

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: P1065962

Luminaire Tested: **NVN-SA4B-740-U-T2BC**

Issue Date: 08/07/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1065962  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 08/07/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: NVN-SA4B-740-U-T2BC  
Description: Navion AREA AND ROADWAY LUMINAIRE 800mA 4xLight Square PACKAGE  
70CRI 4000K FIXTURE w/ TYPE II ANGLED BACKLIGHT CONTROL  
Light Source: (56) 4000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 17341.2 lumens  
Efficiency: N/A  
Efficacy: 120.3 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B0 - U0 - G3

Input Watts (W): 144.1  
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

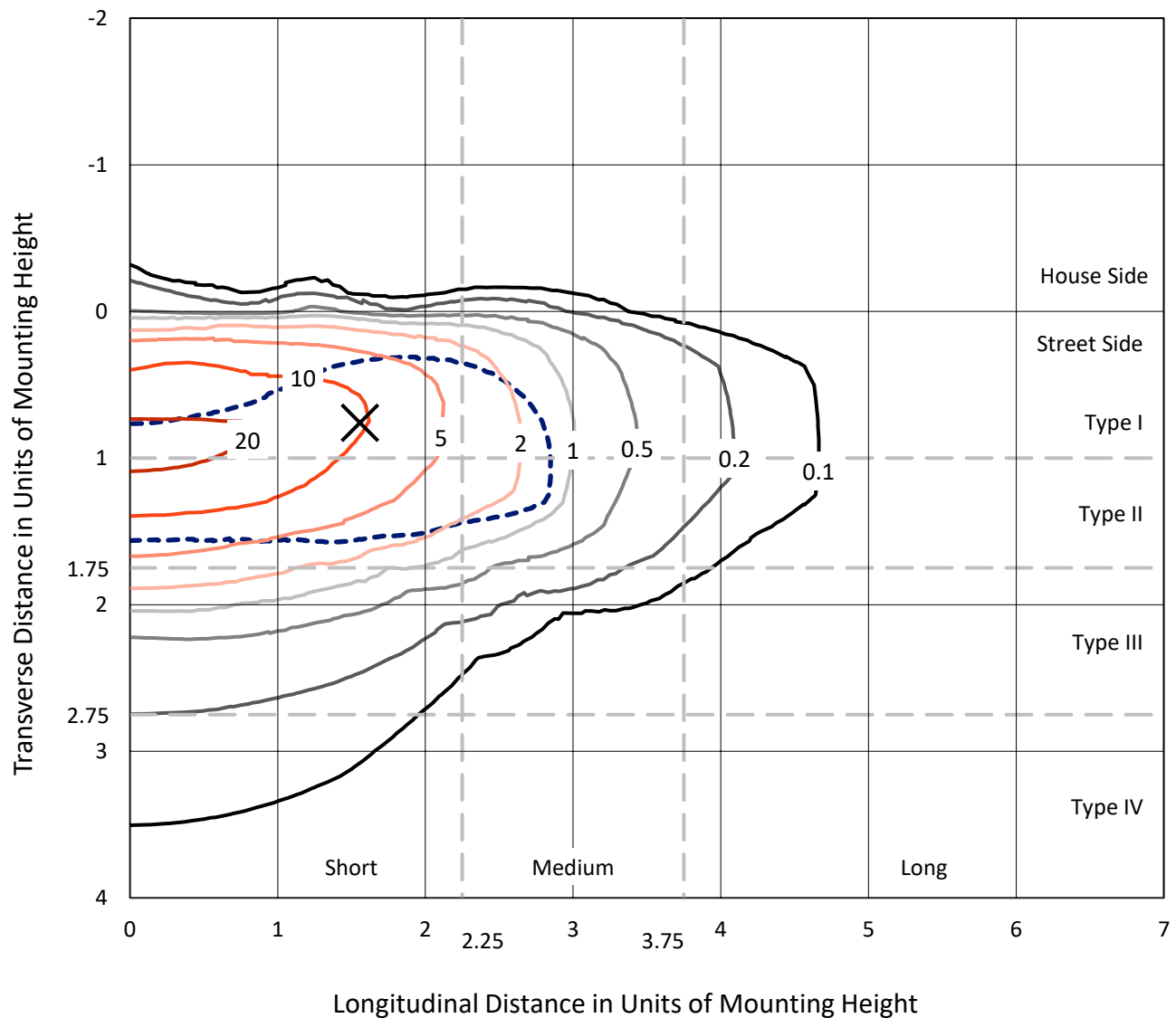


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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 - - - 1/2 Max cd

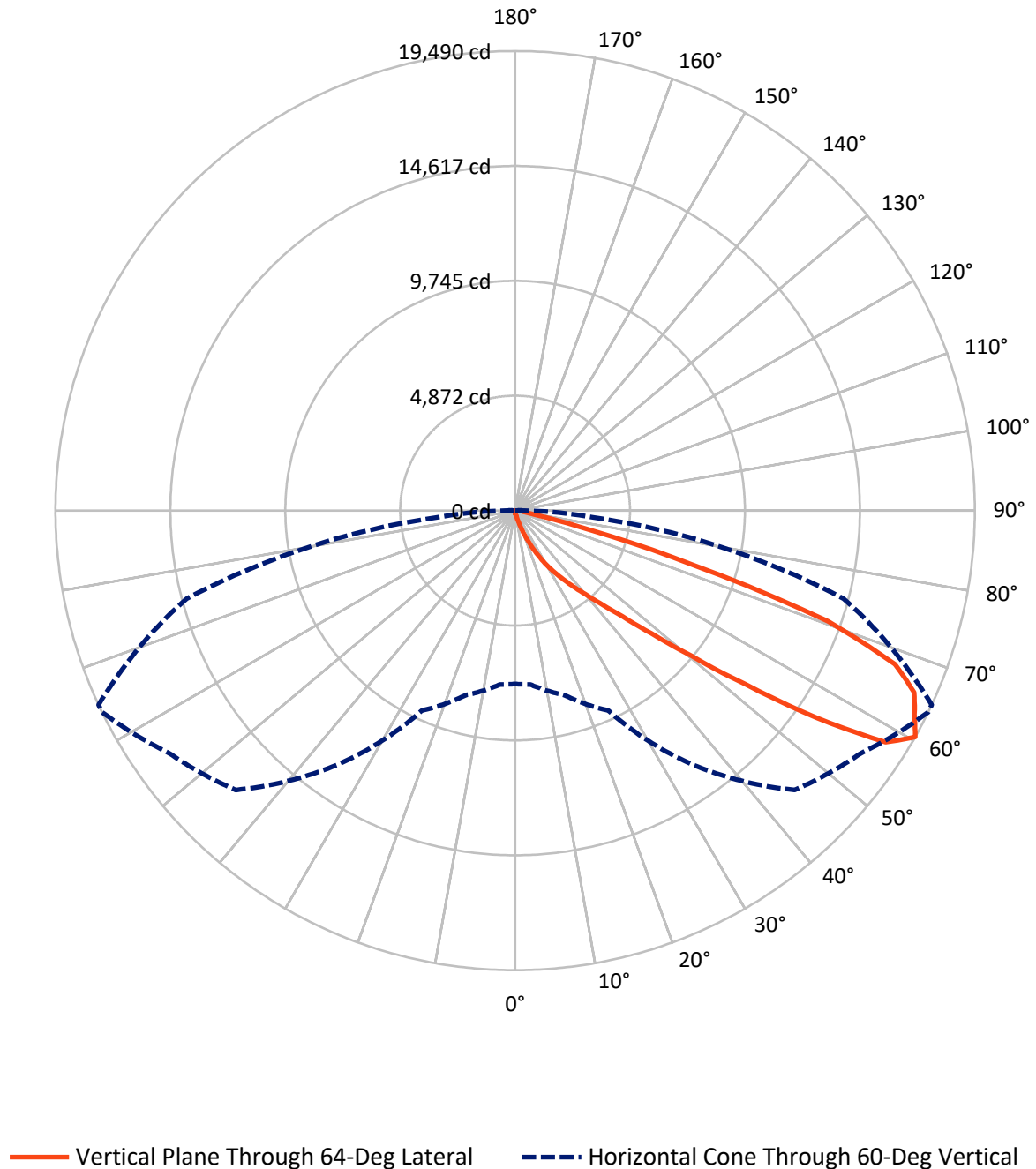


Based on 15 foot mounting height. Maximum calculated value = 24.9 fc  
 Type II - Short - N/A

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## Luminous Intensity Polar Plot



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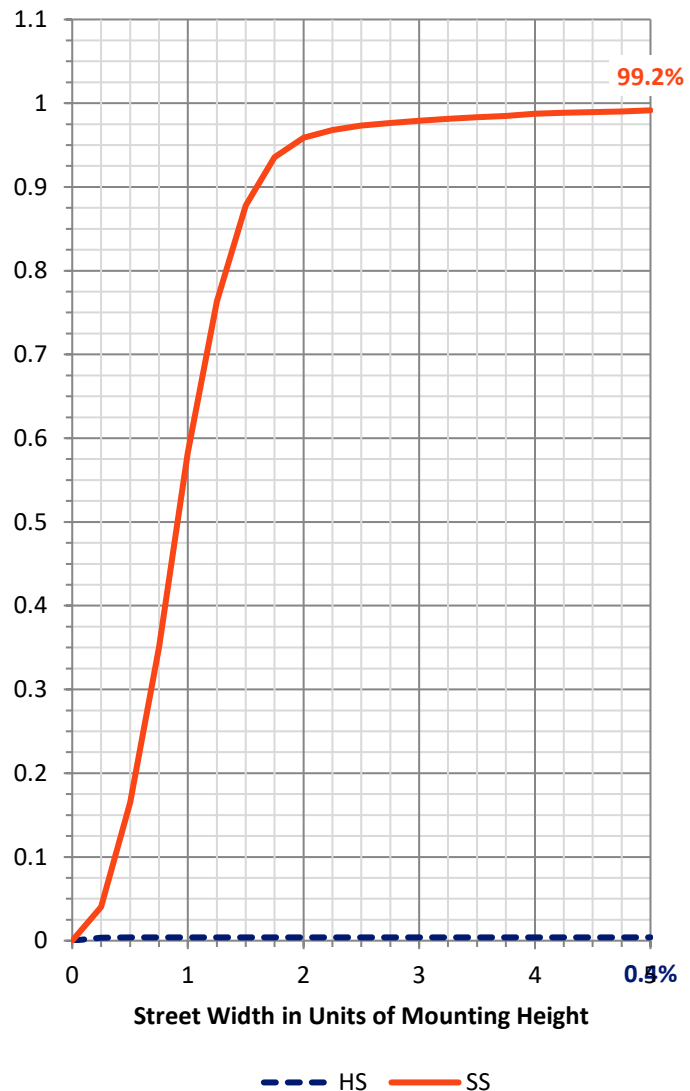
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 70.3     | 0.0    | 70.3    |
|                    | % Fixture | 0.4      | 0.0    | 0.4     |
| <b>Street Side</b> | Lumens    | 17270.9  | 0.0    | 17270.9 |
|                    | % Fixture | 99.6     | 0.0    | 99.6    |
| <b>Total</b>       | Lumens    | 17341.2  | 0.0    | 17341.2 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 17.3    | 0.1       |
| 10°-20°   | 170.4   | 1.0       |
| 20°-30°   | 566.0   | 3.3       |
| 30°-40°   | 1510.2  | 8.7       |
| 40°-50°   | 3838.5  | 22.1      |
| 50°-60°   | 5595.7  | 32.3      |
| 60°-70°   | 4322.2  | 24.9      |
| 70°-80°   | 1186.9  | 6.8       |
| 80°-90°   | 134.0   | 0.8       |
| 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°    | 17341.2 | 100.0     |
| 0°-180°   | 17341.2 | 100.0     |



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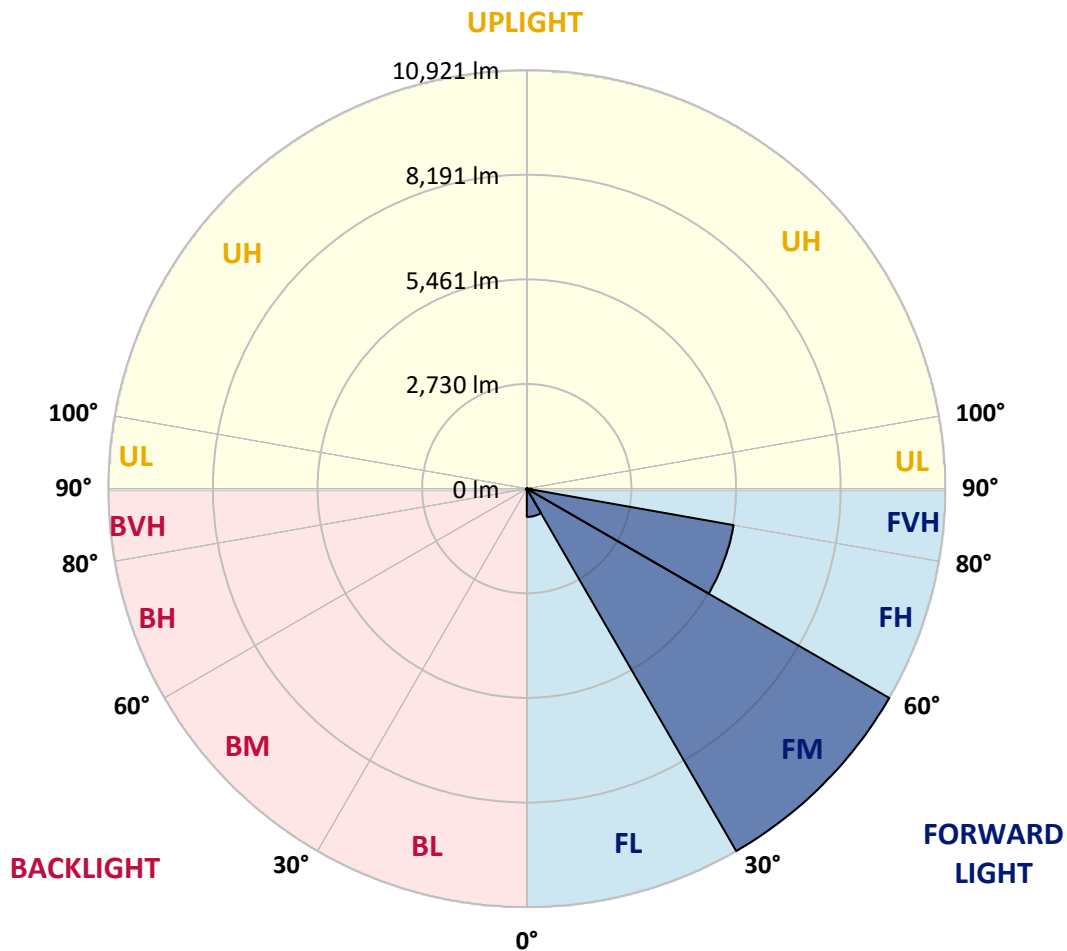
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 737.9   | 4.3       |                         |      |         |
| FM   | (30°-60°)   | 10921.1 | 63.0      |                         |      |         |
| FH   | (60°-80°)   | 5481.1  | 31.6      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 130.8   | 0.8       |                         |      | G2/225  |
| BL   | (0°-30°)    | 15.8    | 0.1       | B0/110                  |      |         |
| BM   | (30°-60°)   | 23.3    | 0.1       | B0/220                  |      |         |
| BH   | (60°-80°)   | 28.0    | 0.2       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 3.2     | 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 II Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 64°     | 65°     | 75°     | 85°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|
| 0°    | 114.6   | 114.6   | 114.6   | 114.6   | 114.6   | 114.6   | 114.6   | 114.6   | 114.6   | 114.6   | 114.6  |
| 2.5°  | 152.7   | 152.7   | 152.7   | 148.0   | 143.2   | 143.2   | 138.4   | 133.7   | 133.7   | 124.1   | 119.3  |
| 5°    | 233.9   | 233.9   | 224.3   | 214.8   | 200.5   | 181.4   | 162.3   | 148.0   | 148.0   | 133.7   | 124.1  |
| 7.5°  | 458.2   | 472.6   | 429.6   | 377.1   | 305.5   | 257.8   | 205.3   | 171.8   | 167.1   | 143.2   | 124.1  |
| 10°   | 992.9   | 983.3   | 916.5   | 787.6   | 620.5   | 448.7   | 286.4   | 210.0   | 200.5   | 152.7   | 124.1  |
| 12.5° | 1494.1  | 1508.4  | 1436.8  | 1293.6  | 1093.1  | 797.2   | 491.7   | 272.1   | 262.5   | 167.1   | 124.1  |
| 15°   | 1923.7  | 1923.7  | 1875.9  | 1804.3  | 1584.8  | 1274.5  | 792.4   | 405.7   | 372.3   | 181.4   | 119.3  |
| 17.5° | 2219.6  | 2214.9  | 2195.8  | 2176.7  | 2047.8  | 1728.0  | 1212.4  | 649.2   | 572.8   | 214.8   | 119.3  |
| 20°   | 2553.8  | 2539.4  | 2563.3  | 2525.1  | 2424.9  | 2171.9  | 1656.4  | 964.2   | 892.6   | 272.1   | 119.3  |
| 22.5° | 2902.2  | 2916.5  | 2935.6  | 2897.5  | 2787.7  | 2568.1  | 2124.2  | 1370.0  | 1293.6  | 377.1   | 124.1  |
| 25°   | 3346.2  | 3336.6  | 3379.6  | 3346.2  | 3207.7  | 2950.0  | 2563.3  | 1813.9  | 1704.1  | 525.1   | 133.7  |
| 27.5° | 3890.3  | 3871.2  | 3899.9  | 3813.9  | 3632.6  | 3370.0  | 2954.7  | 2267.4  | 2138.5  | 754.2   | 152.7  |
| 30°   | 4611.1  | 4625.4  | 4496.5  | 4396.3  | 4138.5  | 3790.1  | 3389.1  | 2754.3  | 2620.6  | 1026.3  | 171.8  |
| 32.5° | 5747.2  | 5646.9  | 5446.5  | 5040.7  | 4701.8  | 4257.9  | 3823.5  | 3179.1  | 3059.8  | 1374.7  | 200.5  |
| 35°   | 7518.1  | 7537.2  | 7098.0  | 6095.6  | 5360.5  | 4845.0  | 4300.8  | 3646.9  | 3561.0  | 1770.9  | 238.7  |
| 37.5° | 9675.7  | 9623.2  | 9236.5  | 7971.6  | 6324.8  | 5575.3  | 4845.0  | 4157.6  | 4033.5  | 2200.5  | 286.4  |
| 40°   | 12119.7 | 11900.1 | 11675.7 | 10816.5 | 8334.4  | 6491.8  | 5532.4  | 4749.5  | 4654.1  | 2697.0  | 362.8  |
| 42.5° | 14076.8 | 14019.5 | 14057.7 | 13699.7 | 11685.3 | 8052.7  | 6444.1  | 5475.1  | 5360.5  | 3312.7  | 496.4  |
| 45°   | 15041.0 | 14959.8 | 15189.0 | 15456.3 | 14940.7 | 11375.0 | 7914.3  | 6401.1  | 6248.4  | 4038.3  | 701.7  |
| 47.5° | 14783.2 | 14725.9 | 15217.6 | 15742.7 | 16430.1 | 15227.2 | 10315.3 | 7785.4  | 7522.9  | 4969.1  | 1007.2 |
| 50°   | 13513.5 | 13518.3 | 14325.0 | 15303.5 | 16391.9 | 17179.5 | 13871.5 | 9680.5  | 9351.1  | 6205.4  | 1484.5 |
| 52.5° | 12277.2 | 12315.4 | 13169.8 | 14597.1 | 15823.8 | 17408.6 | 16993.3 | 12234.2 | 11699.6 | 7661.3  | 2047.8 |
| 55°   | 11007.5 | 11026.6 | 11780.8 | 13790.4 | 15556.5 | 16726.0 | 18597.2 | 15523.1 | 14955.1 | 9475.2  | 2596.7 |
| 57.5° | 9785.5  | 9785.5  | 10067.1 | 11852.4 | 15265.3 | 16663.9 | 18406.2 | 18530.3 | 18067.3 | 11546.9 | 3002.5 |
| 60°   | 7351.0  | 7398.8  | 8100.5  | 9351.1  | 13165.0 | 16754.6 | 17919.4 | 19489.8 | 19489.8 | 14420.4 | 3312.7 |
| 62.5° | 3713.7  | 3785.3  | 4658.8  | 5876.1  | 9031.3  | 15504.0 | 17995.7 | 19007.7 | 19084.1 | 16955.1 | 4019.2 |
| 65°   | 1742.3  | 1823.4  | 2291.2  | 3150.4  | 4859.3  | 10912.0 | 17203.3 | 18597.2 | 18573.3 | 16473.0 | 5508.5 |
| 67.5° | 1250.6  | 1274.5  | 1432.0  | 1837.8  | 2615.8  | 4782.9  | 13131.6 | 17370.4 | 17380.0 | 13995.6 | 6334.3 |
| 70°   | 1121.7  | 1121.7  | 1159.9  | 1279.3  | 1575.2  | 2138.5  | 6382.0  | 14067.2 | 14749.8 | 10807.0 | 5871.3 |
| 72.5° | 1107.4  | 1097.9  | 1088.3  | 1093.1  | 1064.5  | 1074.0  | 2191.0  | 7942.9  | 8916.7  | 7561.1  | 4682.7 |
| 75°   | 1078.8  | 1078.8  | 1069.2  | 1035.8  | 849.7   | 692.1   | 754.2   | 3212.5  | 3713.7  | 5050.3  | 3475.0 |
| 77.5° | 854.4   | 940.4   | 1040.6  | 978.5   | 778.1   | 520.3   | 439.2   | 930.8   | 1174.3  | 3097.9  | 2520.4 |
| 80°   | 396.2   | 401.0   | 396.2   | 415.3   | 496.4   | 372.3   | 324.6   | 453.5   | 458.2   | 1718.4  | 1560.9 |
| 82.5° | 286.4   | 291.2   | 276.9   | 248.2   | 219.6   | 200.5   | 267.3   | 334.1   | 358.0   | 787.6   | 582.4  |
| 85°   | 85.9    | 81.1    | 95.5    | 128.9   | 152.7   | 176.6   | 224.3   | 281.6   | 296.0   | 291.2   | 85.9   |
| 87.5° | 38.2    | 38.2    | 47.7    | 66.8    | 90.7    | 133.7   | 195.7   | 257.8   | 262.5   | 300.7   | 23.9   |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0    |



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CATALOG NUMBER: NVN-SA4B-740-U-T2BC

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 114.6  | 114.6 | 114.6 | 114.6 | 114.6 | 114.6 | 114.6 | 114.6 | 114.6 | 114.6 | 114.6 |
| 2.5°  | 119.3  | 114.6 | 109.8 | 105.0 | 100.2 | 95.5  | 90.7  | 90.7  | 95.5  | 95.5  | 95.5  |
| 5°    | 114.6  | 109.8 | 100.2 | 90.7  | 85.9  | 81.1  | 76.4  | 76.4  | 81.1  | 81.1  | 81.1  |
| 7.5°  | 114.6  | 105.0 | 95.5  | 85.9  | 76.4  | 71.6  | 66.8  | 66.8  | 66.8  | 71.6  | 71.6  |
| 10°   | 114.6  | 105.0 | 90.7  | 76.4  | 66.8  | 62.1  | 57.3  | 52.5  | 57.3  | 57.3  | 57.3  |
| 12.5° | 109.8  | 100.2 | 85.9  | 71.6  | 57.3  | 47.7  | 43.0  | 43.0  | 43.0  | 43.0  | 43.0  |
| 15°   | 105.0  | 95.5  | 81.1  | 62.1  | 47.7  | 38.2  | 28.6  | 28.6  | 28.6  | 33.4  | 33.4  |
| 17.5° | 100.2  | 90.7  | 71.6  | 47.7  | 33.4  | 23.9  | 19.1  | 19.1  | 19.1  | 23.9  | 23.9  |
| 20°   | 100.2  | 85.9  | 62.1  | 38.2  | 23.9  | 14.3  | 9.5   | 9.5   | 9.5   | 14.3  | 19.1  |
| 22.5° | 100.2  | 85.9  | 57.3  | 28.6  | 14.3  | 9.5   | 4.8   | 4.8   | 4.8   | 4.8   | 4.8   |
| 25°   | 100.2  | 81.1  | 52.5  | 23.9  | 9.5   | 4.8   | 0.0   | 0.0   | 4.8   | 9.5   | 14.3  |
| 27.5° | 100.2  | 76.4  | 43.0  | 14.3  | 9.5   | 4.8   | 0.0   | 4.8   | 9.5   | 9.5   | 9.5   |
| 30°   | 100.2  | 76.4  | 38.2  | 14.3  | 4.8   | 0.0   | 0.0   | 4.8   | 9.5   | 9.5   | 14.3  |
| 32.5° | 105.0  | 71.6  | 33.4  | 9.5   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 35°   | 109.8  | 66.8  | 28.6  | 9.5   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 37.5° | 119.3  | 66.8  | 19.1  | 4.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 40°   | 133.7  | 71.6  | 19.1  | 4.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 42.5° | 167.1  | 76.4  | 14.3  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 45°   | 233.9  | 95.5  | 14.3  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 47.5° | 343.7  | 143.2 | 14.3  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 50°   | 501.2  | 195.7 | 9.5   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 52.5° | 615.8  | 195.7 | 9.5   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 55°   | 611.0  | 124.1 | 4.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 57.5° | 467.8  | 85.9  | 4.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 60°   | 396.2  | 62.1  | 4.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 62.5° | 477.3  | 47.7  | 4.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 65°   | 849.7  | 43.0  | 4.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 67.5° | 1365.2 | 43.0  | 4.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 70°   | 1527.5 | 43.0  | 4.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 72.5° | 1193.4 | 38.2  | 4.8   | 4.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 75°   | 654.0  | 33.4  | 4.8   | 4.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 77.5° | 329.4  | 23.9  | 9.5   | 4.8   | 4.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80°   | 138.4  | 19.1  | 9.5   | 4.8   | 4.8   | 4.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 47.7   | 19.1  | 9.5   | 9.5   | 4.8   | 4.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 23.9   | 14.3  | 14.3  | 9.5   | 9.5   | 4.8   | 4.8   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 14.3   | 14.3  | 14.3  | 9.5   | 9.5   | 4.8   | 4.8   | 0.0   | 0.0   | 0.0   | 4.8   |
| 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: SP1-2407-184-1

Test Date: 10/09/2024

Luminaire Tested: GSS-SB1A-740-U-5WQ

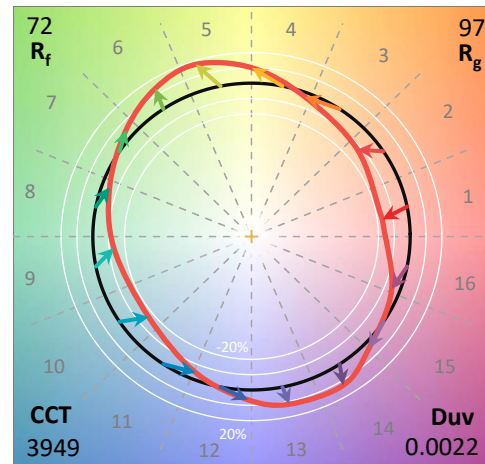
Data in this report applies to families of products including GSS-SB1A-740-U-5WQ

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-1  
 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-740-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 70 CRI  
 4000K CCT 26 LEDS

### Spectral Parameters

|                           |          |           |      |      |       |
|---------------------------|----------|-----------|------|------|-------|
| CCT (K):                  | 3949     | CRI (Ra): | 70.7 |      |       |
| CIE u':                   | 0.2248   | R1:       | 68.0 | R9:  | -36.7 |
| CIE v':                   | 0.5053   | R2:       | 76.0 | R10: | 45.1  |
| Duv:                      | 0.0022   | R3:       | 84.3 | R11: | 70.7  |
| CIE x:                    | 0.3844   | R4:       | 72.0 | R12: | 47.1  |
| CIE y:                    | 0.3840   | R5:       | 68.6 | R13: | 68.5  |
| CIE z:                    | 0.2316   | R6:       | 68.3 | R14: | 91.1  |
| Peak Wavelength (nm):     | 440      | R7:       | 77.9 | R15: | 58.7  |
| Dominant Wavelength (nm): | 578      | R8:       | 50.3 |      |       |
| Purity:                   | 30.60026 |           |      |      |       |
| Rf:                       | 71.8     |           |      |      |       |
| Rg:                       | 96.5     |           |      |      |       |



### Test Conditions

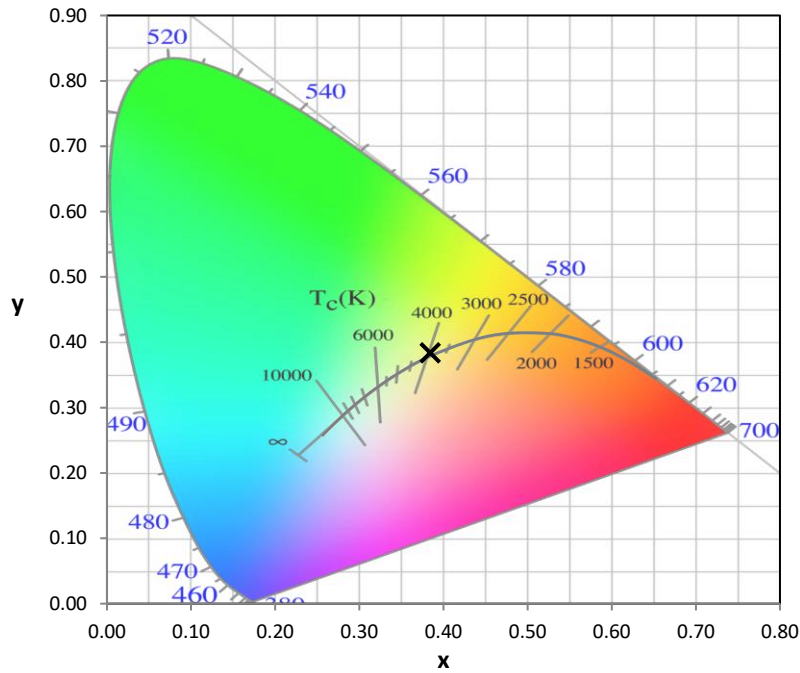
Stabilization Time: 34M  
 Operation Time: 1H 34M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-184-1

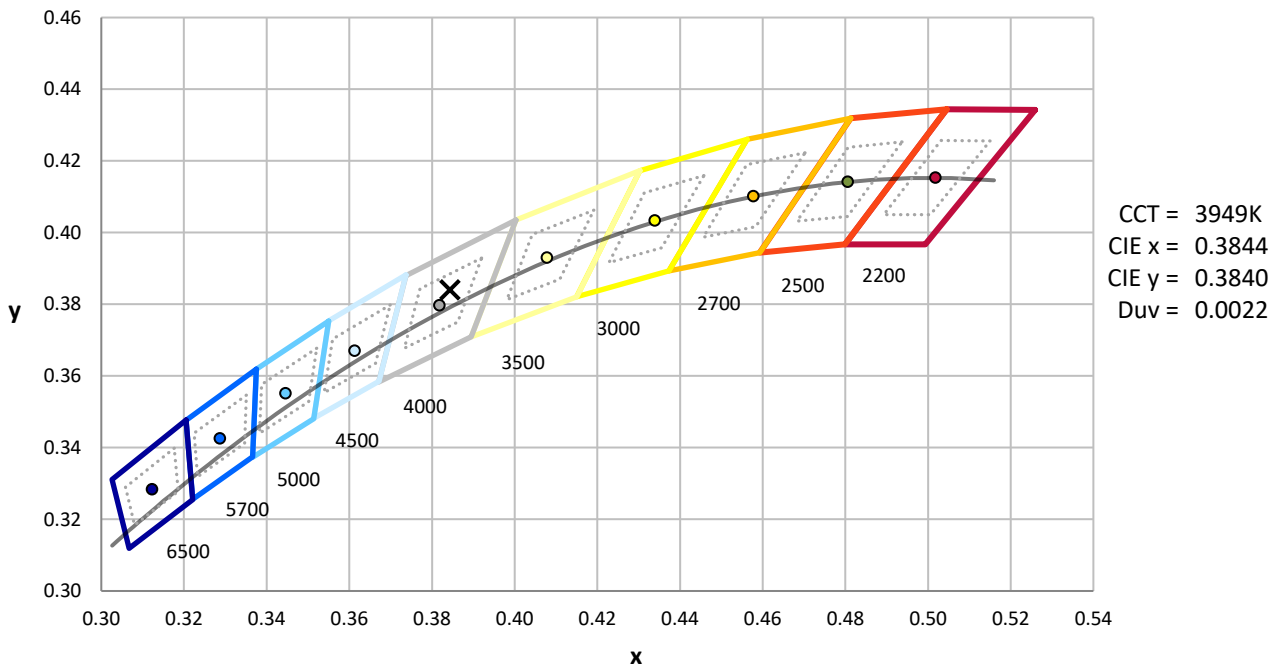
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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



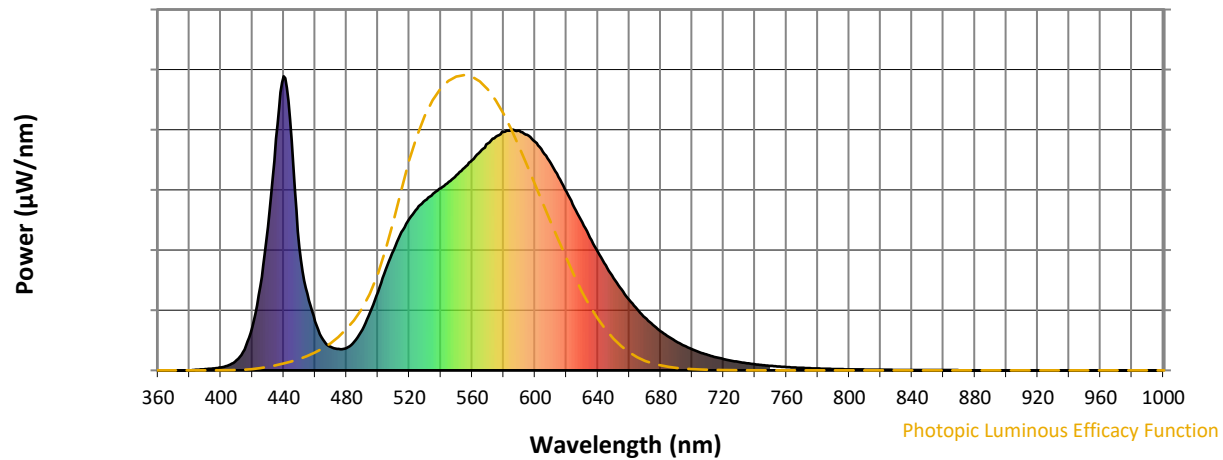
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 4000K 4-step quadrangle

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### Photopic Flux vs. Wavelength

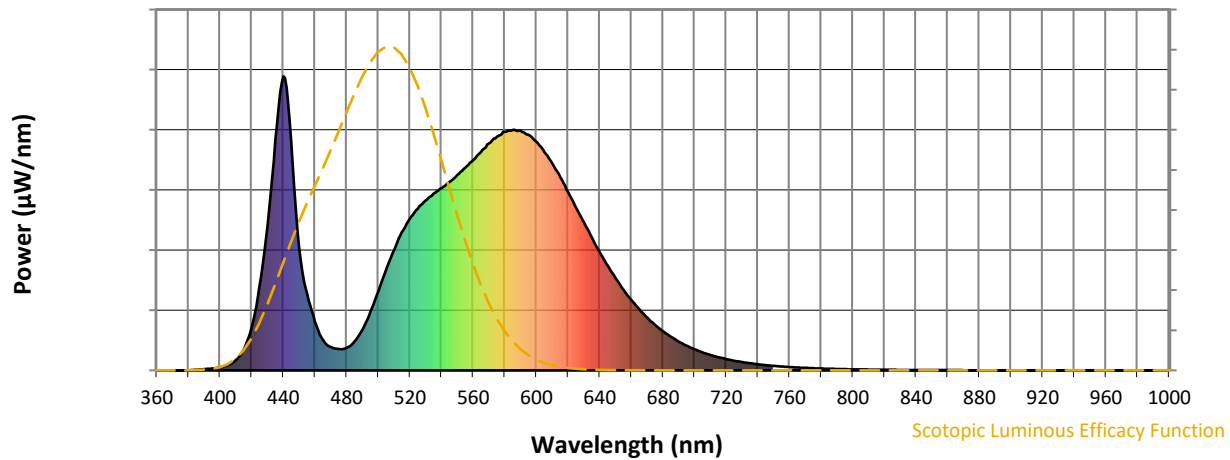


### Photopic Lumens: NR

| λ (nm) | Power W <sup>λ</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>λ</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>λ</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>λ</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>λ</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 139                      | NR            | 620    | 607                      | NR            | 750    | 15                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 198                      | NR            | 625    | 554                      | NR            | 755    | 13                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 267                      | NR            | 630    | 504                      | NR            | 760    | 11                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 343                      | NR            | 635    | 452                      | NR            | 765    | 10                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 410                      | NR            | 640    | 403                      | NR            | 770    | 8                        | NR            | 900    | 0                        | NR            |
| 385    | 2                        | NR            | 515    | 470                      | NR            | 645    | 357                      | NR            | 775    | 7                        | NR            | 905    | 0                        | NR            |
| 390    | 4                        | NR            | 520    | 516                      | NR            | 650    | 314                      | NR            | 780    | 6                        | NR            | 910    | 0                        | NR            |
| 395    | 7                        | NR            | 525    | 550                      | NR            | 655    | 275                      | NR            | 785    | 5                        | NR            | 915    | 0                        | NR            |
| 400    | 10                       | NR            | 530    | 578                      | NR            | 660    | 240                      | NR            | 790    | 5                        | NR            | 920    | 0                        | NR            |
| 405    | 17                       | NR            | 535    | 601                      | NR            | 665    | 208                      | NR            | 795    | 4                        | NR            | 925    | 0                        | NR            |
| 410    | 35                       | NR            | 540    | 620                      | NR            | 670    | 179                      | NR            | 800    | 4                        | NR            | 930    | 0                        | NR            |
| 415    | 70                       | NR            | 545    | 641                      | NR            | 675    | 155                      | NR            | 805    | 3                        | NR            | 935    | 0                        | NR            |
| 420    | 147                      | NR            | 550    | 664                      | NR            | 680    | 133                      | NR            | 810    | 3                        | NR            | 940    | 0                        | NR            |
| 425    | 285                      | NR            | 555    | 689                      | NR            | 685    | 114                      | NR            | 815    | 2                        | NR            | 945    | 0                        | NR            |
| 430    | 487                      | NR            | 560    | 715                      | NR            | 690    | 98                       | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 787                      | NR            | 565    | 743                      | NR            | 695    | 84                       | NR            | 825    | 2                        | NR            | 955    | 0                        | NR            |
| 440    | 1000                     | NR            | 570    | 771                      | NR            | 700    | 72                       | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 783                      | NR            | 575    | 794                      | NR            | 705    | 61                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 417                      | NR            | 580    | 811                      | NR            | 710    | 52                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 261                      | NR            | 585    | 817                      | NR            | 715    | 45                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 167                      | NR            | 590    | 815                      | NR            | 720    | 39                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 104                      | NR            | 595    | 801                      | NR            | 725    | 33                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 79                       | NR            | 600    | 777                      | NR            | 730    | 28                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 73                       | NR            | 605    | 744                      | NR            | 735    | 24                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 76                       | NR            | 610    | 704                      | NR            | 740    | 21                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 98                       | NR            | 615    | 657                      | NR            | 745    | 18                       | NR            | 875    | 1                        | NR            |        |                          |               |

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### Scotopic Flux vs. Wavelength



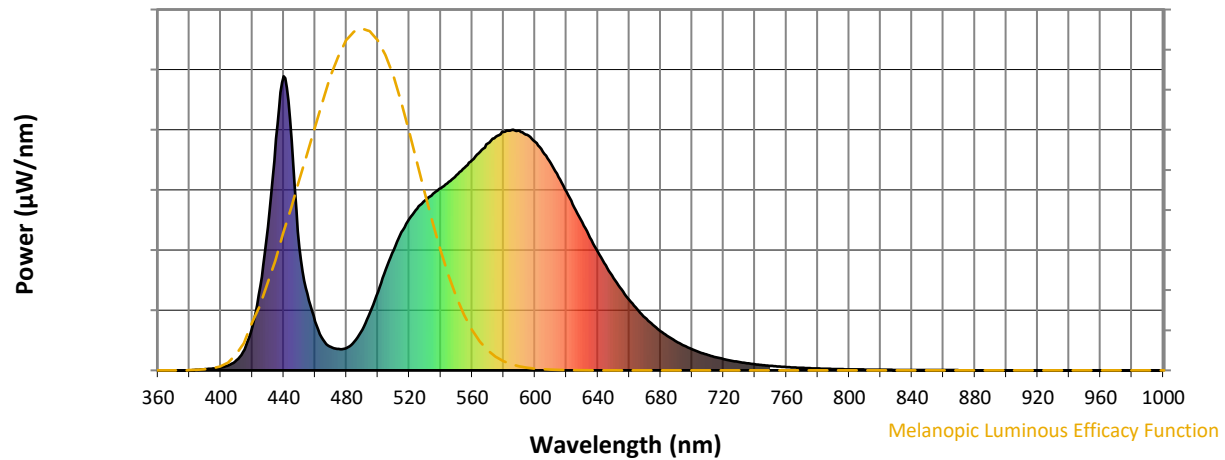
Scotopic Lumens: NR

S/P: 1.47

| 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       | 139                         | NR               | 620       | 607                         | NR               | 750       | 15                          | NR               | 880       | 0                           | NR               |
| 365       | 0                           | NR               | 495       | 198                         | NR               | 625       | 554                         | NR               | 755       | 13                          | NR               | 885       | 0                           | NR               |
| 370       | 0                           | NR               | 500       | 267                         | NR               | 630       | 504                         | NR               | 760       | 11                          | NR               | 890       | 0                           | NR               |
| 375       | 0                           | NR               | 505       | 343                         | NR               | 635       | 452                         | NR               | 765       | 10                          | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 410                         | NR               | 640       | 403                         | NR               | 770       | 8                           | NR               | 900       | 0                           | NR               |
| 385       | 2                           | NR               | 515       | 470                         | NR               | 645       | 357                         | NR               | 775       | 7                           | NR               | 905       | 0                           | NR               |
| 390       | 4                           | NR               | 520       | 516                         | NR               | 650       | 314                         | NR               | 780       | 6                           | NR               | 910       | 0                           | NR               |
| 395       | 7                           | NR               | 525       | 550                         | NR               | 655       | 275                         | NR               | 785       | 5                           | NR               | 915       | 0                           | NR               |
| 400       | 10                          | NR               | 530       | 578                         | NR               | 660       | 240                         | NR               | 790       | 5                           | NR               | 920       | 0                           | NR               |
| 405       | 17                          | NR               | 535       | 601                         | NR               | 665       | 208                         | NR               | 795       | 4                           | NR               | 925       | 0                           | NR               |
| 410       | 35                          | NR               | 540       | 620                         | NR               | 670       | 179                         | NR               | 800       | 4                           | NR               | 930       | 0                           | NR               |
| 415       | 70                          | NR               | 545       | 641                         | NR               | 675       | 155                         | NR               | 805       | 3                           | NR               | 935       | 0                           | NR               |
| 420       | 147                         | NR               | 550       | 664                         | NR               | 680       | 133                         | NR               | 810       | 3                           | NR               | 940       | 0                           | NR               |
| 425       | 285                         | NR               | 555       | 689                         | NR               | 685       | 114                         | NR               | 815       | 2                           | NR               | 945       | 0                           | NR               |
| 430       | 487                         | NR               | 560       | 715                         | NR               | 690       | 98                          | NR               | 820       | 2                           | NR               | 950       | 0                           | NR               |
| 435       | 787                         | NR               | 565       | 743                         | NR               | 695       | 84                          | NR               | 825       | 2                           | NR               | 955       | 0                           | NR               |
| 440       | 1000                        | NR               | 570       | 771                         | NR               | 700       | 72                          | NR               | 830       | 2                           | NR               | 960       | 0                           | NR               |
| 445       | 783                         | NR               | 575       | 794                         | NR               | 705       | 61                          | NR               | 835       | 1                           | NR               | 965       | 0                           | NR               |
| 450       | 417                         | NR               | 580       | 811                         | NR               | 710       | 52                          | NR               | 840       | 1                           | NR               | 970       | 0                           | NR               |
| 455       | 261                         | NR               | 585       | 817                         | NR               | 715       | 45                          | NR               | 845       | 1                           | NR               | 975       | 0                           | NR               |
| 460       | 167                         | NR               | 590       | 815                         | NR               | 720       | 39                          | NR               | 850       | 1                           | NR               | 980       | 0                           | NR               |
| 465       | 104                         | NR               | 595       | 801                         | NR               | 725       | 33                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 79                          | NR               | 600       | 777                         | NR               | 730       | 28                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 73                          | NR               | 605       | 744                         | NR               | 735       | 24                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 76                          | NR               | 610       | 704                         | NR               | 740       | 21                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 98                          | NR               | 615       | 657                         | NR               | 745       | 18                          | NR               | 875       | 1                           | NR               |           |                             |                  |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.78

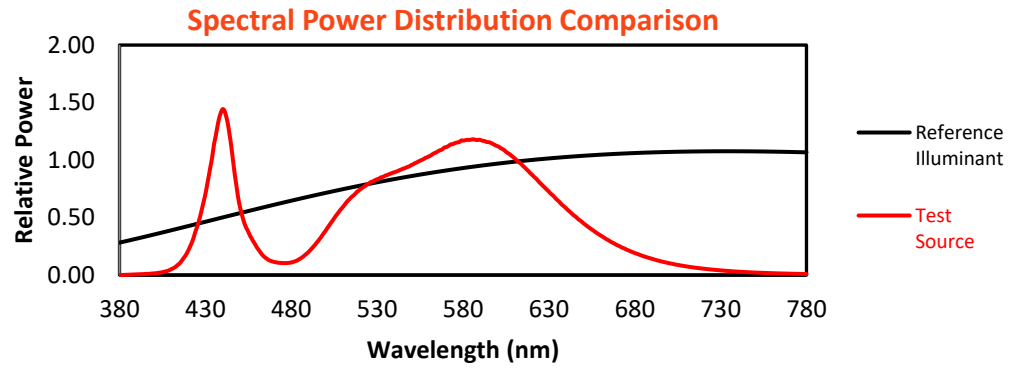
| λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 139                         | NR               | 620       | 607                         | NR               | 750       | 15                          | NR               | 880       | 0                           | NR               |
| 365       | 0                           | NR               | 495       | 198                         | NR               | 625       | 554                         | NR               | 755       | 13                          | NR               | 885       | 0                           | NR               |
| 370       | 0                           | NR               | 500       | 267                         | NR               | 630       | 504                         | NR               | 760       | 11                          | NR               | 890       | 0                           | NR               |
| 375       | 0                           | NR               | 505       | 343                         | NR               | 635       | 452                         | NR               | 765       | 10                          | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 410                         | NR               | 640       | 403                         | NR               | 770       | 8                           | NR               | 900       | 0                           | NR               |
| 385       | 2                           | NR               | 515       | 470                         | NR               | 645       | 357                         | NR               | 775       | 7                           | NR               | 905       | 0                           | NR               |
| 390       | 4                           | NR               | 520       | 516                         | NR               | 650       | 314                         | NR               | 780       | 6                           | NR               | 910       | 0                           | NR               |
| 395       | 7                           | NR               | 525       | 550                         | NR               | 655       | 275                         | NR               | 785       | 5                           | NR               | 915       | 0                           | NR               |
| 400       | 10                          | NR               | 530       | 578                         | NR               | 660       | 240                         | NR               | 790       | 5                           | NR               | 920       | 0                           | NR               |
| 405       | 17                          | NR               | 535       | 601                         | NR               | 665       | 208                         | NR               | 795       | 4                           | NR               | 925       | 0                           | NR               |
| 410       | 35                          | NR               | 540       | 620                         | NR               | 670       | 179                         | NR               | 800       | 4                           | NR               | 930       | 0                           | NR               |
| 415       | 70                          | NR               | 545       | 641                         | NR               | 675       | 155                         | NR               | 805       | 3                           | NR               | 935       | 0                           | NR               |
| 420       | 147                         | NR               | 550       | 664                         | NR               | 680       | 133                         | NR               | 810       | 3                           | NR               | 940       | 0                           | NR               |
| 425       | 285                         | NR               | 555       | 689                         | NR               | 685       | 114                         | NR               | 815       | 2                           | NR               | 945       | 0                           | NR               |
| 430       | 487                         | NR               | 560       | 715                         | NR               | 690       | 98                          | NR               | 820       | 2                           | NR               | 950       | 0                           | NR               |
| 435       | 787                         | NR               | 565       | 743                         | NR               | 695       | 84                          | NR               | 825       | 2                           | NR               | 955       | 0                           | NR               |
| 440       | 1000                        | NR               | 570       | 771                         | NR               | 700       | 72                          | NR               | 830       | 2                           | NR               | 960       | 0                           | NR               |
| 445       | 783                         | NR               | 575       | 794                         | NR               | 705       | 61                          | NR               | 835       | 1                           | NR               | 965       | 0                           | NR               |
| 450       | 417                         | NR               | 580       | 811                         | NR               | 710       | 52                          | NR               | 840       | 1                           | NR               | 970       | 0                           | NR               |
| 455       | 261                         | NR               | 585       | 817                         | NR               | 715       | 45                          | NR               | 845       | 1                           | NR               | 975       | 0                           | NR               |
| 460       | 167                         | NR               | 590       | 815                         | NR               | 720       | 39                          | NR               | 850       | 1                           | NR               | 980       | 0                           | NR               |
| 465       | 104                         | NR               | 595       | 801                         | NR               | 725       | 33                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 79                          | NR               | 600       | 777                         | NR               | 730       | 28                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 73                          | NR               | 605       | 744                         | NR               | 735       | 24                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 76                          | NR               | 610       | 704                         | NR               | 740       | 21                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 98                          | NR               | 615       | 657                         | NR               | 745       | 18                          | NR               | 875       | 1                           | NR               |           |                             |                  |

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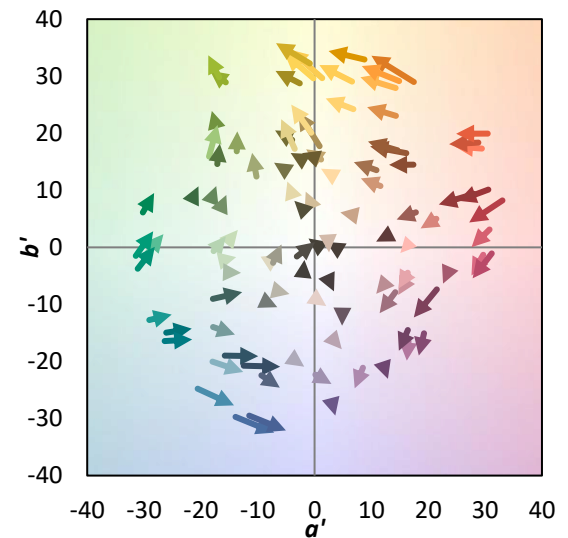
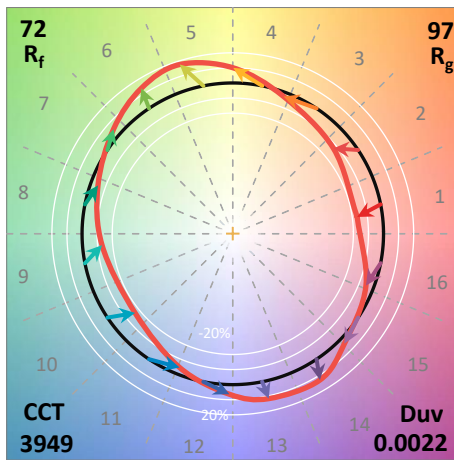
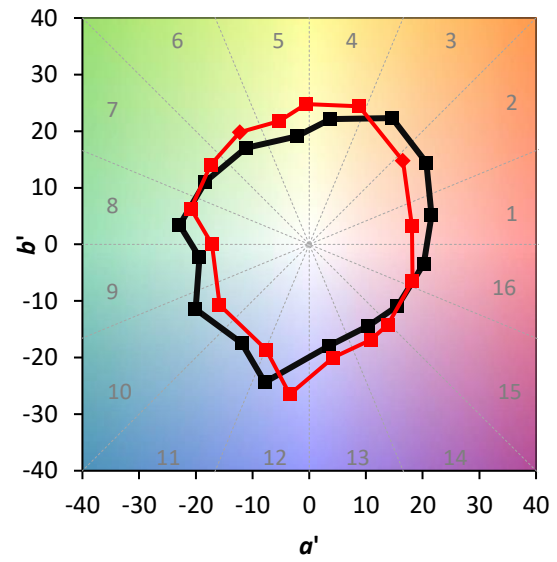
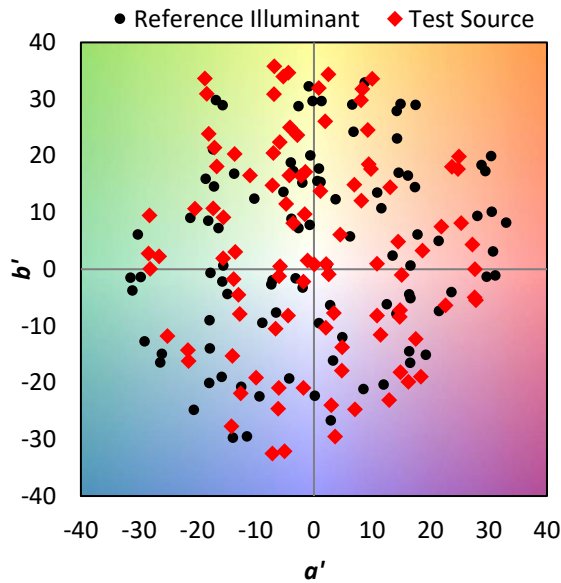
TM-30-18

### Summary

$R_f = 71.8$   
 $R_g = 96.5$   
 CIE  $R_a = 70.7$   
 $R_g = -36.7$



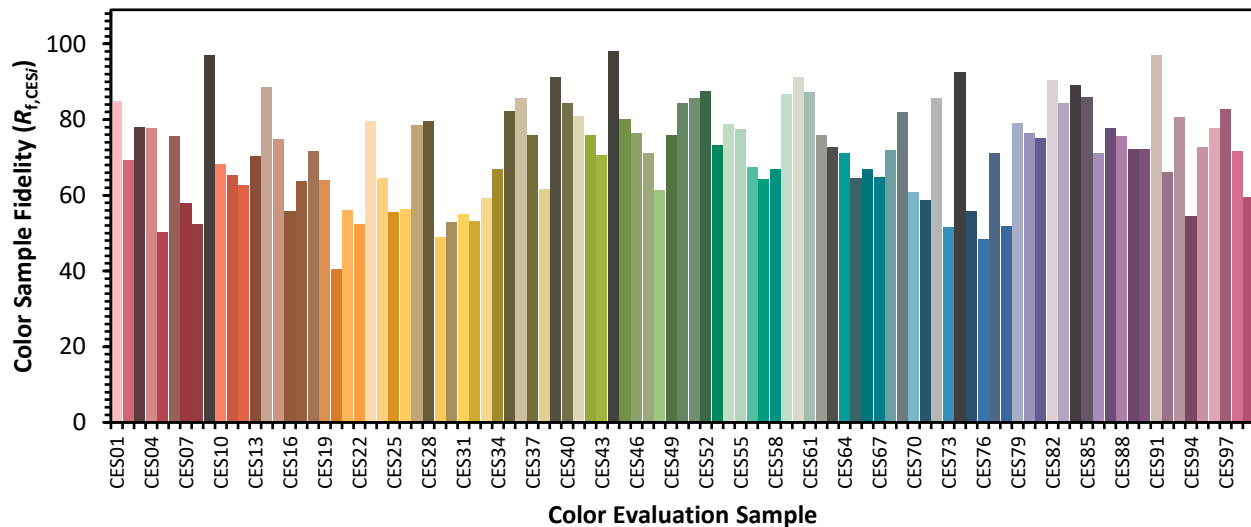
### Color Vector Graphics



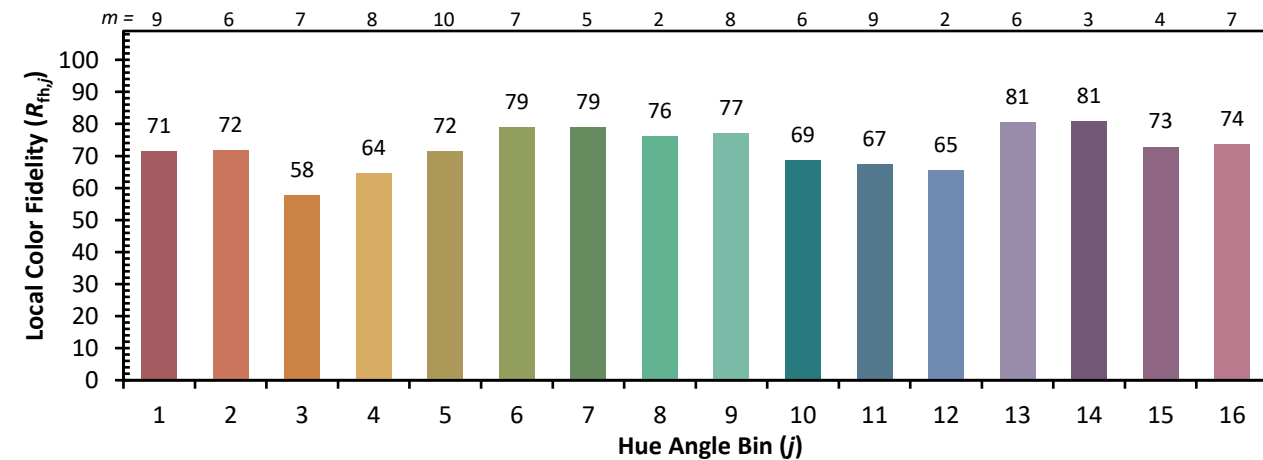
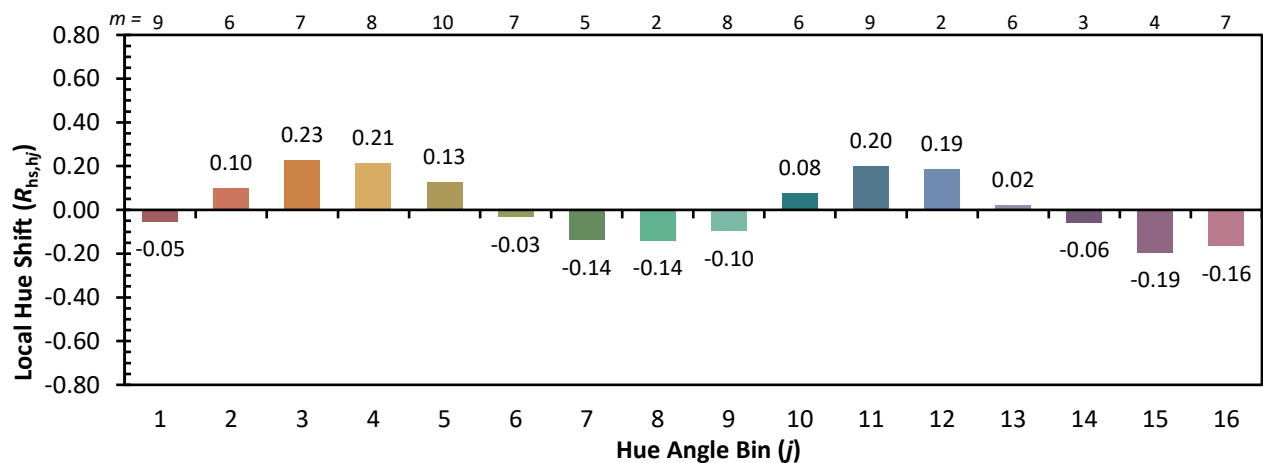
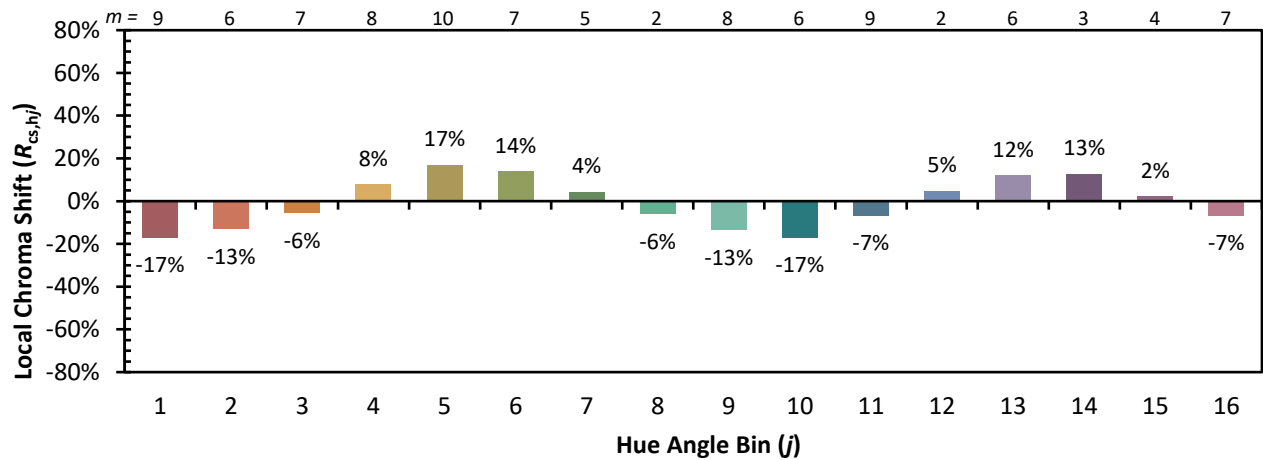


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

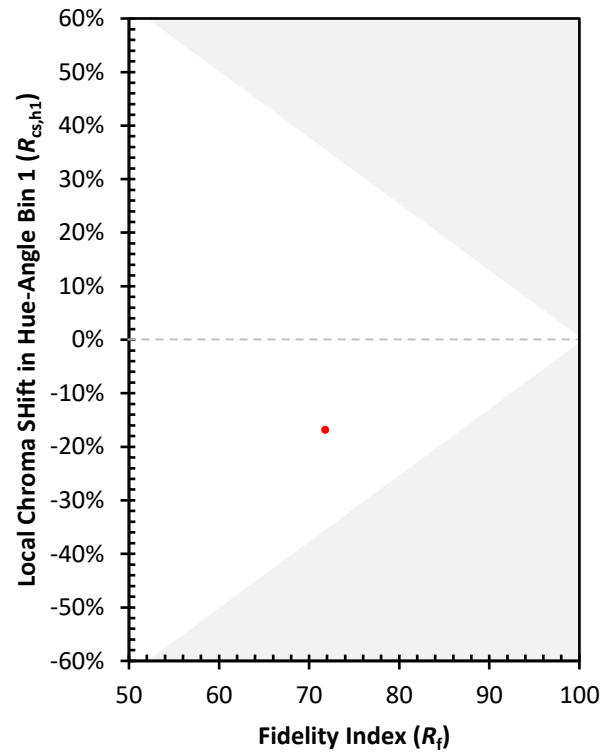
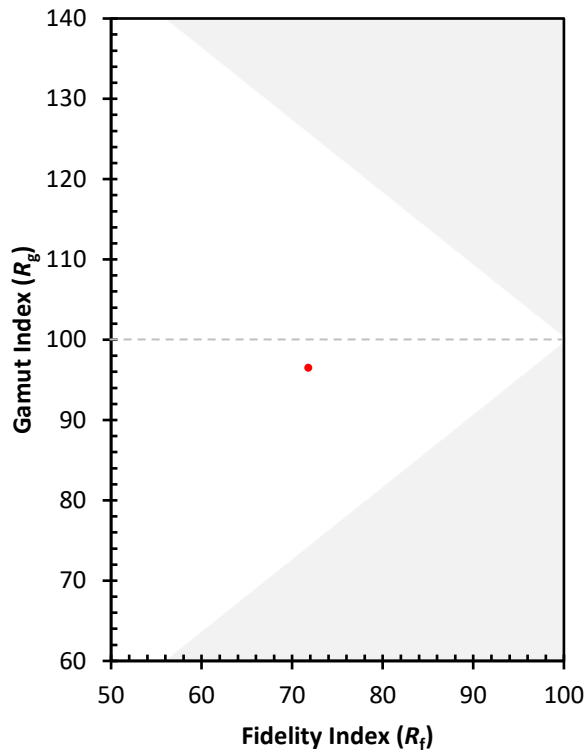
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 56 | CES51 = 86 | CES76 = 48 |
| CES02 = 61 | CES27 = 79 | CES52 = 88 | CES77 = 71 |
| CES03 = 30 | CES28 = 80 | CES53 = 73 | CES78 = 52 |
| CES04 = 70 | CES29 = 49 | CES54 = 79 | CES79 = 79 |
| CES05 = 47 | CES30 = 53 | CES55 = 77 | CES80 = 77 |
| CES06 = 50 | CES31 = 55 | CES56 = 67 | CES81 = 75 |
| CES07 = 40 | CES32 = 53 | CES57 = 64 | CES82 = 90 |
| CES08 = 39 | CES33 = 59 | CES58 = 67 | CES83 = 84 |
| CES09 = 29 | CES34 = 67 | CES59 = 87 | CES84 = 89 |
| CES10 = 74 | CES35 = 82 | CES60 = 91 | CES85 = 86 |
| CES11 = 57 | CES36 = 86 | CES61 = 87 | CES86 = 71 |
| CES12 = 63 | CES37 = 76 | CES62 = 76 | CES87 = 78 |
| CES13 = 42 | CES38 = 62 | CES63 = 73 | CES88 = 76 |
| CES14 = 74 | CES39 = 91 | CES64 = 71 | CES89 = 72 |
| CES15 = 71 | CES40 = 84 | CES65 = 64 | CES90 = 72 |
| CES16 = 46 | CES41 = 81 | CES66 = 67 | CES91 = 97 |
| CES17 = 49 | CES42 = 76 | CES67 = 65 | CES92 = 66 |
| CES18 = 56 | CES43 = 71 | CES68 = 72 | CES93 = 81 |
| CES19 = 72 | CES44 = 98 | CES69 = 82 | CES94 = 55 |
| CES20 = 65 | CES45 = 80 | CES70 = 61 | CES95 = 73 |
| CES21 = 86 | CES46 = 76 | CES71 = 59 | CES96 = 78 |
| CES22 = 78 | CES47 = 71 | CES72 = 86 | CES97 = 83 |
| CES23 = 92 | CES48 = 61 | CES73 = 52 | CES98 = 72 |
| CES24 = 91 | CES49 = 76 | CES74 = 93 | CES99 = 60 |
| CES25 = 72 | CES50 = 84 | CES75 = 56 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)