

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: STREETWORKS

Report Number: P1387964

Luminaire Tested: **VAL-T-SB4B-722-U-T4W**

Issue Date: 02/18/2026

This test was performed under the Supervised Manufacturer's Testing Program. The results of this test have not been  
influenced by sources from within Cooper Lighting Solutions or from external interests.

**Test Information**

Test Method: LM-79-08  
 Report Number: P1387964  
 Test Lab: INNOVATION CENTER(G1)  
 Issue Date: 02/18/2026  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: VAL-T-SB4B-722-U-T4W  
 Description: GALLEON II WALL SLIM HIGH DENSITY LED ARRAYS 45SQUARE 148W 70CRI  
 2200K FIXTURE w/ TYPE IV WIDE DISTRIBUTION OPTIC  
 Light Source: (104) 2200K CCT, 70 CRI LEDS  
 Ballast/Driver: ELECTRONIC DRIVER  
 Luminaire Equipment:

| <u>Sample No.</u> | <u>Condition</u> | <u>Description</u> |
|-------------------|------------------|--------------------|
| a                 | good             | reflector          |
| b                 | good             | lens               |
| c                 | good             | housing            |
| d                 | good             | cord               |

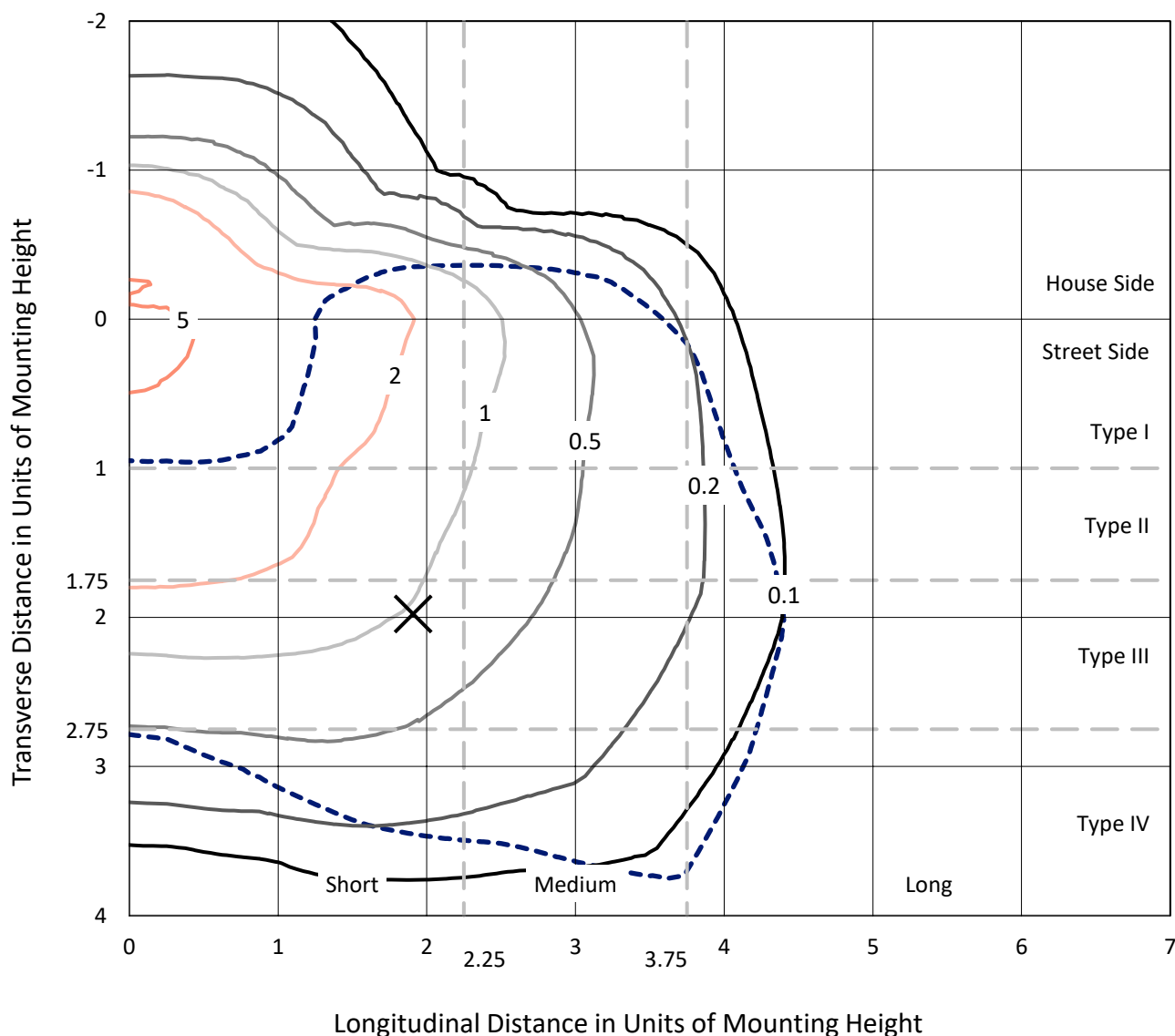
**Summary**

Lumens per Lamp: N/A  
 Luminaire Lumens: 17339.9 lumens  
 Efficiency: N/A  
 Efficacy: 117.2 lumens/watt  
 Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
 IES Classification: Type IV - Short  
 BUG Rating: B3 - U0 - G3  
  
 Input Watts (W): 148  
 Input Voltage (V): 120  
 Input Current (Ain): NR  
 Voltage Rise (V): NR  
 Power Factor: 0.98  
 Total Harmonic Distortion (THDi): 13.6%  
 Frequency (hertz): 60  
 Stabilization Time: NR  
 Operation Time: NR  
 Ambient Temperature (°C): NR  
 Test Distance: 28.75 FT

REPORT NUMBER: P1387964  
 CATALOG NUMBER: VAL-T-SB4B-722-U-T4W

## Iso-Footcandle Lines of Horizontal Illumination

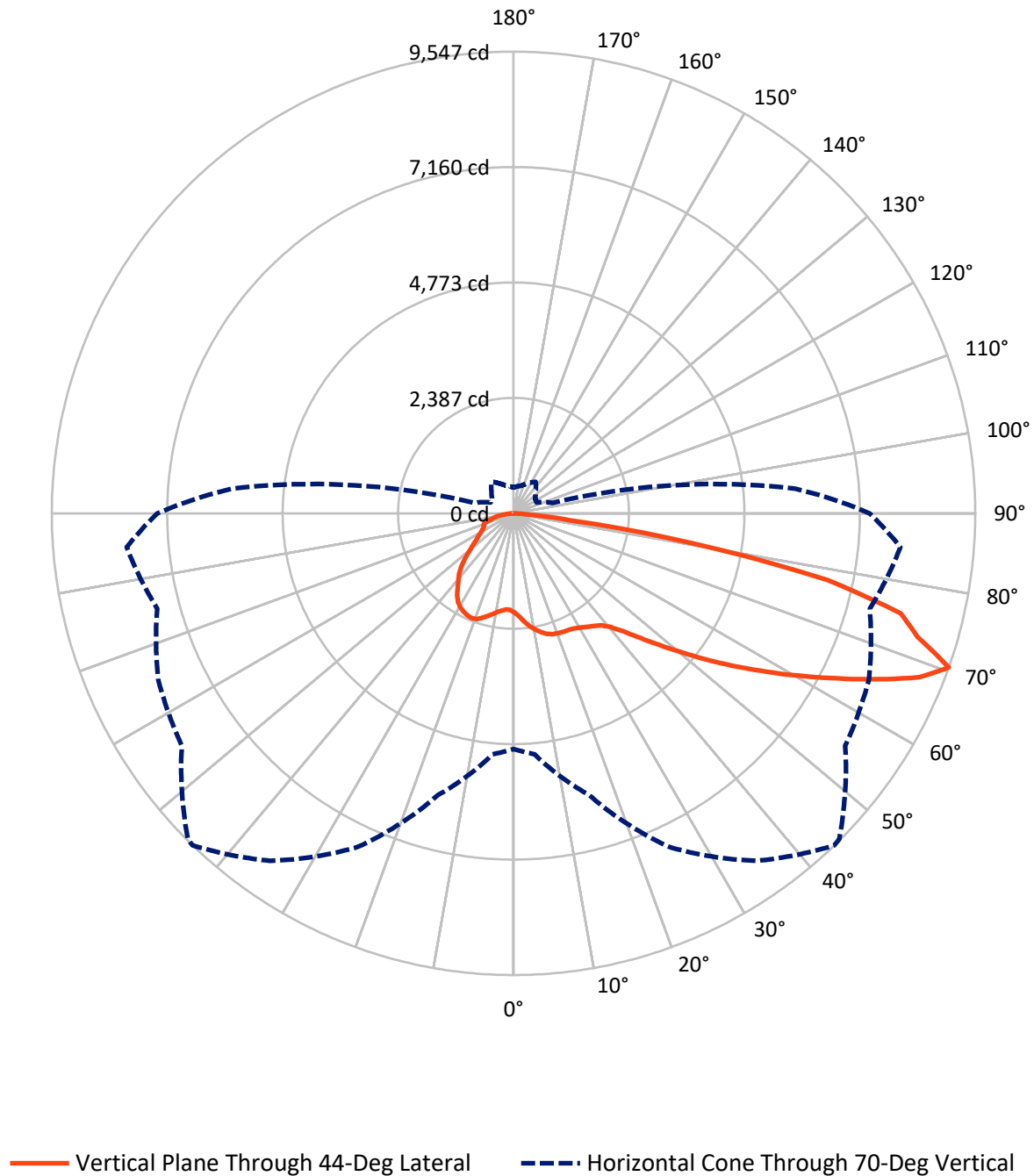
✕ Max cd  
 - - - 1/2 Max cd



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

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## Luminous Intensity Polar Plot



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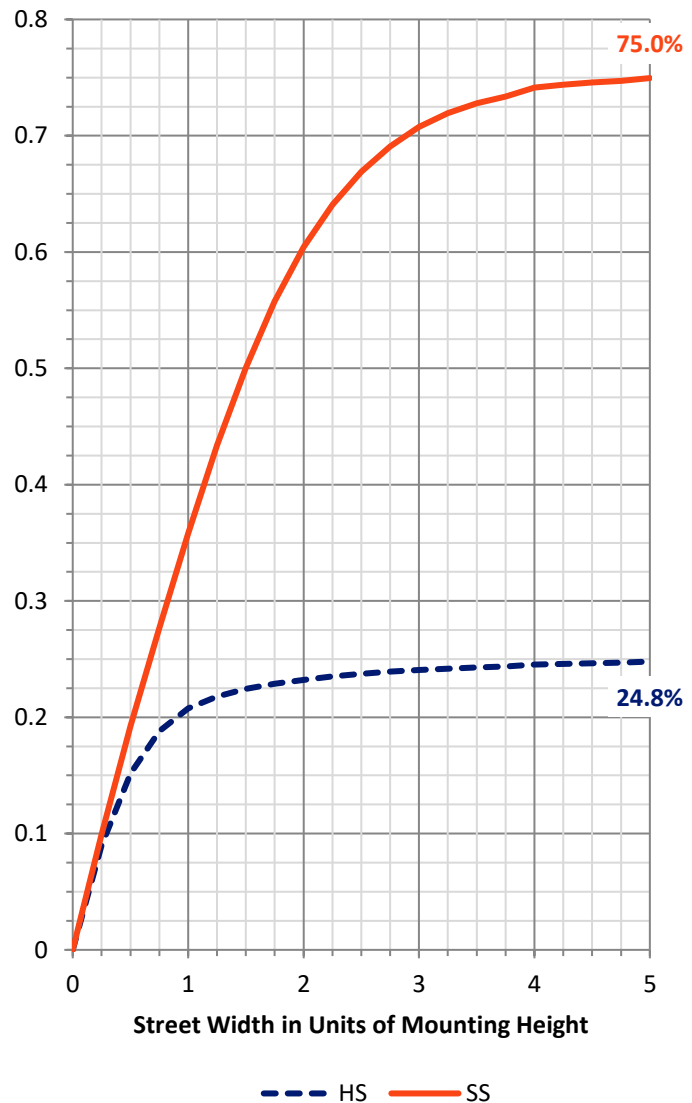
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 4344.8   | 0.0    | 4344.8  |
|                    | % Fixture | 25.1     | 0.0    | 25.1    |
| <b>Street Side</b> | Lumens    | 12995.1  | 0.0    | 12995.1 |
|                    | % Fixture | 74.9     | 0.0    | 74.9    |
| <b>Total</b>       | Lumens    | 17339.9  | 0.0    | 17339.9 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 206.8   | 1.2       |
| 10°-20°   | 678.8   | 3.9       |
| 20°-30°   | 1168.1  | 6.7       |
| 30°-40°   | 1646.7  | 9.5       |
| 40°-50°   | 2278.6  | 13.1      |
| 50°-60°   | 3383.9  | 19.5      |
| 60°-70°   | 4522.5  | 26.1      |
| 70°-80°   | 3190.3  | 18.4      |
| 80°-90°   | 264.2   | 1.5       |
| 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°    | 17339.9 | 100.0     |
| 0°-180°   | 17339.9 | 100.0     |



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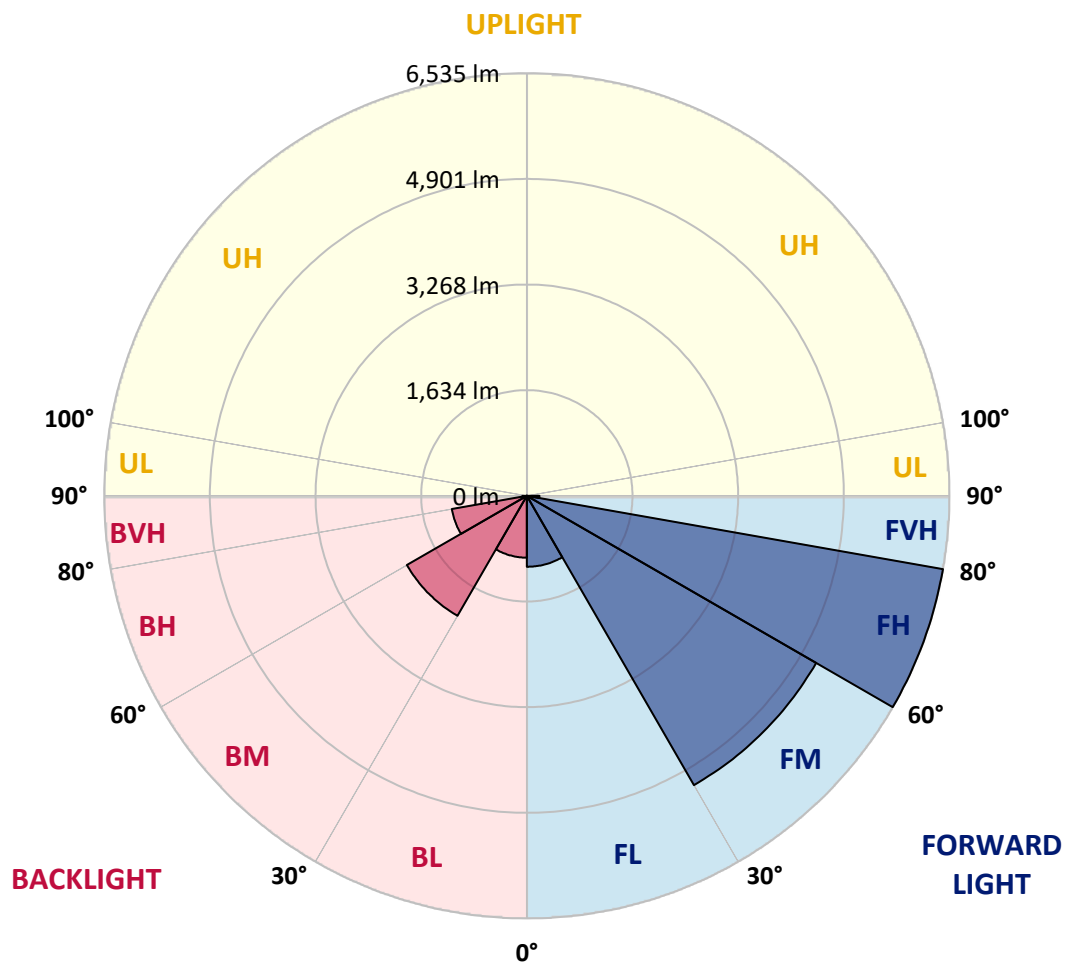
CATALOG NUMBER: VAL-T-SB4B-722-U-T4W

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 1097.4 | 6.3       |                         |      |         |
| FM   | (30°-60°)   | 5166.9 | 29.8      |                         |      |         |
| FH   | (60°-80°)   | 6535.3 | 37.7      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 195.5  | 1.1       |                         |      | G2/225  |
| BL   | (0°-30°)    | 956.3  | 5.5       | B2/1000                 |      |         |
| BM   | (30°-60°)   | 2142.3 | 12.4      | B2/2500                 |      |         |
| BH   | (60°-80°)   | 1177.5 | 6.8       | B3/2500                 |      | G3/2500 |
| BVH  | (80°-90°)   | 68.7   | 0.4       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G3**

Type IV Short



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CATALOG NUMBER: VAL-T-SB4B-722-U-T4W

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 44°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2049.0 | 2049.0 | 2049.0 | 2049.0 | 2049.0 | 2049.0 | 2049.0 | 2049.0 | 2049.0 | 2049.0 | 2049.0 |
| 2.5°  | 2200.5 | 2187.9 | 2175.2 | 2171.0 | 2154.2 | 2129.0 | 2129.0 | 2120.6 | 2099.5 | 2082.7 | 2070.1 |
| 5°    | 2343.5 | 2347.8 | 2326.7 | 2309.9 | 2284.6 | 2242.6 | 2246.8 | 2208.9 | 2166.8 | 2120.6 | 2086.9 |
| 7.5°  | 2482.4 | 2482.4 | 2457.1 | 2436.1 | 2402.4 | 2352.0 | 2352.0 | 2293.1 | 2242.6 | 2179.5 | 2133.2 |
| 10°   | 2608.6 | 2600.2 | 2566.5 | 2541.3 | 2495.0 | 2440.3 | 2436.1 | 2377.2 | 2314.1 | 2242.6 | 2179.5 |
| 12.5° | 2705.4 | 2705.4 | 2671.7 | 2629.7 | 2579.2 | 2520.3 | 2516.1 | 2452.9 | 2389.8 | 2314.1 | 2238.4 |
| 15°   | 2797.9 | 2776.9 | 2747.5 | 2692.8 | 2633.9 | 2587.6 | 2579.2 | 2524.5 | 2461.4 | 2394.0 | 2309.9 |
| 17.5° | 2831.6 | 2823.2 | 2785.3 | 2730.6 | 2675.9 | 2625.4 | 2625.4 | 2575.0 | 2528.7 | 2461.4 | 2377.2 |
| 20°   | 2823.2 | 2810.6 | 2776.9 | 2730.6 | 2688.6 | 2646.5 | 2646.5 | 2608.6 | 2583.4 | 2520.3 | 2444.5 |
| 22.5° | 2781.1 | 2768.5 | 2747.5 | 2705.4 | 2684.3 | 2659.1 | 2659.1 | 2638.1 | 2629.7 | 2591.8 | 2520.3 |
| 25°   | 2768.5 | 2760.1 | 2730.6 | 2692.8 | 2671.7 | 2667.5 | 2671.7 | 2675.9 | 2684.3 | 2654.9 | 2596.0 |
| 27.5° | 2776.9 | 2776.9 | 2751.7 | 2713.8 | 2688.6 | 2692.8 | 2697.0 | 2722.2 | 2747.5 | 2730.6 | 2680.1 |
| 30°   | 2831.6 | 2819.0 | 2802.2 | 2764.3 | 2734.8 | 2739.0 | 2739.0 | 2789.5 | 2814.8 | 2793.7 | 2755.9 |
| 32.5° | 2924.2 | 2911.6 | 2886.3 | 2806.4 | 2776.9 | 2797.9 | 2806.4 | 2848.4 | 2865.3 | 2844.2 | 2827.4 |
| 35°   | 3138.8 | 3151.4 | 3067.2 | 2924.2 | 2844.2 | 2861.1 | 2869.5 | 2898.9 | 2920.0 | 2911.6 | 2894.7 |
| 37.5° | 3530.0 | 3534.3 | 3429.1 | 3172.4 | 2987.3 | 2936.8 | 2941.0 | 2983.1 | 3008.3 | 2978.9 | 2966.2 |
| 40°   | 4018.1 | 4022.3 | 3875.1 | 3525.8 | 3214.5 | 3088.3 | 3084.1 | 3092.5 | 3130.3 | 3079.8 | 3071.4 |
| 42.5° | 4548.2 | 4489.3 | 4363.1 | 3963.4 | 3551.1 | 3340.7 | 3302.8 | 3277.6 | 3323.9 | 3260.8 | 3218.7 |
| 45°   | 5053.1 | 5011.1 | 4838.6 | 4426.2 | 3955.0 | 3673.1 | 3635.2 | 3509.0 | 3584.7 | 3534.3 | 3458.5 |
| 47.5° | 5473.9 | 5440.2 | 5309.8 | 4926.9 | 4413.6 | 4072.8 | 4013.9 | 3816.2 | 3950.8 | 3925.5 | 3833.0 |
| 50°   | 5785.2 | 5751.6 | 5663.2 | 5427.6 | 4994.2 | 4518.8 | 4464.1 | 4224.3 | 4363.1 | 4409.4 | 4337.9 |
| 52.5° | 6012.4 | 6004.0 | 5970.4 | 5932.5 | 5583.3 | 5036.3 | 4973.2 | 4674.5 | 4901.7 | 4990.0 | 4969.0 |
| 55°   | 6357.4 | 6340.6 | 6353.2 | 6416.4 | 6214.4 | 5587.5 | 5494.9 | 5145.7 | 5457.1 | 5621.1 | 5654.8 |
| 57.5° | 6685.6 | 6685.6 | 6795.0 | 6959.1 | 6933.9 | 6180.7 | 6071.3 | 5696.9 | 6130.2 | 6210.2 | 6370.1 |
| 60°   | 6992.8 | 7022.2 | 7173.7 | 7535.5 | 7607.1 | 6824.5 | 6694.0 | 6332.2 | 6769.8 | 6858.1 | 7148.4 |
| 62.5° | 6862.3 | 6933.9 | 7417.7 | 8002.6 | 8238.2 | 7514.5 | 7384.1 | 7030.6 | 7489.2 | 7384.1 | 7644.9 |
| 65°   | 6197.6 | 6307.0 | 7055.9 | 8032.0 | 8852.5 | 8271.8 | 8162.4 | 7817.4 | 7884.7 | 7464.0 | 7922.6 |
| 67.5° | 5499.1 | 5659.0 | 6530.0 | 7674.4 | 9012.3 | 9046.0 | 8949.2 | 8301.3 | 7880.5 | 7548.2 | 8204.5 |
| 70°   | 4872.2 | 5002.6 | 6029.3 | 7611.3 | 8772.5 | 9546.7 | 9525.7 | 8372.8 | 8107.7 | 7623.9 | 8027.8 |
| 72.5° | 3416.4 | 3597.4 | 4649.2 | 7026.4 | 8844.0 | 8730.4 | 8684.2 | 8873.5 | 8276.0 | 7346.2 | 7114.8 |
| 75°   | 1228.6 | 1300.1 | 2410.9 | 4754.4 | 7030.6 | 8267.6 | 8305.5 | 8221.3 | 8112.0 | 6580.4 | 5347.7 |
| 77.5° | 366.0  | 391.3  | 685.8  | 1884.9 | 3942.4 | 6635.1 | 6698.2 | 6475.3 | 6096.6 | 3967.6 | 2023.8 |
| 80°   | 197.7  | 214.6  | 324.0  | 551.2  | 1476.8 | 3744.6 | 3917.1 | 3315.5 | 2196.3 | 1047.7 | 454.4  |
| 82.5° | 96.8   | 105.2  | 168.3  | 269.3  | 635.3  | 1190.7 | 1194.9 | 1060.3 | 715.3  | 315.6  | 168.3  |
| 85°   | 33.7   | 37.9   | 54.7   | 101.0  | 218.8  | 244.0  | 244.0  | 227.2  | 210.4  | 155.7  | 75.7   |
| 87.5° | 8.4    | 8.4    | 12.6   | 16.8   | 21.0   | 25.2   | 25.2   | 29.5   | 33.7   | 37.9   | 37.9   |
| 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: P1387964

CATALOG NUMBER: VAL-T-SB4B-722-U-T4W

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2049.0 | 2049.0 | 2049.0 | 2049.0 | 2049.0 | 2049.0 | 2049.0 | 2049.0 | 2049.0 | 2049.0 | 2049.0 |
| 2.5°  | 2061.6 | 2044.8 | 2032.2 | 2019.6 | 2011.2 | 1994.3 | 1990.1 | 1990.1 | 1985.9 | 1990.1 | 1985.9 |
| 5°    | 2074.3 | 2049.0 | 2028.0 | 2011.2 | 2002.7 | 1994.3 | 1994.3 | 1998.5 | 1994.3 | 1998.5 | 1994.3 |
| 7.5°  | 2099.5 | 2082.7 | 2061.6 | 2036.4 | 2032.2 | 2028.0 | 2032.2 | 2040.6 | 2044.8 | 2049.0 | 2040.6 |
| 10°   | 2150.0 | 2124.8 | 2095.3 | 2082.7 | 2074.3 | 2070.1 | 2082.7 | 2099.5 | 2103.7 | 2112.1 | 2103.7 |
| 12.5° | 2208.9 | 2179.5 | 2158.4 | 2129.0 | 2129.0 | 2133.2 | 2145.8 | 2166.8 | 2179.5 | 2192.1 | 2179.5 |
| 15°   | 2276.2 | 2246.8 | 2217.3 | 2192.1 | 2187.9 | 2196.3 | 2217.3 | 2238.4 | 2242.6 | 2246.8 | 2238.4 |
| 17.5° | 2343.5 | 2314.1 | 2276.2 | 2246.8 | 2242.6 | 2263.6 | 2272.0 | 2272.0 | 2263.6 | 2263.6 | 2251.0 |
| 20°   | 2410.9 | 2389.8 | 2352.0 | 2297.3 | 2314.1 | 2322.5 | 2297.3 | 2276.2 | 2263.6 | 2259.4 | 2246.8 |
| 22.5° | 2490.8 | 2457.1 | 2415.1 | 2356.2 | 2368.8 | 2335.1 | 2288.8 | 2280.4 | 2267.8 | 2272.0 | 2259.4 |
| 25°   | 2566.5 | 2545.5 | 2478.2 | 2402.4 | 2368.8 | 2314.1 | 2284.6 | 2284.6 | 2272.0 | 2280.4 | 2276.2 |
| 27.5° | 2654.9 | 2629.7 | 2537.1 | 2427.7 | 2339.3 | 2280.4 | 2276.2 | 2276.2 | 2255.2 | 2259.4 | 2255.2 |
| 30°   | 2743.3 | 2705.4 | 2583.4 | 2406.7 | 2267.8 | 2229.9 | 2242.6 | 2238.4 | 2229.9 | 2242.6 | 2251.0 |
| 32.5° | 2819.0 | 2789.5 | 2608.6 | 2356.2 | 2179.5 | 2162.6 | 2171.0 | 2192.1 | 2213.1 | 2225.7 | 2242.6 |
| 35°   | 2898.9 | 2865.3 | 2629.7 | 2267.8 | 2082.7 | 2057.4 | 2053.2 | 2116.3 | 2154.2 | 2175.2 | 2187.9 |
| 37.5° | 2983.1 | 2941.0 | 2642.3 | 2171.0 | 1990.1 | 1914.4 | 1927.0 | 1977.5 | 2019.6 | 2057.4 | 2086.9 |
| 40°   | 3096.7 | 3054.6 | 2659.1 | 2065.9 | 1893.3 | 1792.4 | 1775.5 | 1788.2 | 1817.6 | 1872.3 | 1901.8 |
| 42.5° | 3265.0 | 3197.7 | 2659.1 | 1931.2 | 1754.5 | 1683.0 | 1624.1 | 1577.8 | 1561.0 | 1594.6 | 1611.5 |
| 45°   | 3496.4 | 3395.4 | 2642.3 | 1792.4 | 1594.6 | 1544.1 | 1447.4 | 1371.6 | 1304.3 | 1270.6 | 1262.2 |
| 47.5° | 3879.3 | 3702.5 | 2625.4 | 1657.7 | 1443.2 | 1380.0 | 1262.2 | 1173.9 | 1077.1 | 988.7  | 967.7  |
| 50°   | 4392.6 | 4110.7 | 2629.7 | 1523.1 | 1291.7 | 1207.5 | 1102.4 | 1009.8 | 896.2  | 812.0  | 799.4  |
| 52.5° | 5070.0 | 4682.9 | 2654.9 | 1375.8 | 1144.4 | 1068.7 | 980.3  | 887.8  | 774.2  | 711.1  | 706.9  |
| 55°   | 5856.8 | 5372.9 | 2743.3 | 1211.7 | 1009.8 | 950.9  | 887.8  | 799.4  | 702.6  | 647.9  | 639.5  |
| 57.5° | 6774.0 | 6172.3 | 2920.0 | 1039.2 | 887.8  | 866.7  | 816.2  | 732.1  | 652.2  | 597.5  | 589.0  |
| 60°   | 7678.6 | 6946.5 | 3054.6 | 887.8  | 791.0  | 791.0  | 744.7  | 681.6  | 572.2  | 525.9  | 517.5  |
| 62.5° | 8099.3 | 7186.3 | 2797.9 | 765.8  | 715.3  | 727.9  | 698.4  | 610.1  | 576.4  | 555.4  | 542.8  |
| 65°   | 8200.3 | 7051.7 | 2103.7 | 673.2  | 652.2  | 694.2  | 647.9  | 652.2  | 622.7  | 601.7  | 589.0  |
| 67.5° | 8078.3 | 6668.8 | 1346.4 | 593.2  | 605.9  | 652.2  | 715.3  | 719.5  | 622.7  | 576.4  | 568.0  |
| 70°   | 7363.0 | 5848.3 | 828.9  | 525.9  | 542.8  | 643.7  | 795.2  | 677.4  | 589.0  | 551.2  | 534.3  |
| 72.5° | 6142.9 | 4825.9 | 580.6  | 462.8  | 462.8  | 610.1  | 715.3  | 635.3  | 542.8  | 521.7  | 500.7  |
| 75°   | 4312.6 | 3265.0 | 425.0  | 387.1  | 387.1  | 475.4  | 660.6  | 580.6  | 509.1  | 517.5  | 509.1  |
| 77.5° | 1468.4 | 1060.3 | 307.1  | 298.7  | 286.1  | 408.1  | 589.0  | 555.4  | 471.2  | 446.0  | 412.3  |
| 80°   | 433.4  | 340.8  | 227.2  | 210.4  | 206.2  | 328.2  | 496.5  | 408.1  | 336.6  | 307.1  | 286.1  |
| 82.5° | 168.3  | 151.5  | 147.3  | 134.6  | 130.4  | 218.8  | 328.2  | 281.9  | 252.4  | 210.4  | 206.2  |
| 85°   | 67.3   | 67.3   | 75.7   | 75.7   | 67.3   | 117.8  | 197.7  | 155.7  | 147.3  | 130.4  | 126.2  |
| 87.5° | 33.7   | 33.7   | 29.5   | 21.0   | 21.0   | 25.2   | 21.0   | 21.0   | 21.0   | 21.0   | 21.0   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



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

Report Prepared for

Cooper Lighting Solutions

McGraw-Edison

Report Number: SP1-2407-184-2

Test Date: 10/09/2024

Luminaire Tested: GSS-SB1A-722-U-5WQ

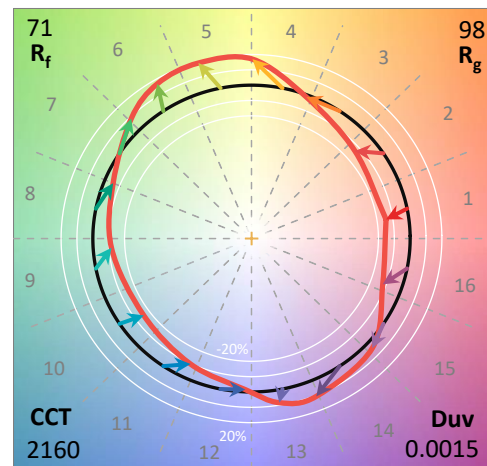
Data in this report applies to families of products including GSS-SB1A-722-U-5WQ

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-2  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/15/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: McGraw-Edison  
 Catalog Number: **GSS-SB1A-722-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 70 CRI  
 2200K CCT 26 LEDS

### Spectral Parameters

|                           |          |           |      |      |       |
|---------------------------|----------|-----------|------|------|-------|
| CCT (K):                  | 2160     | CRI (Ra): | 71.9 |      |       |
| CIE u':                   | 0.2927   | R1:       | 68.7 | R9:  | -17.8 |
| CIE v':                   | 0.5388   | R2:       | 82.6 | R10: | 60.5  |
| Duv:                      | 0.0015   | R3:       | 95.5 | R11: | 60.2  |
| CIE x:                    | 0.5130   | R4:       | 66.4 | R12: | 48.2  |
| CIE y:                    | 0.4197   | R5:       | 65.4 | R13: | 70.7  |
| CIE z:                    | 0.0674   | R6:       | 75.9 | R14: | 96.8  |
| Peak Wavelength (nm):     | 609      | R7:       | 77.2 | R15: | 61.8  |
| Dominant Wavelength (nm): | 587      | R8:       | 43.5 |      |       |
| Purity:                   | 79.96089 |           |      |      |       |
| Rf:                       | 70.6     |           |      |      |       |
| Rg:                       | 97.6     |           |      |      |       |



### Test Conditions

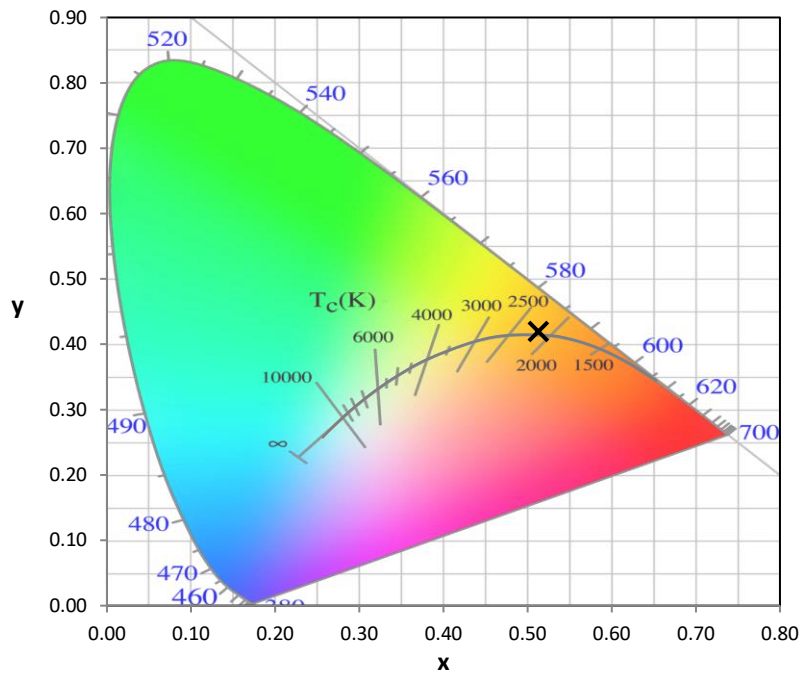
Stabilization Time: 21M  
 Operation Time: 1H 21M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-184-2

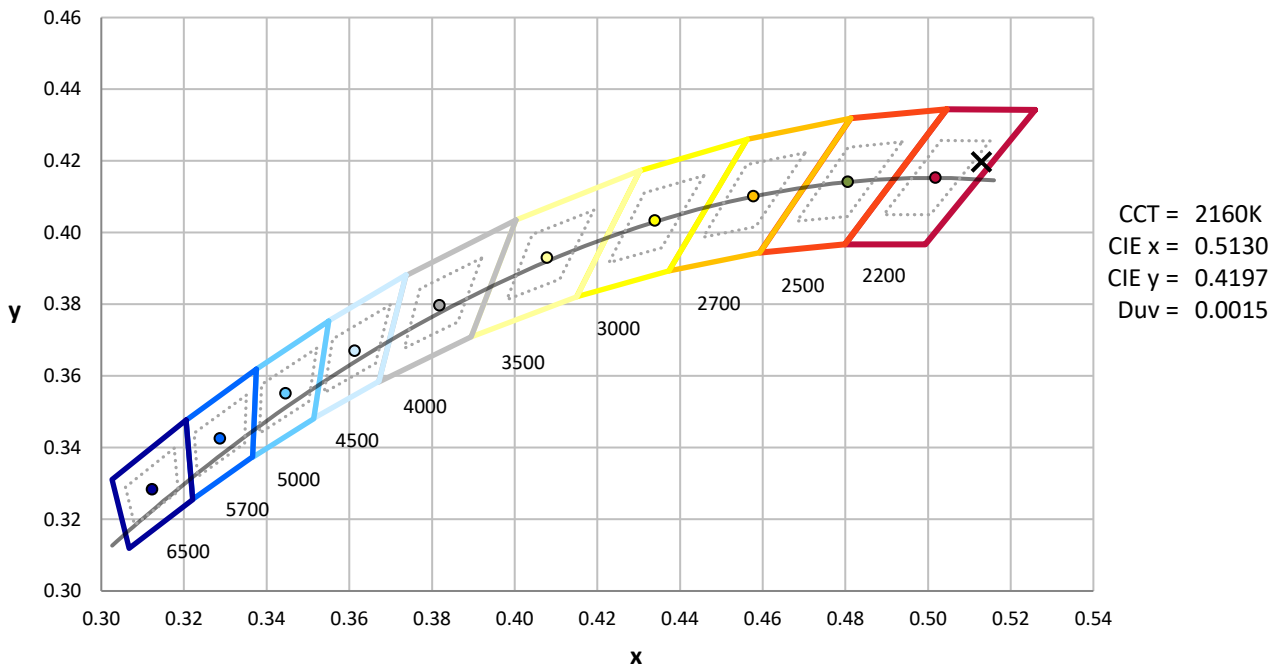
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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 2200K 7-step quadrangle

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### Photopic Flux vs. Wavelength

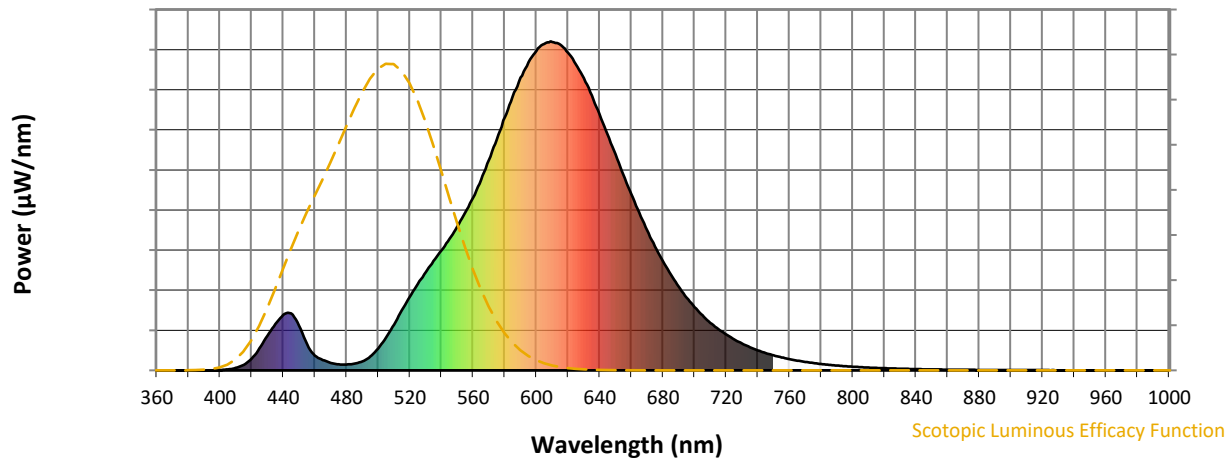


### Photopic Lumens: NR

| $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|
| 360               | 0                                      | NR                             | 490               | 27                                     | NR                             | 620               | 966                                    | NR                             | 750               | 46                                     | NR                             | 880               | 1                                      | NR                             |
| 365               | 0                                      | NR                             | 495               | 42                                     | NR                             | 625               | 930                                    | NR                             | 755               | 39                                     | NR                             | 885               | 1                                      | NR                             |
| 370               | 0                                      | NR                             | 500               | 67                                     | NR                             | 630               | 888                                    | NR                             | 760               | 34                                     | NR                             | 890               | 1                                      | NR                             |
| 375               | 0                                      | NR                             | 505               | 101                                    | NR                             | 635               | 835                                    | NR                             | 765               | 30                                     | NR                             | 895               | 1                                      | NR                             |
| 380               | 0                                      | NR                             | 510               | 139                                    | NR                             | 640               | 778                                    | NR                             | 770               | 26                                     | NR                             | 900               | 1                                      | NR                             |
| 385               | 0                                      | NR                             | 515               | 183                                    | NR                             | 645               | 717                                    | NR                             | 775               | 22                                     | NR                             | 905               | 1                                      | NR                             |
| 390               | 0                                      | NR                             | 520               | 224                                    | NR                             | 650               | 656                                    | NR                             | 780               | 19                                     | NR                             | 910               | 1                                      | NR                             |
| 395               | 0                                      | NR                             | 525               | 262                                    | NR                             | 655               | 595                                    | NR                             | 785               | 17                                     | NR                             | 915               | 1                                      | NR                             |
| 400               | 1                                      | NR                             | 530               | 299                                    | NR                             | 660               | 536                                    | NR                             | 790               | 15                                     | NR                             | 920               | 1                                      | NR                             |
| 405               | 3                                      | NR                             | 535               | 332                                    | NR                             | 665               | 480                                    | NR                             | 795               | 13                                     | NR                             | 925               | 1                                      | NR                             |
| 410               | 7                                      | NR                             | 540               | 365                                    | NR                             | 670               | 425                                    | NR                             | 800               | 11                                     | NR                             | 930               | 1                                      | NR                             |
| 415               | 17                                     | NR                             | 545               | 400                                    | NR                             | 675               | 376                                    | NR                             | 805               | 10                                     | NR                             | 935               | 0                                      | NR                             |
| 420               | 36                                     | NR                             | 550               | 437                                    | NR                             | 680               | 332                                    | NR                             | 810               | 8                                      | NR                             | 940               | 0                                      | NR                             |
| 425               | 67                                     | NR                             | 555               | 479                                    | NR                             | 685               | 291                                    | NR                             | 815               | 8                                      | NR                             | 945               | 0                                      | NR                             |
| 430               | 105                                    | NR                             | 560               | 525                                    | NR                             | 690               | 255                                    | NR                             | 820               | 7                                      | NR                             | 950               | 0                                      | NR                             |
| 435               | 141                                    | NR                             | 565               | 579                                    | NR                             | 695               | 221                                    | NR                             | 825               | 6                                      | NR                             | 955               | 0                                      | NR                             |
| 440               | 169                                    | NR                             | 570               | 639                                    | NR                             | 700               | 192                                    | NR                             | 830               | 5                                      | NR                             | 960               | 0                                      | NR                             |
| 445               | 173                                    | NR                             | 575               | 703                                    | NR                             | 705               | 167                                    | NR                             | 835               | 4                                      | NR                             | 965               | 0                                      | NR                             |
| 450               | 136                                    | NR                             | 580               | 769                                    | NR                             | 710               | 144                                    | NR                             | 840               | 4                                      | NR                             | 970               | 0                                      | NR                             |
| 455               | 80                                     | NR                             | 585               | 832                                    | NR                             | 715               | 125                                    | NR                             | 845               | 3                                      | NR                             | 975               | 0                                      | NR                             |
| 460               | 45                                     | NR                             | 590               | 890                                    | NR                             | 720               | 109                                    | NR                             | 850               | 3                                      | NR                             | 980               | 0                                      | NR                             |
| 465               | 32                                     | NR                             | 595               | 937                                    | NR                             | 725               | 94                                     | NR                             | 855               | 3                                      | NR                             | 985               | 0                                      | NR                             |
| 470               | 23                                     | NR                             | 600               | 972                                    | NR                             | 730               | 81                                     | NR                             | 860               | 2                                      | NR                             | 990               | 0                                      | NR                             |
| 475               | 18                                     | NR                             | 605               | 992                                    | NR                             | 735               | 70                                     | NR                             | 865               | 2                                      | NR                             | 995               | 0                                      | NR                             |
| 480               | 18                                     | NR                             | 610               | 998                                    | NR                             | 740               | 61                                     | NR                             | 870               | 2                                      | NR                             | 1000              | 0                                      | NR                             |
| 485               | 20                                     | NR                             | 615               | 990                                    | NR                             | 745               | 53                                     | NR                             | 875               | 2                                      | NR                             |                   |                                        |                                |

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### Scotopic Flux vs. Wavelength



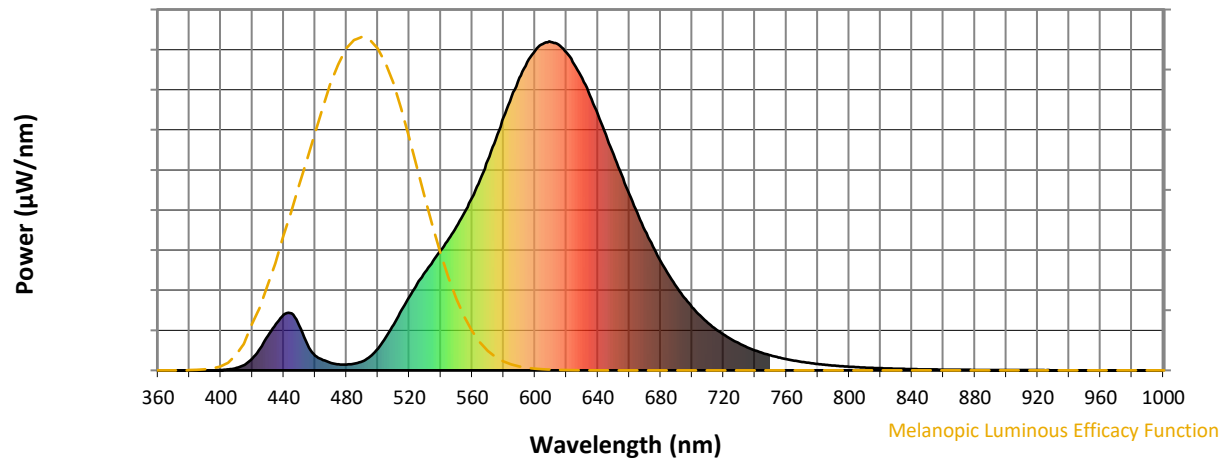
Scotopic Lumens: NR

S/P: 0.8

| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | NR                             | 490               | 27                                   | NR                             | 620               | 966                                  | NR                             | 750               | 46                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 42                                   | NR                             | 625               | 930                                  | NR                             | 755               | 39                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 67                                   | NR                             | 630               | 888                                  | NR                             | 760               | 34                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 101                                  | NR                             | 635               | 835                                  | NR                             | 765               | 30                                   | NR                             | 895               | 1                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 139                                  | NR                             | 640               | 778                                  | NR                             | 770               | 26                                   | NR                             | 900               | 1                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 183                                  | NR                             | 645               | 717                                  | NR                             | 775               | 22                                   | NR                             | 905               | 1                                    | NR                             |
| 390               | 0                                    | NR                             | 520               | 224                                  | NR                             | 650               | 656                                  | NR                             | 780               | 19                                   | NR                             | 910               | 1                                    | NR                             |
| 395               | 0                                    | NR                             | 525               | 262                                  | NR                             | 655               | 595                                  | NR                             | 785               | 17                                   | NR                             | 915               | 1                                    | NR                             |
| 400               | 1                                    | NR                             | 530               | 299                                  | NR                             | 660               | 536                                  | NR                             | 790               | 15                                   | NR                             | 920               | 1                                    | NR                             |
| 405               | 3                                    | NR                             | 535               | 332                                  | NR                             | 665               | 480                                  | NR                             | 795               | 13                                   | NR                             | 925               | 1                                    | NR                             |
| 410               | 7                                    | NR                             | 540               | 365                                  | NR                             | 670               | 425                                  | NR                             | 800               | 11                                   | NR                             | 930               | 1                                    | NR                             |
| 415               | 17                                   | NR                             | 545               | 400                                  | NR                             | 675               | 376                                  | NR                             | 805               | 10                                   | NR                             | 935               | 0                                    | NR                             |
| 420               | 36                                   | NR                             | 550               | 437                                  | NR                             | 680               | 332                                  | NR                             | 810               | 8                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 67                                   | NR                             | 555               | 479                                  | NR                             | 685               | 291                                  | NR                             | 815               | 8                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 105                                  | NR                             | 560               | 525                                  | NR                             | 690               | 255                                  | NR                             | 820               | 7                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 141                                  | NR                             | 565               | 579                                  | NR                             | 695               | 221                                  | NR                             | 825               | 6                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 169                                  | NR                             | 570               | 639                                  | NR                             | 700               | 192                                  | NR                             | 830               | 5                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 173                                  | NR                             | 575               | 703                                  | NR                             | 705               | 167                                  | NR                             | 835               | 4                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 136                                  | NR                             | 580               | 769                                  | NR                             | 710               | 144                                  | NR                             | 840               | 4                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 80                                   | NR                             | 585               | 832                                  | NR                             | 715               | 125                                  | NR                             | 845               | 3                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 45                                   | NR                             | 590               | 890                                  | NR                             | 720               | 109                                  | NR                             | 850               | 3                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 32                                   | NR                             | 595               | 937                                  | NR                             | 725               | 94                                   | NR                             | 855               | 3                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 23                                   | NR                             | 600               | 972                                  | NR                             | 730               | 81                                   | NR                             | 860               | 2                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 18                                   | NR                             | 605               | 992                                  | NR                             | 735               | 70                                   | NR                             | 865               | 2                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 18                                   | NR                             | 610               | 998                                  | NR                             | 740               | 61                                   | NR                             | 870               | 2                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 20                                   | NR                             | 615               | 990                                  | NR                             | 745               | 53                                   | NR                             | 875               | 2                                    | NR                             |                   |                                      |                                |

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### Melanopic Flux vs. Wavelength

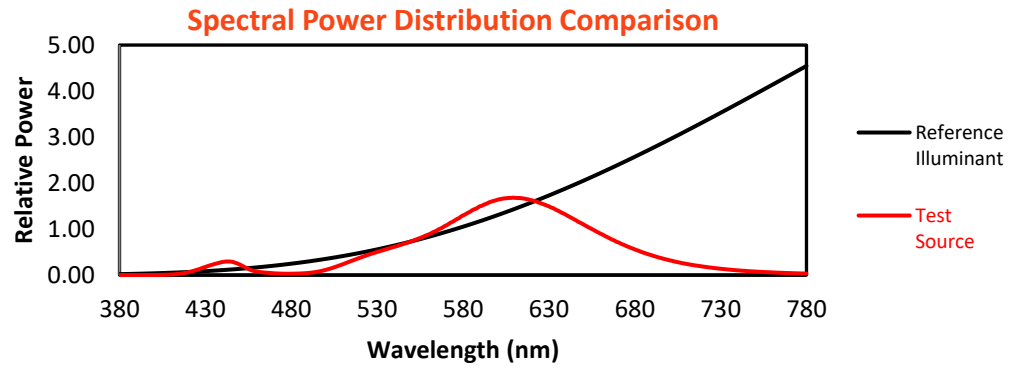
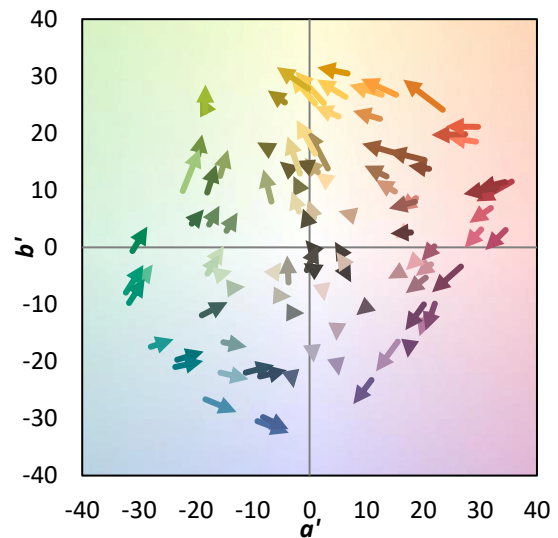
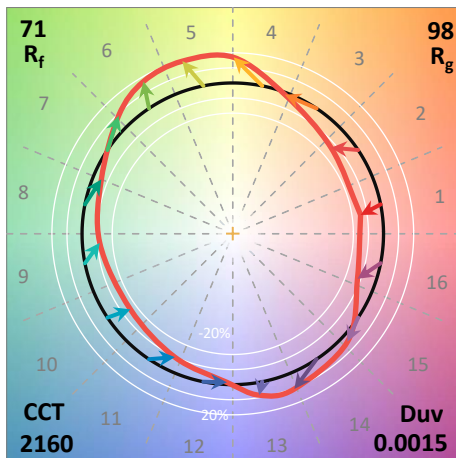
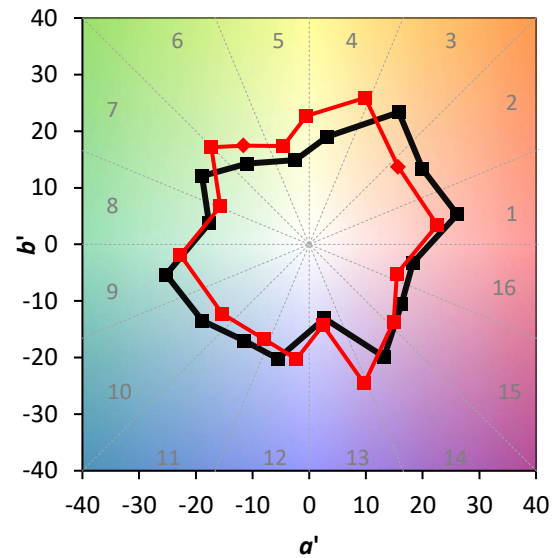
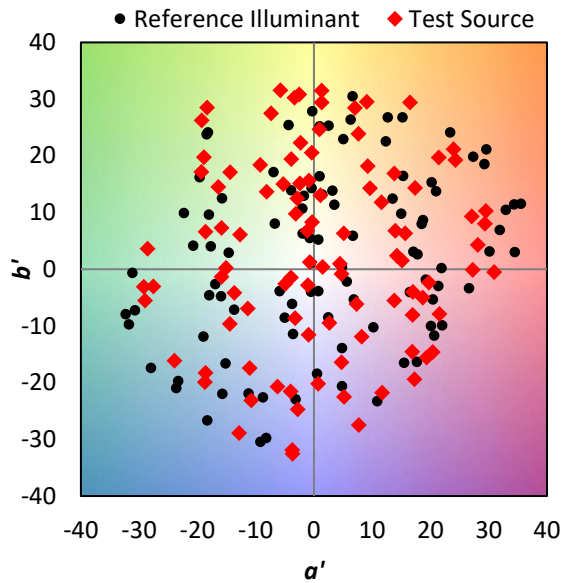


Melanopic Lumens: NR

M/P: 1.21

| $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|
| 360               | 0                                      | NR                             | 490               | 27                                     | NR                             | 620               | 966                                    | NR                             | 750               | 46                                     | NR                             | 880               | 1                                      | NR                             |
| 365               | 0                                      | NR                             | 495               | 42                                     | NR                             | 625               | 930                                    | NR                             | 755               | 39                                     | NR                             | 885               | 1                                      | NR                             |
| 370               | 0                                      | NR                             | 500               | 67                                     | NR                             | 630               | 888                                    | NR                             | 760               | 34                                     | NR                             | 890               | 1                                      | NR                             |
| 375               | 0                                      | NR                             | 505               | 101                                    | NR                             | 635               | 835                                    | NR                             | 765               | 30                                     | NR                             | 895               | 1                                      | NR                             |
| 380               | 0                                      | NR                             | 510               | 139                                    | NR                             | 640               | 778                                    | NR                             | 770               | 26                                     | NR                             | 900               | 1                                      | NR                             |
| 385               | 0                                      | NR                             | 515               | 183                                    | NR                             | 645               | 717                                    | NR                             | 775               | 22                                     | NR                             | 905               | 1                                      | NR                             |
| 390               | 0                                      | NR                             | 520               | 224                                    | NR                             | 650               | 656                                    | NR                             | 780               | 19                                     | NR                             | 910               | 1                                      | NR                             |
| 395               | 0                                      | NR                             | 525               | 262                                    | NR                             | 655               | 595                                    | NR                             | 785               | 17                                     | NR                             | 915               | 1                                      | NR                             |
| 400               | 1                                      | NR                             | 530               | 299                                    | NR                             | 660               | 536                                    | NR                             | 790               | 15                                     | NR                             | 920               | 1                                      | NR                             |
| 405               | 3                                      | NR                             | 535               | 332                                    | NR                             | 665               | 480                                    | NR                             | 795               | 13                                     | NR                             | 925               | 1                                      | NR                             |
| 410               | 7                                      | NR                             | 540               | 365                                    | NR                             | 670               | 425                                    | NR                             | 800               | 11                                     | NR                             | 930               | 1                                      | NR                             |
| 415               | 17                                     | NR                             | 545               | 400                                    | NR                             | 675               | 376                                    | NR                             | 805               | 10                                     | NR                             | 935               | 0                                      | NR                             |
| 420               | 36                                     | NR                             | 550               | 437                                    | NR                             | 680               | 332                                    | NR                             | 810               | 8                                      | NR                             | 940               | 0                                      | NR                             |
| 425               | 67                                     | NR                             | 555               | 479                                    | NR                             | 685               | 291                                    | NR                             | 815               | 8                                      | NR                             | 945               | 0                                      | NR                             |
| 430               | 105                                    | NR                             | 560               | 525                                    | NR                             | 690               | 255                                    | NR                             | 820               | 7                                      | NR                             | 950               | 0                                      | NR                             |
| 435               | 141                                    | NR                             | 565               | 579                                    | NR                             | 695               | 221                                    | NR                             | 825               | 6                                      | NR                             | 955               | 0                                      | NR                             |
| 440               | 169                                    | NR                             | 570               | 639                                    | NR                             | 700               | 192                                    | NR                             | 830               | 5                                      | NR                             | 960               | 0                                      | NR                             |
| 445               | 173                                    | NR                             | 575               | 703                                    | NR                             | 705               | 167                                    | NR                             | 835               | 4                                      | NR                             | 965               | 0                                      | NR                             |
| 450               | 136                                    | NR                             | 580               | 769                                    | NR                             | 710               | 144                                    | NR                             | 840               | 4                                      | NR                             | 970               | 0                                      | NR                             |
| 455               | 80                                     | NR                             | 585               | 832                                    | NR                             | 715               | 125                                    | NR                             | 845               | 3                                      | NR                             | 975               | 0                                      | NR                             |
| 460               | 45                                     | NR                             | 590               | 890                                    | NR                             | 720               | 109                                    | NR                             | 850               | 3                                      | NR                             | 980               | 0                                      | NR                             |
| 465               | 32                                     | NR                             | 595               | 937                                    | NR                             | 725               | 94                                     | NR                             | 855               | 3                                      | NR                             | 985               | 0                                      | NR                             |
| 470               | 23                                     | NR                             | 600               | 972                                    | NR                             | 730               | 81                                     | NR                             | 860               | 2                                      | NR                             | 990               | 0                                      | NR                             |
| 475               | 18                                     | NR                             | 605               | 992                                    | NR                             | 735               | 70                                     | NR                             | 865               | 2                                      | NR                             | 995               | 0                                      | NR                             |
| 480               | 18                                     | NR                             | 610               | 998                                    | NR                             | 740               | 61                                     | NR                             | 870               | 2                                      | NR                             | 1000              | 0                                      | NR                             |
| 485               | 20                                     | NR                             | 615               | 990                                    | NR                             | 745               | 53                                     | NR                             | 875               | 2                                      | NR                             |                   |                                        |                                |

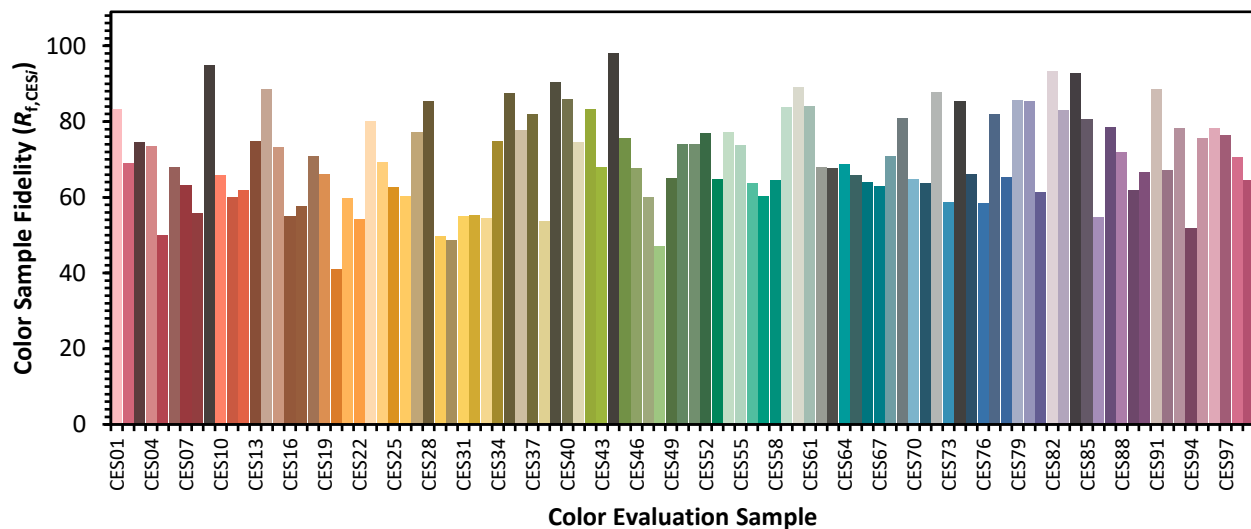
REPORT NUMBER: SP1-2407-184-2

**TM-30-18**
**Summary**
 $R_f = 70.6$   
 $R_g = 97.6$   
 CIE  $R_a = 71.9$   
 $R_g = -17.8$ 

**Color Vector Graphics**


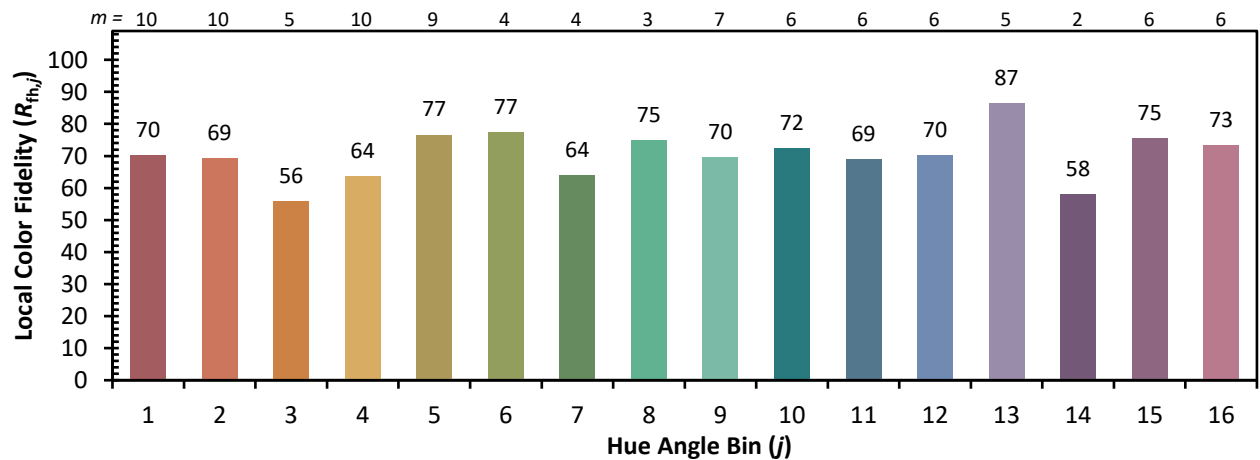
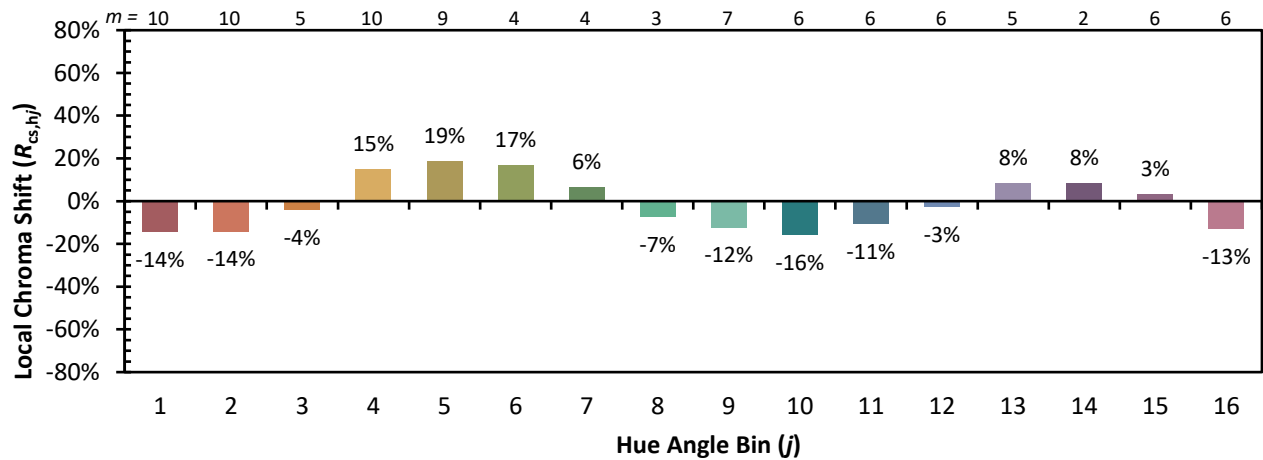


Individual Sample Fidelity Index ( $R_{f,i}$ )

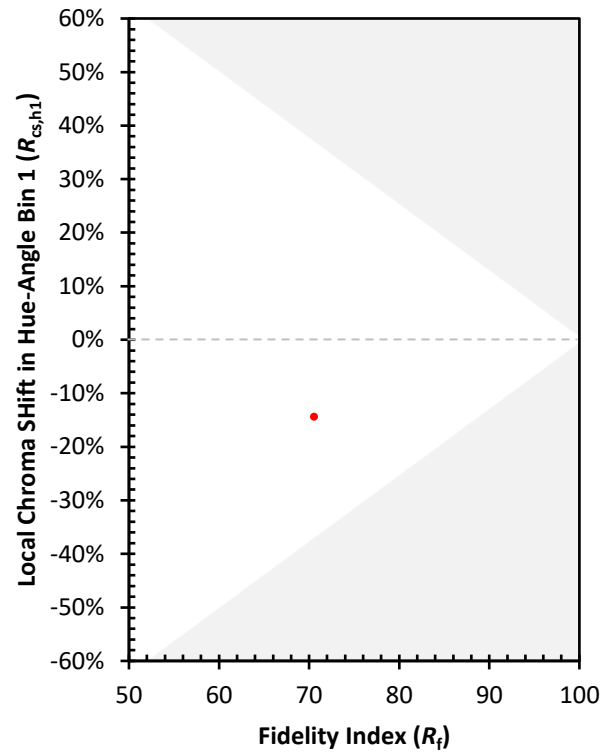
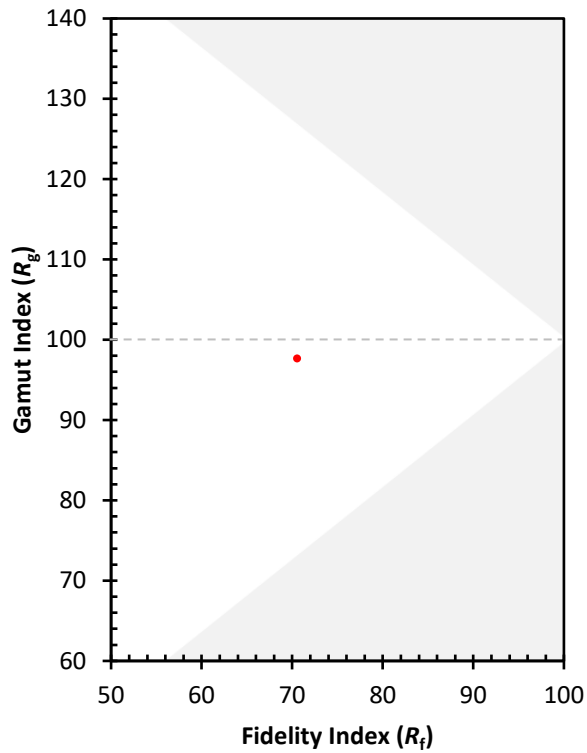
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 60 | CES51 = 74 | CES76 = 58 |
| CES02 = 65 | CES27 = 77 | CES52 = 77 | CES77 = 82 |
| CES03 = 32 | CES28 = 85 | CES53 = 65 | CES78 = 65 |
| CES04 = 72 | CES29 = 50 | CES54 = 77 | CES79 = 86 |
| CES05 = 52 | CES30 = 49 | CES55 = 74 | CES80 = 85 |
| CES06 = 53 | CES31 = 55 | CES56 = 64 | CES81 = 61 |
| CES07 = 44 | CES32 = 55 | CES57 = 60 | CES82 = 93 |
| CES08 = 43 | CES33 = 55 | CES58 = 64 | CES83 = 83 |
| CES09 = 29 | CES34 = 75 | CES59 = 84 | CES84 = 93 |
| CES10 = 79 | CES35 = 88 | CES60 = 89 | CES85 = 81 |
| CES11 = 62 | CES36 = 78 | CES61 = 84 | CES86 = 55 |
| CES12 = 68 | CES37 = 82 | CES62 = 68 | CES87 = 79 |
| CES13 = 45 | CES38 = 54 | CES63 = 68 | CES88 = 72 |
| CES14 = 75 | CES39 = 90 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 86 | CES65 = 66 | CES90 = 67 |
| CES16 = 49 | CES41 = 75 | CES66 = 64 | CES91 = 89 |
| CES17 = 51 | CES42 = 83 | CES67 = 63 | CES92 = 67 |
| CES18 = 57 | CES43 = 68 | CES68 = 71 | CES93 = 78 |
| CES19 = 74 | CES44 = 98 | CES69 = 81 | CES94 = 52 |
| CES20 = 68 | CES45 = 76 | CES70 = 65 | CES95 = 76 |
| CES21 = 89 | CES46 = 68 | CES71 = 64 | CES96 = 78 |
| CES22 = 81 | CES47 = 60 | CES72 = 88 | CES97 = 76 |
| CES23 = 92 | CES48 = 47 | CES73 = 59 | CES98 = 71 |
| CES24 = 92 | CES49 = 65 | CES74 = 85 | CES99 = 65 |
| CES25 = 74 | CES50 = 74 | CES75 = 66 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)