

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: P641877

Luminaire Tested: GWS-SA6B-827-U-RW-W-GRSWH

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P641877  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-51)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA6B-827-U-RW-W-GRSWH  
Description: GALLEON WALL SLIM LUMINAIRE. (6) LIGHTSQUARES WITH 16 LEDS EACH AND RECTANGULAR WIDE OPTICS W/ FACTORY INSTALLED GLARE SHIELD, WH  
Light Source: (96) 2700K CCT, 80 CRI LEDS  
Ballast/Driver: -

**Summary**

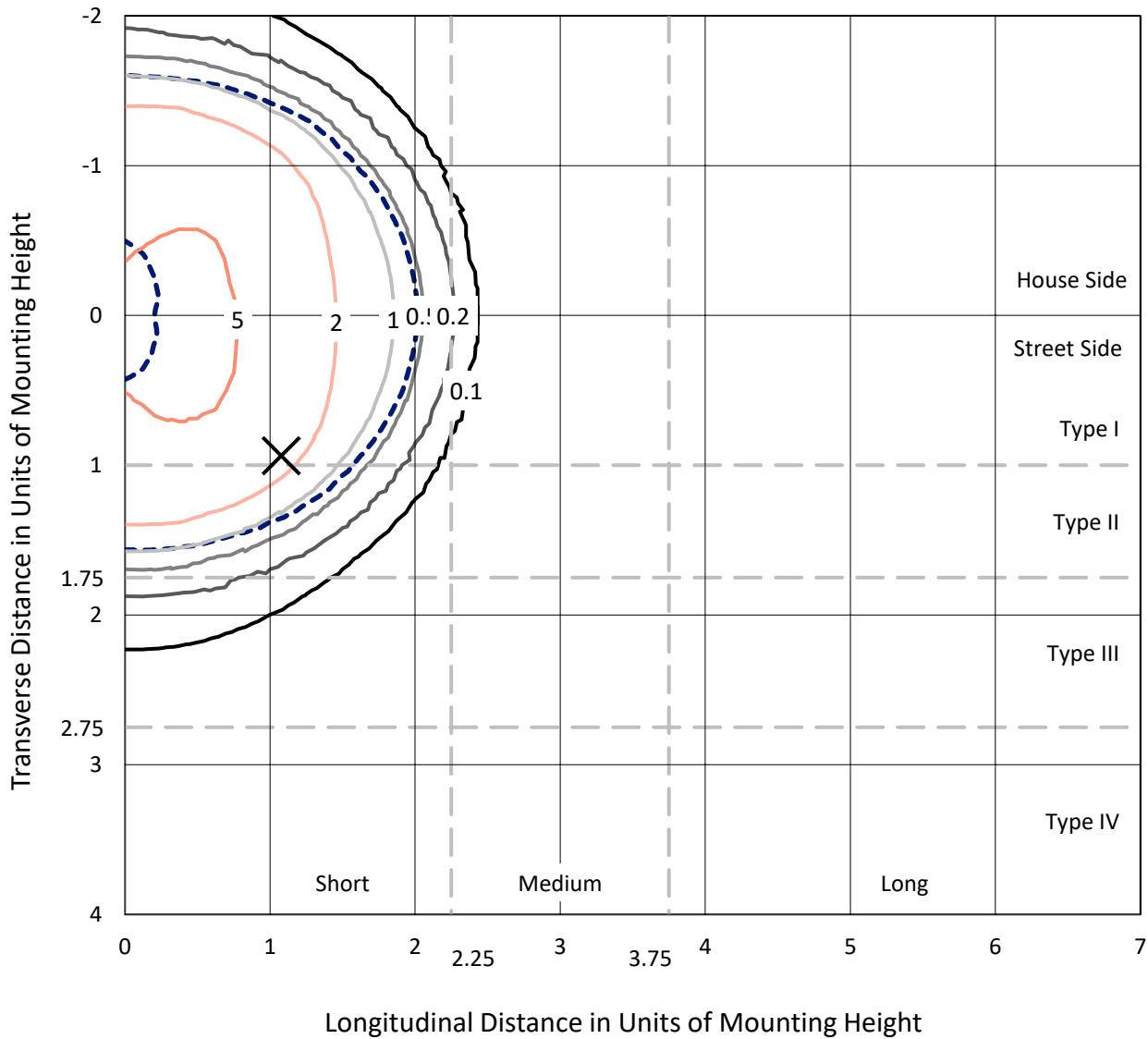
Lumens per Lamp: N/A  
Luminaire Lumens: 13720.5 lumens  
Efficiency: N/A  
Efficacy: 98.8 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type V - Short  
BUG Rating: B3 - U0 - G1  
  
Input Watts (W): 138.9  
Input Voltage (V): 120  
Input Current (Ain): NR  
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: P641877  
 CATALOG NUMBER: GWS-SA6B-827-U-RW-W-GRSWH

### Iso-Footcandle Lines of Horizontal Illumination

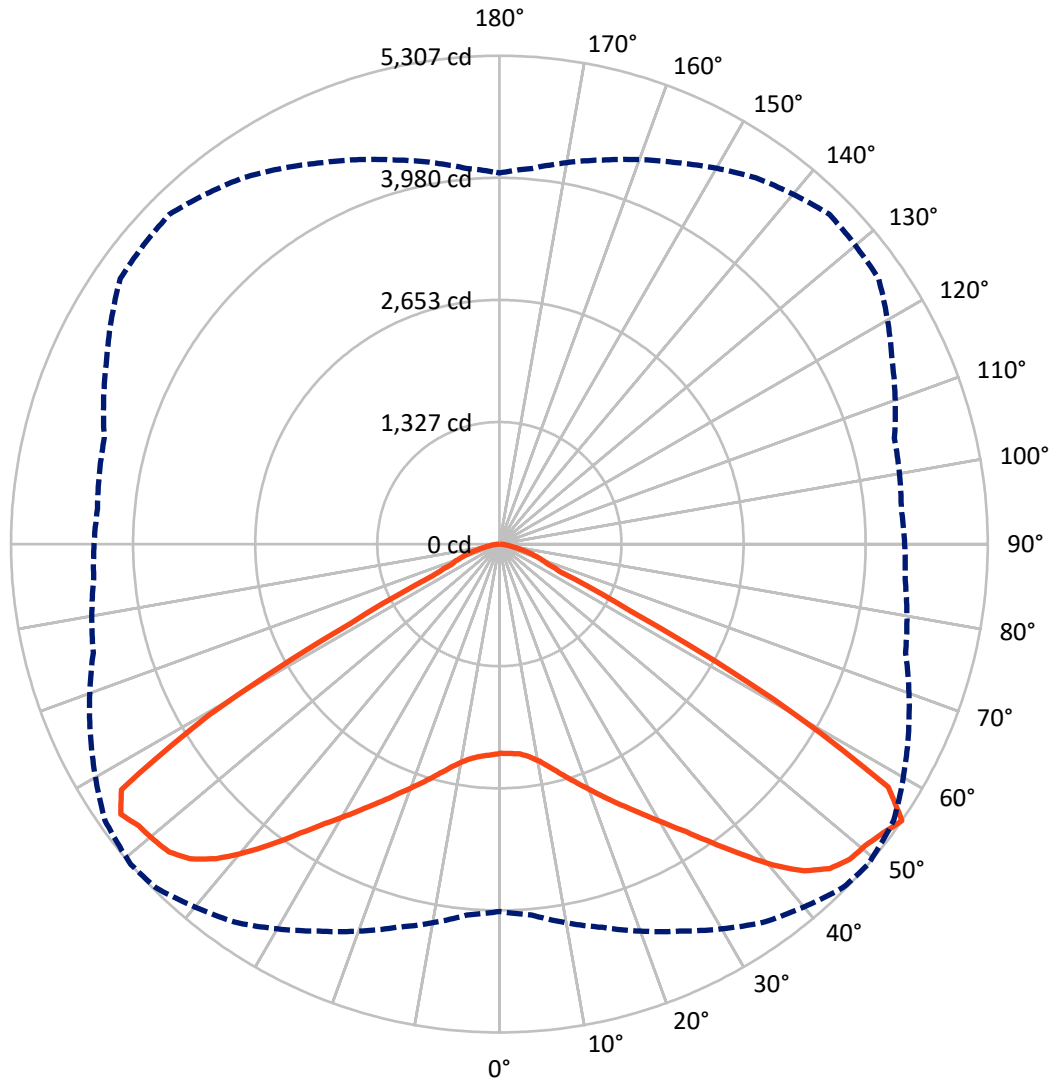
✕ Max cd  
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 6.3 fc  
 Type V - Short - N/A

REPORT NUMBER: P641877  
CATALOG NUMBER: GWS-SA6B-827-U-RW-W-GRSWH

### Luminous Intensity Polar Plot



— Vertical Plane Through 49-Deg Lateral    - - - Horizontal Cone Through 55-Deg Vertical

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 6792.9   | 0.0    | 6792.9  |
|                    | % Fixture | 49.5     | 0.0    | 49.5    |
| <b>Street Side</b> | Lumens    | 6927.5   | 0.0    | 6927.5  |
|                    | % Fixture | 50.5     | 0.0    | 50.5    |
| <b>Total</b>       | Lumens    | 13720.5  | 0.0    | 13720.5 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 221.7   | 1.6       |
| 10°-20°   | 731.3   | 5.3       |
| 20°-30°   | 1393.0  | 10.2      |
| 30°-40°   | 2361.4  | 17.2      |
| 40°-50°   | 3553.7  | 25.9      |
| 50°-60°   | 3889.9  | 28.4      |
| 60°-70°   | 1230.0  | 9.0       |
| 70°-80°   | 295.2   | 2.2       |
| 80°-90°   | 44.3    | 0.3       |
| 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°    | 13720.5 | 100.0     |
| 0°-180°   | 13720.5 | 100.0     |

**Coefficient of Utilization**



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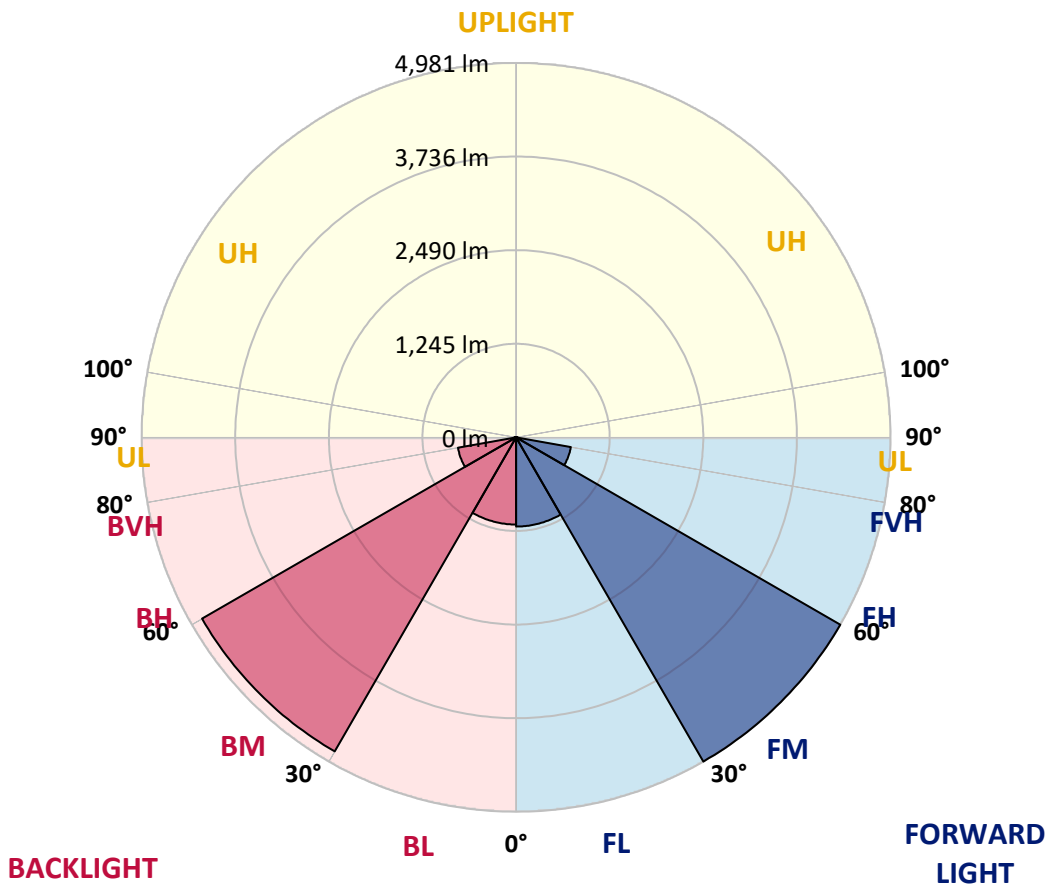
CATALOG NUMBER: GWS-SA6B-827-U-RW-W-GRSWH

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

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 1186.3 | 8.6       |                         |      |         |
| FM (30°-60°)   | 4980.9 | 36.3      |                         |      |         |
| FH (60°-80°)   | 739.9  | 5.4       |                         |      | G1/1800 |
| FVH (80°-90°)  | 20.5   | 0.1       |                         |      | G1/100  |
| BL (0°-30°)    | 1159.8 | 8.5       | B3/2500                 |      |         |
| BM (30°-60°)   | 4824.1 | 35.2      | B3/5000                 |      |         |
| BH (60°-80°)   | 785.3  | 5.7       | B2/1000                 |      | G1/1800 |
| BVH (80°-90°)  | 23.8   | 0.2       |                         |      | G1/100  |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G1**

Type V Short





REPORT NUMBER: P641877

CATALOG NUMBER: GWS-SA6B-827-U-RW-W-GRSWH

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 49°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2272.9 | 2272.9 | 2272.9 | 2272.9 | 2272.9 | 2272.9 | 2272.9 | 2272.9 | 2272.9 | 2272.9 | 2272.9 |
| 2.5°  | 2239.4 | 2241.6 | 2246.1 | 2253.9 | 2261.7 | 2272.9 | 2277.3 | 2282.9 | 2281.8 | 2288.5 | 2288.5 |
| 5°    | 2228.3 | 2231.6 | 2238.3 | 2249.5 | 2262.8 | 2284.0 | 2289.6 | 2303.0 | 2316.4 | 2333.1 | 2338.7 |
| 7.5°  | 2241.6 | 2246.1 | 2253.9 | 2271.8 | 2291.9 | 2319.7 | 2330.9 | 2353.2 | 2378.9 | 2409.0 | 2421.3 |
| 10°   | 2267.3 | 2272.9 | 2286.3 | 2315.3 | 2347.6 | 2390.0 | 2400.1 | 2428.0 | 2469.3 | 2510.5 | 2535.1 |
| 12.5° | 2296.3 | 2305.2 | 2329.8 | 2375.5 | 2423.5 | 2479.3 | 2494.9 | 2529.5 | 2574.1 | 2627.7 | 2661.2 |
| 15°   | 2329.8 | 2337.6 | 2375.5 | 2440.3 | 2515.0 | 2588.7 | 2606.5 | 2640.0 | 2690.2 | 2742.6 | 2789.5 |
| 17.5° | 2400.1 | 2413.5 | 2458.1 | 2532.9 | 2619.9 | 2706.9 | 2727.0 | 2765.0 | 2805.1 | 2846.4 | 2891.0 |
| 20°   | 2496.0 | 2507.2 | 2564.1 | 2656.7 | 2759.4 | 2838.6 | 2858.7 | 2892.2 | 2911.1 | 2932.3 | 2970.3 |
| 22.5° | 2592.0 | 2607.6 | 2672.3 | 2781.7 | 2902.2 | 2988.1 | 3003.7 | 3035.0 | 3021.6 | 3014.9 | 3039.4 |
| 25°   | 2711.4 | 2732.6 | 2796.2 | 2915.6 | 3038.3 | 3144.3 | 3156.6 | 3183.4 | 3161.1 | 3126.5 | 3125.4 |
| 27.5° | 2859.8 | 2878.8 | 2944.6 | 3067.3 | 3189.0 | 3299.4 | 3322.9 | 3358.6 | 3309.5 | 3267.1 | 3236.9 |
| 30°   | 3036.1 | 3048.4 | 3120.9 | 3251.4 | 3376.4 | 3481.3 | 3511.4 | 3547.1 | 3510.3 | 3440.0 | 3409.9 |
| 32.5° | 3241.4 | 3258.1 | 3341.8 | 3479.1 | 3590.6 | 3695.5 | 3725.7 | 3770.3 | 3730.1 | 3650.9 | 3613.0 |
| 35°   | 3488.0 | 3504.7 | 3592.9 | 3742.4 | 3856.2 | 3964.4 | 3985.6 | 4022.5 | 3972.2 | 3880.8 | 3850.6 |
| 37.5° | 3755.8 | 3777.0 | 3888.6 | 4030.3 | 4149.7 | 4275.7 | 4276.9 | 4288.0 | 4216.6 | 4102.8 | 4069.3 |
| 40°   | 4057.0 | 4084.9 | 4196.5 | 4343.8 | 4487.7 | 4590.4 | 4589.3 | 4558.0 | 4437.5 | 4261.2 | 4209.9 |
| 42.5° | 4355.0 | 4377.3 | 4490.0 | 4641.7 | 4785.7 | 4882.7 | 4853.7 | 4777.9 | 4603.8 | 4363.9 | 4295.8 |
| 45°   | 4570.3 | 4587.1 | 4705.3 | 4876.0 | 5022.2 | 5082.5 | 5030.0 | 4938.5 | 4703.1 | 4428.6 | 4328.2 |
| 47.5° | 4671.9 | 4694.2 | 4813.6 | 4983.2 | 5148.3 | 5182.9 | 5120.4 | 5034.5 | 4761.1 | 4488.9 | 4353.9 |
| 50°   | 4617.2 | 4646.2 | 4781.2 | 4938.5 | 5124.9 | 5196.3 | 5151.6 | 5065.7 | 4822.5 | 4548.0 | 4399.6 |
| 52.5° | 4475.5 | 4503.4 | 4674.1 | 4864.9 | 5075.8 | 5217.5 | 5216.4 | 5146.1 | 4892.8 | 4564.7 | 4401.8 |
| 55°   | 3991.2 | 4045.9 | 4311.5 | 4640.6 | 5015.5 | 5280.0 | 5306.7 | 5232.0 | 4903.9 | 4569.2 | 4425.3 |
| 57.5° | 2597.6 | 2693.5 | 2945.7 | 3374.2 | 4126.2 | 4802.4 | 4983.2 | 5001.0 | 4823.6 | 4550.2 | 4429.7 |
| 60°   | 1084.6 | 1161.5 | 1361.3 | 1645.8 | 2267.3 | 3071.8 | 3422.2 | 3773.6 | 4197.6 | 4351.6 | 4388.4 |
| 62.5° | 673.9  | 680.6  | 700.7  | 765.4  | 973.0  | 1365.7 | 1591.1 | 1920.3 | 2550.7 | 3087.4 | 3335.1 |
| 65°   | 608.1  | 611.5  | 615.9  | 611.5  | 621.5  | 669.5  | 729.7  | 844.7  | 1101.3 | 1368.0 | 1684.9 |
| 67.5° | 535.6  | 540.0  | 543.4  | 540.0  | 543.4  | 545.6  | 552.3  | 562.4  | 609.2  | 647.2  | 676.2  |
| 70°   | 432.9  | 439.6  | 445.2  | 443.0  | 456.4  | 456.4  | 463.1  | 470.9  | 494.3  | 522.2  | 542.3  |
| 72.5° | 330.3  | 324.7  | 331.4  | 333.6  | 345.9  | 352.6  | 362.6  | 371.6  | 398.3  | 415.1  | 440.7  |
| 75°   | 214.2  | 208.7  | 218.7  | 224.3  | 241.0  | 249.9  | 258.9  | 267.8  | 286.8  | 297.9  | 322.5  |
| 77.5° | 116.0  | 114.9  | 125.0  | 132.8  | 150.6  | 161.8  | 168.5  | 175.2  | 190.8  | 194.1  | 209.8  |
| 80°   | 66.9   | 66.9   | 73.6   | 79.2   | 90.4   | 102.7  | 109.3  | 114.9  | 126.1  | 129.4  | 136.1  |
| 82.5° | 36.8   | 36.8   | 40.2   | 43.5   | 52.4   | 59.1   | 64.7   | 69.2   | 79.2   | 82.6   | 85.9   |
| 85°   | 17.9   | 16.7   | 19.0   | 21.2   | 24.5   | 27.9   | 31.2   | 33.5   | 41.3   | 43.5   | 48.0   |
| 87.5° | 2.2    | 2.2    | 2.2    | 3.3    | 4.5    | 6.7    | 7.8    | 7.8    | 12.3   | 14.5   | 16.7   |
| 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: P641877

CATALOG NUMBER: GWS-SA6B-827-U-RW-W-GRSWH

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2272.9 | 2272.9 | 2272.9 | 2272.9 | 2272.9 | 2272.9 | 2272.9 | 2272.9 | 2272.9 | 2272.9 | 2272.9 |
| 2.5°  | 2295.2 | 2280.7 | 2289.6 | 2293.0 | 2293.0 | 2289.6 | 2275.1 | 2270.7 | 2264.0 | 2253.9 | 2253.9 |
| 5°    | 2346.5 | 2335.4 | 2337.6 | 2332.0 | 2318.6 | 2301.9 | 2275.1 | 2261.7 | 2250.6 | 2238.3 | 2237.2 |
| 7.5°  | 2434.7 | 2420.2 | 2417.9 | 2396.7 | 2361.0 | 2325.3 | 2285.2 | 2260.6 | 2243.9 | 2228.3 | 2227.1 |
| 10°   | 2549.6 | 2536.2 | 2519.5 | 2477.1 | 2424.6 | 2372.2 | 2317.5 | 2284.0 | 2259.5 | 2237.2 | 2236.1 |
| 12.5° | 2677.9 | 2662.3 | 2631.1 | 2568.6 | 2502.7 | 2451.4 | 2388.9 | 2337.6 | 2300.8 | 2270.7 | 2265.1 |
| 15°   | 2817.4 | 2795.1 | 2741.5 | 2667.9 | 2603.2 | 2548.5 | 2481.5 | 2407.9 | 2352.1 | 2304.1 | 2298.5 |
| 17.5° | 2924.5 | 2895.5 | 2837.5 | 2768.3 | 2714.7 | 2660.1 | 2573.0 | 2480.4 | 2400.1 | 2339.8 | 2330.9 |
| 20°   | 2998.2 | 2974.7 | 2908.9 | 2857.6 | 2826.3 | 2778.3 | 2676.8 | 2571.9 | 2481.5 | 2405.7 | 2401.2 |
| 22.5° | 3066.2 | 3038.3 | 2973.6 | 2943.5 | 2943.5 | 2911.1 | 2814.0 | 2690.2 | 2584.2 | 2496.0 | 2484.9 |
| 25°   | 3143.2 | 3113.1 | 3064.0 | 3060.6 | 3076.3 | 3061.8 | 2944.6 | 2811.8 | 2688.0 | 2588.7 | 2570.8 |
| 27.5° | 3250.3 | 3216.9 | 3187.8 | 3207.9 | 3230.2 | 3214.6 | 3084.1 | 2930.1 | 2799.5 | 2699.1 | 2683.5 |
| 30°   | 3421.0 | 3379.8 | 3353.0 | 3377.5 | 3421.0 | 3375.3 | 3233.6 | 3070.7 | 2939.0 | 2828.6 | 2820.7 |
| 32.5° | 3619.7 | 3572.8 | 3544.9 | 3583.9 | 3623.0 | 3551.6 | 3411.0 | 3254.8 | 3116.4 | 3000.4 | 2987.0 |
| 35°   | 3858.4 | 3799.3 | 3758.0 | 3810.5 | 3850.6 | 3780.3 | 3640.9 | 3492.5 | 3338.5 | 3218.0 | 3200.1 |
| 37.5° | 4070.4 | 3999.0 | 3971.1 | 4044.8 | 4098.3 | 4052.6 | 3900.8 | 3761.4 | 3592.9 | 3461.2 | 3453.4 |
| 40°   | 4224.4 | 4154.1 | 4134.0 | 4255.7 | 4349.4 | 4338.2 | 4202.1 | 4042.5 | 3884.1 | 3732.4 | 3717.8 |
| 42.5° | 4291.4 | 4242.3 | 4246.7 | 4410.8 | 4555.8 | 4627.2 | 4505.6 | 4334.9 | 4182.0 | 4024.7 | 4014.6 |
| 45°   | 4305.9 | 4275.7 | 4311.5 | 4516.8 | 4707.6 | 4853.7 | 4750.0 | 4607.1 | 4434.2 | 4282.4 | 4278.0 |
| 47.5° | 4321.5 | 4304.8 | 4359.4 | 4577.0 | 4803.5 | 4973.1 | 4915.1 | 4767.8 | 4592.6 | 4444.2 | 4433.1 |
| 50°   | 4358.3 | 4351.6 | 4413.0 | 4619.4 | 4849.3 | 5005.5 | 4939.6 | 4793.5 | 4613.8 | 4467.7 | 4440.9 |
| 52.5° | 4369.5 | 4358.3 | 4446.5 | 4685.2 | 4925.1 | 5004.4 | 4862.7 | 4671.9 | 4491.1 | 4328.2 | 4300.3 |
| 55°   | 4404.1 | 4384.0 | 4444.2 | 4709.8 | 5030.0 | 5069.1 | 4858.2 | 4572.5 | 4320.4 | 4098.3 | 4032.5 |
| 57.5° | 4413.0 | 4390.7 | 4429.7 | 4669.6 | 4916.2 | 4881.6 | 4270.2 | 3689.9 | 3214.6 | 2968.0 | 2995.9 |
| 60°   | 4365.0 | 4371.7 | 4304.8 | 4278.0 | 3943.2 | 3481.3 | 2614.3 | 2089.9 | 1641.3 | 1451.7 | 1492.9 |
| 62.5° | 3322.9 | 3350.7 | 3122.0 | 2714.7 | 2087.7 | 1654.7 | 1094.6 | 850.2  | 719.7  | 686.2  | 691.8  |
| 65°   | 1677.0 | 1715.0 | 1477.3 | 1221.8 | 908.3  | 734.2  | 634.9  | 614.8  | 608.1  | 600.3  | 600.3  |
| 67.5° | 663.9  | 675.1  | 666.1  | 623.7  | 580.2  | 564.6  | 560.1  | 557.9  | 550.1  | 545.6  | 546.7  |
| 70°   | 533.4  | 542.3  | 528.9  | 502.1  | 484.3  | 483.1  | 480.9  | 476.4  | 470.9  | 470.9  | 474.2  |
| 72.5° | 435.2  | 444.1  | 425.1  | 408.4  | 395.0  | 385.0  | 379.4  | 376.0  | 368.2  | 368.2  | 371.6  |
| 75°   | 320.2  | 325.8  | 310.2  | 308.0  | 293.5  | 283.4  | 274.5  | 270.0  | 260.0  | 255.5  | 258.9  |
| 77.5° | 213.1  | 212.0  | 204.2  | 204.2  | 198.6  | 186.3  | 176.3  | 166.3  | 152.9  | 143.9  | 146.2  |
| 80°   | 138.4  | 138.4  | 135.0  | 135.0  | 129.4  | 119.4  | 107.1  | 97.1   | 89.3   | 82.6   | 82.6   |
| 82.5° | 88.1   | 87.0   | 85.9   | 84.8   | 82.6   | 72.5   | 63.6   | 56.9   | 51.3   | 46.9   | 48.0   |
| 85°   | 49.1   | 49.1   | 46.9   | 46.9   | 42.4   | 36.8   | 32.4   | 27.9   | 24.5   | 23.4   | 23.4   |
| 87.5° | 16.7   | 16.7   | 15.6   | 15.6   | 13.4   | 10.0   | 7.8    | 6.7    | 5.6    | 4.5    | 5.6    |
| 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

Invue

Report Number: SP1-2407-157-9

Test Date: 10/03/2024

Luminaire Tested: EMM2-HTN-SA1A-827-U-5WQ

Data applicable to all product families utilizing light square engine

**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2407-157-9  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 10/03/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: Invue  
 Catalog Number: **EMM2-HTN-SA1A-827-U-5WQ**  
 Description: Epic Modern Light Square 40W 5WQ Optic

**Spectral Parameters**

CCT (K): 2764  
 CIE u': 0.2591  
 CIE v': 0.5290  
 Duv: 0.0020  
 CIE x: 0.4581  
 CIE y: 0.4156  
 CIE z: 0.1263  
 Peak Wavelength (nm): 603  
 Dominant Wavelength (nm): 583  
 Purity: 62.2537  
 Rf: 84.7  
 Rg: 94.6

|           |      |      |      |
|-----------|------|------|------|
| CRI (Ra): | 80.9 |      |      |
| R1:       | 78.8 | R9:  | -1.5 |
| R2:       | 89.9 | R10: | 77.9 |
| R3:       | 96.2 | R11: | 78.9 |
| R4:       | 79.1 | R12: | 71.6 |
| R5:       | 79.1 | R13: | 81.2 |
| R6:       | 88.8 | R14: | 98.5 |
| R7:       | 81.3 | R15: | 69.9 |
| R8:       | 54.3 |      |      |



**Test Conditions**

Stabilization Time: 81M  
 Operation Time: 2H 21M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-157-9

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

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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 2700K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



**Photopic Lumens: 4337.9**

| $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | 0.0                            | 490               | 18018                                | 2.6                            | 620               | 87426                                | 22.8                           | 750               | 2680                                 | 0.0                            | 880               | 58                                   | 0.0                            |
| 365               | 0                                    | 0.0                            | 495               | 22295                                | 3.9                            | 625               | 83013                                | 18.2                           | 755               | 2287                                 | 0.0                            | 885               | 46                                   | 0.0                            |
| 370               | 0                                    | 0.0                            | 500               | 26478                                | 5.8                            | 630               | 78077                                | 14.1                           | 760               | 1944                                 | 0.0                            | 890               | 45                                   | 0.0                            |
| 375               | 0                                    | 0.0                            | 505               | 30524                                | 8.5                            | 635               | 72080                                | 10.7                           | 765               | 1653                                 | 0.0                            | 895               | 41                                   | 0.0                            |
| 380               | 0                                    | 0.0                            | 510               | 33611                                | 11.5                           | 640               | 66249                                | 7.9                            | 770               | 1413                                 | 0.0                            | 900               | 38                                   | 0.0                            |
| 385               | 0                                    | 0.0                            | 515               | 36490                                | 15.2                           | 645               | 59973                                | 5.7                            | 775               | 1198                                 | 0.0                            | 905               | 33                                   | 0.0                            |
| 390               | 0                                    | 0.0                            | 520               | 38610                                | 18.7                           | 650               | 53972                                | 3.9                            | 780               | 1025                                 | 0.0                            | 910               | 30                                   | 0.0                            |
| 395               | 0                                    | 0.0                            | 525               | 40511                                | 21.9                           | 655               | 48369                                | 2.7                            | 785               | 874                                  | 0.0                            | 915               | 23                                   | 0.0                            |
| 400               | 48                                   | 0.0                            | 530               | 42223                                | 24.9                           | 660               | 42641                                | 1.8                            | 790               | 747                                  | 0.0                            | 920               | 24                                   | 0.0                            |
| 405               | 201                                  | 0.0                            | 535               | 44137                                | 27.6                           | 665               | 37602                                | 1.1                            | 795               | 639                                  | 0.0                            | 925               | 22                                   | 0.0                            |
| 410               | 457                                  | 0.0                            | 540               | 46032                                | 30.0                           | 670               | 32798                                | 0.7                            | 800               | 547                                  | 0.0                            | 930               | 22                                   | 0.0                            |
| 415               | 925                                  | 0.0                            | 545               | 48553                                | 32.5                           | 675               | 28558                                | 0.5                            | 805               | 473                                  | 0.0                            | 935               | 17                                   | 0.0                            |
| 420               | 1816                                 | 0.0                            | 550               | 51408                                | 34.9                           | 680               | 24782                                | 0.3                            | 810               | 401                                  | 0.0                            | 940               | 13                                   | 0.0                            |
| 425               | 3217                                 | 0.0                            | 555               | 54711                                | 37.4                           | 685               | 21386                                | 0.2                            | 815               | 351                                  | 0.0                            | 945               | 6                                    | 0.0                            |
| 430               | 5520                                 | 0.0                            | 560               | 58847                                | 40.0                           | 690               | 18413                                | 0.1                            | 820               | 307                                  | 0.0                            | 950               | 10                                   | 0.0                            |
| 435               | 9225                                 | 0.1                            | 565               | 63386                                | 42.4                           | 695               | 15721                                | 0.1                            | 825               | 261                                  | 0.0                            | 955               | 11                                   | 0.0                            |
| 440               | 15522                                | 0.2                            | 570               | 68196                                | 44.3                           | 700               | 13432                                | 0.0                            | 830               | 228                                  | 0.0                            | 960               | 8                                    | 0.0                            |
| 445               | 27642                                | 0.6                            | 575               | 73613                                | 46.0                           | 705               | 11513                                | 0.0                            | 835               | 193                                  | 0.0                            | 965               | 12                                   | 0.0                            |
| 450               | 36602                                | 0.9                            | 580               | 79207                                | 47.1                           | 710               | 9780                                 | 0.0                            | 840               | 174                                  | 0.0                            | 970               | 3                                    | 0.0                            |
| 455               | 28292                                | 0.9                            | 585               | 84248                                | 47.0                           | 715               | 8356                                 | 0.0                            | 845               | 151                                  | 0.0                            | 975               | 8                                    | 0.0                            |
| 460               | 21166                                | 0.9                            | 590               | 88397                                | 45.7                           | 720               | 7161                                 | 0.0                            | 850               | 123                                  | 0.0                            | 980               | 2                                    | 0.0                            |
| 465               | 19092                                | 1.0                            | 595               | 91428                                | 43.4                           | 725               | 6067                                 | 0.0                            | 855               | 106                                  | 0.0                            | 985               | 13                                   | 0.0                            |
| 470               | 14951                                | 0.9                            | 600               | 93452                                | 40.3                           | 730               | 5164                                 | 0.0                            | 860               | 95                                   | 0.0                            | 990               | 16                                   | 0.0                            |
| 475               | 12606                                | 1.0                            | 605               | 93959                                | 36.4                           | 735               | 4393                                 | 0.0                            | 865               | 82                                   | 0.0                            | 995               | 20                                   | 0.0                            |
| 480               | 13323                                | 1.3                            | 610               | 93079                                | 32.0                           | 740               | 3694                                 | 0.0                            | 870               | 77                                   | 0.0                            | 1000              | 0                                    | 0.0                            |
| 485               | 15164                                | 1.8                            | 615               | 90707                                | 27.3                           | 745               | 3157                                 | 0.0                            | 875               | 65                                   | 0.0                            |                   |                                      |                                |

REPORT NUMBER: SP1-2407-157-9

**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 5286.7**

**S/P: 1.22**

| $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | 0.0                            | 490               | 18018                                | 75.9                           | 620               | 87426                                | 0.4                            | 750               | 2680                                 | 0.0                            | 880               | 58                                   | 0.0                            |
| 365               | 0                                    | 0.0                            | 495               | 22295                                | 93.2                           | 625               | 83013                                | 0.2                            | 755               | 2287                                 | 0.0                            | 885               | 46                                   | 0.0                            |
| 370               | 0                                    | 0.0                            | 500               | 26478                                | 107.8                          | 630               | 78077                                | 0.1                            | 760               | 1944                                 | 0.0                            | 890               | 45                                   | 0.0                            |
| 375               | 0                                    | 0.0                            | 505               | 30524                                | 118.7                          | 635               | 72080                                | 0.1                            | 765               | 1653                                 | 0.0                            | 895               | 41                                   | 0.0                            |
| 380               | 0                                    | 0.0                            | 510               | 33611                                | 122.2                          | 640               | 66249                                | 0.1                            | 770               | 1413                                 | 0.0                            | 900               | 38                                   | 0.0                            |
| 385               | 0                                    | 0.0                            | 515               | 36490                                | 120.8                          | 645               | 59973                                | 0.0                            | 775               | 1198                                 | 0.0                            | 905               | 33                                   | 0.0                            |
| 390               | 0                                    | 0.0                            | 520               | 38610                                | 113.9                          | 650               | 53972                                | 0.0                            | 780               | 1025                                 | 0.0                            | 910               | 30                                   | 0.0                            |
| 395               | 0                                    | 0.0                            | 525               | 40511                                | 104.1                          | 655               | 48369                                | 0.0                            | 785               | 874                                  | 0.0                            | 915               | 23                                   | 0.0                            |
| 400               | 48                                   | 0.0                            | 530               | 42223                                | 92.4                           | 660               | 42641                                | 0.0                            | 790               | 747                                  | 0.0                            | 920               | 24                                   | 0.0                            |
| 405               | 201                                  | 0.0                            | 535               | 44137                                | 80.5                           | 665               | 37602                                | 0.0                            | 795               | 639                                  | 0.0                            | 925               | 22                                   | 0.0                            |
| 410               | 457                                  | 0.1                            | 540               | 46032                                | 68.2                           | 670               | 32798                                | 0.0                            | 800               | 547                                  | 0.0                            | 930               | 22                                   | 0.0                            |
| 415               | 925                                  | 0.3                            | 545               | 48553                                | 57.1                           | 675               | 28558                                | 0.0                            | 805               | 473                                  | 0.0                            | 935               | 17                                   | 0.0                            |
| 420               | 1816                                 | 1.1                            | 550               | 51408                                | 46.7                           | 680               | 24782                                | 0.0                            | 810               | 401                                  | 0.0                            | 940               | 13                                   | 0.0                            |
| 425               | 3217                                 | 2.5                            | 555               | 54711                                | 37.4                           | 685               | 21386                                | 0.0                            | 815               | 351                                  | 0.0                            | 945               | 6                                    | 0.0                            |
| 430               | 5520                                 | 5.9                            | 560               | 58847                                | 29.4                           | 690               | 18413                                | 0.0                            | 820               | 307                                  | 0.0                            | 950               | 10                                   | 0.0                            |
| 435               | 9225                                 | 12.5                           | 565               | 63386                                | 22.5                           | 695               | 15721                                | 0.0                            | 825               | 261                                  | 0.0                            | 955               | 11                                   | 0.0                            |
| 440               | 15522                                | 26.3                           | 570               | 68196                                | 16.9                           | 700               | 13432                                | 0.0                            | 830               | 228                                  | 0.0                            | 960               | 8                                    | 0.0                            |
| 445               | 27642                                | 55.2                           | 575               | 73613                                | 12.4                           | 705               | 11513                                | 0.0                            | 835               | 193                                  | 0.0                            | 965               | 12                                   | 0.0                            |
| 450               | 36602                                | 85.4                           | 580               | 79207                                | 9.0                            | 710               | 9780                                 | 0.0                            | 840               | 174                                  | 0.0                            | 970               | 3                                    | 0.0                            |
| 455               | 28292                                | 75.1                           | 585               | 84248                                | 6.3                            | 715               | 8356                                 | 0.0                            | 845               | 151                                  | 0.0                            | 975               | 8                                    | 0.0                            |
| 460               | 21166                                | 63.2                           | 590               | 88397                                | 4.4                            | 720               | 7161                                 | 0.0                            | 850               | 123                                  | 0.0                            | 980               | 2                                    | 0.0                            |
| 465               | 19092                                | 63.2                           | 595               | 91428                                | 3.0                            | 725               | 6067                                 | 0.0                            | 855               | 106                                  | 0.0                            | 985               | 13                                   | 0.0                            |
| 470               | 14951                                | 54.2                           | 600               | 93452                                | 2.0                            | 730               | 5164                                 | 0.0                            | 860               | 95                                   | 0.0                            | 990               | 16                                   | 0.0                            |
| 475               | 12606                                | 48.8                           | 605               | 93959                                | 1.3                            | 735               | 4393                                 | 0.0                            | 865               | 82                                   | 0.0                            | 995               | 20                                   | 0.0                            |
| 480               | 13323                                | 54.2                           | 610               | 93079                                | 0.9                            | 740               | 3694                                 | 0.0                            | 870               | 77                                   | 0.0                            | 1000              | 0                                    | 0.0                            |
| 485               | 15164                                | 63.3                           | 615               | 90707                                | 0.5                            | 745               | 3157                                 | 0.0                            | 875               | 65                                   | 0.0                            |                   |                                      |                                |

REPORT NUMBER: SP1-2407-157-9

Melanopic Flux vs. Wavelength



Melanopic Lumens: 9797 M/P: 2.26

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 0             | 0.0           | 490    | 18018         | 27.7          | 620    | 87426         | 1.1           | 750    | 2680          | 0.0           | 880    | 58            | 0.0           |
| 365    | 0             | 0.0           | 495    | 22295         | 36.0          | 625    | 83013         | 0.7           | 755    | 2287          | 0.0           | 885    | 46            | 0.0           |
| 370    | 0             | 0.0           | 500    | 26478         | 44.2          | 630    | 78077         | 0.4           | 760    | 1944          | 0.0           | 890    | 45            | 0.0           |
| 375    | 0             | 0.0           | 505    | 30524         | 51.8          | 635    | 72080         | 0.3           | 765    | 1653          | 0.0           | 895    | 41            | 0.0           |
| 380    | 0             | 0.0           | 510    | 33611         | 57.0          | 640    | 66249         | 0.2           | 770    | 1413          | 0.0           | 900    | 38            | 0.0           |
| 385    | 0             | 0.0           | 515    | 36490         | 60.5          | 645    | 59973         | 0.1           | 775    | 1198          | 0.0           | 905    | 33            | 0.0           |
| 390    | 0             | 0.0           | 520    | 38610         | 61.4          | 650    | 53972         | 0.1           | 780    | 1025          | 0.0           | 910    | 30            | 0.0           |
| 395    | 0             | 0.0           | 525    | 40511         | 60.6          | 655    | 48369         | 0.0           | 785    | 874           | 0.0           | 915    | 23            | 0.0           |
| 400    | 48            | 0.0           | 530    | 42223         | 58.2          | 660    | 42641         | 0.0           | 790    | 747           | 0.0           | 920    | 24            | 0.0           |
| 405    | 201           | 0.0           | 535    | 44137         | 55.0          | 665    | 37602         | 0.0           | 795    | 639           | 0.0           | 925    | 22            | 0.0           |
| 410    | 457           | 0.0           | 540    | 46032         | 50.9          | 670    | 32798         | 0.0           | 800    | 547           | 0.0           | 930    | 22            | 0.0           |
| 415    | 925           | 0.1           | 545    | 48553         | 46.6          | 675    | 28558         | 0.0           | 805    | 473           | 0.0           | 935    | 17            | 0.0           |
| 420    | 1816          | 0.3           | 550    | 51408         | 42.0          | 680    | 24782         | 0.0           | 810    | 401           | 0.0           | 940    | 13            | 0.0           |
| 425    | 3217          | 0.8           | 555    | 54711         | 37.4          | 685    | 21386         | 0.0           | 815    | 351           | 0.0           | 945    | 6             | 0.0           |
| 430    | 5520          | 1.9           | 560    | 58847         | 32.9          | 690    | 18413         | 0.0           | 820    | 307           | 0.0           | 950    | 10            | 0.0           |
| 435    | 9225          | 4.1           | 565    | 63386         | 28.4          | 695    | 15721         | 0.0           | 825    | 261           | 0.0           | 955    | 11            | 0.0           |
| 440    | 15522         | 8.7           | 570    | 68196         | 24.1          | 700    | 13432         | 0.0           | 830    | 228           | 0.0           | 960    | 8             | 0.0           |
| 445    | 27642         | 18.5          | 575    | 73613         | 20.0          | 705    | 11513         | 0.0           | 835    | 193           | 0.0           | 965    | 12            | 0.0           |
| 450    | 36602         | 28.3          | 580    | 79207         | 16.3          | 710    | 9780          | 0.0           | 840    | 174           | 0.0           | 970    | 3             | 0.0           |
| 455    | 28292         | 24.7          | 585    | 84248         | 12.9          | 715    | 8356          | 0.0           | 845    | 151           | 0.0           | 975    | 8             | 0.0           |
| 460    | 21166         | 20.4          | 590    | 88397         | 9.8           | 720    | 7161          | 0.0           | 850    | 123           | 0.0           | 980    | 2             | 0.0           |
| 465    | 19092         | 20.1          | 595    | 91428         | 7.3           | 725    | 6067          | 0.0           | 855    | 106           | 0.0           | 985    | 13            | 0.0           |
| 470    | 14951         | 17.2          | 600    | 93452         | 5.3           | 730    | 5164          | 0.0           | 860    | 95            | 0.0           | 990    | 16            | 0.0           |
| 475    | 12606         | 15.7          | 605    | 93959         | 3.7           | 735    | 4393          | 0.0           | 865    | 82            | 0.0           | 995    | 20            | 0.0           |
| 480    | 13323         | 18.0          | 610    | 93079         | 2.5           | 740    | 3694          | 0.0           | 870    | 77            | 0.0           | 1000   | 0             | 0.0           |
| 485    | 15164         | 21.9          | 615    | 90707         | 1.7           | 745    | 3157          | 0.0           | 875    | 65            | 0.0           |        |               |               |

**Summary**

$R_f = 84.7$   
 $R_g = 94.6$   
 CIE  $R_a = 80.9$   
 $R_9 = -1.5$



**Color Vector Graphics**





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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 84 | CES51 = 95 | CES76 = 81 |
| CES02 = 63 | CES27 = 95 | CES52 = 94 | CES77 = 84 |
| CES03 = 31 | CES28 = 94 | CES53 = 89 | CES78 = 81 |
| CES04 = 71 | CES29 = 87 | CES54 = 91 | CES79 = 89 |
| CES05 = 50 | CES30 = 94 | CES55 = 90 | CES80 = 89 |
| CES06 = 52 | CES31 = 89 | CES56 = 86 | CES81 = 69 |
| CES07 = 43 | CES32 = 82 | CES57 = 85 | CES82 = 96 |
| CES08 = 41 | CES33 = 91 | CES58 = 86 | CES83 = 93 |
| CES09 = 29 | CES34 = 92 | CES59 = 91 | CES84 = 92 |
| CES10 = 77 | CES35 = 96 | CES60 = 94 | CES85 = 76 |
| CES11 = 60 | CES36 = 90 | CES61 = 89 | CES86 = 65 |
| CES12 = 66 | CES37 = 96 | CES62 = 94 | CES87 = 84 |
| CES13 = 44 | CES38 = 98 | CES63 = 87 | CES88 = 86 |
| CES14 = 74 | CES39 = 98 | CES64 = 82 | CES89 = 73 |
| CES15 = 72 | CES40 = 95 | CES65 = 78 | CES90 = 88 |
| CES16 = 48 | CES41 = 96 | CES66 = 81 | CES91 = 82 |
| CES17 = 50 | CES42 = 97 | CES67 = 80 | CES92 = 64 |
| CES18 = 57 | CES43 = 91 | CES68 = 83 | CES93 = 78 |
| CES19 = 73 | CES44 = 99 | CES69 = 88 | CES94 = 59 |
| CES20 = 67 | CES45 = 93 | CES70 = 80 | CES95 = 74 |
| CES21 = 87 | CES46 = 89 | CES71 = 79 | CES96 = 83 |
| CES22 = 79 | CES47 = 92 | CES72 = 92 | CES97 = 88 |
| CES23 = 92 | CES48 = 83 | CES73 = 75 | CES98 = 83 |
| CES24 = 91 | CES49 = 90 | CES74 = 91 | CES99 = 74 |
| CES25 = 72 | CES50 = 94 | CES75 = 81 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)