATALOG NUMBER: GWS-SA6B-830-U-SL2-W-GRSBK

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

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 1275.0 | 12.9      |                         |      |         |
| FM (30°-60°)   | 5542.1 | 56.1      |                         |      |         |
| FH (60°-80°)   | 1112.9 | 11.3      |                         |      | G1/1800 |
| FVH (80°-90°)  | 0.0    | 0.0       |                         |      | G0/10   |
| BL (0°-30°)    | 834.4  | 8.4       | B2/1000                 |      |         |
| BM (30°-60°)   | 935.9  | 9.5       | B1/1000                 |      |         |
| BH (60°-80°)   | 175.7  | 1.8       | B1/500                  |      | G1/500  |
| 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: B2-U0-G1**

Type II Short





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CATALOG NUMBER: GWS-SA6B-830-U-SL2-W-GRSBK

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 50°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 3465.1 | 3465.1 | 3465.1 | 3465.1 | 3465.1 | 3465.1 | 3465.1 | 3465.1 | 3465.1 | 3465.1 | 3465.1 |
| 2.5°  | 3219.1 | 3221.5 | 3222.7 | 3255.3 | 3267.4 | 3315.6 | 3340.9 | 3354.2 | 3389.1 | 3430.1 | 3463.9 |
| 5°    | 3003.3 | 2999.7 | 3005.7 | 3046.7 | 3073.2 | 3144.4 | 3183.0 | 3209.5 | 3286.6 | 3383.1 | 3463.9 |
| 7.5°  | 2815.2 | 2822.5 | 2829.7 | 2874.3 | 2914.1 | 2991.3 | 3046.7 | 3086.5 | 3193.8 | 3337.3 | 3473.5 |
| 10°   | 2682.6 | 2682.6 | 2693.5 | 2744.1 | 2791.1 | 2886.4 | 2941.8 | 2992.5 | 3120.3 | 3296.3 | 3484.4 |
| 12.5° | 2584.9 | 2586.2 | 2599.4 | 2657.3 | 2711.5 | 2810.4 | 2868.3 | 2917.7 | 3058.8 | 3255.3 | 3486.8 |
| 15°   | 2539.1 | 2535.5 | 2546.4 | 2607.9 | 2668.1 | 2761.0 | 2821.3 | 2869.5 | 3015.4 | 3232.4 | 3498.8 |
| 17.5° | 2527.1 | 2524.7 | 2533.1 | 2593.4 | 2654.9 | 2745.3 | 2804.4 | 2852.6 | 3009.3 | 3239.6 | 3535.0 |
| 20°   | 2562.0 | 2557.2 | 2553.6 | 2605.4 | 2663.3 | 2752.5 | 2814.0 | 2868.3 | 3038.3 | 3279.4 | 3590.5 |
| 22.5° | 2645.2 | 2645.2 | 2636.8 | 2662.1 | 2700.7 | 2781.5 | 2845.4 | 2916.5 | 3114.2 | 3359.0 | 3672.5 |
| 25°   | 2798.4 | 2786.3 | 2770.6 | 2781.5 | 2776.6 | 2827.3 | 2903.2 | 3002.1 | 3257.7 | 3490.4 | 3772.5 |
| 27.5° | 2973.2 | 2984.0 | 2957.5 | 2958.7 | 2916.5 | 2898.4 | 2986.4 | 3135.9 | 3471.1 | 3676.1 | 3920.8 |
| 30°   | 3210.7 | 3202.2 | 3203.5 | 3199.8 | 3102.2 | 3016.6 | 3111.8 | 3310.8 | 3740.0 | 3959.4 | 4113.7 |
| 32.5° | 3396.4 | 3408.4 | 3448.2 | 3471.1 | 3343.3 | 3205.9 | 3307.1 | 3548.3 | 4046.2 | 4282.5 | 4350.0 |
| 35°   | 3592.9 | 3614.6 | 3695.4 | 3770.1 | 3662.8 | 3504.9 | 3613.4 | 3863.0 | 4334.4 | 4602.0 | 4621.3 |
| 37.5° | 3800.3 | 3843.7 | 3940.1 | 4071.5 | 4054.7 | 3914.8 | 4013.7 | 4233.1 | 4561.0 | 4794.9 | 4845.6 |
| 40°   | 4037.8 | 4080.0 | 4237.9 | 4427.2 | 4467.0 | 4435.6 | 4468.2 | 4596.0 | 4710.5 | 4803.4 | 4942.0 |
| 42.5° | 4298.2 | 4356.1 | 4556.2 | 4809.4 | 4958.9 | 4986.6 | 4910.7 | 4897.4 | 4775.6 | 4706.9 | 4921.5 |
| 45°   | 4605.6 | 4673.2 | 4899.8 | 5227.8 | 5465.3 | 5502.7 | 5371.2 | 5201.2 | 4816.6 | 4635.8 | 4860.0 |
| 47.5° | 4950.5 | 5014.4 | 5239.8 | 5634.1 | 5987.3 | 6001.8 | 5772.7 | 5499.0 | 4938.4 | 4717.8 | 4907.1 |
| 50°   | 5066.2 | 5106.0 | 5301.3 | 5764.3 | 6415.4 | 6526.3 | 6194.7 | 5834.2 | 5183.2 | 4958.9 | 5136.1 |
| 52.5° | 4668.3 | 4684.0 | 4854.0 | 5321.8 | 6328.5 | 7041.1 | 6810.8 | 6334.6 | 5618.4 | 5326.6 | 5489.4 |
| 55°   | 3699.0 | 3673.7 | 3811.1 | 4240.3 | 5500.2 | 6936.2 | 7369.0 | 7120.7 | 6179.0 | 5758.3 | 5948.8 |
| 57.5° | 2587.4 | 2557.2 | 2525.9 | 2816.4 | 4104.1 | 5880.0 | 6790.3 | 7230.4 | 6713.2 | 6186.3 | 6444.3 |
| 60°   | 2126.8 | 2097.9 | 1945.9 | 1812.1 | 2481.3 | 4222.2 | 5215.7 | 6044.0 | 6669.7 | 6164.6 | 6428.6 |
| 62.5° | 1837.4 | 1820.6 | 1759.1 | 1577.0 | 1460.1 | 2410.1 | 3266.2 | 4059.5 | 5118.1 | 4840.8 | 4855.2 |
| 65°   | 1443.2 | 1438.4 | 1480.6 | 1499.8 | 1291.3 | 1333.5 | 1666.2 | 2109.9 | 2767.0 | 2609.1 | 2474.0 |
| 67.5° | 986.2  | 975.4  | 1055.0 | 1297.3 | 1241.8 | 1052.5 | 975.4  | 983.8  | 1197.2 | 731.8  | 581.1  |
| 70°   | 626.9  | 601.6  | 602.8  | 804.2  | 1010.3 | 830.7  | 752.3  | 661.9  | 595.6  | 108.5  | 123.0  |
| 72.5° | 401.5  | 385.8  | 331.6  | 362.9  | 467.8  | 405.1  | 408.7  | 352.1  | 235.1  | 57.9   | 67.5   |
| 75°   | 168.8  | 155.5  | 119.4  | 95.2   | 94.0   | 59.1   | 51.8   | 48.2   | 32.6   | 32.6   | 35.0   |
| 77.5° | 1.2    | 0.0    | 0.0    | 1.2    | 2.4    | 1.2    | 1.2    | 2.4    | 4.8    | 7.2    | 8.4    |
| 80°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 1.2    |
| 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    |



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CATALOG NUMBER: GWS-SA6B-830-U-SL2-W-GRSBK

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 3465.1 | 3465.1 | 3465.1 | 3465.1 | 3465.1 | 3465.1 | 3465.1 | 3465.1 | 3465.1 | 3465.1 | 3465.1 |
| 2.5°  | 3484.4 | 3455.4 | 3488.0 | 3500.0 | 3498.8 | 3500.0 | 3465.1 | 3441.0 | 3439.8 | 3409.6 | 3395.2 |
| 5°    | 3497.6 | 3474.7 | 3498.8 | 3483.2 | 3445.8 | 3398.8 | 3336.1 | 3281.8 | 3257.7 | 3222.7 | 3205.9 |
| 7.5°  | 3523.0 | 3498.8 | 3495.2 | 3432.5 | 3339.7 | 3240.8 | 3129.9 | 3031.0 | 2978.0 | 2914.1 | 2917.7 |
| 10°   | 3541.0 | 3513.3 | 3466.3 | 3338.5 | 3184.2 | 3026.2 | 2861.0 | 2714.0 | 2621.1 | 2535.5 | 2521.0 |
| 12.5° | 3548.3 | 3507.3 | 3397.6 | 3204.7 | 2987.6 | 2781.5 | 2539.1 | 2329.3 | 2184.7 | 2072.5 | 2056.9 |
| 15°   | 3561.5 | 3495.2 | 3309.6 | 3043.1 | 2745.3 | 2453.5 | 2144.9 | 1857.9 | 1666.2 | 1537.2 | 1548.1 |
| 17.5° | 3582.0 | 3482.0 | 3210.7 | 2862.3 | 2484.9 | 2072.5 | 1655.4 | 1326.2 | 1150.2 | 1075.5 | 1076.7 |
| 20°   | 3611.0 | 3466.3 | 3102.2 | 2663.3 | 2172.6 | 1642.1 | 1157.4 | 909.1  | 859.6  | 857.2  | 853.6  |
| 22.5° | 3649.6 | 3450.6 | 2986.4 | 2445.1 | 1802.5 | 1150.2 | 770.4  | 693.3  | 713.8  | 753.5  | 760.8  |
| 25°   | 3695.4 | 3431.3 | 2857.4 | 2199.1 | 1398.6 | 754.7  | 577.5  | 565.5  | 614.9  | 667.9  | 680.0  |
| 27.5° | 3766.5 | 3421.7 | 2710.3 | 1919.4 | 981.4  | 541.3  | 472.6  | 479.9  | 524.5  | 569.1  | 579.9  |
| 30°   | 3887.1 | 3439.8 | 2550.0 | 1605.9 | 630.6  | 431.6  | 409.9  | 420.8  | 444.9  | 467.8  | 477.4  |
| 32.5° | 4051.0 | 3492.8 | 2394.5 | 1263.5 | 449.7  | 375.0  | 370.1  | 376.2  | 385.8  | 399.1  | 402.7  |
| 35°   | 4242.7 | 3584.4 | 2234.1 | 904.2  | 371.3  | 342.4  | 337.6  | 337.6  | 342.4  | 344.8  | 346.0  |
| 37.5° | 4400.7 | 3680.9 | 2083.4 | 601.6  | 332.8  | 317.1  | 309.9  | 306.2  | 305.0  | 307.4  | 308.7  |
| 40°   | 4469.4 | 3720.7 | 1919.4 | 437.7  | 305.0  | 294.2  | 283.3  | 272.5  | 272.5  | 280.9  | 282.1  |
| 42.5° | 4421.2 | 3676.1 | 1730.1 | 361.7  | 285.7  | 270.1  | 253.2  | 243.5  | 248.4  | 256.8  | 259.2  |
| 45°   | 4318.7 | 3566.4 | 1521.6 | 319.5  | 266.5  | 246.0  | 226.7  | 220.6  | 225.5  | 236.3  | 238.7  |
| 47.5° | 4301.8 | 3494.0 | 1272.0 | 291.8  | 246.0  | 225.5  | 205.0  | 198.9  | 205.0  | 213.4  | 215.8  |
| 50°   | 4469.4 | 3556.7 | 994.7  | 267.7  | 226.7  | 203.8  | 186.9  | 180.8  | 184.5  | 189.3  | 191.7  |
| 52.5° | 4775.6 | 3789.4 | 803.0  | 244.8  | 203.8  | 182.1  | 171.2  | 164.0  | 164.0  | 168.8  | 170.0  |
| 55°   | 5227.8 | 4195.7 | 693.3  | 218.2  | 177.2  | 165.2  | 155.5  | 148.3  | 148.3  | 150.7  | 151.9  |
| 57.5° | 5748.6 | 4687.6 | 718.6  | 183.3  | 155.5  | 149.5  | 141.1  | 135.0  | 137.4  | 137.4  | 137.4  |
| 60°   | 5676.3 | 4651.5 | 769.2  | 154.3  | 137.4  | 135.0  | 127.8  | 125.4  | 131.4  | 126.6  | 124.2  |
| 62.5° | 4181.3 | 3213.1 | 402.7  | 126.6  | 118.2  | 115.7  | 110.9  | 115.7  | 124.2  | 110.9  | 106.1  |
| 65°   | 2030.3 | 1555.3 | 161.6  | 103.7  | 100.1  | 97.7   | 95.2   | 102.5  | 107.3  | 86.8   | 82.0   |
| 67.5° | 477.4  | 388.2  | 104.9  | 88.0   | 83.2   | 78.4   | 80.8   | 82.0   | 78.4   | 59.1   | 56.7   |
| 70°   | 124.2  | 121.8  | 82.0   | 73.5   | 66.3   | 61.5   | 61.5   | 60.3   | 51.8   | 37.4   | 35.0   |
| 72.5° | 67.5   | 66.3   | 59.1   | 55.5   | 45.8   | 41.0   | 42.2   | 37.4   | 28.9   | 21.7   | 20.5   |
| 75°   | 33.8   | 36.2   | 33.8   | 31.3   | 25.3   | 22.9   | 22.9   | 20.5   | 14.5   | 8.4    | 8.4    |
| 77.5° | 7.2    | 8.4    | 8.4    | 7.2    | 6.0    | 4.8    | 4.8    | 6.0    | 2.4    | 0.0    | 0.0    |
| 80°   | 1.2    | 1.2    | 1.2    | 1.2    | 1.2    | 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

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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**

| $\lambda$<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 ( $R_{f,i}$ )**

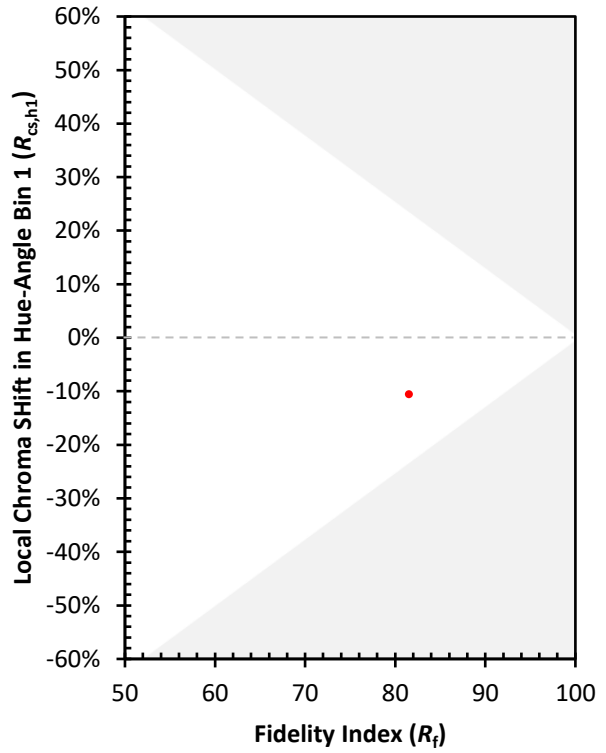
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 74 | CES51 = 89 | CES76 = 70 |
| CES02 = 63 | CES27 = 88 | CES52 = 92 | CES77 = 86 |
| CES03 = 31 | CES28 = 89 | CES53 = 81 | CES78 = 72 |
| CES04 = 70 | CES29 = 67 | CES54 = 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)