

Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: McGRAW-EDISON

Report Number: P387099

Luminaire Tested: **GWC-SA2D-750-U-T3**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P387099  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-14)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GWC-SA2D-750-U-T3  
Description: GALLEON WALL LUMINAIRE  
(2) 70 CRI, 5000K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 16196 lumens  
Efficiency: N/A  
Efficacy: 125.6 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 0.5' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B2 - U0 - G3

Input Watts (W): 129  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT

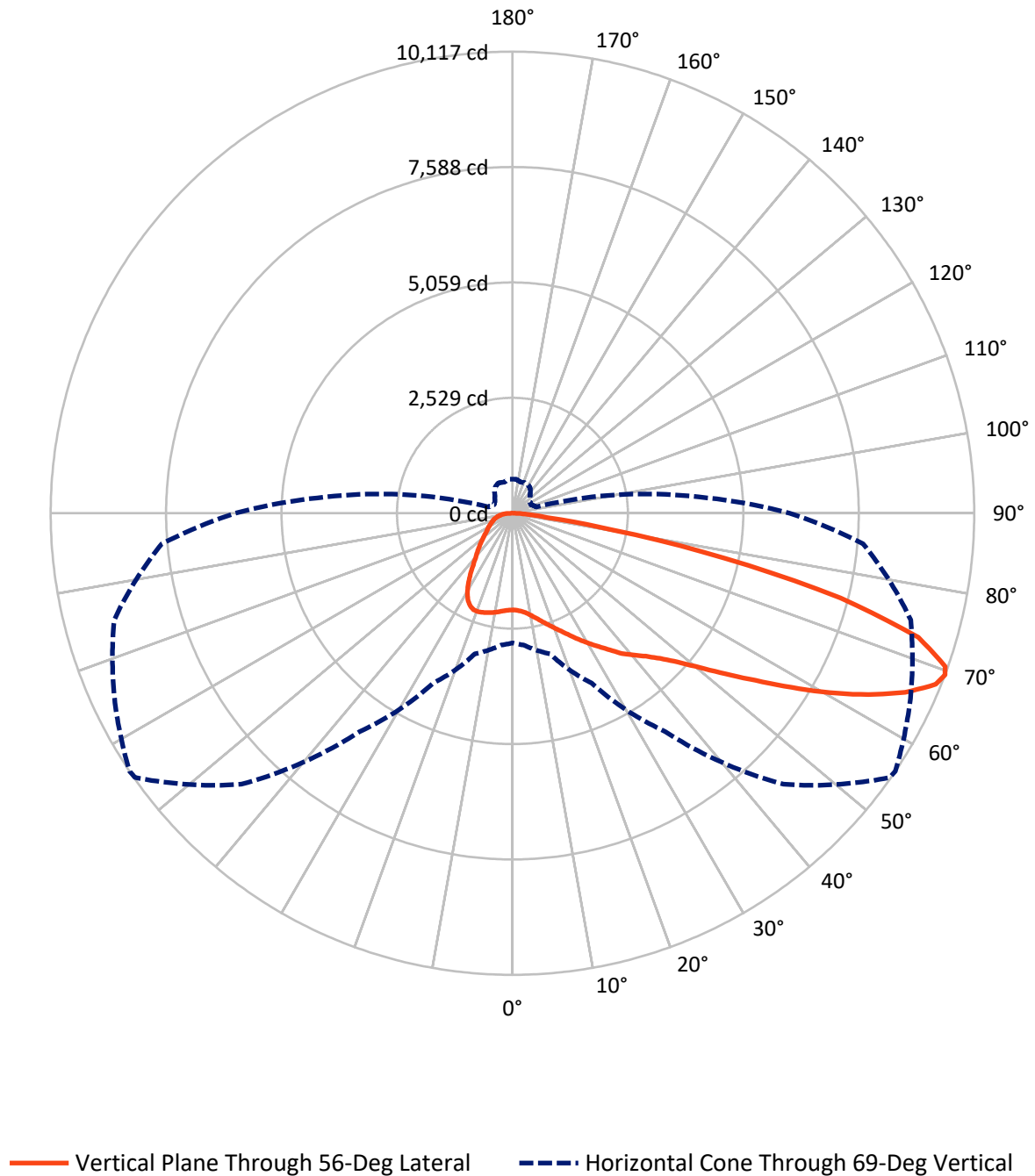




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CATALOG NUMBER: GWC-SA2D-750-U-T3

## Luminous Intensity Polar Plot



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CATALOG NUMBER: GWC-SA2D-750-U-T3

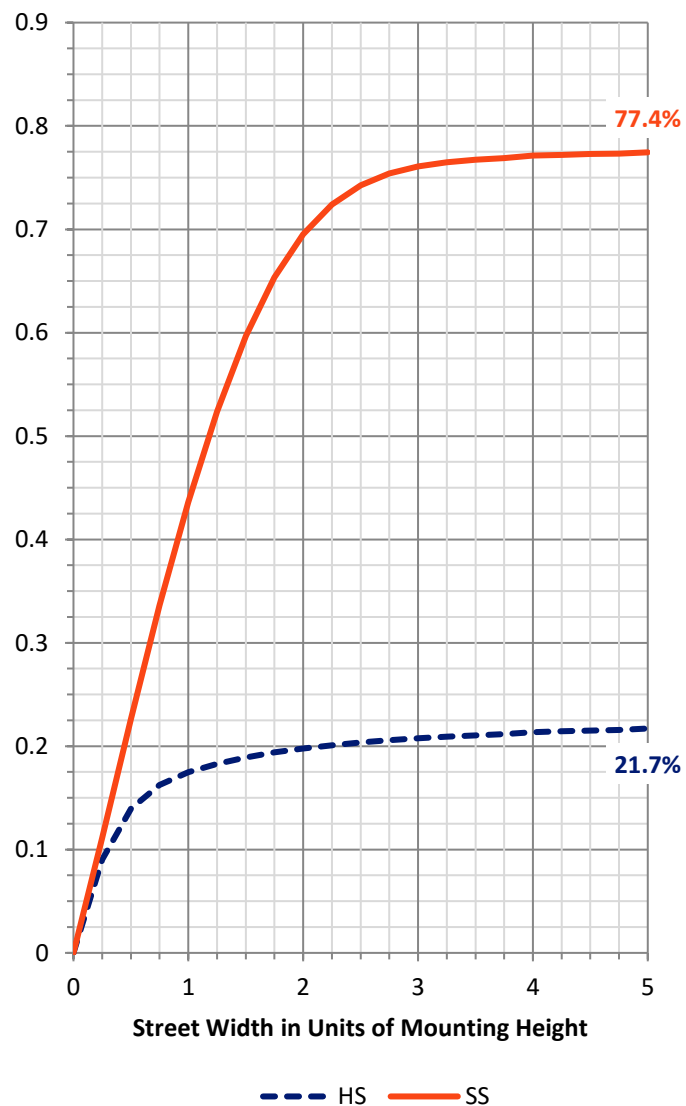
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 3606.8   | 0.0    | 3606.8  |
|                    | % Fixture | 22.3     | 0.0    | 22.3    |
| <b>Street Side</b> | Lumens    | 12589.2  | 0.0    | 12589.2 |
|                    | % Fixture | 77.7     | 0.0    | 77.7    |
| <b>Total</b>       | Lumens    | 16196.0  | 0.0    | 16196.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 208.0   | 1.3       |
| 10°-20°   | 668.7   | 4.1       |
| 20°-30°   | 1167.3  | 7.2       |
| 30°-40°   | 1676.8  | 10.4      |
| 40°-50°   | 2320.6  | 14.3      |
| 50°-60°   | 3400.0  | 21.0      |
| 60°-70°   | 4145.3  | 25.6      |
| 70°-80°   | 2291.8  | 14.2      |
| 80°-90°   | 317.4   | 2.0       |
| 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°    | 16196.0 | 100.0     |
| 0°-180°   | 16196.0 | 100.0     |

**Coefficient of Utilization**



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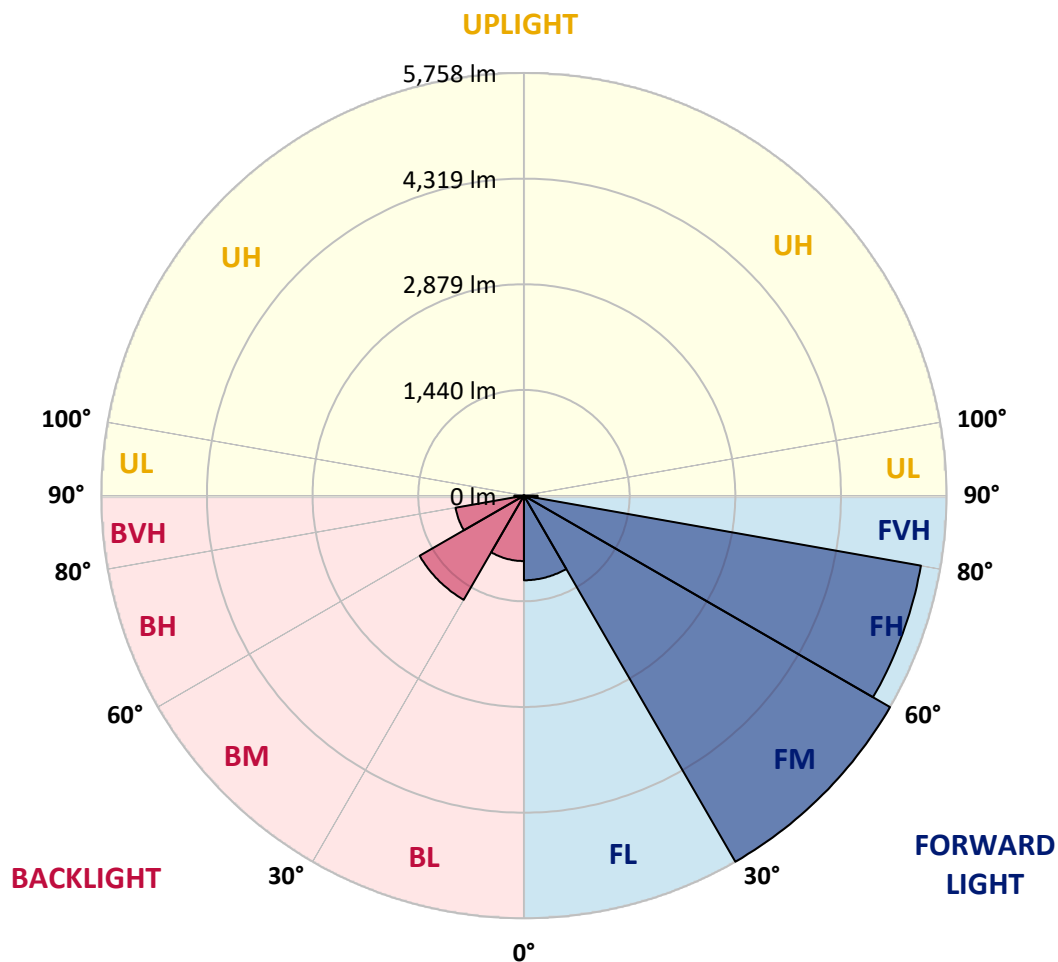
CATALOG NUMBER: GWC-SA2D-750-U-T3

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 1152.7 | 7.1       |                         |      |         |
| FM   | (30°-60°)   | 5758.3 | 35.6      |                         |      |         |
| FH   | (60°-80°)   | 5491.3 | 33.9      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 187.0  | 1.2       |                         |      | G2/225  |
| BL   | (0°-30°)    | 891.3  | 5.5       | B2/1000                 |      |         |
| BM   | (30°-60°)   | 1639.2 | 10.1      | B2/2500                 |      |         |
| BH   | (60°-80°)   | 945.8  | 5.8       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 130.4  | 0.8       |                         |      | G2/225  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B2-U0-G3**

Type III Short



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CATALOG NUMBER: GWC-SA2D-750-U-T3

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°     | 56°     | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|---------|---------|--------|--------|--------|
| 0°    | 2117.4 | 2117.4 | 2117.4 | 2117.4 | 2117.4 | 2117.4 | 2117.4  | 2117.4  | 2117.4 | 2117.4 | 2117.4 |
| 2.5°  | 2130.8 | 2133.0 | 2131.3 | 2135.8 | 2130.8 | 2134.1 | 2131.3  | 2131.3  | 2129.7 | 2124.6 | 2119.1 |
| 5°    | 2164.3 | 2168.7 | 2165.9 | 2170.4 | 2164.3 | 2165.4 | 2160.3  | 2160.3  | 2155.3 | 2144.7 | 2133.6 |
| 7.5°  | 2216.7 | 2221.7 | 2219.5 | 2223.9 | 2215.6 | 2215.6 | 2208.9  | 2208.3  | 2198.3 | 2181.0 | 2168.2 |
| 10°   | 2279.2 | 2285.9 | 2283.6 | 2290.3 | 2283.6 | 2285.9 | 2279.2  | 2279.2  | 2265.8 | 2241.2 | 2225.1 |
| 12.5° | 2370.1 | 2378.5 | 2372.4 | 2371.8 | 2369.0 | 2373.5 | 2367.9  | 2366.8  | 2354.5 | 2321.0 | 2298.7 |
| 15°   | 2491.8 | 2500.7 | 2487.9 | 2486.7 | 2471.1 | 2469.4 | 2469.4  | 2467.8  | 2460.0 | 2419.8 | 2383.0 |
| 17.5° | 2631.8 | 2634.6 | 2623.4 | 2605.6 | 2585.5 | 2572.7 | 2571.0  | 2575.5  | 2575.5 | 2528.6 | 2470.0 |
| 20°   | 2769.1 | 2774.1 | 2765.2 | 2745.1 | 2719.4 | 2700.4 | 2687.0  | 2696.0  | 2695.4 | 2639.6 | 2556.5 |
| 22.5° | 2918.6 | 2930.3 | 2916.9 | 2891.2 | 2861.1 | 2839.9 | 2816.5  | 2824.3  | 2824.9 | 2756.2 | 2641.3 |
| 25°   | 3112.2 | 3101.6 | 3093.2 | 3057.0 | 3014.0 | 2992.2 | 2970.5  | 2978.3  | 2976.1 | 2881.8 | 2728.9 |
| 27.5° | 3283.5 | 3285.7 | 3274.6 | 3236.1 | 3186.4 | 3138.4 | 3137.3  | 3142.3  | 3134.0 | 3012.3 | 2811.5 |
| 30°   | 3482.7 | 3483.8 | 3468.2 | 3433.6 | 3379.4 | 3317.5 | 3303.0  | 3311.4  | 3293.5 | 3136.2 | 2898.5 |
| 32.5° | 3680.7 | 3686.3 | 3669.0 | 3627.2 | 3583.7 | 3508.3 | 3479.3  | 3484.9  | 3440.3 | 3262.8 | 2988.3 |
| 35°   | 3854.3 | 3862.1 | 3856.5 | 3828.6 | 3781.2 | 3716.4 | 3681.8  | 3678.5  | 3623.3 | 3417.9 | 3107.2 |
| 37.5° | 4031.1 | 4038.4 | 4032.2 | 4008.8 | 3989.8 | 3921.2 | 3902.8  | 3902.8  | 3806.8 | 3576.4 | 3258.4 |
| 40°   | 4213.0 | 4224.2 | 4216.9 | 4184.6 | 4168.4 | 4137.1 | 4093.0  | 4082.4  | 3978.7 | 3766.7 | 3505.0 |
| 42.5° | 4382.1 | 4396.6 | 4425.6 | 4406.6 | 4373.7 | 4378.2 | 4289.4  | 4283.9  | 4208.0 | 4047.9 | 3814.6 |
| 45°   | 4622.0 | 4643.2 | 4692.3 | 4677.8 | 4671.1 | 4646.5 | 4541.1  | 4536.1  | 4507.0 | 4426.1 | 4199.1 |
| 47.5° | 4883.7 | 4912.7 | 5001.4 | 5004.2 | 5076.1 | 5029.8 | 4886.4  | 4869.1  | 4875.8 | 4879.2 | 4668.3 |
| 50°   | 5124.7 | 5156.5 | 5302.1 | 5370.7 | 5540.3 | 5550.4 | 5321.1  | 5305.5  | 5331.7 | 5408.7 | 5215.1 |
| 52.5° | 5317.2 | 5357.3 | 5539.2 | 5751.2 | 6041.9 | 6124.5 | 5856.1  | 5844.4  | 5864.0 | 5996.7 | 5833.3 |
| 55°   | 5458.3 | 5501.8 | 5699.9 | 6086.0 | 6550.2 | 6695.8 | 6472.1  | 6460.9  | 6473.2 | 6642.3 | 6505.6 |
| 57.5° | 5491.2 | 5501.8 | 5789.2 | 6311.4 | 6979.3 | 7329.1 | 7225.9  | 7203.6  | 7143.3 | 7290.6 | 7247.6 |
| 60°   | 5336.7 | 5379.1 | 5715.5 | 6390.6 | 7311.2 | 7953.4 | 8013.7  | 7985.8  | 7816.7 | 7937.3 | 7902.7 |
| 62.5° | 5023.1 | 5099.0 | 5440.5 | 6270.1 | 7441.2 | 8463.4 | 8786.4  | 8753.0  | 8461.7 | 8539.8 | 8373.6 |
| 65°   | 4510.9 | 4543.3 | 4902.1 | 5854.5 | 7276.1 | 8789.8 | 9475.5  | 9458.8  | 9092.2 | 8970.0 | 8460.6 |
| 67.5° | 3594.8 | 3655.6 | 3960.3 | 4985.8 | 6600.4 | 8751.3 | 10008.3 | 10006.7 | 9504.0 | 9129.6 | 8152.1 |
| 69°   | 2839.9 | 2903.0 | 3193.1 | 4107.0 | 5840.5 | 8399.2 | 10097.6 | 10117.1 | 9620.0 | 9032.5 | 7711.3 |
| 70°   | 2264.1 | 2337.2 | 2536.4 | 3459.2 | 5166.0 | 7935.0 | 10023.4 | 10058.5 | 9597.7 | 8872.4 | 7304.6 |
| 72.5° | 963.6  | 1022.7 | 1164.4 | 1783.2 | 3148.5 | 5925.3 | 9164.7  | 9297.5  | 9080.5 | 8120.3 | 6036.9 |
| 75°   | 420.7  | 439.1  | 503.3  | 727.0  | 1397.6 | 3224.9 | 7179.6  | 7425.1  | 7764.3 | 6863.8 | 4497.0 |
| 77.5° | 308.0  | 315.8  | 350.9  | 426.8  | 627.1  | 1218.0 | 4617.0  | 4759.8  | 5599.5 | 4994.7 | 2758.5 |
| 80°   | 238.2  | 243.8  | 271.2  | 313.6  | 409.5  | 492.7  | 2105.7  | 2228.4  | 3148.5 | 2565.4 | 1148.8 |
| 82.5° | 189.7  | 193.6  | 212.6  | 231.0  | 282.9  | 298.5  | 699.1   | 775.5   | 1162.2 | 708.6  | 304.1  |
| 85°   | 176.3  | 180.8  | 187.5  | 168.5  | 181.3  | 175.2  | 302.4   | 316.4   | 350.9  | 278.4  | 127.2  |
| 87.5° | 79.8   | 94.3   | 185.8  | 131.1  | 96.5   | 77.0   | 123.9   | 129.4   | 145.6  | 146.2  | 56.4   |
| 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: GWC-SA2D-750-U-T3

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2117.4 | 2117.4 | 2117.4 | 2117.4 | 2117.4 | 2117.4 | 2117.4 | 2117.4 | 2117.4 | 2117.4 | 2117.4 |
| 2.5°  | 2122.4 | 2120.7 | 2123.5 | 2116.8 | 2125.2 | 2124.6 | 2121.8 | 2123.0 | 2128.5 | 2128.0 | 2128.5 |
| 5°    | 2135.2 | 2134.1 | 2137.5 | 2132.4 | 2142.5 | 2145.8 | 2146.4 | 2151.4 | 2157.6 | 2159.2 | 2159.2 |
| 7.5°  | 2167.6 | 2167.6 | 2169.3 | 2162.6 | 2169.3 | 2168.7 | 2165.9 | 2170.9 | 2177.1 | 2177.6 | 2177.1 |
| 10°   | 2223.4 | 2223.9 | 2221.2 | 2203.9 | 2198.3 | 2183.2 | 2169.3 | 2169.8 | 2177.6 | 2183.8 | 2185.5 |
| 12.5° | 2293.7 | 2291.5 | 2279.2 | 2247.4 | 2223.9 | 2193.3 | 2178.8 | 2178.2 | 2186.0 | 2191.0 | 2192.7 |
| 15°   | 2374.0 | 2367.9 | 2336.1 | 2284.2 | 2242.9 | 2212.8 | 2189.4 | 2183.8 | 2179.3 | 2173.7 | 2174.3 |
| 17.5° | 2449.9 | 2436.0 | 2383.0 | 2311.0 | 2267.5 | 2227.3 | 2182.1 | 2145.8 | 2120.7 | 2106.2 | 2101.8 |
| 20°   | 2526.9 | 2499.6 | 2423.1 | 2336.1 | 2280.9 | 2207.8 | 2120.7 | 2047.1 | 2001.3 | 1980.1 | 1976.2 |
| 22.5° | 2597.2 | 2553.1 | 2460.5 | 2362.3 | 2270.3 | 2141.9 | 2005.2 | 1898.1 | 1834.5 | 1806.1 | 1808.3 |
| 25°   | 2665.8 | 2604.5 | 2499.6 | 2380.7 | 2216.7 | 2025.9 | 1844.6 | 1712.9 | 1639.2 | 1607.4 | 1606.3 |
| 27.5° | 2726.1 | 2656.4 | 2542.0 | 2365.7 | 2116.8 | 1860.7 | 1654.3 | 1526.0 | 1464.6 | 1437.3 | 1432.8 |
| 30°   | 2795.3 | 2721.6 | 2598.3 | 2308.2 | 1970.6 | 1669.9 | 1468.5 | 1378.1 | 1334.6 | 1307.3 | 1302.2 |
| 32.5° | 2879.5 | 2810.3 | 2644.6 | 2203.9 | 1783.7 | 1470.7 | 1323.4 | 1260.4 | 1220.8 | 1190.1 | 1184.5 |
| 35°   | 3002.3 | 2927.5 | 2656.4 | 2054.3 | 1578.4 | 1313.4 | 1216.9 | 1152.1 | 1098.6 | 1059.0 | 1055.1 |
| 37.5° | 3156.3 | 3074.3 | 2629.6 | 1860.7 | 1379.2 | 1211.3 | 1128.2 | 1048.4 | 978.6  | 922.8  | 913.9  |
| 40°   | 3378.3 | 3254.5 | 2555.4 | 1637.6 | 1232.5 | 1132.6 | 1041.7 | 950.7  | 864.2  | 799.0  | 786.1  |
| 42.5° | 3645.0 | 3465.9 | 2441.5 | 1415.5 | 1124.8 | 1052.8 | 955.8  | 843.0  | 760.5  | 714.2  | 707.5  |
| 45°   | 3984.3 | 3685.8 | 2283.6 | 1221.3 | 1018.8 | 973.0  | 863.1  | 759.4  | 708.0  | 674.0  | 668.4  |
| 47.5° | 4371.5 | 3932.4 | 2117.9 | 1063.4 | 929.0  | 898.3  | 788.9  | 722.0  | 681.2  | 654.5  | 649.4  |
| 50°   | 4847.4 | 4210.8 | 1942.2 | 934.0  | 838.6  | 808.5  | 753.8  | 701.3  | 669.0  | 648.3  | 643.3  |
| 52.5° | 5384.1 | 4524.9 | 1815.5 | 831.9  | 763.8  | 742.1  | 735.4  | 690.2  | 663.9  | 648.3  | 643.3  |
| 55°   | 5962.1 | 4844.6 | 1678.8 | 746.0  | 699.1  | 705.2  | 723.1  | 691.3  | 673.4  | 654.5  | 647.2  |
| 57.5° | 6540.7 | 5174.9 | 1526.5 | 673.4  | 647.8  | 677.9  | 714.7  | 693.5  | 678.5  | 660.0  | 653.3  |
| 60°   | 6998.2 | 5384.1 | 1290.5 | 612.6  | 607.0  | 647.8  | 694.6  | 676.8  | 657.3  | 657.8  | 656.7  |
| 62.5° | 7211.9 | 5373.0 | 1030.0 | 558.5  | 566.3  | 607.0  | 662.3  | 650.6  | 634.4  | 656.1  | 657.8  |
| 65°   | 7092.0 | 5105.2 | 801.8  | 509.4  | 522.8  | 564.6  | 628.8  | 637.7  | 643.3  | 685.2  | 690.7  |
| 67.5° | 6588.7 | 4584.0 | 621.0  | 466.4  | 483.2  | 535.6  | 632.1  | 694.6  | 701.9  | 746.0  | 745.4  |
| 69°   | 6068.2 | 4095.3 | 539.5  | 444.1  | 463.6  | 542.9  | 675.7  | 730.9  | 703.6  | 750.4  | 743.7  |
| 70°   | 5631.8 | 3708.6 | 496.0  | 429.1  | 454.7  | 555.7  | 704.7  | 730.3  | 695.2  | 735.4  | 724.2  |
| 72.5° | 4337.4 | 2668.1 | 420.7  | 401.2  | 424.6  | 531.7  | 713.0  | 714.2  | 675.7  | 683.5  | 664.5  |
| 75°   | 2974.9 | 1686.1 | 367.1  | 363.2  | 378.8  | 479.3  | 686.3  | 682.4  | 624.9  | 613.7  | 598.1  |
| 77.5° | 1640.3 | 856.4  | 311.9  | 327.0  | 337.6  | 424.6  | 623.8  | 618.2  | 570.8  | 547.3  | 541.8  |
| 80°   | 632.7  | 374.9  | 263.3  | 290.7  | 297.4  | 367.7  | 546.8  | 541.8  | 502.1  | 472.0  | 463.6  |
| 82.5° | 238.8  | 196.4  | 217.6  | 251.6  | 249.4  | 303.5  | 463.1  | 460.3  | 421.8  | 377.7  | 364.3  |
| 85°   | 110.5  | 117.7  | 172.4  | 207.6  | 191.4  | 224.8  | 370.5  | 375.5  | 328.6  | 276.2  | 276.2  |
| 87.5° | 46.9   | 65.8   | 122.2  | 156.8  | 128.9  | 151.8  | 271.7  | 259.4  | 238.2  | 165.2  | 155.1  |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



LM-79-08: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

INVUE

Report Number: SP1-2104-224-4

Luminaire Tested: CCW-SA-2A-750-U-SL4

Test Date: 05/04/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2104-224-4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 05/04/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: INVUE  
 Catalog Number: **CCW-SA-2A-750-U-SL4**  
 Description: INVUE WALL PACK ClearCurve Light Square

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 4797   | CRI (Ra): | 71.8 |      |       |
| CIE u':                   | 0.2115 | R1:       | 69.5 | R9:  | -28.1 |
| CIE v':                   | 0.4912 | R2:       | 75.8 | R10: | 43.3  |
| Duv:                      | 0.0031 | R3:       | 81.2 | R11: | 71.1  |
| CIE x:                    | 0.3518 | R4:       | 73.2 | R12: | 43.8  |
| CIE y:                    | 0.3631 | R5:       | 70.2 | R13: | 69.8  |
| CIE z:                    | 0.2851 | R6:       | 67.5 | R14: | 89.4  |
| Peak Wavelength (nm):     | 445    | R7:       | 80.3 |      |       |
| Dominant Wavelength (nm): | 572    | R8:       | 57.0 |      |       |
| Purity:                   | 14.6   |           |      |      |       |
| Rf:                       | 72.7   |           |      |      |       |
| Rg:                       | 96.4   |           |      |      |       |



### Test Conditions

Stabilization Time: 91M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.8/44%  
 Sphere Temperature (°C): 24.5

REPORT NUMBER: SP1-2104-224-4

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 1/31/2021        | 7/31/2021            |
| Power Meter                    | IN0071                | 12/1/2020        | 12/1/2021            |
| AC Power Source                | IN0063                | 12/1/2020        | 12/1/2021            |
| DC Power Source                | IN0208                | 12/1/2020        | 12/1/2021            |
| Sphere Thermometer             | IN0085                | 12/1/2020        | 12/1/2021            |
| Room Thermometer               | IN0046                | 12/1/2020        | 12/1/2021            |

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**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 5000K 7-step quadrangle

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### Photopic Flux vs. Wavelength



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| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2166             | 0.0              | 490       | 18819            | 2.7              | 620       | 63002            | 16.4             | 750       | 3328             | 0.0              | 880       | 2830             | 0.0              |
| 365       | 1672             | 0.0              | 495       | 25621            | 4.6              | 625       | 58119            | 12.8             | 755       | 3244             | 0.0              | 885       | 2751             | 0.0              |
| 370       | 1688             | 0.0              | 500       | 34501            | 7.6              | 630       | 52745            | 9.5              | 760       | 2856             | 0.0              | 890       | 2579             | 0.0              |
| 375       | 2041             | 0.0              | 505       | 44365            | 12.4             | 635       | 47707            | 7.2              | 765       | 2696             | 0.0              | 895       | 2461             | 0.0              |
| 380       | 1996             | 0.0              | 510       | 53923            | 18.5             | 640       | 42815            | 5.1              | 770       | 2495             | 0.0              | 900       | 2372             | 0.0              |
| 385       | 1720             | 0.0              | 515       | 62101            | 25.7             | 645       | 38643            | 3.7              | 775       | 2247             | 0.0              | 905       | 2190             | 0.0              |
| 390       | 1706             | 0.0              | 520       | 68661            | 33.3             | 650       | 34557            | 2.5              | 780       | 2133             | 0.0              | 910       | 3204             | 0.0              |
| 395       | 1550             | 0.0              | 525       | 73606            | 39.5             | 655       | 30447            | 1.7              | 785       | 2276             | 0.0              | 915       | 2069             | 0.0              |
| 400       | 1444             | 0.0              | 530       | 77628            | 45.7             | 660       | 27287            | 1.1              | 790       | 2093             | 0.0              | 920       | 2977             | 0.0              |
| 405       | 1761             | 0.0              | 535       | 79955            | 49.6             | 665       | 24046            | 0.8              | 795       | 1681             | 0.0              | 925       | 2332             | 0.0              |
| 410       | 2694             | 0.0              | 540       | 81715            | 53.2             | 670       | 20995            | 0.5              | 800       | 2044             | 0.0              | 930       | 2929             | 0.0              |
| 415       | 5767             | 0.0              | 545       | 83067            | 55.3             | 675       | 18242            | 0.3              | 805       | 1519             | 0.0              | 935       | 3495             | 0.0              |
| 420       | 12476            | 0.0              | 550       | 84799            | 57.6             | 680       | 15871            | 0.2              | 810       | 1549             | 0.0              | 940       | 2810             | 0.0              |
| 425       | 26189            | 0.1              | 555       | 86279            | 58.9             | 685       | 13910            | 0.1              | 815       | 2097             | 0.0              | 945       | 2657             | 0.0              |
| 430       | 49608            | 0.4              | 560       | 87792            | 59.7             | 690       | 12111            | 0.1              | 820       | 2098             | 0.0              | 950       | 1935             | 0.0              |
| 435       | 79442            | 0.9              | 565       | 88893            | 59.1             | 695       | 10644            | 0.0              | 825       | 2049             | 0.0              | 955       | 2408             | 0.0              |
| 440       | 114477           | 1.8              | 570       | 89760            | 58.4             | 700       | 9267             | 0.0              | 830       | 2352             | 0.0              | 960       | 2331             | 0.0              |
| 445       | 134358           | 2.8              | 575       | 90097            | 56.1             | 705       | 8161             | 0.0              | 835       | 2358             | 0.0              | 965       | 2231             | 0.0              |
| 450       | 112862           | 2.9              | 580       | 90008            | 53.5             | 710       | 7567             | 0.0              | 840       | 1853             | 0.0              | 970       | 688              | 0.0              |
| 455       | 68630            | 2.3              | 585       | 88925            | 49.4             | 715       | 6794             | 0.0              | 845       | 2553             | 0.0              | 975       | 2537             | 0.0              |
| 460       | 41987            | 1.7              | 590       | 87580            | 45.3             | 720       | 6069             | 0.0              | 850       | 2413             | 0.0              | 980       | 2826             | 0.0              |
| 465       | 28353            | 1.5              | 595       | 84246            | 39.9             | 725       | 5588             | 0.0              | 855       | 2597             | 0.0              | 985       | 3000             | 0.0              |
| 470       | 19290            | 1.2              | 600       | 81176            | 35.0             | 730       | 4999             | 0.0              | 860       | 2269             | 0.0              | 990       | 2880             | 0.0              |
| 475       | 14790            | 1.2              | 605       | 77529            | 30.0             | 735       | 4495             | 0.0              | 865       | 2210             | 0.0              | 995       | 3332             | 0.0              |
| 480       | 13767            | 1.3              | 610       | 72750            | 25.0             | 740       | 4033             | 0.0              | 870       | 2564             | 0.0              | 1000      | 4187             | 0.0              |
| 485       | 14964            | 1.8              | 615       | 68174            | 20.6             | 745       | 3625             | 0.0              | 875       | 2169             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2104-224-4

### Scotopic Flux vs. Wavelength



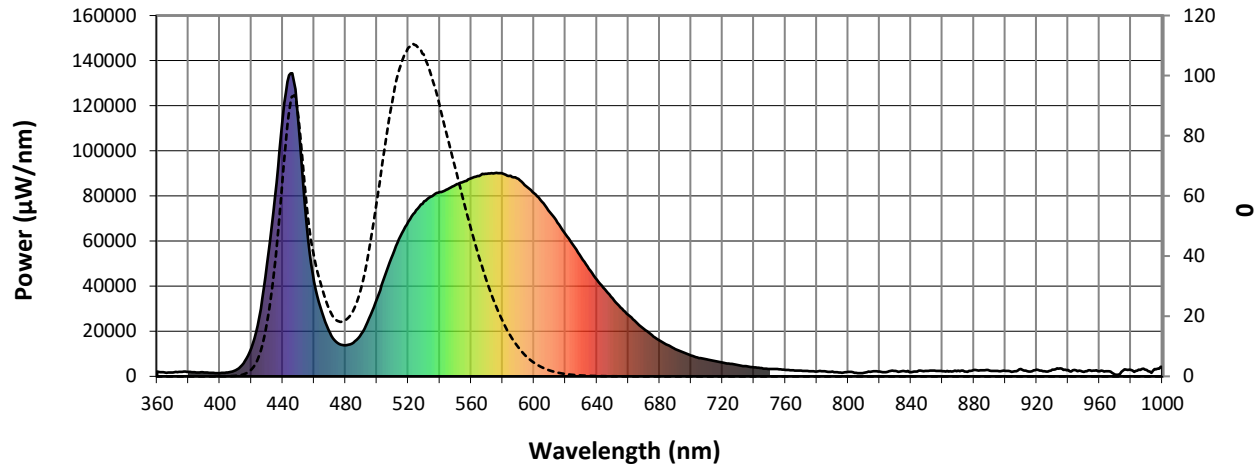
Scotopic Lumens: 9214.6

S/P: 1.71

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2166             | 0.0              | 490       | 18819            | 29.0             | 620       | 63002            | 0.8              | 750       | 3328             | 0.0              | 880       | 2830             | 0.0              |
| 365       | 1672             | 0.0              | 495       | 25621            | 41.4             | 625       | 58119            | 0.5              | 755       | 3244             | 0.0              | 885       | 2751             | 0.0              |
| 370       | 1688             | 0.0              | 500       | 34501            | 57.7             | 630       | 52745            | 0.3              | 760       | 2856             | 0.0              | 890       | 2579             | 0.0              |
| 375       | 2041             | 0.0              | 505       | 44365            | 75.4             | 635       | 47707            | 0.2              | 765       | 2696             | 0.0              | 895       | 2461             | 0.0              |
| 380       | 1996             | 0.0              | 510       | 53923            | 91.4             | 640       | 42815            | 0.1              | 770       | 2495             | 0.0              | 900       | 2372             | 0.0              |
| 385       | 1720             | 0.0              | 515       | 62101            | 102.9            | 645       | 38643            | 0.1              | 775       | 2247             | 0.0              | 905       | 2190             | 0.0              |
| 390       | 1706             | 0.0              | 520       | 68661            | 109.1            | 650       | 34557            | 0.0              | 780       | 2133             | 0.0              | 910       | 3204             | 0.0              |
| 395       | 1550             | 0.0              | 525       | 73606            | 110.1            | 655       | 30447            | 0.0              | 785       | 2276             | 0.0              | 915       | 2069             | 0.0              |
| 400       | 1444             | 0.0              | 530       | 77628            | 107.0            | 660       | 27287            | 0.0              | 790       | 2093             | 0.0              | 920       | 2977             | 0.0              |
| 405       | 1761             | 0.1              | 535       | 79955            | 99.6             | 665       | 24046            | 0.0              | 795       | 1681             | 0.0              | 925       | 2332             | 0.0              |
| 410       | 2694             | 0.2              | 540       | 81715            | 90.3             | 670       | 20995            | 0.0              | 800       | 2044             | 0.0              | 930       | 2929             | 0.0              |
| 415       | 5767             | 0.6              | 545       | 83067            | 79.6             | 675       | 18242            | 0.0              | 805       | 1519             | 0.0              | 935       | 3495             | 0.0              |
| 420       | 12476            | 2.1              | 550       | 84799            | 69.3             | 680       | 15871            | 0.0              | 810       | 1549             | 0.0              | 940       | 2810             | 0.0              |
| 425       | 26189            | 6.4              | 555       | 86279            | 59.0             | 685       | 13910            | 0.0              | 815       | 2097             | 0.0              | 945       | 2657             | 0.0              |
| 430       | 49608            | 16.9             | 560       | 87792            | 49.1             | 690       | 12111            | 0.0              | 820       | 2098             | 0.0              | 950       | 1935             | 0.0              |
| 435       | 79442            | 35.5             | 565       | 88893            | 39.9             | 695       | 10644            | 0.0              | 825       | 2049             | 0.0              | 955       | 2408             | 0.0              |
| 440       | 114477           | 64.0             | 570       | 89760            | 31.7             | 700       | 9267             | 0.0              | 830       | 2352             | 0.0              | 960       | 2331             | 0.0              |
| 445       | 134358           | 90.0             | 575       | 90097            | 24.5             | 705       | 8161             | 0.0              | 835       | 2358             | 0.0              | 965       | 2231             | 0.0              |
| 450       | 112862           | 87.5             | 580       | 90008            | 18.5             | 710       | 7567             | 0.0              | 840       | 1853             | 0.0              | 970       | 688              | 0.0              |
| 455       | 68630            | 60.0             | 585       | 88925            | 13.6             | 715       | 6794             | 0.0              | 845       | 2553             | 0.0              | 975       | 2537             | 0.0              |
| 460       | 41987            | 40.6             | 590       | 87580            | 9.8              | 720       | 6069             | 0.0              | 850       | 2413             | 0.0              | 980       | 2826             | 0.0              |
| 465       | 28353            | 29.9             | 595       | 84246            | 6.7              | 725       | 5588             | 0.0              | 855       | 2597             | 0.0              | 985       | 3000             | 0.0              |
| 470       | 19290            | 22.2             | 600       | 81176            | 4.6              | 730       | 4999             | 0.0              | 860       | 2269             | 0.0              | 990       | 2880             | 0.0              |
| 475       | 14790            | 18.5             | 605       | 77529            | 3.0              | 735       | 4495             | 0.0              | 865       | 2210             | 0.0              | 995       | 3332             | 0.0              |
| 480       | 13767            | 18.6             | 610       | 72750            | 2.0              | 740       | 4033             | 0.0              | 870       | 2564             | 0.0              | 1000      | 4187             | 0.0              |
| 485       | 14964            | 21.7             | 615       | 68174            | 1.3              | 745       | 3625             | 0.0              | 875       | 2169             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2104-224-4

### Melanopic Flux vs. Wavelength


**Melanopic Lumens: 3619.9**
**M/P: 0.67**

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2166             | 0.0              | 490       | 18819            | 15.7             | 620       | 63002            | 0.0              | 750       | 3328             | 0.0              | 880       | 2830             | 0.0              |
| 365       | 1672             | 0.0              | 495       | 25621            | 21.2             | 625       | 58119            | 0.0              | 755       | 3244             | 0.0              | 885       | 2751             | 0.0              |
| 370       | 1688             | 0.0              | 500       | 34501            | 27.7             | 630       | 52745            | 0.0              | 760       | 2856             | 0.0              | 890       | 2579             | 0.0              |
| 375       | 2041             | 0.0              | 505       | 44365            | 34.0             | 635       | 47707            | 0.0              | 765       | 2696             | 0.0              | 895       | 2461             | 0.0              |
| 380       | 1996             | 0.0              | 510       | 53923            | 38.7             | 640       | 42815            | 0.0              | 770       | 2495             | 0.0              | 900       | 2372             | 0.0              |
| 385       | 1720             | 0.0              | 515       | 62101            | 40.6             | 645       | 38643            | 0.0              | 775       | 2247             | 0.0              | 905       | 2190             | 0.0              |
| 390       | 1706             | 0.0              | 520       | 68661            | 40.0             | 650       | 34557            | 0.0              | 780       | 2133             | 0.0              | 910       | 3204             | 0.0              |
| 395       | 1550             | 0.0              | 525       | 73606            | 37.3             | 655       | 30447            | 0.0              | 785       | 2276             | 0.0              | 915       | 2069             | 0.0              |
| 400       | 1444             | 0.0              | 530       | 77628            | 33.5             | 660       | 27287            | 0.0              | 790       | 2093             | 0.0              | 920       | 2977             | 0.0              |
| 405       | 1761             | 0.0              | 535       | 79955            | 28.8             | 665       | 24046            | 0.0              | 795       | 1681             | 0.0              | 925       | 2332             | 0.0              |
| 410       | 2694             | 0.1              | 540       | 81715            | 23.9             | 670       | 20995            | 0.0              | 800       | 2044             | 0.0              | 930       | 2929             | 0.0              |
| 415       | 5767             | 0.4              | 545       | 83067            | 19.3             | 675       | 18242            | 0.0              | 805       | 1519             | 0.0              | 935       | 3495             | 0.0              |
| 420       | 12476            | 1.4              | 550       | 84799            | 15.2             | 680       | 15871            | 0.0              | 810       | 1549             | 0.0              | 940       | 2810             | 0.0              |
| 425       | 26189            | 4.1              | 555       | 86279            | 11.6             | 685       | 13910            | 0.0              | 815       | 2097             | 0.0              | 945       | 2657             | 0.0              |
| 430       | 49608            | 10.5             | 560       | 87792            | 8.7              | 690       | 12111            | 0.0              | 820       | 2098             | 0.0              | 950       | 1935             | 0.0              |
| 435       | 79442            | 21.2             | 565       | 88893            | 6.2              | 695       | 10644            | 0.0              | 825       | 2049             | 0.0              | 955       | 2408             | 0.0              |
| 440       | 114477           | 38.3             | 570       | 89760            | 4.4              | 700       | 9267             | 0.0              | 830       | 2352             | 0.0              | 960       | 2331             | 0.0              |
| 445       | 134358           | 53.0             | 575       | 90097            | 3.0              | 705       | 8161             | 0.0              | 835       | 2358             | 0.0              | 965       | 2231             | 0.0              |
| 450       | 112862           | 52.0             | 580       | 90008            | 2.0              | 710       | 7567             | 0.0              | 840       | 1853             | 0.0              | 970       | 688              | 0.0              |
| 455       | 68630            | 36.0             | 585       | 88925            | 1.3              | 715       | 6794             | 0.0              | 845       | 2553             | 0.0              | 975       | 2537             | 0.0              |
| 460       | 41987            | 24.7             | 590       | 87580            | 0.9              | 720       | 6069             | 0.0              | 850       | 2413             | 0.0              | 980       | 2826             | 0.0              |
| 465       | 28353            | 18.5             | 595       | 84246            | 0.5              | 725       | 5588             | 0.0              | 855       | 2597             | 0.0              | 985       | 3000             | 0.0              |
| 470       | 19290            | 13.8             | 600       | 81176            | 0.3              | 730       | 4999             | 0.0              | 860       | 2269             | 0.0              | 990       | 2880             | 0.0              |
| 475       | 14790            | 11.3             | 605       | 77529            | 0.2              | 735       | 4495             | 0.0              | 865       | 2210             | 0.0              | 995       | 3332             | 0.0              |
| 480       | 13767            | 11.1             | 610       | 72750            | 0.1              | 740       | 4033             | 0.0              | 870       | 2564             | 0.0              | 1000      | 4187             | 0.0              |
| 485       | 14964            | 12.3             | 615       | 68174            | 0.1              | 745       | 3625             | 0.0              | 875       | 2169             | 0.0              |           |                  |                  |

### Summary

$R_f = 72.7$   
 $R_g = 96.4$   
 $CIE R_a = 71.8$   
 $R_g = -28.1$



### Color Vector Graphics





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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 57 | CES51 = 89 | CES76 = 45 |
| CES02 = 60 | CES27 = 82 | CES52 = 89 | CES77 = 66 |
| CES03 = 30 | CES28 = 78 | CES53 = 76 | CES78 = 48 |
| CES04 = 69 | CES29 = 55 | CES54 = 82 | CES79 = 76 |
| CES05 = 46 | CES30 = 66 | CES55 = 82 | CES80 = 73 |
| CES06 = 50 | CES31 = 60 | CES56 = 71 | CES81 = 75 |
| CES07 = 39 | CES32 = 54 | CES57 = 69 | CES82 = 89 |
| CES08 = 38 | CES33 = 67 | CES58 = 71 | CES83 = 85 |
| CES09 = 29 | CES34 = 65 | CES59 = 87 | CES84 = 87 |
| CES10 = 73 | CES35 = 80 | CES60 = 92 | CES85 = 82 |
| CES11 = 56 | CES36 = 97 | CES61 = 86 | CES86 = 75 |
| CES12 = 62 | CES37 = 74 | CES62 = 84 | CES87 = 76 |
| CES13 = 42 | CES38 = 76 | CES63 = 73 | CES88 = 78 |
| CES14 = 74 | CES39 = 93 | CES64 = 70 | CES89 = 74 |
| CES15 = 70 | CES40 = 86 | CES65 = 64 | CES90 = 76 |
| CES16 = 46 | CES41 = 87 | CES66 = 64 | CES91 = 86 |
| CES17 = 49 | CES42 = 73 | CES67 = 61 | CES92 = 66 |
| CES18 = 55 | CES43 = 71 | CES68 = 68 | CES93 = 80 |
| CES19 = 71 | CES44 = 98 | CES69 = 78 | CES94 = 57 |
| CES20 = 64 | CES45 = 81 | CES70 = 57 | CES95 = 70 |
| CES21 = 85 | CES46 = 80 | CES71 = 53 | CES96 = 78 |
| CES22 = 77 | CES47 = 78 | CES72 = 84 | CES97 = 84 |
| CES23 = 91 | CES48 = 71 | CES73 = 47 | CES98 = 73 |
| CES24 = 90 | CES49 = 79 | CES74 = 95 | CES99 = 62 |
| CES25 = 71 | CES50 = 87 | CES75 = 51 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)