

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



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

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: STREETWORKS

Report Number: P1065841

Luminaire Tested: **NVN-SA4A-750-U-T3BC**

Issue Date: 08/07/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1065841  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 08/07/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: NVN-SA4A-750-U-T3BC  
Description: Navion AREA AND ROADWAY LUMINAIRE 615mA 4xLight Square PACKAGE  
70CRI 5000K FIXTURE w/ TYPE III ANGLED BACKLIGHT CONTROL  
Light Source: (56) 5000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 14782 lumens  
Efficiency: N/A  
Efficacy: 137.6 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B0 - U0 - G3

Input Watts (W): 107.4  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.97  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



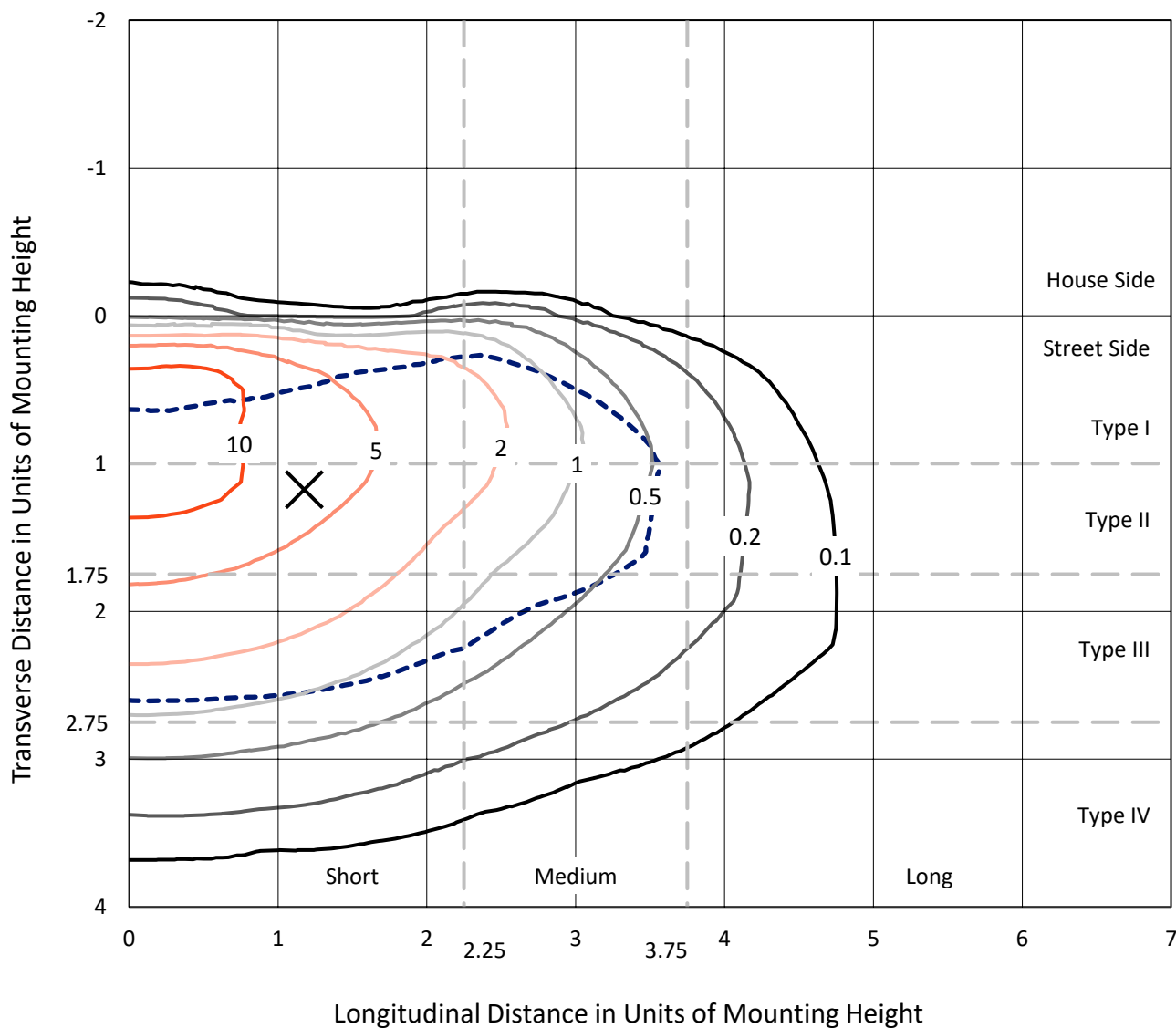
REPORT NUMBER: P1065841

CATALOG NUMBER: NVN-SA4A-750-U-T3BC

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd

--- 1/2 Max cd

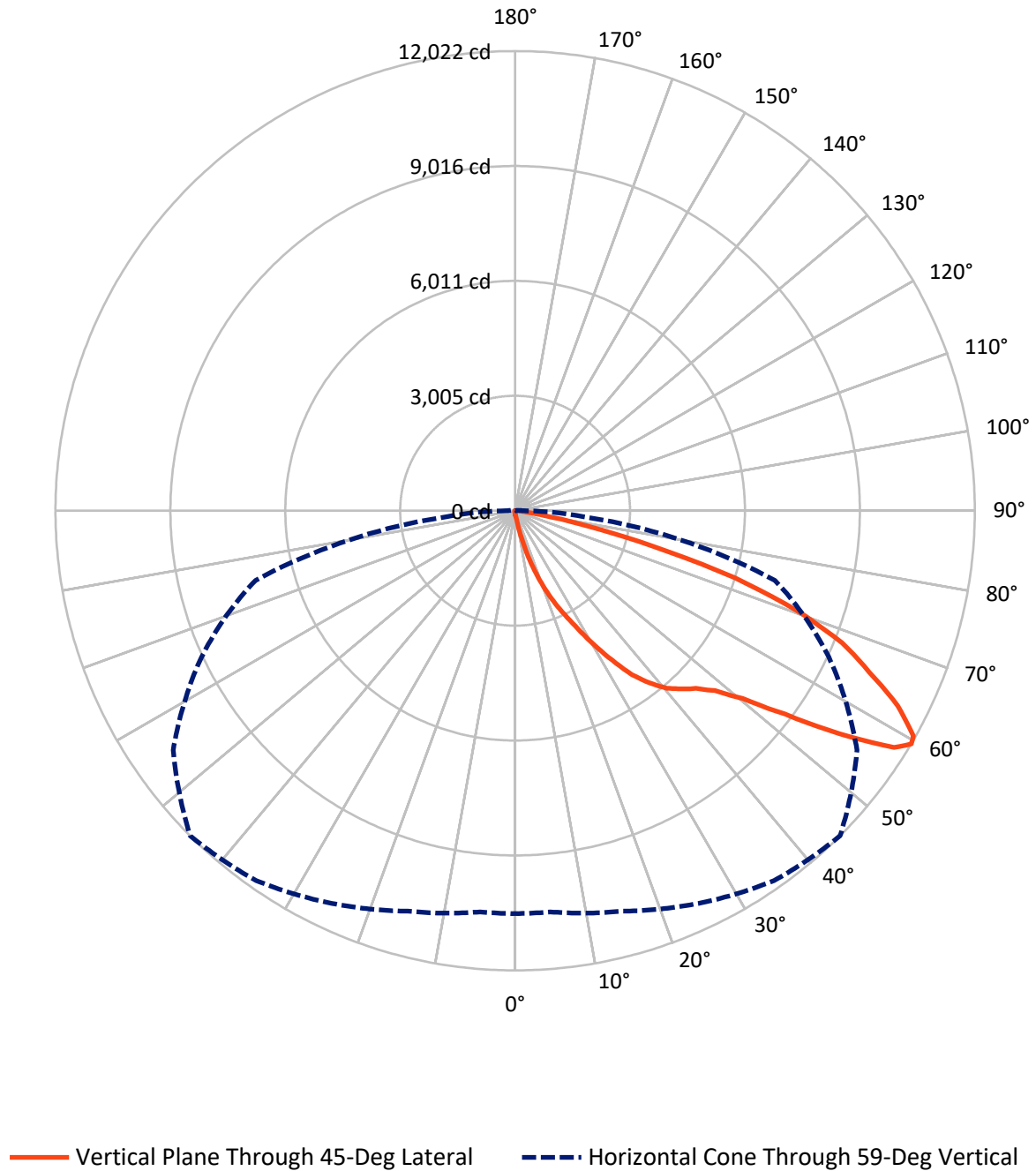


Based on 15 foot mounting height. Maximum calculated value = 16.1 fc  
 Type III - Short - N/A

REPORT NUMBER: P1065841

CATALOG NUMBER: NVN-SA4A-750-U-T3BC

## Luminous Intensity Polar Plot



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CATALOG NUMBER: NVN-SA4A-750-U-T3BC

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 52.5     | 0.0    | 52.5    |
|                    | % Fixture | 0.4      | 0.0    | 0.4     |
| <b>Street Side</b> | Lumens    | 14729.5  | 0.0    | 14729.5 |
|                    | % Fixture | 99.6     | 0.0    | 99.6    |
| <b>Total</b>       | Lumens    | 14782.0  | 0.0    | 14782.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 13.7    | 0.1       |
| 10°-20°   | 163.4   | 1.1       |
| 20°-30°   | 587.1   | 4.0       |
| 30°-40°   | 1364.2  | 9.2       |
| 40°-50°   | 2325.1  | 15.7      |
| 50°-60°   | 3831.2  | 25.9      |
| 60°-70°   | 4429.7  | 30.0      |
| 70°-80°   | 1903.2  | 12.9      |
| 80°-90°   | 164.5   | 1.1       |
| 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°    | 14782.0 | 100.0     |
| 0°-180°   | 14782.0 | 100.0     |



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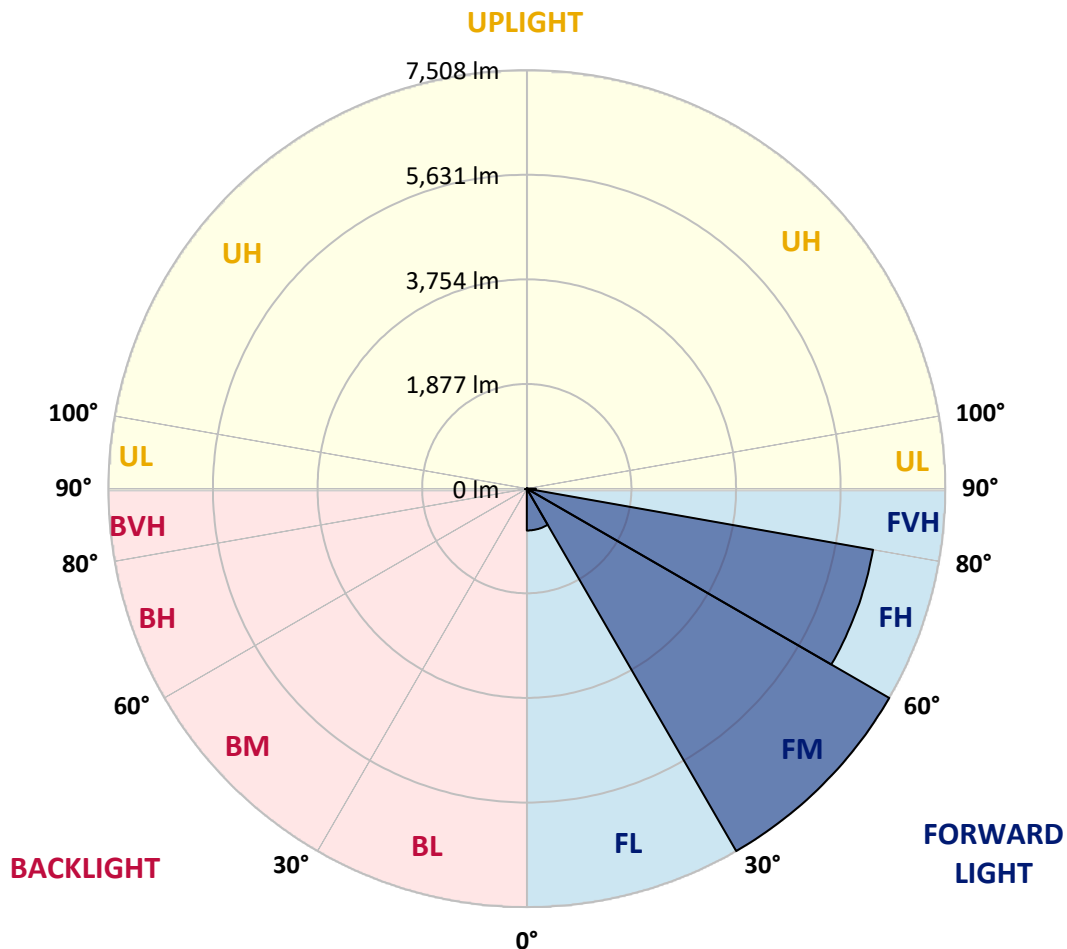
CATALOG NUMBER: NVN-SA4A-750-U-T3BC

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 751.2  | 5.1       |                         |      |         |
| FM   | (30°-60°)   | 7507.8 | 50.8      |                         |      |         |
| FH   | (60°-80°)   | 6308.2 | 42.7      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 162.3  | 1.1       |                         |      | G2/225  |
| BL   | (0°-30°)    | 13.0   | 0.1       | B0/110                  |      |         |
| BM   | (30°-60°)   | 12.7   | 0.1       | B0/220                  |      |         |
| BH   | (60°-80°)   | 24.7   | 0.2       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 2.1    | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B0-U0-G3**

Type III Short



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CATALOG NUMBER: NVN-SA4A-750-U-T3BC

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 44°     | 45°     | 55°     | 65°     | 75°     | 85°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|
| 0°    | 93.4    | 93.4    | 93.4    | 93.4    | 93.4    | 93.4    | 93.4    | 93.4    | 93.4    | 93.4    | 93.4   |
| 2.5°  | 121.3   | 121.3   | 118.3   | 114.3   | 113.3   | 110.3   | 110.3   | 107.3   | 103.4   | 100.4   | 96.4   |
| 5°    | 175.9   | 174.9   | 167.0   | 157.0   | 144.1   | 136.2   | 136.2   | 125.2   | 115.3   | 106.4   | 98.4   |
| 7.5°  | 384.7   | 375.7   | 346.9   | 299.2   | 236.6   | 194.8   | 191.8   | 156.0   | 132.2   | 114.3   | 99.4   |
| 10°   | 882.6   | 851.8   | 811.1   | 696.8   | 514.9   | 359.8   | 352.9   | 227.6   | 158.0   | 123.2   | 101.4  |
| 12.5° | 1446.2  | 1471.0  | 1389.5  | 1209.6  | 996.9   | 741.5   | 691.8   | 383.7   | 208.7   | 135.2   | 103.4  |
| 15°   | 1959.1  | 1953.1  | 1907.4  | 1760.3  | 1514.8  | 1174.8  | 1144.0  | 666.9   | 299.2   | 154.1   | 105.4  |
| 17.5° | 2342.7  | 2335.8  | 2292.0  | 2197.6  | 2008.8  | 1668.8  | 1642.0  | 1063.5  | 469.1   | 180.9   | 107.3  |
| 20°   | 2747.3  | 2738.3  | 2676.7  | 2601.2  | 2436.2  | 2146.9  | 2115.1  | 1506.8  | 734.5   | 224.6   | 107.3  |
| 22.5° | 3232.3  | 3215.4  | 3149.8  | 3021.6  | 2847.7  | 2596.2  | 2567.4  | 1960.1  | 1063.5  | 296.2   | 112.3  |
| 25°   | 3818.7  | 3789.9  | 3699.5  | 3584.2  | 3374.5  | 3040.5  | 3009.7  | 2465.0  | 1460.1  | 404.5   | 117.3  |
| 27.5° | 4487.7  | 4492.6  | 4370.4  | 4175.6  | 3894.3  | 3553.4  | 3495.7  | 2917.2  | 1870.6  | 559.6   | 123.2  |
| 30°   | 5281.8  | 5232.1  | 5060.2  | 4833.6  | 4560.2  | 4125.9  | 4070.2  | 3367.5  | 2331.8  | 788.2   | 133.2  |
| 32.5° | 6025.3  | 5971.6  | 5740.1  | 5454.8  | 5161.6  | 4703.4  | 4657.6  | 3873.4  | 2751.2  | 1058.6  | 151.1  |
| 35°   | 6663.4  | 6625.7  | 6301.6  | 5953.8  | 5693.3  | 5283.8  | 5269.9  | 4438.0  | 3244.2  | 1349.8  | 171.0  |
| 37.5° | 7225.0  | 7156.4  | 6740.0  | 6379.2  | 6114.8  | 5748.0  | 5718.2  | 4954.8  | 3719.4  | 1687.7  | 200.8  |
| 40°   | 7704.1  | 7666.3  | 7158.4  | 6684.3  | 6469.6  | 6141.6  | 6103.8  | 5408.1  | 4210.4  | 2080.3  | 237.6  |
| 42.5° | 8217.0  | 8167.3  | 7674.3  | 7142.5  | 6746.9  | 6396.1  | 6371.2  | 5781.8  | 4647.7  | 2511.7  | 292.2  |
| 45°   | 8796.4  | 8704.0  | 8271.6  | 7794.5  | 7193.2  | 6659.5  | 6631.6  | 6114.8  | 5096.0  | 2974.9  | 358.8  |
| 47.5° | 9415.7  | 9335.2  | 8985.3  | 8650.3  | 7958.5  | 7093.8  | 7034.2  | 6398.0  | 5541.3  | 3509.6  | 443.3  |
| 50°   | 10045.8 | 10047.8 | 9785.4  | 9624.4  | 8893.8  | 7799.5  | 7715.0  | 6814.5  | 6009.4  | 4082.1  | 568.5  |
| 52.5° | 10779.4 | 10798.3 | 10794.3 | 10675.0 | 10108.5 | 8953.5  | 8840.2  | 7446.7  | 6553.1  | 4750.1  | 741.5  |
| 55°   | 11086.5 | 11120.3 | 11340.0 | 11604.3 | 11450.3 | 10416.6 | 10295.3 | 8537.0  | 7273.7  | 5494.5  | 997.9  |
| 57.5° | 10835.0 | 10872.8 | 11176.0 | 11639.1 | 11993.0 | 11697.8 | 11683.9 | 9956.4  | 8222.9  | 6397.1  | 1417.4 |
| 59°   | 10535.9 | 10530.9 | 10842.0 | 11333.0 | 11810.1 | 12001.9 | 12021.8 | 10916.5 | 9049.9  | 7030.2  | 1779.2 |
| 60°   | 10337.1 | 10341.0 | 10547.8 | 11051.7 | 11558.6 | 11891.6 | 11969.1 | 11482.1 | 9533.0  | 7485.4  | 2089.3 |
| 62.5° | 9569.7  | 9615.5  | 9779.5  | 10247.6 | 10728.7 | 11100.4 | 11232.6 | 11986.0 | 10915.5 | 8560.9  | 3167.7 |
| 65°   | 8735.8  | 8738.8  | 8972.4  | 9372.9  | 9834.1  | 10095.5 | 10179.0 | 11201.8 | 11838.9 | 9656.2  | 4582.1 |
| 67.5° | 7247.9  | 7308.5  | 7573.9  | 8222.9  | 8832.2  | 9163.2  | 9226.8  | 9750.6  | 11456.2 | 10369.9 | 5290.8 |
| 70°   | 5072.1  | 5151.6  | 5530.3  | 6372.2  | 7279.7  | 7823.4  | 7819.4  | 8105.6  | 10082.6 | 10051.8 | 4485.7 |
| 72.5° | 2532.6  | 2669.7  | 2978.9  | 3880.4  | 4979.7  | 5833.5  | 6013.4  | 6520.3  | 8099.7  | 8349.2  | 3346.6 |
| 75°   | 1119.2  | 1127.1  | 1303.1  | 1757.3  | 2474.9  | 3559.3  | 3720.3  | 5175.5  | 6214.2  | 5802.7  | 2417.3 |
| 77.5° | 651.0   | 657.0   | 688.8   | 789.2   | 1002.9  | 1744.4  | 1925.3  | 3394.3  | 4391.3  | 3372.5  | 1576.4 |
| 80°   | 236.6   | 242.5   | 241.5   | 299.2   | 439.3   | 686.8   | 765.3   | 1645.0  | 2929.2  | 1776.2  | 826.0  |
| 82.5° | 145.1   | 145.1   | 140.1   | 141.1   | 160.0   | 263.4   | 288.2   | 700.7   | 1426.3  | 874.7   | 236.6  |
| 85°   | 71.6    | 75.5    | 80.5    | 90.4    | 107.3   | 130.2   | 138.2   | 200.8   | 480.1   | 211.7   | 56.7   |
| 87.5° | 42.7    | 43.7    | 47.7    | 57.6    | 71.6    | 93.4    | 99.4    | 136.2   | 172.0   | 142.1   | 13.9   |
| 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: P1065841

CATALOG NUMBER: NVN-SA4A-750-U-T3BC

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°  | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|------|------|------|------|------|------|------|------|------|------|
| 0°    | 93.4   | 93.4 | 93.4 | 93.4 | 93.4 | 93.4 | 93.4 | 93.4 | 93.4 | 93.4 | 93.4 |
| 2.5°  | 94.4   | 93.4 | 88.5 | 84.5 | 80.5 | 76.5 | 73.6 | 70.6 | 70.6 | 71.6 | 70.6 |
| 5°    | 94.4   | 90.4 | 82.5 | 75.5 | 69.6 | 64.6 | 59.6 | 55.7 | 54.7 | 54.7 | 55.7 |
| 7.5°  | 93.4   | 88.5 | 77.5 | 68.6 | 60.6 | 53.7 | 48.7 | 43.7 | 42.7 | 43.7 | 42.7 |
| 10°   | 92.4   | 86.5 | 73.6 | 62.6 | 51.7 | 44.7 | 37.8 | 32.8 | 32.8 | 32.8 | 33.8 |
| 12.5° | 92.4   | 83.5 | 69.6 | 56.7 | 44.7 | 36.8 | 29.8 | 24.8 | 23.9 | 23.9 | 23.9 |
| 15°   | 91.4   | 81.5 | 65.6 | 49.7 | 37.8 | 27.8 | 21.9 | 16.9 | 16.9 | 16.9 | 16.9 |
| 17.5° | 89.5   | 78.5 | 60.6 | 43.7 | 29.8 | 20.9 | 14.9 | 9.9  | 9.9  | 11.9 | 11.9 |
| 20°   | 87.5   | 75.5 | 54.7 | 35.8 | 24.8 | 15.9 | 9.9  | 6.0  | 6.0  | 8.9  | 9.9  |
| 22.5° | 88.5   | 75.5 | 50.7 | 31.8 | 19.9 | 11.9 | 8.0  | 5.0  | 4.0  | 7.0  | 8.9  |
| 25°   | 89.5   | 73.6 | 45.7 | 27.8 | 14.9 | 8.9  | 6.0  | 2.0  | 1.0  | 2.0  | 3.0  |
| 27.5° | 89.5   | 71.6 | 39.8 | 21.9 | 10.9 | 7.0  | 3.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 30°   | 88.5   | 68.6 | 34.8 | 17.9 | 8.0  | 4.0  | 1.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 32.5° | 87.5   | 65.6 | 31.8 | 13.9 | 7.0  | 2.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 35°   | 88.5   | 61.6 | 27.8 | 10.9 | 4.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 2.0  |
| 37.5° | 91.4   | 57.6 | 23.9 | 8.9  | 3.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 40°   | 95.4   | 54.7 | 19.9 | 7.0  | 1.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 42.5° | 103.4  | 54.7 | 17.9 | 5.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 45°   | 113.3  | 54.7 | 14.9 | 4.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 47.5° | 126.2  | 55.7 | 12.9 | 4.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 50°   | 142.1  | 57.6 | 11.9 | 3.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 52.5° | 154.1  | 55.7 | 10.9 | 3.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 55°   | 174.9  | 53.7 | 9.9  | 2.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 57.5° | 202.8  | 50.7 | 9.9  | 1.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 59°   | 230.6  | 46.7 | 9.9  | 1.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 60°   | 262.4  | 44.7 | 8.9  | 1.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 62.5° | 433.4  | 39.8 | 8.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 65°   | 836.9  | 37.8 | 7.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 67.5° | 1352.8 | 37.8 | 5.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 70°   | 1422.3 | 37.8 | 4.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 72.5° | 946.2  | 30.8 | 3.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 75°   | 506.9  | 27.8 | 3.0  | 1.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 77.5° | 273.3  | 25.8 | 4.0  | 2.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 80°   | 120.3  | 18.9 | 5.0  | 3.0  | 2.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 82.5° | 47.7   | 12.9 | 6.0  | 5.0  | 4.0  | 2.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 85°   | 22.9   | 9.9  | 8.0  | 7.0  | 5.0  | 3.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 87.5° | 10.9   | 9.9  | 8.9  | 8.0  | 7.0  | 5.0  | 1.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 90°   | 0.0    | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |



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

Report Prepared for

Cooper Lighting Solutions

McGraw-Edison

Report Number: SP1-2407-184-6

Test Date: 10/10/2024

Luminaire Tested: GSS-SB1A-750-U-5WQ

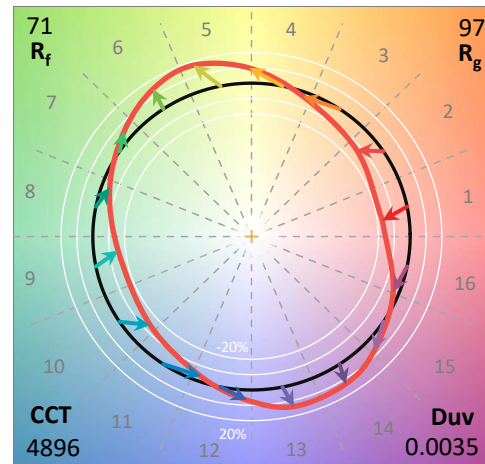
Data in this report applies to families of products including GSS-SB1A-750-U-5WQ

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-6  
 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-750-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 70 CRI  
 5000K CCT 26 LEDS

### Spectral Parameters

|                           |          |           |      |      |       |
|---------------------------|----------|-----------|------|------|-------|
| CCT (K):                  | 4896     | CRI (Ra): | 70.2 |      |       |
| CIE u':                   | 0.2101   | R1:       | 68.1 | R9:  | -35.1 |
| CIE v':                   | 0.4901   | R2:       | 73.9 | R10: | 39.3  |
| Duv:                      | 0.0035   | R3:       | 79.4 | R11: | 71.1  |
| CIE x:                    | 0.3489   | R4:       | 72.1 | R12: | 43.8  |
| CIE y:                    | 0.3618   | R5:       | 69.2 | R13: | 68.1  |
| CIE z:                    | 0.2893   | R6:       | 65.7 | R14: | 88.4  |
| Peak Wavelength (nm):     | 443      | R7:       | 78.1 | R15: | 59.7  |
| Dominant Wavelength (nm): | 570      | R8:       | 55.3 |      |       |
| Purity:                   | 13.25435 |           |      |      |       |
| Rf:                       | 70.7     |           |      |      |       |
| Rg:                       | 96.8     |           |      |      |       |



### Test Conditions

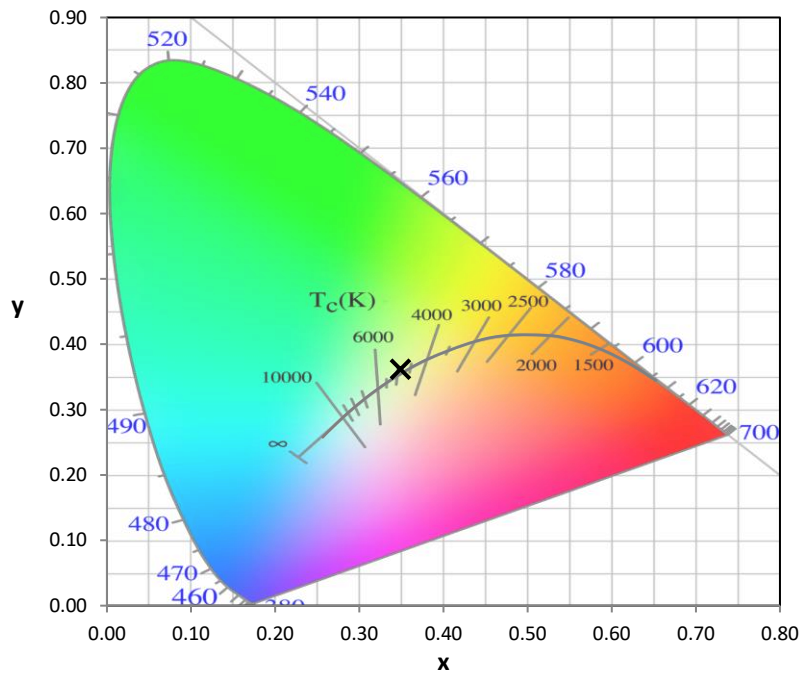
Stabilization Time: 21M  
 Operation Time: 1H 21M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-184-6

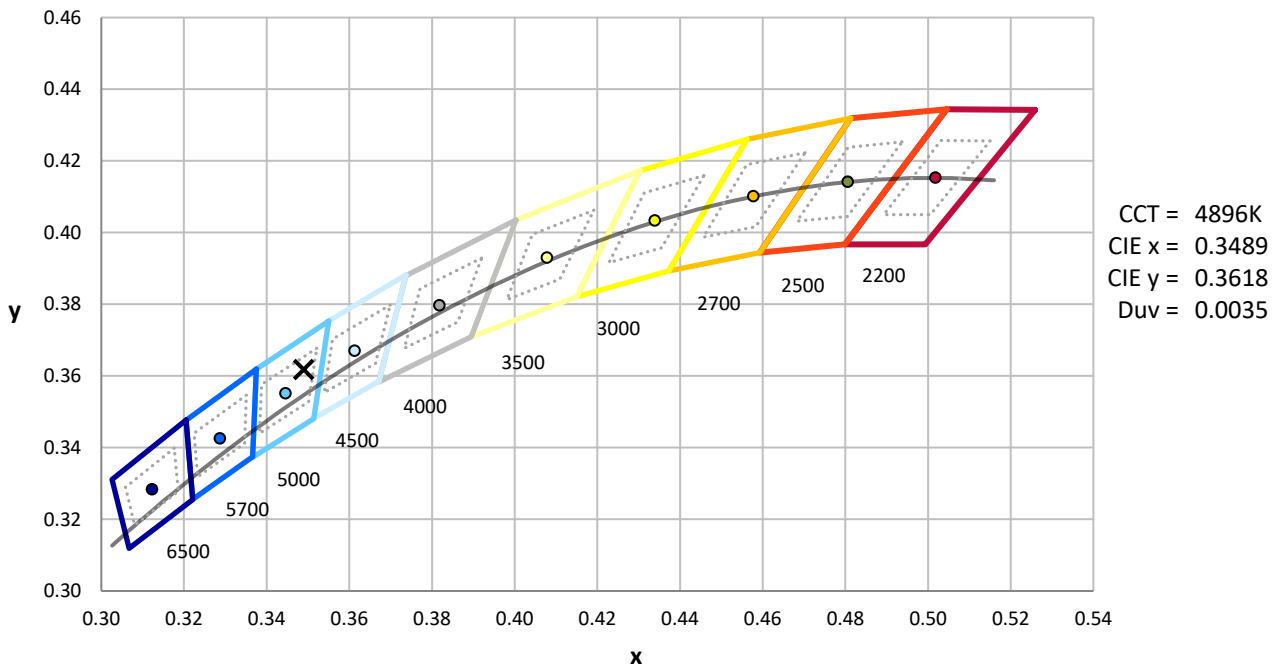
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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**



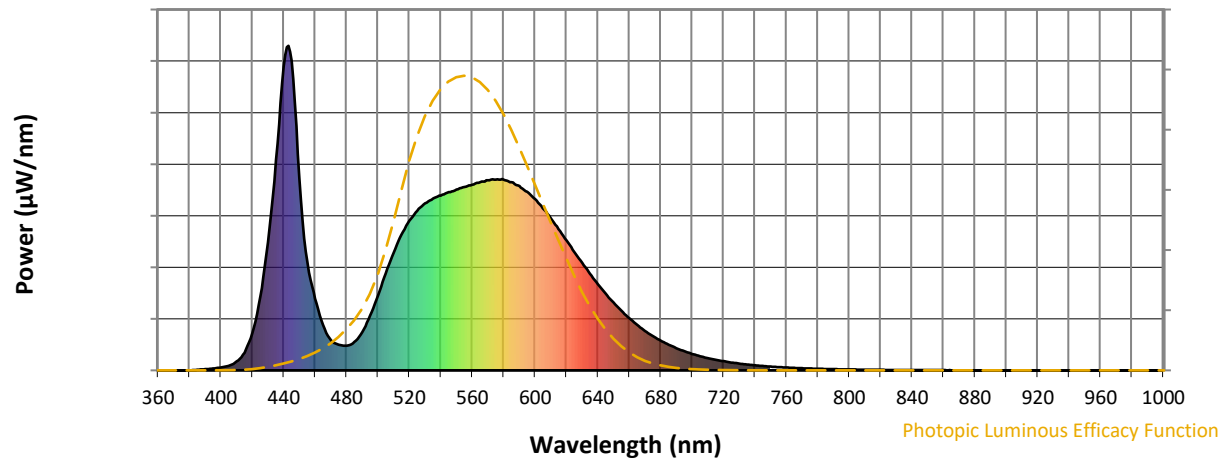
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 5000K 4-step quadrangle

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### Photopic Flux vs. Wavelength

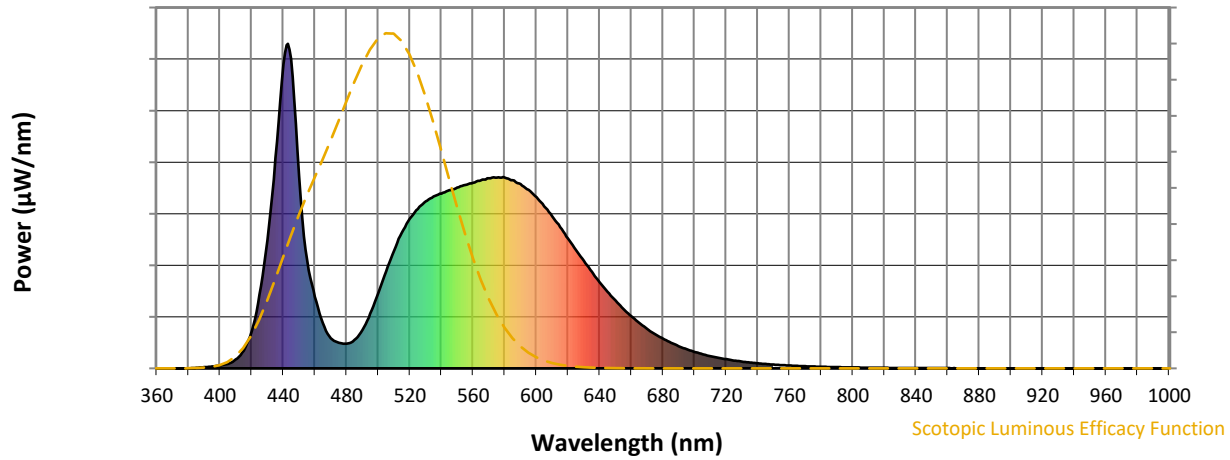


### Photopic Lumens: NR

| λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 118                         | NR               | 620       | 401                         | NR               | 750       | 12                          | NR               | 880       | 0                           | NR               |
| 365       | 0                           | NR               | 495       | 168                         | NR               | 625       | 365                         | NR               | 755       | 10                          | NR               | 885       | 0                           | NR               |
| 370       | 0                           | NR               | 500       | 230                         | NR               | 630       | 331                         | NR               | 760       | 9                           | NR               | 890       | 0                           | NR               |
| 375       | 0                           | NR               | 505       | 299                         | NR               | 635       | 298                         | NR               | 765       | 8                           | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 362                         | NR               | 640       | 266                         | NR               | 770       | 6                           | NR               | 900       | 0                           | NR               |
| 385       | 2                           | NR               | 515       | 418                         | NR               | 645       | 236                         | NR               | 775       | 6                           | NR               | 905       | 0                           | NR               |
| 390       | 4                           | NR               | 520       | 461                         | NR               | 650       | 209                         | NR               | 780       | 5                           | NR               | 910       | 0                           | NR               |
| 395       | 6                           | NR               | 525       | 491                         | NR               | 655       | 184                         | NR               | 785       | 4                           | NR               | 915       | 0                           | NR               |
| 400       | 9                           | NR               | 530       | 514                         | NR               | 660       | 160                         | NR               | 790       | 4                           | NR               | 920       | 0                           | NR               |
| 405       | 14                          | NR               | 535       | 530                         | NR               | 665       | 140                         | NR               | 795       | 3                           | NR               | 925       | 0                           | NR               |
| 410       | 27                          | NR               | 540       | 539                         | NR               | 670       | 122                         | NR               | 800       | 3                           | NR               | 930       | 0                           | NR               |
| 415       | 55                          | NR               | 545       | 549                         | NR               | 675       | 106                         | NR               | 805       | 2                           | NR               | 935       | 0                           | NR               |
| 420       | 115                         | NR               | 550       | 557                         | NR               | 680       | 92                          | NR               | 810       | 2                           | NR               | 940       | 0                           | NR               |
| 425       | 226                         | NR               | 555       | 565                         | NR               | 685       | 79                          | NR               | 815       | 2                           | NR               | 945       | 0                           | NR               |
| 430       | 395                         | NR               | 560       | 572                         | NR               | 690       | 68                          | NR               | 820       | 2                           | NR               | 950       | 0                           | NR               |
| 435       | 648                         | NR               | 565       | 580                         | NR               | 695       | 59                          | NR               | 825       | 1                           | NR               | 955       | 0                           | NR               |
| 440       | 937                         | NR               | 570       | 586                         | NR               | 700       | 51                          | NR               | 830       | 1                           | NR               | 960       | 0                           | NR               |
| 445       | 953                         | NR               | 575       | 588                         | NR               | 705       | 44                          | NR               | 835       | 1                           | NR               | 965       | 0                           | NR               |
| 450       | 591                         | NR               | 580       | 588                         | NR               | 710       | 38                          | NR               | 840       | 1                           | NR               | 970       | 0                           | NR               |
| 455       | 334                         | NR               | 585       | 580                         | NR               | 715       | 32                          | NR               | 845       | 1                           | NR               | 975       | 0                           | NR               |
| 460       | 221                         | NR               | 590       | 568                         | NR               | 720       | 28                          | NR               | 850       | 1                           | NR               | 980       | 0                           | NR               |
| 465       | 140                         | NR               | 595       | 550                         | NR               | 725       | 24                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 93                          | NR               | 600       | 527                         | NR               | 730       | 21                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 79                          | NR               | 605       | 499                         | NR               | 735       | 18                          | NR               | 865       | 0                           | NR               | 995       | 0                           | NR               |
| 480       | 76                          | NR               | 610       | 469                         | NR               | 740       | 15                          | NR               | 870       | 0                           | NR               | 1000      | 0                           | NR               |
| 485       | 87                          | NR               | 615       | 435                         | NR               | 745       | 13                          | NR               | 875       | 0                           | NR               |           |                             |                  |

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### Scotopic Flux vs. Wavelength



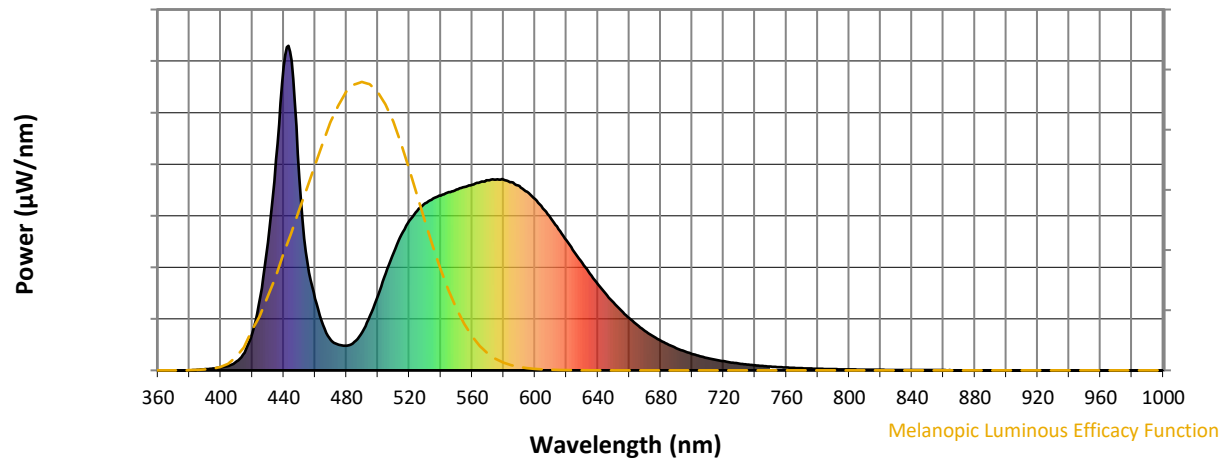
Scotopic Lumens: NR

S/P: 1.7

| λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(Φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 118                         | NR               | 620       | 401                         | NR               | 750       | 12                          | NR               | 880       | 0                           | NR               |
| 365       | 0                           | NR               | 495       | 168                         | NR               | 625       | 365                         | NR               | 755       | 10                          | NR               | 885       | 0                           | NR               |
| 370       | 0                           | NR               | 500       | 230                         | NR               | 630       | 331                         | NR               | 760       | 9                           | NR               | 890       | 0                           | NR               |
| 375       | 0                           | NR               | 505       | 299                         | NR               | 635       | 298                         | NR               | 765       | 8                           | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 362                         | NR               | 640       | 266                         | NR               | 770       | 6                           | NR               | 900       | 0                           | NR               |
| 385       | 2                           | NR               | 515       | 418                         | NR               | 645       | 236                         | NR               | 775       | 6                           | NR               | 905       | 0                           | NR               |
| 390       | 4                           | NR               | 520       | 461                         | NR               | 650       | 209                         | NR               | 780       | 5                           | NR               | 910       | 0                           | NR               |
| 395       | 6                           | NR               | 525       | 491                         | NR               | 655       | 184                         | NR               | 785       | 4                           | NR               | 915       | 0                           | NR               |
| 400       | 9                           | NR               | 530       | 514                         | NR               | 660       | 160                         | NR               | 790       | 4                           | NR               | 920       | 0                           | NR               |
| 405       | 14                          | NR               | 535       | 530                         | NR               | 665       | 140                         | NR               | 795       | 3                           | NR               | 925       | 0                           | NR               |
| 410       | 27                          | NR               | 540       | 539                         | NR               | 670       | 122                         | NR               | 800       | 3                           | NR               | 930       | 0                           | NR               |
| 415       | 55                          | NR               | 545       | 549                         | NR               | 675       | 106                         | NR               | 805       | 2                           | NR               | 935       | 0                           | NR               |
| 420       | 115                         | NR               | 550       | 557                         | NR               | 680       | 92                          | NR               | 810       | 2                           | NR               | 940       | 0                           | NR               |
| 425       | 226                         | NR               | 555       | 565                         | NR               | 685       | 79                          | NR               | 815       | 2                           | NR               | 945       | 0                           | NR               |
| 430       | 395                         | NR               | 560       | 572                         | NR               | 690       | 68                          | NR               | 820       | 2                           | NR               | 950       | 0                           | NR               |
| 435       | 648                         | NR               | 565       | 580                         | NR               | 695       | 59                          | NR               | 825       | 1                           | NR               | 955       | 0                           | NR               |
| 440       | 937                         | NR               | 570       | 586                         | NR               | 700       | 51                          | NR               | 830       | 1                           | NR               | 960       | 0                           | NR               |
| 445       | 953                         | NR               | 575       | 588                         | NR               | 705       | 44                          | NR               | 835       | 1                           | NR               | 965       | 0                           | NR               |
| 450       | 591                         | NR               | 580       | 588                         | NR               | 710       | 38                          | NR               | 840       | 1                           | NR               | 970       | 0                           | NR               |
| 455       | 334                         | NR               | 585       | 580                         | NR               | 715       | 32                          | NR               | 845       | 1                           | NR               | 975       | 0                           | NR               |
| 460       | 221                         | NR               | 590       | 568                         | NR               | 720       | 28                          | NR               | 850       | 1                           | NR               | 980       | 0                           | NR               |
| 465       | 140                         | NR               | 595       | 550                         | NR               | 725       | 24                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 93                          | NR               | 600       | 527                         | NR               | 730       | 21                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 79                          | NR               | 605       | 499                         | NR               | 735       | 18                          | NR               | 865       | 0                           | NR               | 995       | 0                           | NR               |
| 480       | 76                          | NR               | 610       | 469                         | NR               | 740       | 15                          | NR               | 870       | 0                           | NR               | 1000      | 0                           | NR               |
| 485       | 87                          | NR               | 615       | 435                         | NR               | 745       | 13                          | NR               | 875       | 0                           | NR               |           |                             |                  |

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### Melanopic Flux vs. Wavelength


**Melanopic Lumens: NR**
**M/P: 3.37**

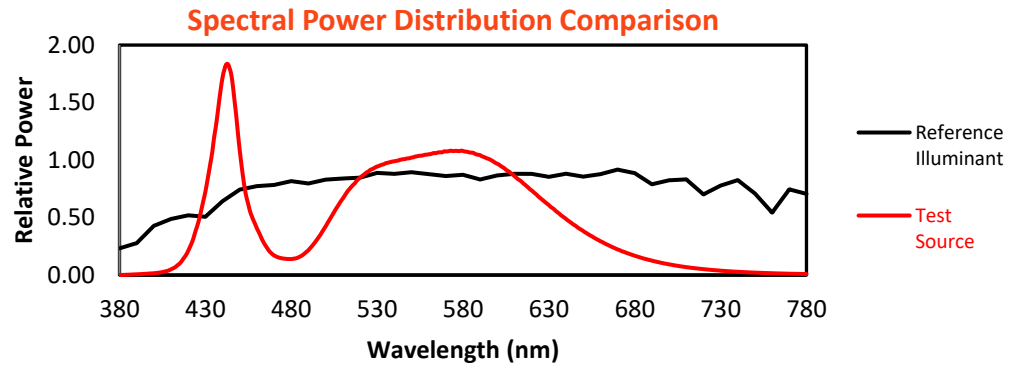
| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<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               | 118                                  | NR                             | 620               | 401                                  | NR                             | 750               | 12                                   | NR                             | 880               | 0                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 168                                  | NR                             | 625               | 365                                  | NR                             | 755               | 10                                   | NR                             | 885               | 0                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 230                                  | NR                             | 630               | 331                                  | NR                             | 760               | 9                                    | NR                             | 890               | 0                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 299                                  | NR                             | 635               | 298                                  | NR                             | 765               | 8                                    | NR                             | 895               | 0                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 362                                  | NR                             | 640               | 266                                  | NR                             | 770               | 6                                    | NR                             | 900               | 0                                    | NR                             |
| 385               | 2                                    | NR                             | 515               | 418                                  | NR                             | 645               | 236                                  | NR                             | 775               | 6                                    | NR                             | 905               | 0                                    | NR                             |
| 390               | 4                                    | NR                             | 520               | 461                                  | NR                             | 650               | 209                                  | NR                             | 780               | 5                                    | NR                             | 910               | 0                                    | NR                             |
| 395               | 6                                    | NR                             | 525               | 491                                  | NR                             | 655               | 184                                  | NR                             | 785               | 4                                    | NR                             | 915               | 0                                    | NR                             |
| 400               | 9                                    | NR                             | 530               | 514                                  | NR                             | 660               | 160                                  | NR                             | 790               | 4                                    | NR                             | 920               | 0                                    | NR                             |
| 405               | 14                                   | NR                             | 535               | 530                                  | NR                             | 665               | 140                                  | NR                             | 795               | 3                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 27                                   | NR                             | 540               | 539                                  | NR                             | 670               | 122                                  | NR                             | 800               | 3                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 55                                   | NR                             | 545               | 549                                  | NR                             | 675               | 106                                  | NR                             | 805               | 2                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 115                                  | NR                             | 550               | 557                                  | NR                             | 680               | 92                                   | NR                             | 810               | 2                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 226                                  | NR                             | 555               | 565                                  | NR                             | 685               | 79                                   | NR                             | 815               | 2                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 395                                  | NR                             | 560               | 572                                  | NR                             | 690               | 68                                   | NR                             | 820               | 2                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 648                                  | NR                             | 565               | 580                                  | NR                             | 695               | 59                                   | NR                             | 825               | 1                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 937                                  | NR                             | 570               | 586                                  | NR                             | 700               | 51                                   | NR                             | 830               | 1                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 953                                  | NR                             | 575               | 588                                  | NR                             | 705               | 44                                   | NR                             | 835               | 1                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 591                                  | NR                             | 580               | 588                                  | NR                             | 710               | 38                                   | NR                             | 840               | 1                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 334                                  | NR                             | 585               | 580                                  | NR                             | 715               | 32                                   | NR                             | 845               | 1                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 221                                  | NR                             | 590               | 568                                  | NR                             | 720               | 28                                   | NR                             | 850               | 1                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 140                                  | NR                             | 595               | 550                                  | NR                             | 725               | 24                                   | NR                             | 855               | 1                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 93                                   | NR                             | 600               | 527                                  | NR                             | 730               | 21                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 79                                   | NR                             | 605               | 499                                  | NR                             | 735               | 18                                   | NR                             | 865               | 0                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 76                                   | NR                             | 610               | 469                                  | NR                             | 740               | 15                                   | NR                             | 870               | 0                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 87                                   | NR                             | 615               | 435                                  | NR                             | 745               | 13                                   | NR                             | 875               | 0                                    | NR                             |                   |                                      |                                |

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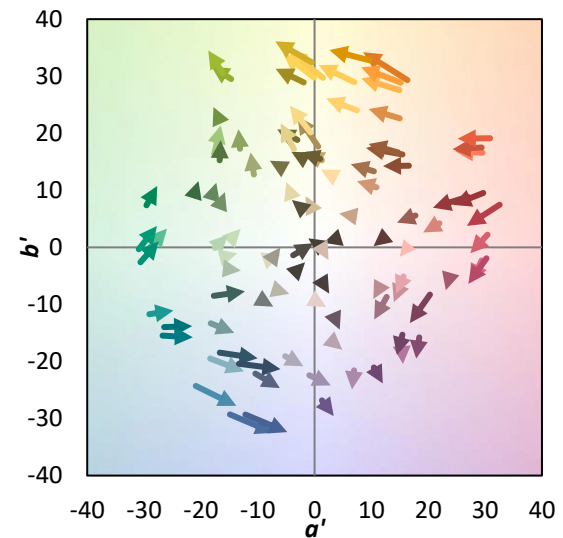
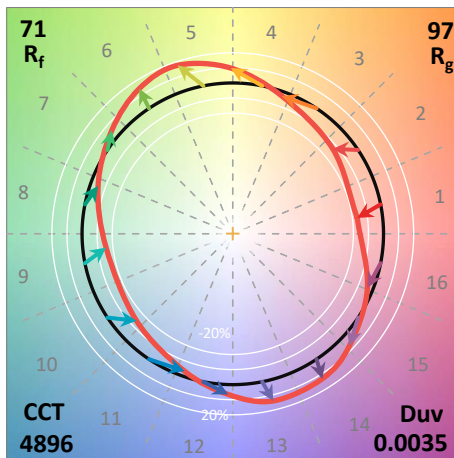
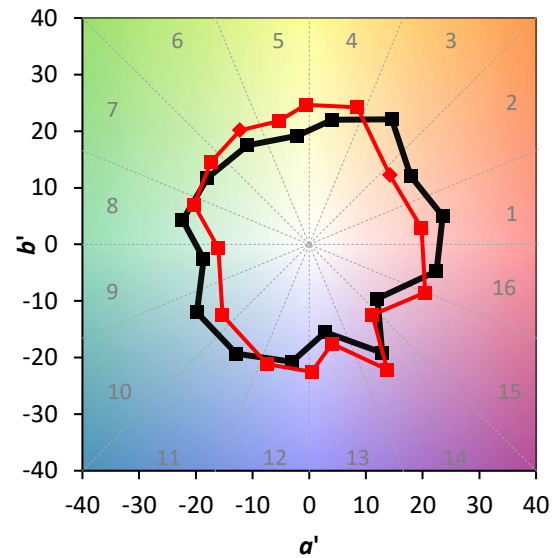
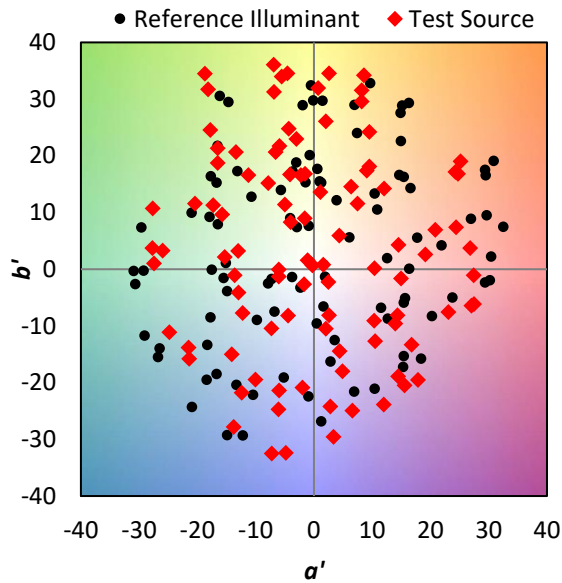
TM-30-18

### Summary

$R_f = 70.7$   
 $R_g = 96.8$   
 $CIE R_a = 70.2$   
 $R_g = -35.1$



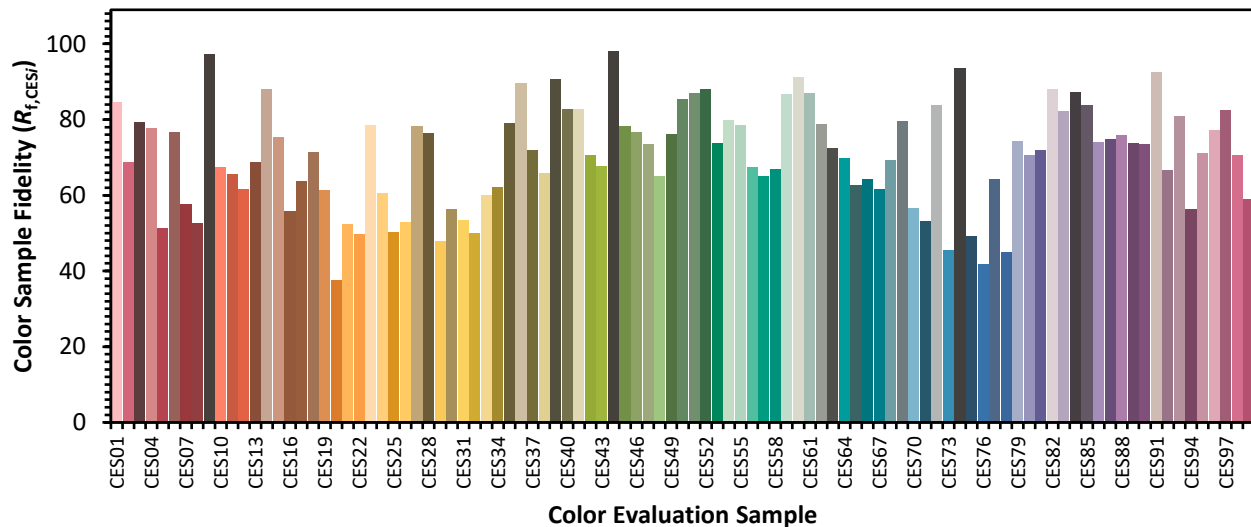
### Color Vector Graphics



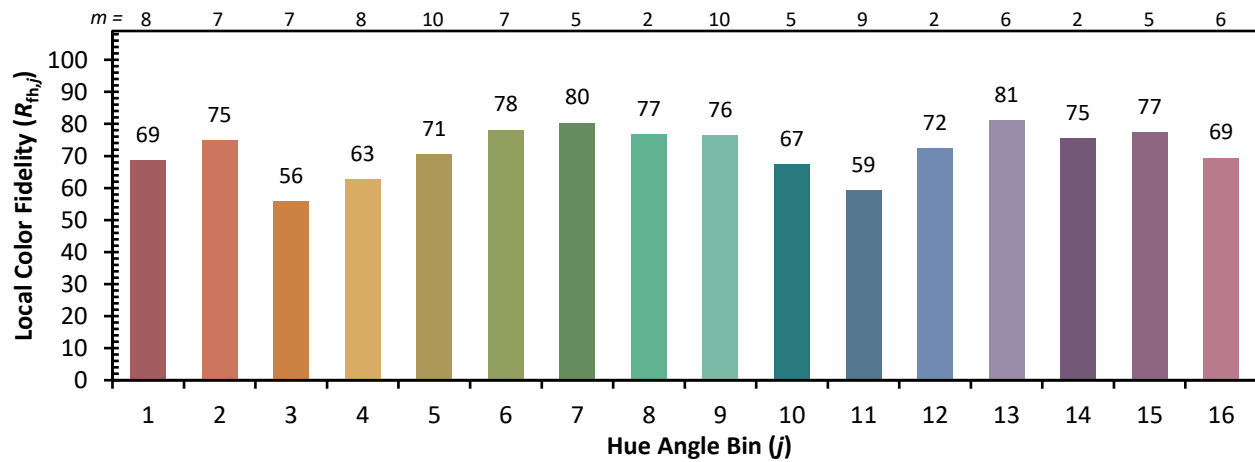
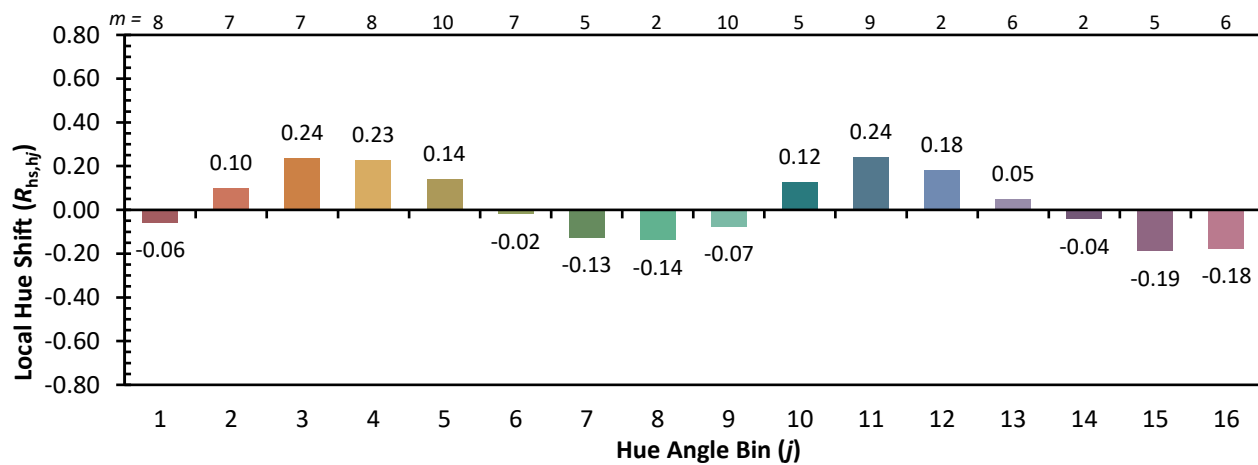
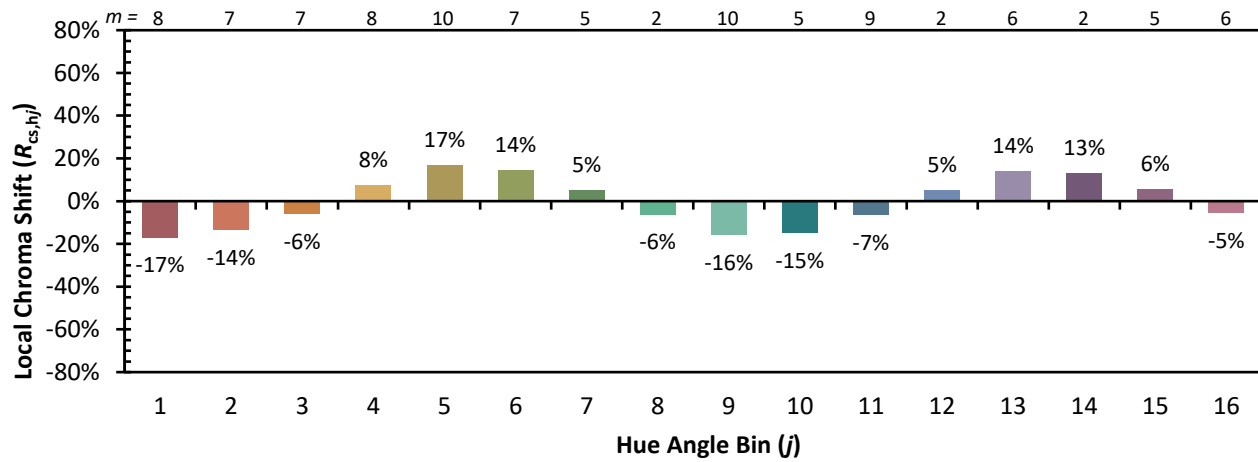


Individual Sample Fidelity Index ( $R_{f,i}$ )

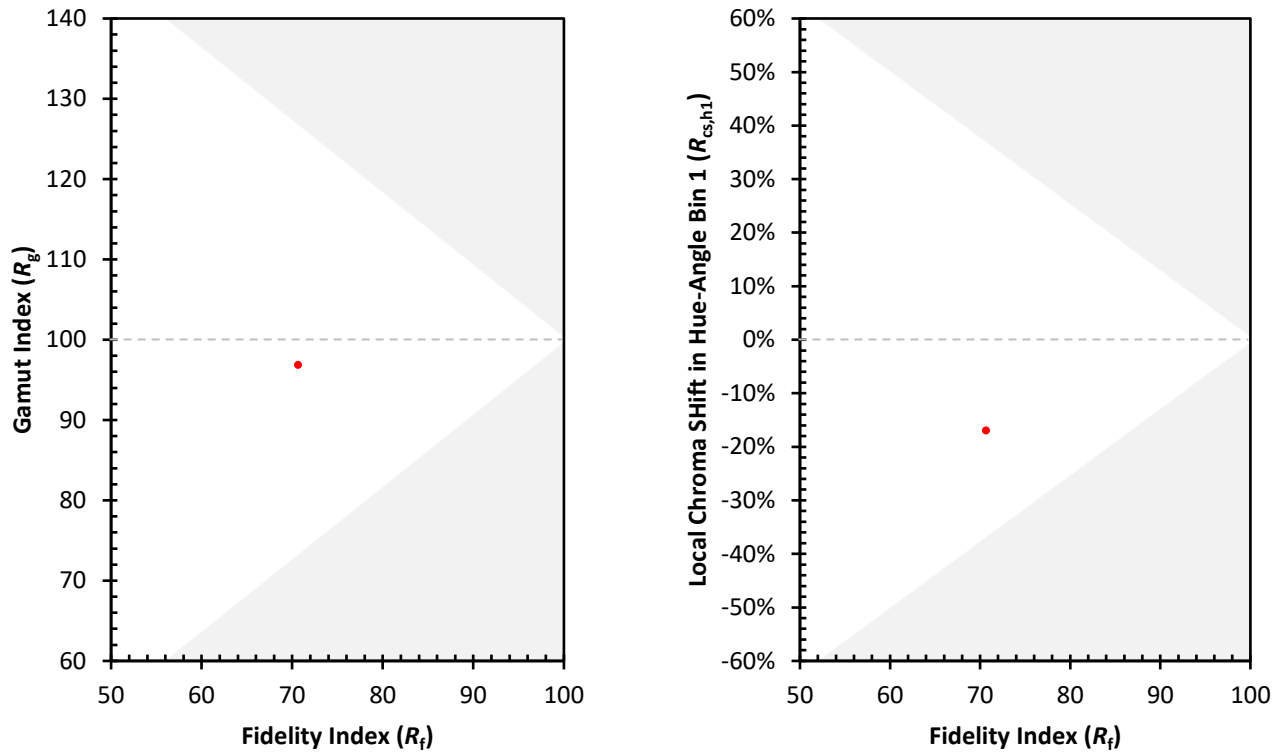
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 53 | CES51 = 87 | CES76 = 42 |
| CES02 = 59 | CES27 = 78 | CES52 = 88 | CES77 = 64 |
| CES03 = 30 | CES28 = 76 | CES53 = 74 | CES78 = 45 |
| CES04 = 69 | CES29 = 48 | CES54 = 80 | CES79 = 74 |
| CES05 = 46 | CES30 = 56 | CES55 = 79 | CES80 = 71 |
| CES06 = 50 | CES31 = 54 | CES56 = 68 | CES81 = 72 |
| CES07 = 39 | CES32 = 50 | CES57 = 65 | CES82 = 88 |
| CES08 = 38 | CES33 = 60 | CES58 = 67 | CES83 = 82 |
| CES09 = 29 | CES34 = 62 | CES59 = 87 | CES84 = 87 |
| CES10 = 72 | CES35 = 79 | CES60 = 91 | CES85 = 84 |
| CES11 = 56 | CES36 = 90 | CES61 = 87 | CES86 = 74 |
| CES12 = 61 | CES37 = 72 | CES62 = 79 | CES87 = 75 |
| CES13 = 41 | CES38 = 66 | CES63 = 72 | CES88 = 76 |
| CES14 = 74 | CES39 = 91 | CES64 = 70 | CES89 = 74 |
| CES15 = 70 | CES40 = 83 | CES65 = 63 | CES90 = 73 |
| CES16 = 46 | CES41 = 83 | CES66 = 64 | CES91 = 92 |
| CES17 = 49 | CES42 = 70 | CES67 = 62 | CES92 = 67 |
| CES18 = 55 | CES43 = 68 | CES68 = 69 | CES93 = 81 |
| CES19 = 71 | CES44 = 98 | CES69 = 80 | CES94 = 56 |
| CES20 = 64 | CES45 = 78 | CES70 = 56 | CES95 = 71 |
| CES21 = 85 | CES46 = 77 | CES71 = 53 | CES96 = 77 |
| CES22 = 77 | CES47 = 73 | CES72 = 84 | CES97 = 82 |
| CES23 = 91 | CES48 = 65 | CES73 = 46 | CES98 = 71 |
| CES24 = 90 | CES49 = 76 | CES74 = 94 | CES99 = 59 |
| CES25 = 71 | CES50 = 85 | CES75 = 49 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)