

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: P1387965

Luminaire Tested: **VAL-T-SB4C-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: P1387965  
 Test Lab: INNOVATION CENTER(G1)  
 Issue Date: 02/18/2026  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: VAL-T-SB4C-722-U-T4W  
 Description: GALLEON II WALL SLIM HIGH DENSITY LED ARRAYS 45 SQUARE 204W 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               |

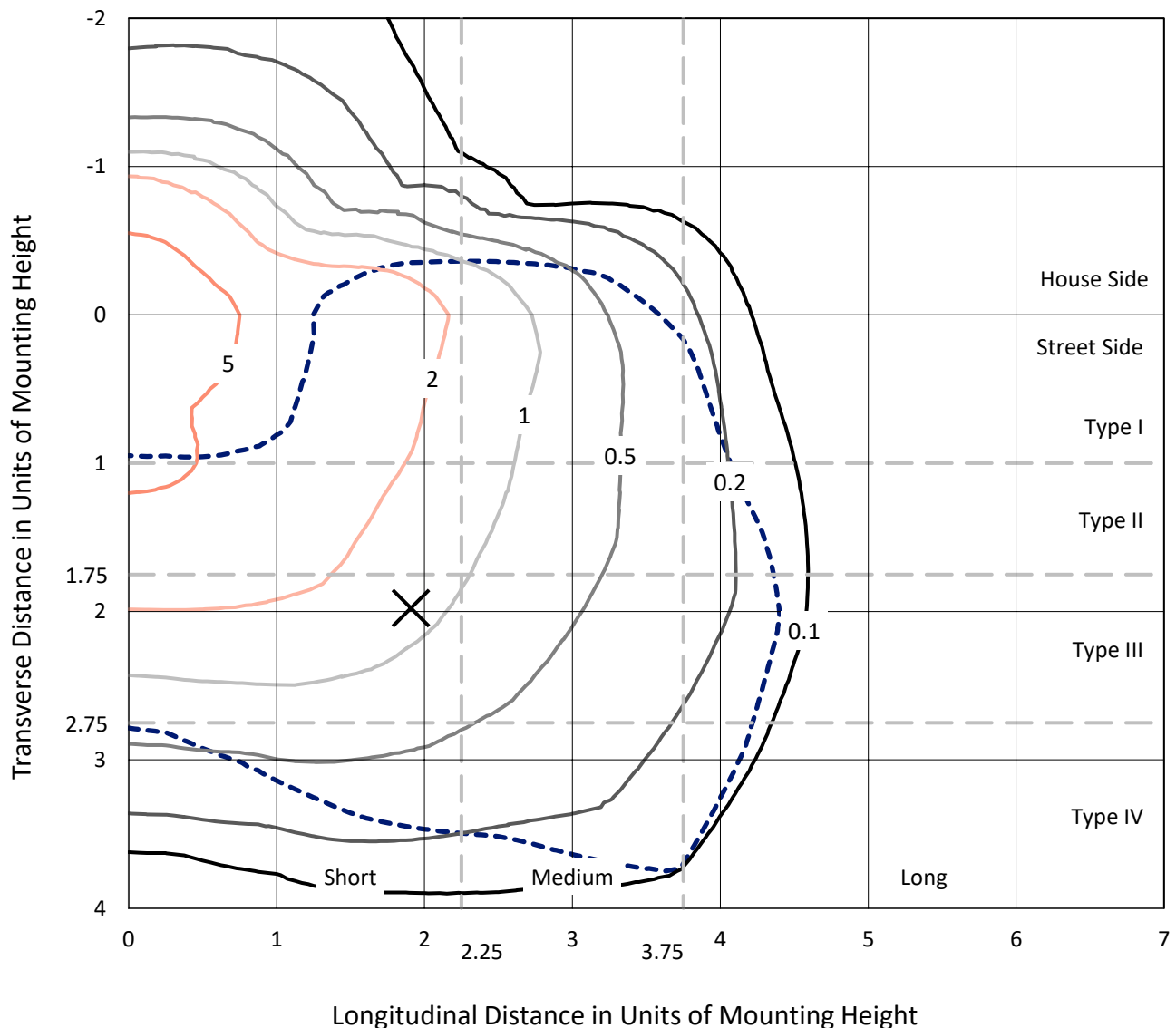
**Summary**

Lumens per Lamp: N/A  
 Luminaire Lumens: 22866.3 lumens  
 Efficiency: N/A  
 Efficacy: 112.1 lumens/watt  
 Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
 IES Classification: Type IV - Short  
 BUG Rating: B3 - U0 - G4  
  
 Input Watts (W): 204  
 Input Voltage (V): 120  
 Input Current (Ain): NR  
 Voltage Rise (V): NR  
 Power Factor: 0.98  
 Total Harmonic Distortion (THDi): 9.5%  
 Frequency (hertz): 60  
 Stabilization Time: NR  
 Operation Time: NR  
 Ambient Temperature (°C): NR  
 Test Distance: 28.75 FT

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## Iso-Footcandle Lines of Horizontal Illumination

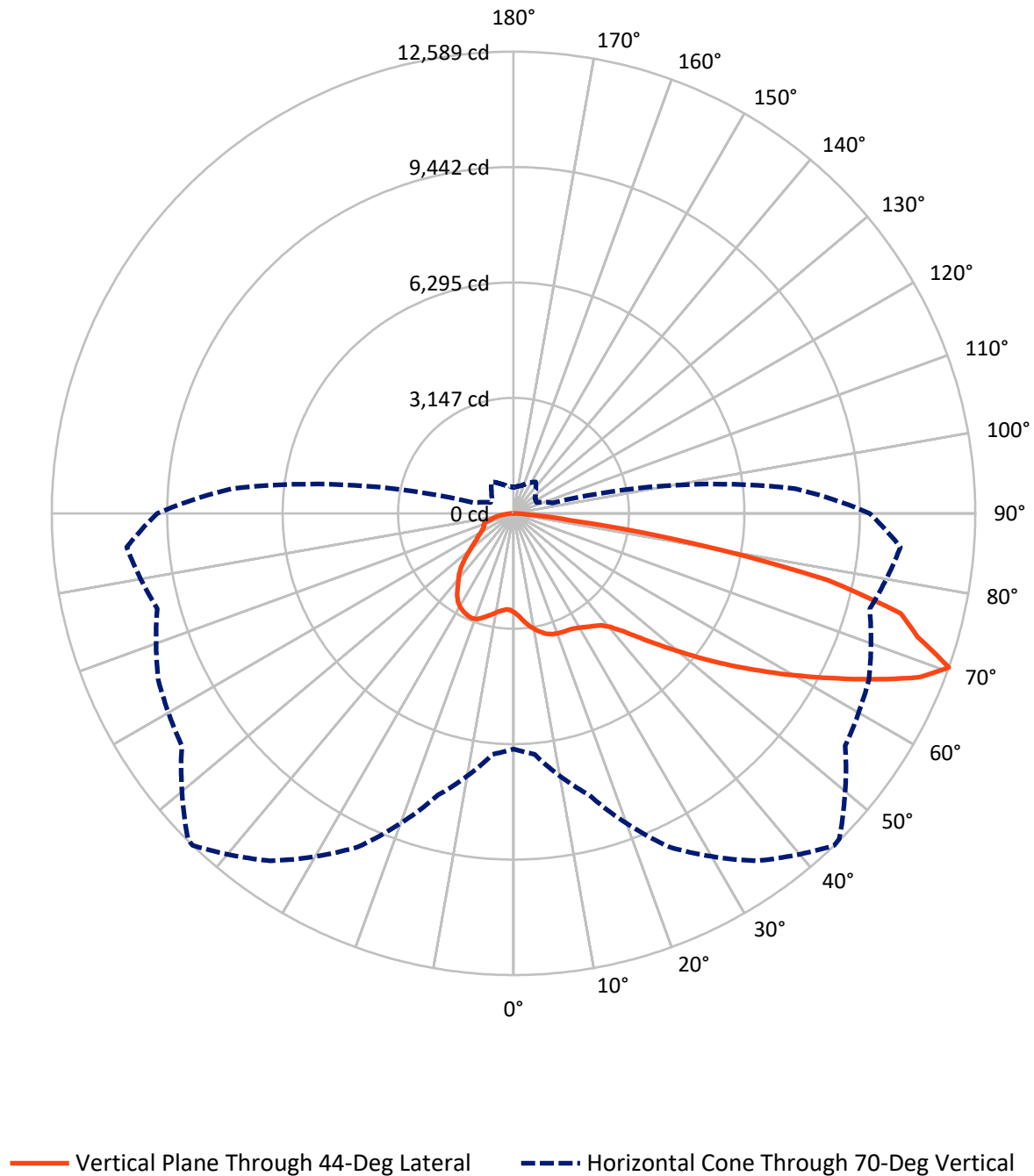
✕ Max cd  
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 8.3 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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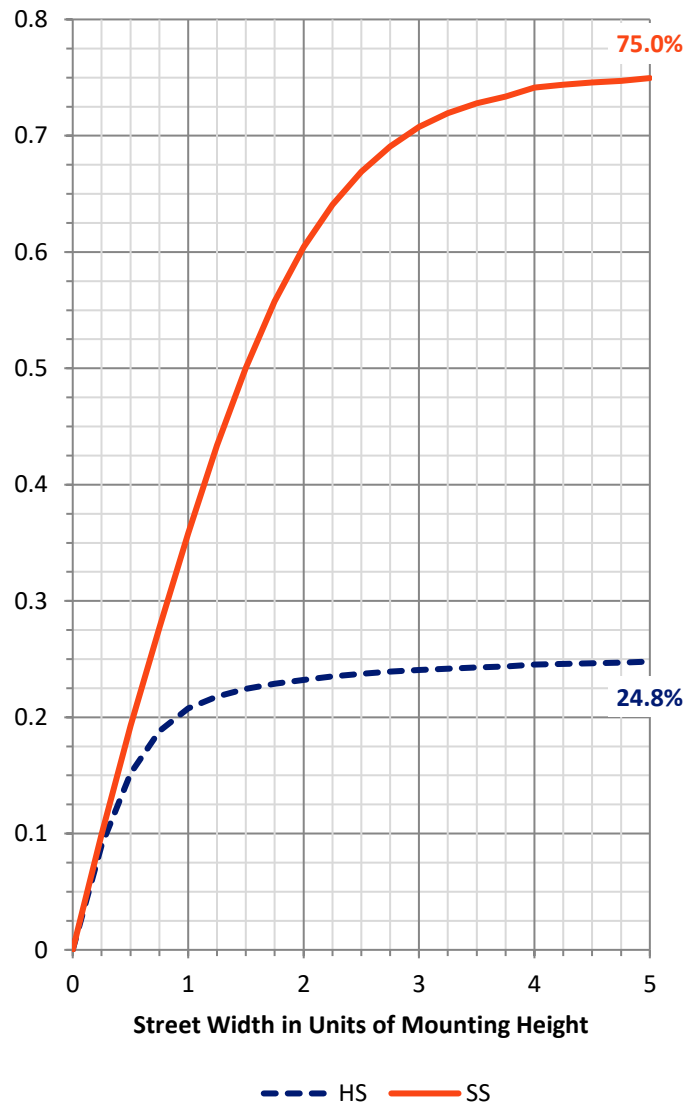
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 5729.6   | 0.0    | 5729.6  |
|                    | % Fixture | 25.1     | 0.0    | 25.1    |
| <b>Street Side</b> | Lumens    | 17136.7  | 0.0    | 17136.7 |
|                    | % Fixture | 74.9     | 0.0    | 74.9    |
| <b>Total</b>       | Lumens    | 22866.3  | 0.0    | 22866.3 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 272.7   | 1.2       |
| 10°-20°   | 895.2   | 3.9       |
| 20°-30°   | 1540.4  | 6.7       |
| 30°-40°   | 2171.5  | 9.5       |
| 40°-50°   | 3004.8  | 13.1      |
| 50°-60°   | 4462.4  | 19.5      |
| 60°-70°   | 5963.9  | 26.1      |
| 70°-80°   | 4207.1  | 18.4      |
| 80°-90°   | 348.4   | 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°    | 22866.3 | 100.0     |
| 0°-180°   | 22866.3 | 100.0     |



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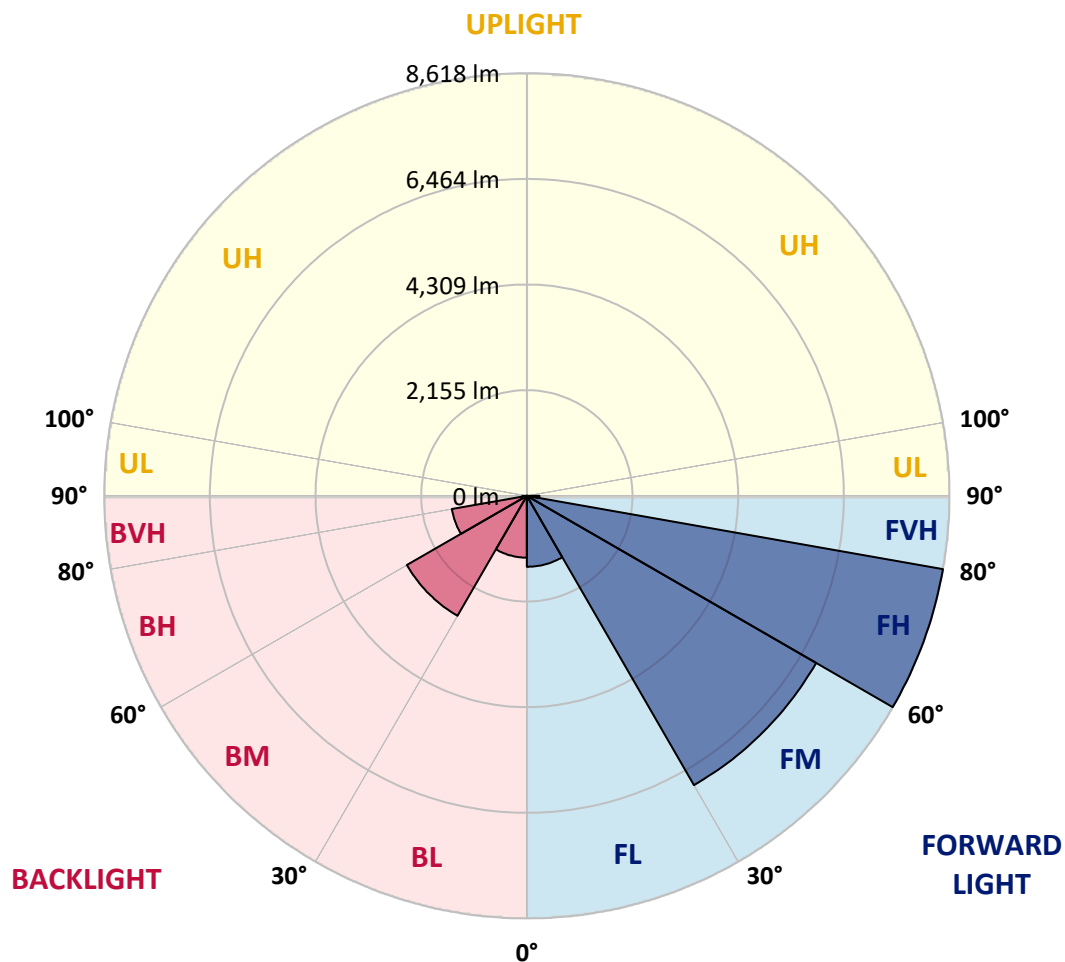
CATALOG NUMBER: VAL-T-SB4C-722-U-T4W

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|--------|-----------|-------------------------|------|----------|
|      |             |        |           | B                       | U    | G        |
| FL   | (0°-30°)    | 1447.1 | 6.3       |                         |      |          |
| FM   | (30°-60°)   | 6813.6 | 29.8      |                         |      |          |
| FH   | (60°-80°)   | 8618.1 | 37.7      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 257.8  | 1.1       |                         |      | G3/500   |
| BL   | (0°-30°)    | 1261.1 | 5.5       | B3/2500                 |      |          |
| BM   | (30°-60°)   | 2825.1 | 12.4      | B3/5000                 |      |          |
| BH   | (60°-80°)   | 1552.8 | 6.8       | B3/2500                 |      | G3/2500  |
| BVH  | (80°-90°)   | 90.6   | 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-G4**

Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°     | 35°     | 44°     | 45°     | 55°     | 65°     | 75°     | 85°     |
|-------|--------|--------|--------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 2702.1 | 2702.1 | 2702.1 | 2702.1  | 2702.1  | 2702.1  | 2702.1  | 2702.1  | 2702.1  | 2702.1  | 2702.1  |
| 2.5°  | 2901.8 | 2885.2 | 2868.5 | 2863.0  | 2840.8  | 2807.5  | 2807.5  | 2796.4  | 2768.6  | 2746.5  | 2729.8  |
| 5°    | 3090.5 | 3096.0 | 3068.3 | 3046.1  | 3012.8  | 2957.3  | 2962.8  | 2912.9  | 2857.4  | 2796.4  | 2752.0  |
| 7.5°  | 3273.5 | 3273.5 | 3240.3 | 3212.5  | 3168.1  | 3101.5  | 3101.5  | 3023.9  | 2957.3  | 2874.1  | 2813.0  |
| 10°   | 3440.0 | 3428.9 | 3384.5 | 3351.2  | 3290.2  | 3218.1  | 3212.5  | 3134.8  | 3051.6  | 2957.3  | 2874.1  |
| 12.5° | 3567.6 | 3567.6 | 3523.2 | 3467.7  | 3401.2  | 3323.5  | 3317.9  | 3234.7  | 3151.5  | 3051.6  | 2951.7  |
| 15°   | 3689.7 | 3661.9 | 3623.1 | 3551.0  | 3473.3  | 3412.3  | 3401.2  | 3329.0  | 3245.8  | 3157.0  | 3046.1  |
| 17.5° | 3734.1 | 3723.0 | 3673.0 | 3600.9  | 3528.8  | 3462.2  | 3462.2  | 3395.6  | 3334.6  | 3245.8  | 3134.8  |
| 20°   | 3723.0 | 3706.3 | 3661.9 | 3600.9  | 3545.4  | 3489.9  | 3489.9  | 3440.0  | 3406.7  | 3323.5  | 3223.6  |
| 22.5° | 3667.5 | 3650.8 | 3623.1 | 3567.6  | 3539.9  | 3506.6  | 3506.6  | 3478.8  | 3467.7  | 3417.8  | 3323.5  |
| 25°   | 3650.8 | 3639.7 | 3600.9 | 3551.0  | 3523.2  | 3517.7  | 3523.2  | 3528.8  | 3539.9  | 3501.0  | 3423.4  |
| 27.5° | 3661.9 | 3661.9 | 3628.6 | 3578.7  | 3545.4  | 3551.0  | 3556.5  | 3589.8  | 3623.1  | 3600.9  | 3534.3  |
| 30°   | 3734.1 | 3717.4 | 3695.2 | 3645.3  | 3606.5  | 3612.0  | 3612.0  | 3678.6  | 3711.9  | 3684.1  | 3634.2  |
| 32.5° | 3856.1 | 3839.5 | 3806.2 | 3700.8  | 3661.9  | 3689.7  | 3700.8  | 3756.3  | 3778.5  | 3750.7  | 3728.5  |
| 35°   | 4139.1 | 4155.7 | 4044.8 | 3856.1  | 3750.7  | 3772.9  | 3784.0  | 3822.8  | 3850.6  | 3839.5  | 3817.3  |
| 37.5° | 4655.1 | 4660.6 | 4521.9 | 4183.5  | 3939.4  | 3872.8  | 3878.3  | 3933.8  | 3967.1  | 3928.3  | 3911.6  |
| 40°   | 5298.7 | 5304.3 | 5110.1 | 4649.5  | 4239.0  | 4072.5  | 4067.0  | 4078.1  | 4128.0  | 4061.4  | 4050.3  |
| 42.5° | 5997.8 | 5920.1 | 5753.7 | 5226.6  | 4682.8  | 4405.4  | 4355.5  | 4322.2  | 4383.2  | 4300.0  | 4244.5  |
| 45°   | 6663.6 | 6608.1 | 6380.6 | 5836.9  | 5215.5  | 4843.7  | 4793.8  | 4627.4  | 4727.2  | 4660.6  | 4560.8  |
| 47.5° | 7218.4 | 7174.1 | 7002.1 | 6497.2  | 5820.3  | 5370.8  | 5293.2  | 5032.4  | 5209.9  | 5176.6  | 5054.6  |
| 50°   | 7629.0 | 7584.6 | 7468.1 | 7157.4  | 6585.9  | 5959.0  | 5886.8  | 5570.6  | 5753.7  | 5814.7  | 5720.4  |
| 52.5° | 7928.6 | 7917.5 | 7873.2 | 7823.2  | 7362.7  | 6641.4  | 6558.2  | 6164.3  | 6463.9  | 6580.4  | 6552.6  |
| 55°   | 8383.6 | 8361.4 | 8378.1 | 8461.3  | 8195.0  | 7368.3  | 7246.2  | 6785.7  | 7196.3  | 7412.6  | 7457.0  |
| 57.5° | 8816.4 | 8816.4 | 8960.6 | 9177.0  | 9143.7  | 8150.6  | 8006.3  | 7512.5  | 8084.0  | 8189.4  | 8400.3  |
| 60°   | 9221.4 | 9260.3 | 9460.0 | 9937.2  | 10031.5 | 8999.5  | 8827.5  | 8350.3  | 8927.4  | 9043.9  | 9426.7  |
| 62.5° | 9049.4 | 9143.7 | 9781.8 | 10553.0 | 10863.7 | 9909.4  | 9737.4  | 9271.4  | 9876.1  | 9737.4  | 10081.4 |
| 65°   | 8172.8 | 8317.0 | 9304.6 | 10591.9 | 11673.8 | 10908.1 | 10763.9 | 10308.9 | 10397.7 | 9842.8  | 10447.6 |
| 67.5° | 7251.7 | 7462.6 | 8611.1 | 10120.3 | 11884.6 | 11929.0 | 11801.4 | 10947.0 | 10392.1 | 9953.8  | 10819.4 |
| 70°   | 6425.0 | 6597.0 | 7950.8 | 10037.0 | 11568.4 | 12589.3 | 12561.5 | 11041.3 | 10691.7 | 10053.7 | 10586.3 |
| 72.5° | 4505.3 | 4743.9 | 6131.0 | 9265.8  | 11662.7 | 11512.9 | 11451.9 | 11701.5 | 10913.7 | 9687.5  | 9382.3  |
| 75°   | 1620.1 | 1714.5 | 3179.2 | 6269.7  | 9271.4  | 10902.6 | 10952.5 | 10841.5 | 10697.3 | 8677.7  | 7052.0  |
| 77.5° | 482.7  | 516.0  | 904.4  | 2485.7  | 5198.8  | 8749.8  | 8833.0  | 8539.0  | 8039.6  | 5232.1  | 2668.8  |
| 80°   | 260.8  | 283.0  | 427.2  | 726.8   | 1947.5  | 4938.1  | 5165.5  | 4372.1  | 2896.3  | 1381.5  | 599.2   |
| 82.5° | 127.6  | 138.7  | 221.9  | 355.1   | 837.8   | 1570.2  | 1575.7  | 1398.2  | 943.2   | 416.1   | 221.9   |
| 85°   | 44.4   | 49.9   | 72.1   | 133.2   | 288.5   | 321.8   | 321.8   | 299.6   | 277.4   | 205.3   | 99.9    |
| 87.5° | 11.1   | 11.1   | 16.6   | 22.2    | 27.7    | 33.3    | 33.3    | 38.8    | 44.4    | 49.9    | 49.9    |
| 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: P1387965

CATALOG NUMBER: VAL-T-SB4C-722-U-T4W

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2702.1  | 2702.1 | 2702.1 | 2702.1 | 2702.1 | 2702.1 | 2702.1 | 2702.1 | 2702.1 | 2702.1 | 2702.1 |
| 2.5°  | 2718.7  | 2696.5 | 2679.9 | 2663.2 | 2652.1 | 2629.9 | 2624.4 | 2624.4 | 2618.8 | 2624.4 | 2618.8 |
| 5°    | 2735.4  | 2702.1 | 2674.3 | 2652.1 | 2641.0 | 2629.9 | 2629.9 | 2635.5 | 2629.9 | 2635.5 | 2629.9 |
| 7.5°  | 2768.6  | 2746.5 | 2718.7 | 2685.4 | 2679.9 | 2674.3 | 2679.9 | 2691.0 | 2696.5 | 2702.1 | 2691.0 |
| 10°   | 2835.2  | 2801.9 | 2763.1 | 2746.5 | 2735.4 | 2729.8 | 2746.5 | 2768.6 | 2774.2 | 2785.3 | 2774.2 |
| 12.5° | 2912.9  | 2874.1 | 2846.3 | 2807.5 | 2807.5 | 2813.0 | 2829.7 | 2857.4 | 2874.1 | 2890.7 | 2874.1 |
| 15°   | 3001.7  | 2962.8 | 2924.0 | 2890.7 | 2885.2 | 2896.3 | 2924.0 | 2951.7 | 2957.3 | 2962.8 | 2951.7 |
| 17.5° | 3090.5  | 3051.6 | 3001.7 | 2962.8 | 2957.3 | 2985.0 | 2996.1 | 2996.1 | 2985.0 | 2985.0 | 2968.4 |
| 20°   | 3179.2  | 3151.5 | 3101.5 | 3029.4 | 3051.6 | 3062.7 | 3029.4 | 3001.7 | 2985.0 | 2979.5 | 2962.8 |
| 22.5° | 3284.6  | 3240.3 | 3184.8 | 3107.1 | 3123.7 | 3079.4 | 3018.3 | 3007.2 | 2990.6 | 2996.1 | 2979.5 |
| 25°   | 3384.5  | 3356.8 | 3268.0 | 3168.1 | 3123.7 | 3051.6 | 3012.8 | 3012.8 | 2996.1 | 3007.2 | 3001.7 |
| 27.5° | 3501.0  | 3467.7 | 3345.7 | 3201.4 | 3084.9 | 3007.2 | 3001.7 | 3001.7 | 2973.9 | 2979.5 | 2973.9 |
| 30°   | 3617.5  | 3567.6 | 3406.7 | 3173.7 | 2990.6 | 2940.6 | 2957.3 | 2951.7 | 2940.6 | 2957.3 | 2968.4 |
| 32.5° | 3717.4  | 3678.6 | 3440.0 | 3107.1 | 2874.1 | 2851.9 | 2863.0 | 2890.7 | 2918.5 | 2935.1 | 2957.3 |
| 35°   | 3822.8  | 3778.5 | 3467.7 | 2990.6 | 2746.5 | 2713.2 | 2707.6 | 2790.8 | 2840.8 | 2868.5 | 2885.2 |
| 37.5° | 3933.8  | 3878.3 | 3484.4 | 2863.0 | 2624.4 | 2524.5 | 2541.2 | 2607.7 | 2663.2 | 2713.2 | 2752.0 |
| 40°   | 4083.6  | 4028.1 | 3506.6 | 2724.3 | 2496.8 | 2363.6 | 2341.4 | 2358.1 | 2396.9 | 2469.0 | 2507.9 |
| 42.5° | 4305.5  | 4216.8 | 3506.6 | 2546.7 | 2313.7 | 2219.4 | 2141.7 | 2080.6 | 2058.5 | 2102.8 | 2125.0 |
| 45°   | 4610.7  | 4477.5 | 3484.4 | 2363.6 | 2102.8 | 2036.3 | 1908.6 | 1808.8 | 1720.0 | 1675.6 | 1664.5 |
| 47.5° | 5115.6  | 4882.6 | 3462.2 | 2186.1 | 1903.1 | 1819.9 | 1664.5 | 1548.0 | 1420.4 | 1303.9 | 1276.1 |
| 50°   | 5792.5  | 5420.8 | 3467.7 | 2008.5 | 1703.4 | 1592.4 | 1453.7 | 1331.6 | 1181.8 | 1070.8 | 1054.2 |
| 52.5° | 6685.8  | 6175.4 | 3501.0 | 1814.3 | 1509.2 | 1409.3 | 1292.8 | 1170.7 | 1020.9 | 937.7  | 932.1  |
| 55°   | 7723.4  | 7085.3 | 3617.5 | 1597.9 | 1331.6 | 1253.9 | 1170.7 | 1054.2 | 926.6  | 854.5  | 843.4  |
| 57.5° | 8932.9  | 8139.5 | 3850.6 | 1370.5 | 1170.7 | 1143.0 | 1076.4 | 965.4  | 860.0  | 787.9  | 776.8  |
| 60°   | 10125.8 | 9160.4 | 4028.1 | 1170.7 | 1043.1 | 1043.1 | 982.1  | 898.8  | 754.6  | 693.5  | 682.5  |
| 62.5° | 10680.6 | 9476.6 | 3689.7 | 1009.8 | 943.2  | 959.9  | 921.0  | 804.5  | 760.1  | 732.4  | 715.7  |
| 65°   | 10813.8 | 9299.1 | 2774.2 | 887.7  | 860.0  | 915.5  | 854.5  | 860.0  | 821.2  | 793.4  | 776.8  |
| 67.5° | 10652.9 | 8794.2 | 1775.5 | 782.3  | 799.0  | 860.0  | 943.2  | 948.8  | 821.2  | 760.1  | 749.0  |
| 70°   | 9709.7  | 7712.3 | 1093.0 | 693.5  | 715.7  | 848.9  | 1048.6 | 893.3  | 776.8  | 726.8  | 704.6  |
| 72.5° | 8100.6  | 6364.0 | 765.7  | 610.3  | 610.3  | 804.5  | 943.2  | 837.8  | 715.7  | 688.0  | 660.3  |
| 75°   | 5687.1  | 4305.5 | 560.4  | 510.5  | 510.5  | 627.0  | 871.1  | 765.7  | 671.4  | 682.5  | 671.4  |
| 77.5° | 1936.4  | 1398.2 | 405.0  | 393.9  | 377.3  | 538.2  | 776.8  | 732.4  | 621.4  | 588.1  | 543.7  |
| 80°   | 571.5   | 449.4  | 299.6  | 277.4  | 271.9  | 432.8  | 654.7  | 538.2  | 443.9  | 405.0  | 377.3  |
| 82.5° | 221.9   | 199.7  | 194.2  | 177.5  | 172.0  | 288.5  | 432.8  | 371.7  | 332.9  | 277.4  | 271.9  |
| 85°   | 88.8    | 88.8   | 99.9   | 99.9   | 88.8   | 155.4  | 260.8  | 205.3  | 194.2  | 172.0  | 166.5  |
| 87.5° | 44.4    | 44.4   | 38.8   | 27.7   | 27.7   | 33.3   | 27.7   | 27.7   | 27.7   | 27.7   | 27.7   |
| 90°   | 0.0     | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



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

Report Prepared for

Cooper Lighting Solutions

McGraw-Edison

Report Number: SP1-2407-184-2

Test Date: 10/09/2024

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

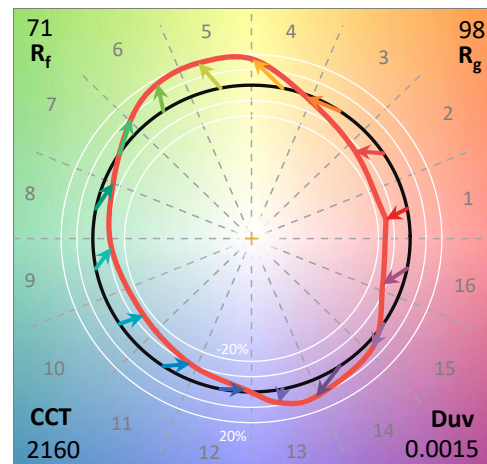
Data in this report applies to families of products including GSS-SB1A-722-U-5WQ

### 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

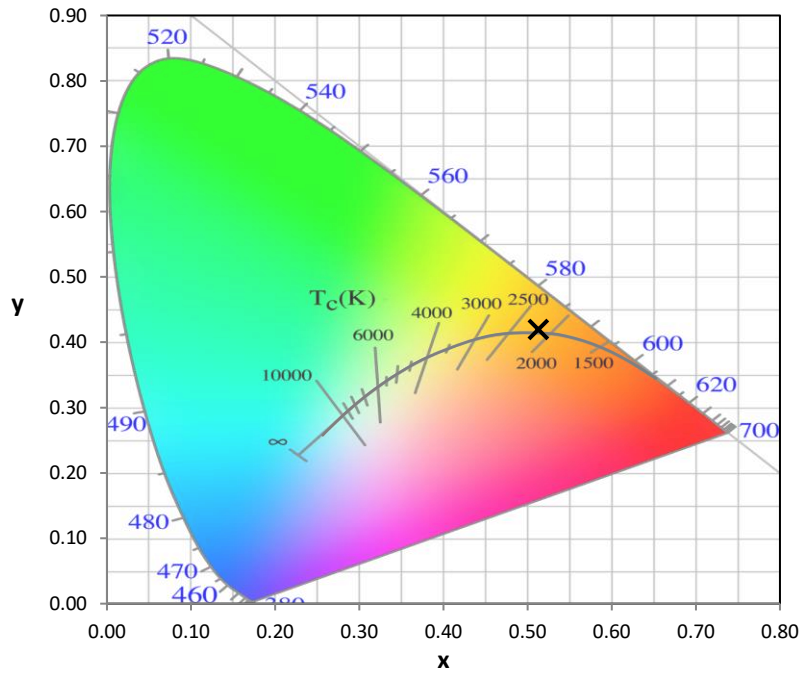
Stabilization Time: 21M  
 Operation Time: 1H 21M  
 Sphere Temperature (°C): 25.2

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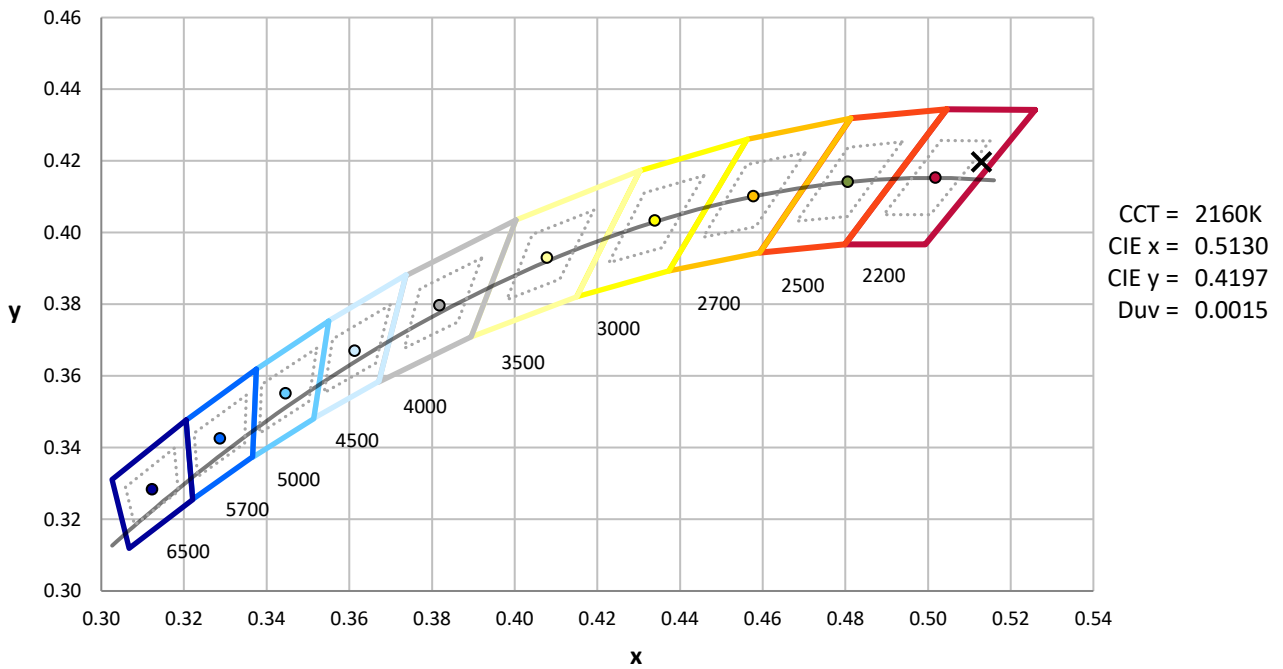
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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

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**CIE 1931 Chromaticity Diagram**



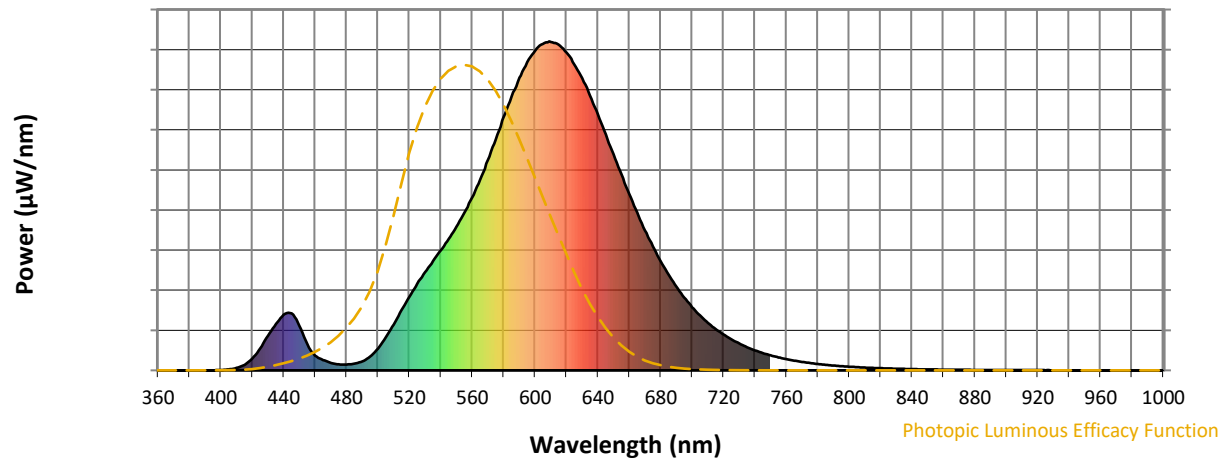
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 2200K 7-step quadrangle

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### Photopic Flux vs. Wavelength

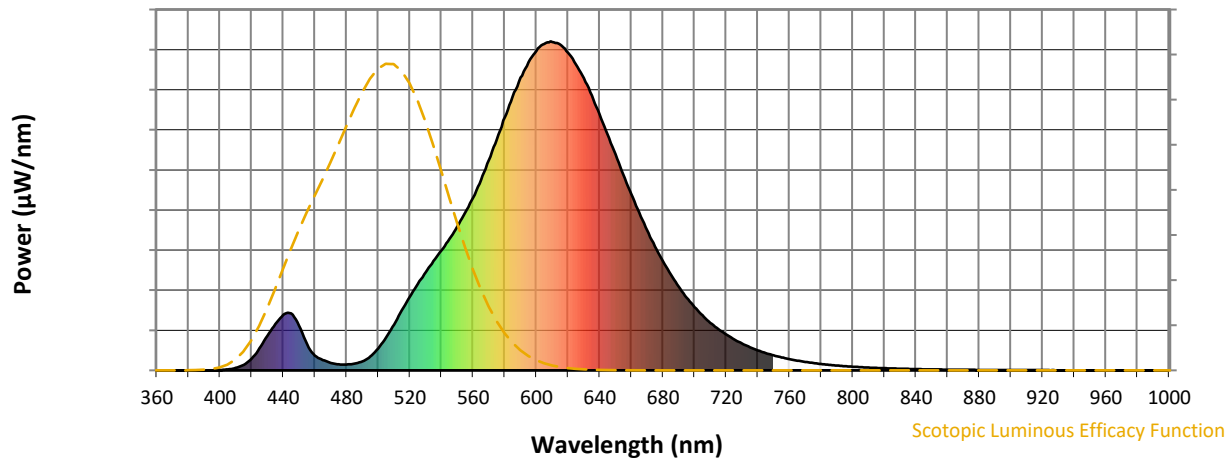


### Photopic Lumens: NR

| $\lambda$<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



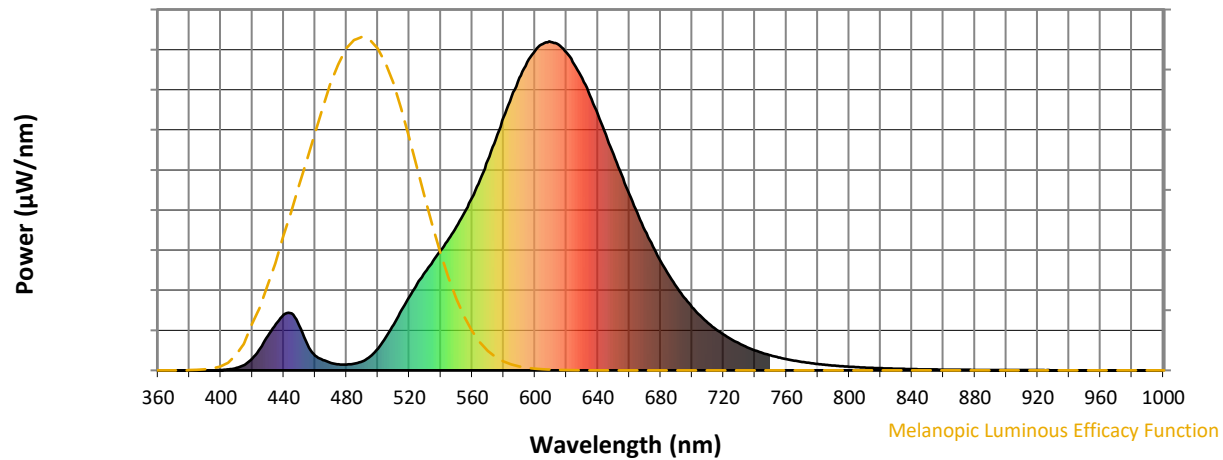
Scotopic Lumens: NR

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

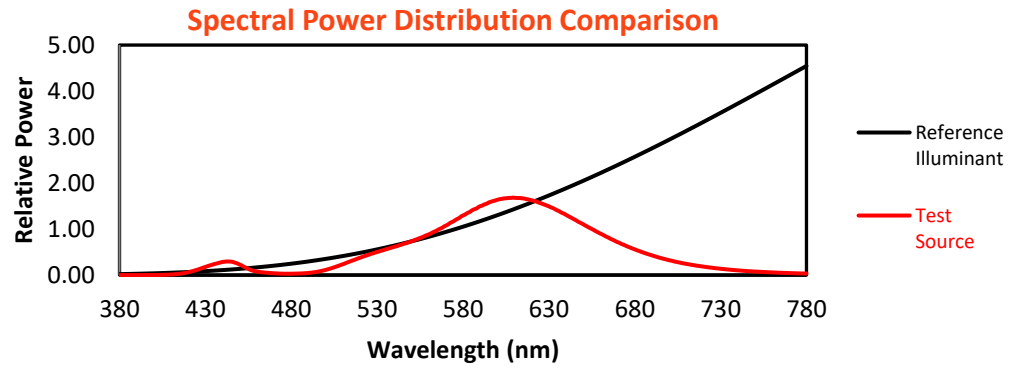
| $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | 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                             |                   |                                        |                                |

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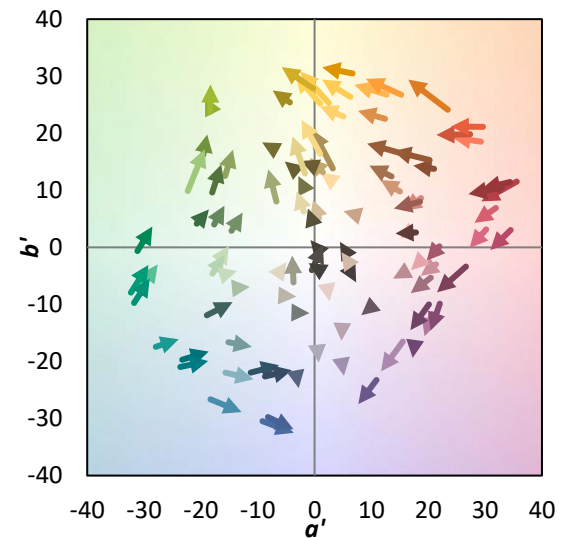
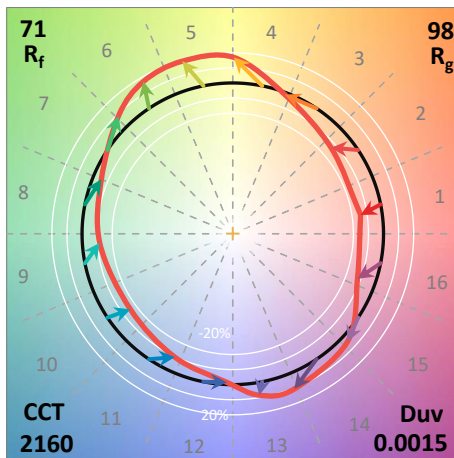
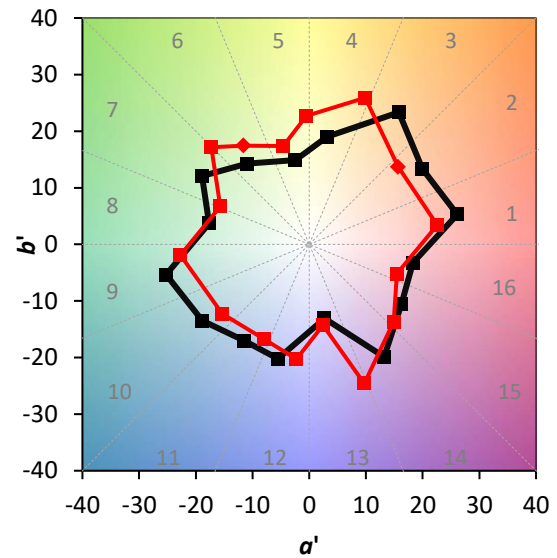
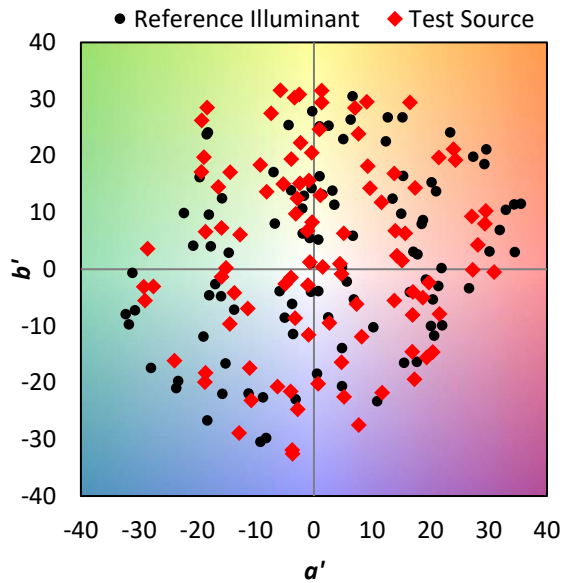
TM-30-18

### Summary

$R_f = 70.6$   
 $R_g = 97.6$   
 $CIE R_a = 71.9$   
 $R_g = -17.8$



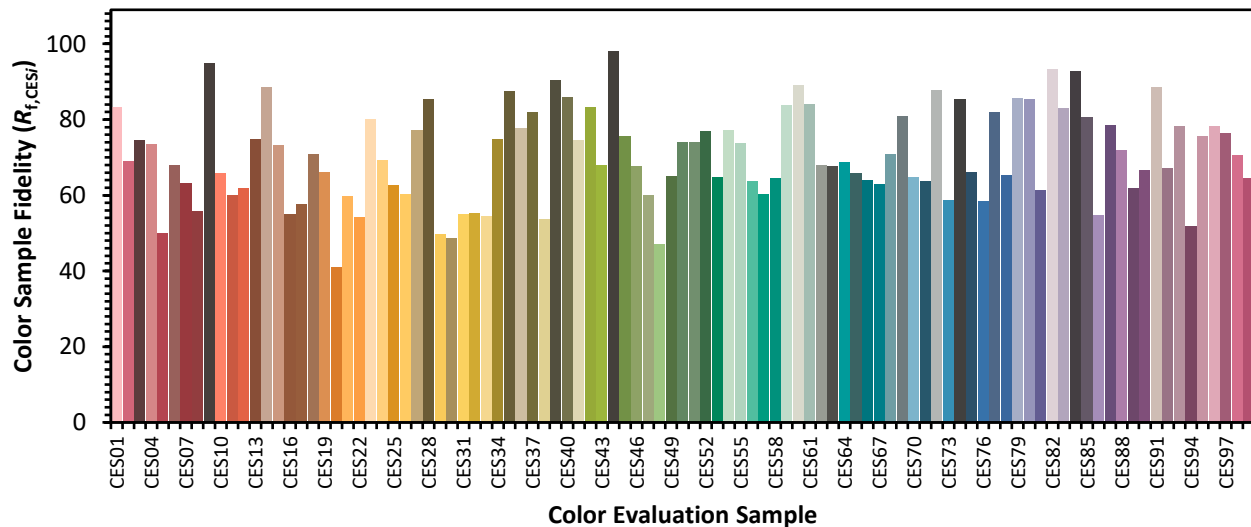
### Color Vector Graphics



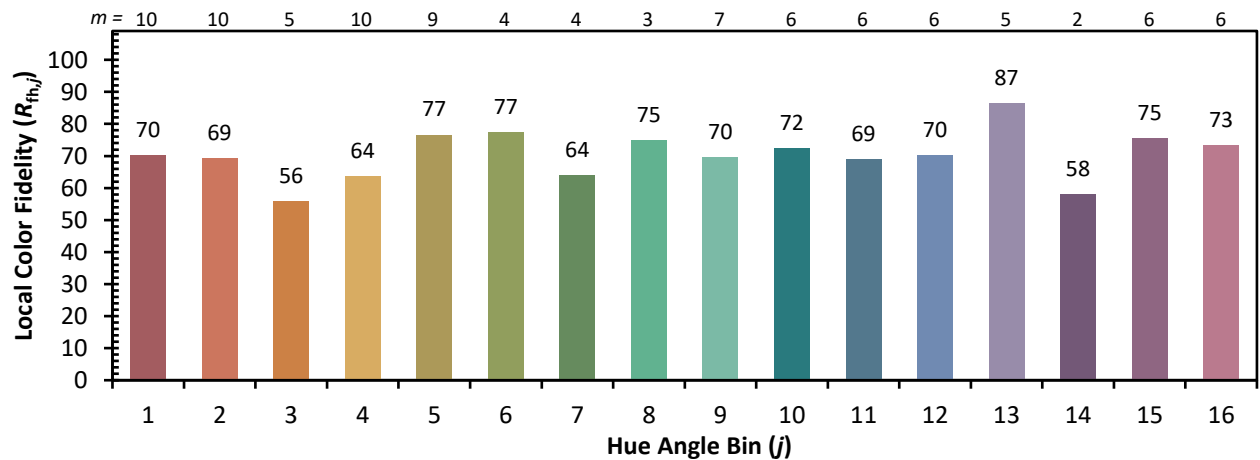
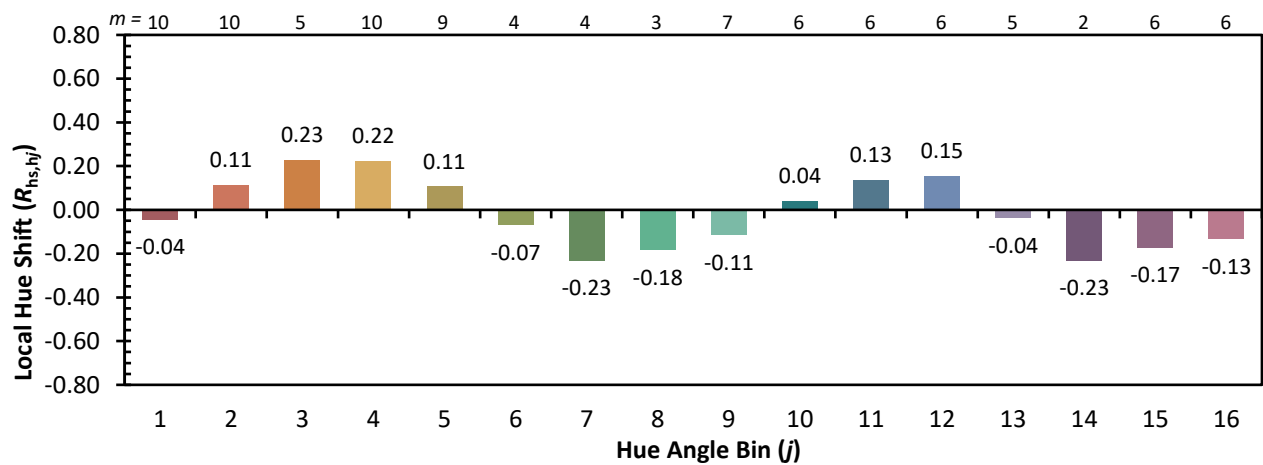
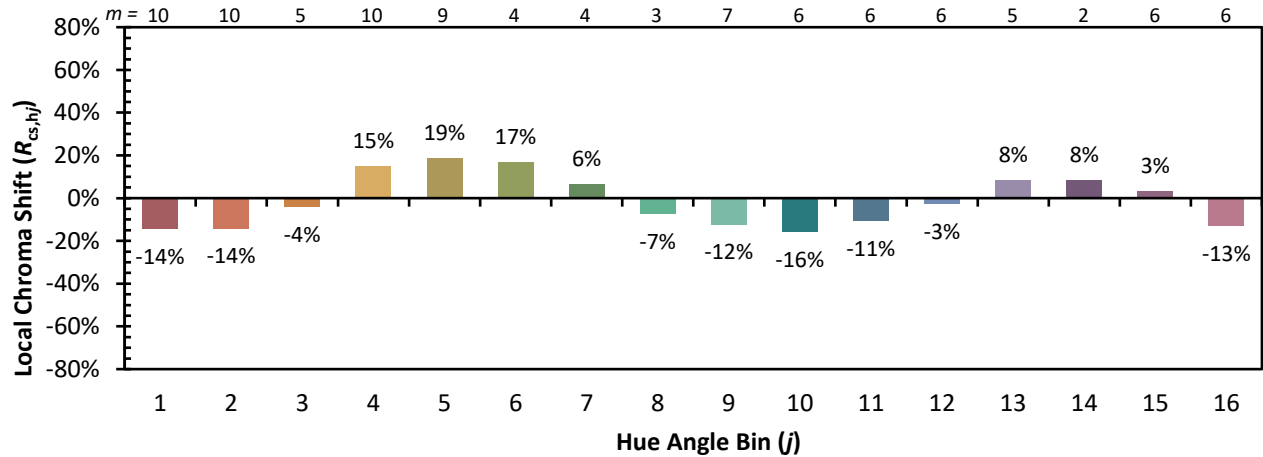


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

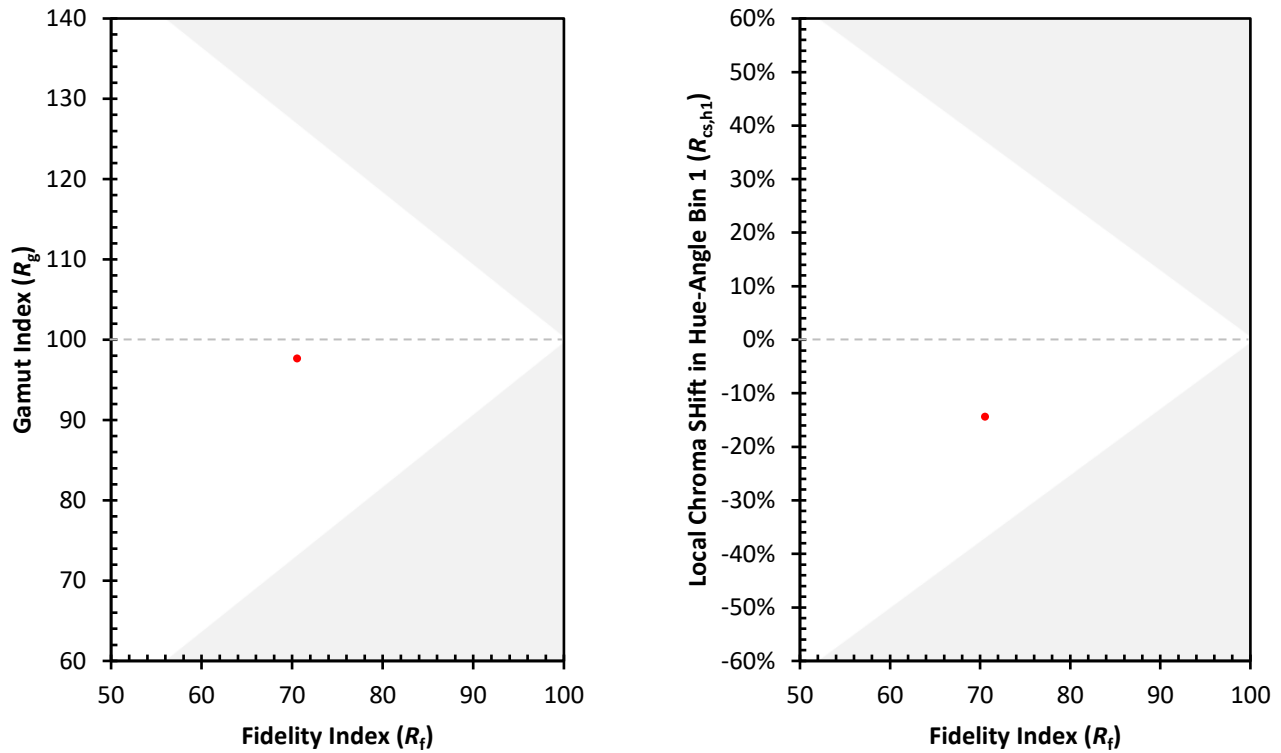
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 60 | CES51 = 74 | CES76 = 58 |
| CES02 = 65 | CES27 = 77 | CES52 = 77 | CES77 = 82 |
| CES03 = 32 | CES28 = 85 | CES53 = 65 | CES78 = 65 |
| CES04 = 72 | CES29 = 50 | CES54 = 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)