

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: McGRAW-EDISON

Report Number: P1047535

Luminaire Tested: **GALN-SA5C-935-U-T3BC**

Issue Date: 07/10/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1047535  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 07/10/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GALN-SA5C-935-U-T3BC  
Description: GALLEON II AREA AND ROADWAY LUMINAIRE 1050mA 5xLight Square PACKAGE  
90CRI 3500K FIXTURE w/ TYPE III ANGLED BACKLIGHT CONTROL  
Light Source: (70) 3500K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 21228.1 lumens  
Efficiency: N/A  
Efficacy: 89.9 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B0 - U0 - G4

Input Watts (W): 236  
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

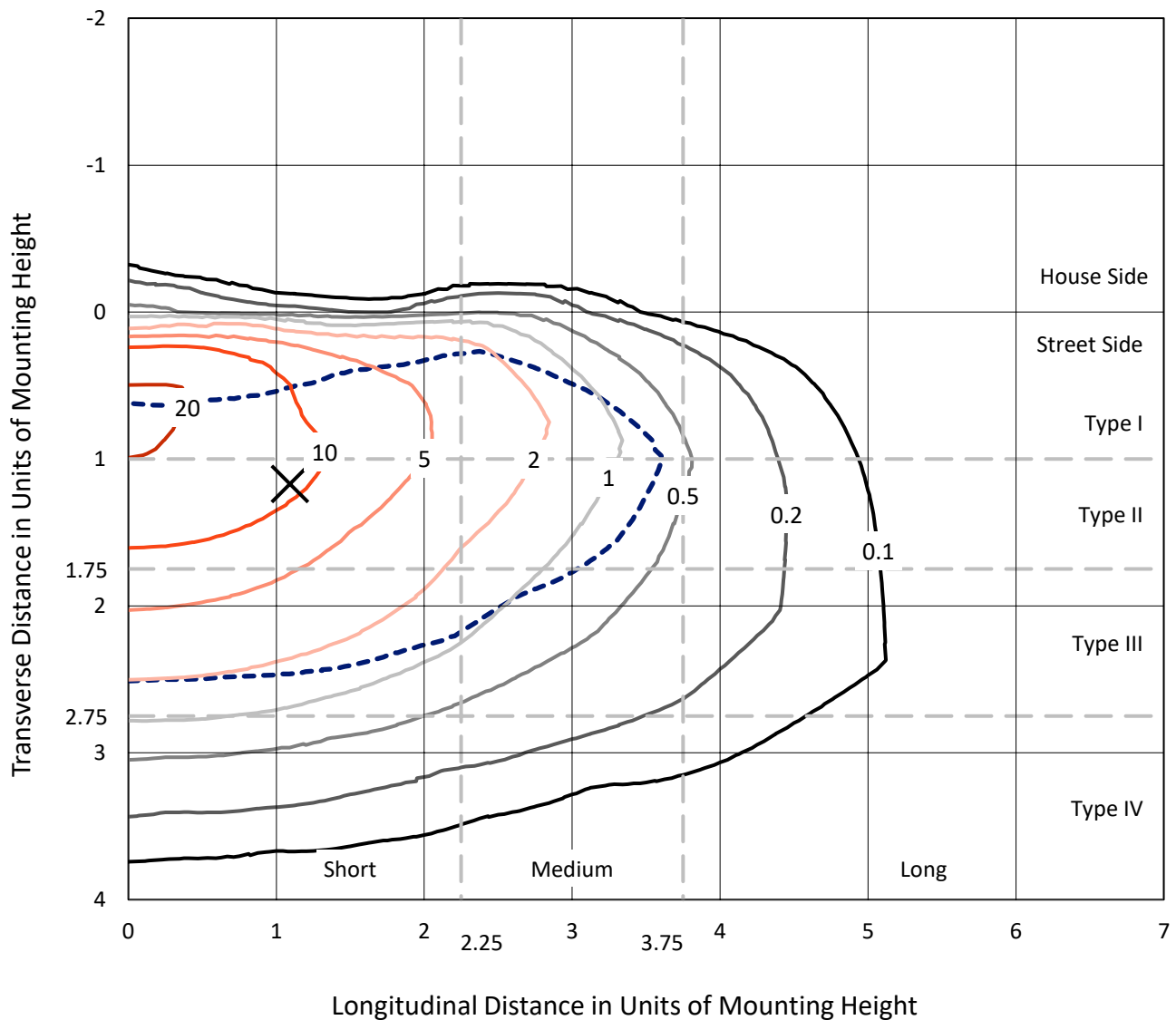


REPORT NUMBER: P1047535

CATALOG NUMBER: GALN-SA5C-935-U-T3BC

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
- - - 1/2 Max cd

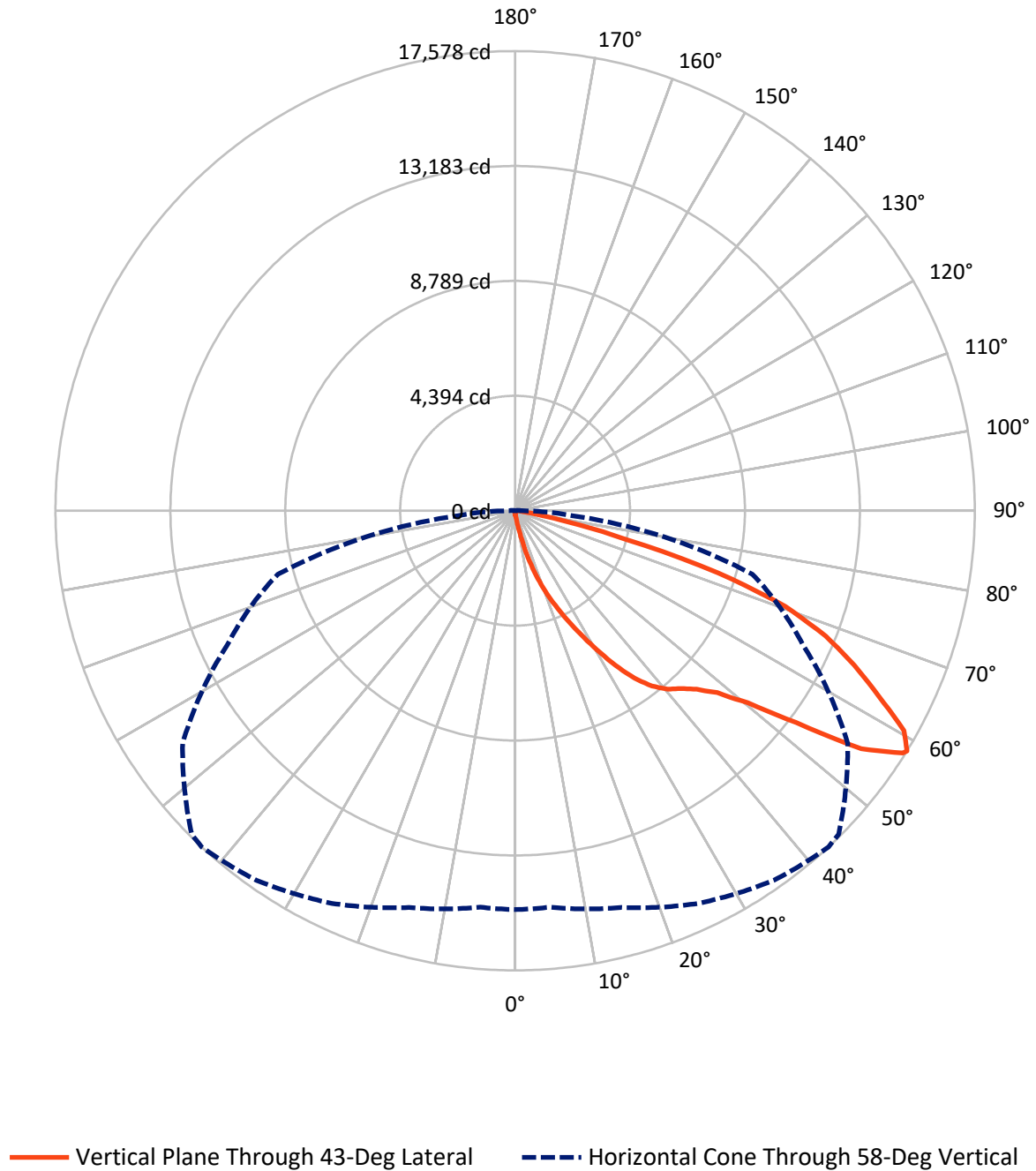


Based on 15 foot mounting height. Maximum calculated value = 23.8 fc  
Type III - Short - N/A

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CATALOG NUMBER: GALN-SA5C-935-U-T3BC

## Luminous Intensity Polar Plot



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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 77.5     | 0.0    | 77.5    |
|                    | % Fixture | 0.4      | 0.0    | 0.4     |
| <b>Street Side</b> | Lumens    | 21150.6  | 0.0    | 21150.6 |
|                    | % Fixture | 99.6     | 0.0    | 99.6    |
| <b>Total</b>       | Lumens    | 21228.1  | 0.0    | 21228.1 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 20.3    | 0.1       |
| 10°-20°   | 244.0   | 1.1       |
| 20°-30°   | 879.5   | 4.1       |
| 30°-40°   | 2012.3  | 9.5       |
| 40°-50°   | 3394.0  | 16.0      |
| 50°-60°   | 5600.8  | 26.4      |
| 60°-70°   | 6259.7  | 29.5      |
| 70°-80°   | 2584.5  | 12.2      |
| 80°-90°   | 233.0   | 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°    | 21228.1 | 100.0     |
| 0°-180°   | 21228.1 | 100.0     |



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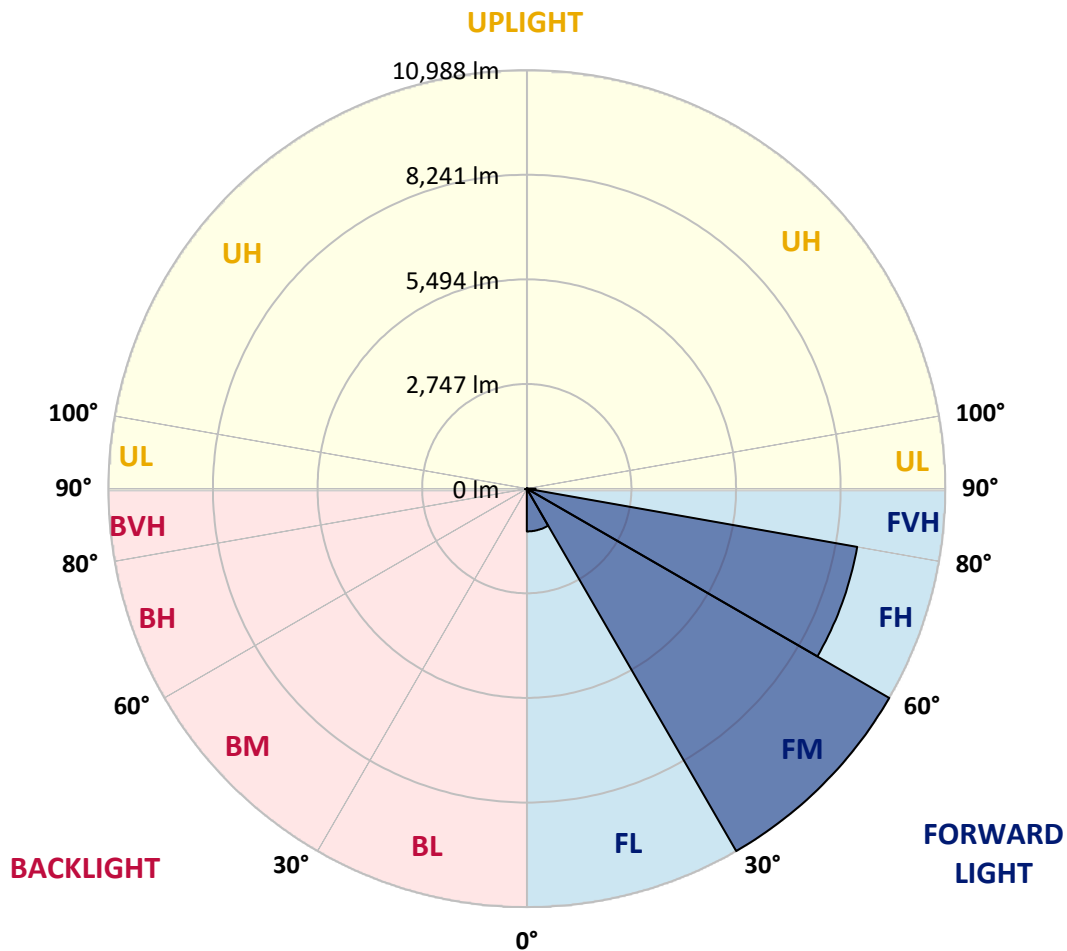
CATALOG NUMBER: GALN-SA5C-935-U-T3BC

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 1123.6  | 5.3       |                         |      |          |
| FM   | (30°-60°)   | 10988.5 | 51.8      |                         |      |          |
| FH   | (60°-80°)   | 8808.7  | 41.5      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 229.8   | 1.1       |                         |      | G3/500   |
| BL   | (0°-30°)    | 20.2    | 0.1       | B0/110                  |      |          |
| BM   | (30°-60°)   | 18.6    | 0.1       | B0/220                  |      |          |
| BH   | (60°-80°)   | 35.5    | 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-G4**

Type III Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 43°     | 45°     | 55°     | 65°     | 75°     | 85°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|
| 0°    | 138.8   | 138.8   | 138.8   | 138.8   | 138.8   | 138.8   | 138.8   | 138.8   | 138.8   | 138.8   | 138.8  |
| 2.5°  | 166.6   | 172.1   | 166.6   | 166.6   | 166.6   | 161.0   | 161.0   | 155.5   | 155.5   | 149.9   | 144.4  |
| 5°    | 244.3   | 244.3   | 227.6   | 216.5   | 205.4   | 199.9   | 194.3   | 183.2   | 172.1   | 161.0   | 149.9  |
| 7.5°  | 544.1   | 544.1   | 494.1   | 427.5   | 338.7   | 288.7   | 277.6   | 227.6   | 194.3   | 172.1   | 149.9  |
| 10°   | 1299.2  | 1299.2  | 1188.1  | 1004.9  | 777.3   | 577.4   | 516.3   | 327.6   | 233.2   | 183.2   | 155.5  |
| 12.5° | 2159.7  | 2187.5  | 2048.7  | 1815.5  | 1476.8  | 1127.1  | 1004.9  | 599.6   | 310.9   | 199.9   | 155.5  |
| 15°   | 2931.5  | 2864.8  | 2826.0  | 2603.9  | 2281.9  | 1865.5  | 1710.0  | 1010.5  | 449.7   | 227.6   | 155.5  |
| 17.5° | 3453.4  | 3453.4  | 3397.8  | 3247.9  | 2953.7  | 2587.2  | 2459.5  | 1632.3  | 727.3   | 260.9   | 161.0  |
| 20°   | 4064.1  | 4064.1  | 3964.1  | 3858.7  | 3597.7  | 3286.8  | 3164.6  | 2320.7  | 1127.1  | 333.1   | 161.0  |
| 22.5° | 4802.5  | 4813.6  | 4702.6  | 4513.8  | 4263.9  | 3919.7  | 3814.2  | 2959.2  | 1632.3  | 444.2   | 166.6  |
| 25°   | 5701.9  | 5713.0  | 5552.0  | 5374.4  | 4991.3  | 4619.3  | 4458.3  | 3692.1  | 2248.6  | 621.8   | 166.6  |
| 27.5° | 6695.7  | 6773.5  | 6534.7  | 6229.4  | 5824.1  | 5357.7  | 5235.6  | 4352.8  | 2859.3  | 877.2   | 177.7  |
| 30°   | 7933.8  | 7933.8  | 7617.4  | 7189.9  | 6751.3  | 6173.8  | 6018.4  | 5046.8  | 3508.9  | 1215.9  | 188.8  |
| 32.5° | 8999.8  | 8916.5  | 8511.2  | 8061.5  | 7595.2  | 7056.6  | 6890.1  | 5774.1  | 4175.1  | 1637.8  | 211.0  |
| 35°   | 9816.0  | 9743.8  | 9244.1  | 8761.1  | 8355.8  | 7861.7  | 7661.8  | 6562.5  | 4880.2  | 2115.3  | 244.3  |
| 37.5° | 10515.5 | 10487.8 | 9810.4  | 9205.2  | 8938.7  | 8505.7  | 8328.0  | 7306.5  | 5574.2  | 2631.7  | 283.2  |
| 40°   | 11281.7 | 11192.9 | 10471.1 | 9721.6  | 9321.8  | 8972.1  | 8811.0  | 7906.1  | 6240.5  | 3236.8  | 338.7  |
| 42.5° | 11936.8 | 11831.3 | 11181.8 | 10448.9 | 9766.0  | 9294.1  | 9138.6  | 8411.3  | 6890.1  | 3842.0  | 410.8  |
| 45°   | 12664.1 | 12608.6 | 11953.5 | 11398.3 | 10487.8 | 9732.7  | 9527.3  | 8816.6  | 7484.1  | 4563.8  | 505.2  |
| 47.5° | 13757.9 | 13658.0 | 13047.2 | 12592.0 | 11537.1 | 10398.9 | 10104.7 | 9233.0  | 8056.0  | 5274.4  | 649.6  |
| 50°   | 15029.3 | 14962.7 | 14601.8 | 14240.9 | 13191.6 | 11537.1 | 11187.3 | 9832.6  | 8694.5  | 6118.3  | 838.4  |
| 52.5° | 16067.5 | 16056.4 | 16100.8 | 16106.4 | 15312.5 | 13452.5 | 12930.6 | 10798.7 | 9427.3  | 6951.1  | 1104.9 |
| 55°   | 16045.3 | 16095.3 | 16583.9 | 17144.6 | 17205.7 | 16067.5 | 15562.3 | 12425.4 | 10382.3 | 7978.2  | 1476.8 |
| 57.5° | 15445.7 | 15406.8 | 15923.2 | 16767.1 | 17361.2 | 17483.3 | 17400.0 | 14951.6 | 11820.2 | 9216.3  | 2048.7 |
| 58°   | 15251.4 | 15218.1 | 15706.7 | 16567.2 | 17250.1 | 17577.7 | 17494.4 | 15523.4 | 12142.3 | 9394.0  | 2204.2 |
| 60°   | 14546.3 | 14551.8 | 14840.5 | 15623.4 | 16306.3 | 17083.6 | 17161.3 | 17155.7 | 13746.8 | 10582.1 | 2987.0 |
| 62.5° | 13613.5 | 13569.1 | 13835.6 | 14474.1 | 15073.7 | 15595.6 | 15728.9 | 17266.8 | 16095.3 | 12092.3 | 4480.5 |
| 65°   | 12325.5 | 12258.8 | 12542.0 | 13263.8 | 13907.8 | 14246.5 | 14252.0 | 15778.8 | 17200.1 | 13713.5 | 6612.5 |
| 67.5° | 9932.6  | 9877.0  | 10443.3 | 11370.5 | 12364.3 | 12808.5 | 13008.4 | 13691.3 | 16267.4 | 14812.8 | 7833.9 |
| 70°   | 6085.0  | 6201.6  | 6990.0  | 8444.6  | 10143.5 | 10959.7 | 11259.5 | 11470.5 | 13852.3 | 14646.2 | 6551.4 |
| 72.5° | 2809.3  | 2670.5  | 3342.3  | 4358.3  | 6296.0  | 8111.5  | 8422.4  | 9249.7  | 10981.9 | 12714.1 | 4885.8 |
| 75°   | 1310.3  | 1260.3  | 1415.8  | 1904.3  | 2853.7  | 4380.5  | 4946.8  | 7384.2  | 8422.4  | 8844.4  | 3525.5 |
| 77.5° | 671.8   | 677.3   | 805.0   | 866.1   | 1177.0  | 2026.5  | 2326.3  | 4858.0  | 6173.8  | 4935.7  | 2365.2 |
| 80°   | 294.3   | 305.4   | 310.9   | 338.7   | 477.5   | 782.8   | 882.8   | 2254.1  | 4219.5  | 2515.1  | 1293.6 |
| 82.5° | 188.8   | 194.3   | 194.3   | 194.3   | 227.6   | 310.9   | 355.3   | 905.0   | 2104.2  | 1249.2  | 399.7  |
| 85°   | 99.9    | 99.9    | 111.0   | 138.8   | 161.0   | 188.8   | 199.9   | 288.7   | 694.0   | 372.0   | 94.4   |
| 87.5° | 55.5    | 61.1    | 66.6    | 83.3    | 105.5   | 127.7   | 138.8   | 199.9   | 266.5   | 255.4   | 22.2   |
| 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: P1047535

CATALOG NUMBER: GALN-SA5C-935-U-T3BC

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 138.8  | 138.8 | 138.8 | 138.8 | 138.8 | 138.8 | 138.8 | 138.8 | 138.8 | 138.8 | 138.8 |
| 2.5°  | 144.4  | 138.8 | 133.2 | 127.7 | 122.1 | 116.6 | 116.6 | 116.6 | 116.6 | 116.6 | 116.6 |
| 5°    | 138.8  | 133.2 | 127.7 | 116.6 | 105.5 | 99.9  | 94.4  | 88.8  | 88.8  | 88.8  | 88.8  |
| 7.5°  | 138.8  | 133.2 | 116.6 | 105.5 | 94.4  | 83.3  | 72.2  | 72.2  | 72.2  | 72.2  | 72.2  |
| 10°   | 138.8  | 127.7 | 111.0 | 94.4  | 77.7  | 66.6  | 61.1  | 55.5  | 55.5  | 55.5  | 55.5  |
| 12.5° | 138.8  | 122.1 | 105.5 | 83.3  | 66.6  | 55.5  | 50.0  | 44.4  | 44.4  | 44.4  | 44.4  |
| 15°   | 138.8  | 122.1 | 99.9  | 77.7  | 61.1  | 44.4  | 38.9  | 33.3  | 33.3  | 33.3  | 33.3  |
| 17.5° | 133.2  | 116.6 | 94.4  | 66.6  | 50.0  | 33.3  | 27.8  | 22.2  | 22.2  | 27.8  | 27.8  |
| 20°   | 127.7  | 111.0 | 83.3  | 55.5  | 38.9  | 27.8  | 16.7  | 16.7  | 16.7  | 16.7  | 16.7  |
| 22.5° | 127.7  | 111.0 | 77.7  | 50.0  | 33.3  | 16.7  | 11.1  | 11.1  | 11.1  | 11.1  | 16.7  |
| 25°   | 127.7  | 105.5 | 66.6  | 38.9  | 22.2  | 11.1  | 5.6   | 5.6   | 5.6   | 5.6   | 5.6   |
| 27.5° | 127.7  | 105.5 | 61.1  | 33.3  | 16.7  | 11.1  | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   |
| 30°   | 122.1  | 99.9  | 55.5  | 27.8  | 11.1  | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 32.5° | 122.1  | 94.4  | 44.4  | 22.2  | 11.1  | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 35°   | 127.7  | 88.8  | 38.9  | 16.7  | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 5.6   |
| 37.5° | 133.2  | 83.3  | 33.3  | 11.1  | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 40°   | 138.8  | 77.7  | 33.3  | 11.1  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 42.5° | 149.9  | 77.7  | 27.8  | 11.1  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 45°   | 161.0  | 77.7  | 22.2  | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 47.5° | 183.2  | 83.3  | 22.2  | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 50°   | 199.9  | 88.8  | 16.7  | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 52.5° | 222.1  | 83.3  | 16.7  | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 55°   | 249.8  | 83.3  | 16.7  | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 57.5° | 272.0  | 77.7  | 16.7  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 58°   | 283.2  | 72.2  | 11.1  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 60°   | 338.7  | 66.6  | 11.1  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 62.5° | 527.4  | 55.5  | 11.1  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 65°   | 1071.5 | 50.0  | 11.1  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 67.5° | 1998.7 | 44.4  | 11.1  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 70°   | 2237.5 | 50.0  | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 72.5° | 1410.2 | 38.9  | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 75°   | 744.0  | 38.9  | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 77.5° | 372.0  | 38.9  | 5.6   | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80°   | 172.1  | 27.8  | 5.6   | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 72.2   | 16.7  | 11.1  | 5.6   | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 33.3   | 16.7  | 11.1  | 11.1  | 5.6   | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 16.7   | 16.7  | 16.7  | 11.1  | 11.1  | 5.6   | 5.6   | 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: SP1-2407-184-15

Test Date: 10/11/2024

Luminaire Tested: GSS-SB1A-935-U-5WQ

Data in this report applies to families of products including GSS-SB1A-935-U-5WQ

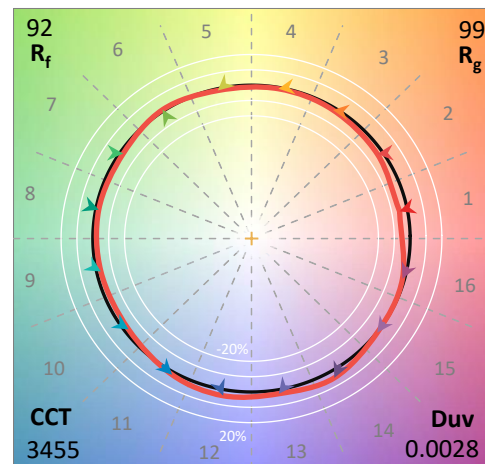
### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-15  
 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-935-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 90 CRI  
 3500K CCT 26 LEDS

### Spectral Parameters

CCT (K): 3455  
 CIE  $u'$ : 0.2356  
 CIE  $v'$ : 0.5159  
 Duv: 0.0028  
 CIE x: 0.4109  
 CIE y: 0.3999  
 CIE z: 0.1892  
 Peak Wavelength (nm): 616  
 Dominant Wavelength (nm): 579  
 Purity: 43.35383  
 R<sub>f</sub>: 92.3  
 R<sub>g</sub>: 98.5

CRI (Ra): 92.2  
 R1: 92.0  
 R2: 94.4  
 R3: 95.6  
 R4: 93.2  
 R5: 91.4  
 R6: 92.5  
 R7: 94.5  
 R8: 84.2  
 R9: 59.8  
 R10: 85.8  
 R11: 93.2  
 R12: 78.0  
 R13: 92.5  
 R14: 97.0  
 R15: 88.4



### Test Conditions

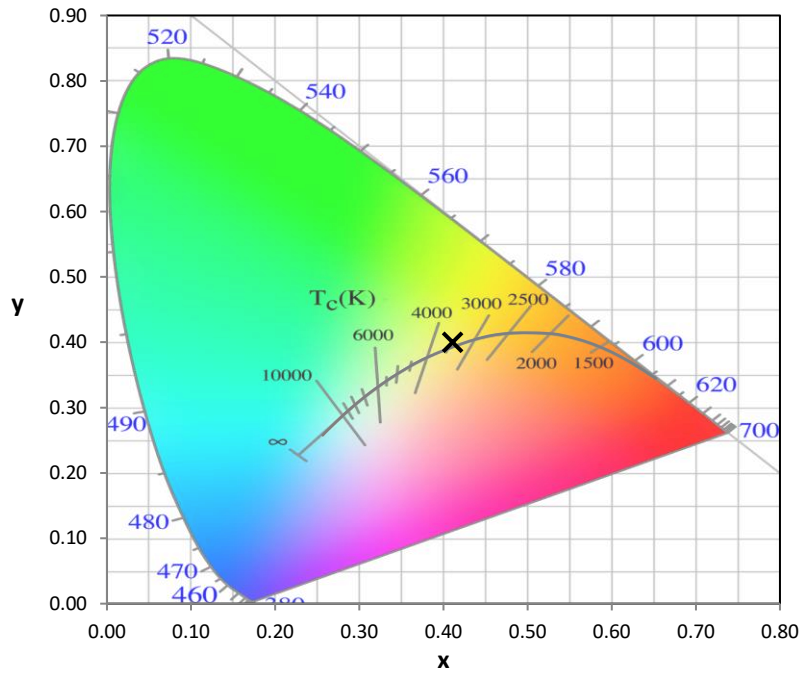
Stabilization Time: 20M  
 Operation Time: 1H 20M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-184-15

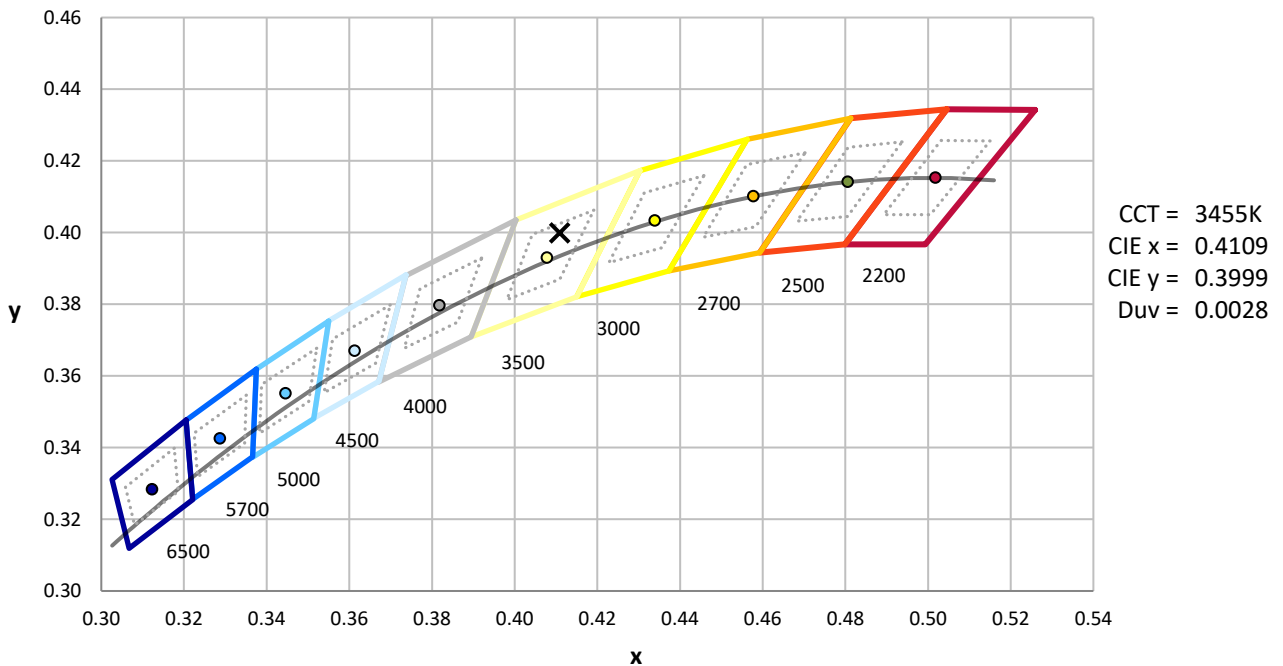
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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

REPORT NUMBER: SP1-2407-184-15

**CIE 1931 Chromaticity Diagram**



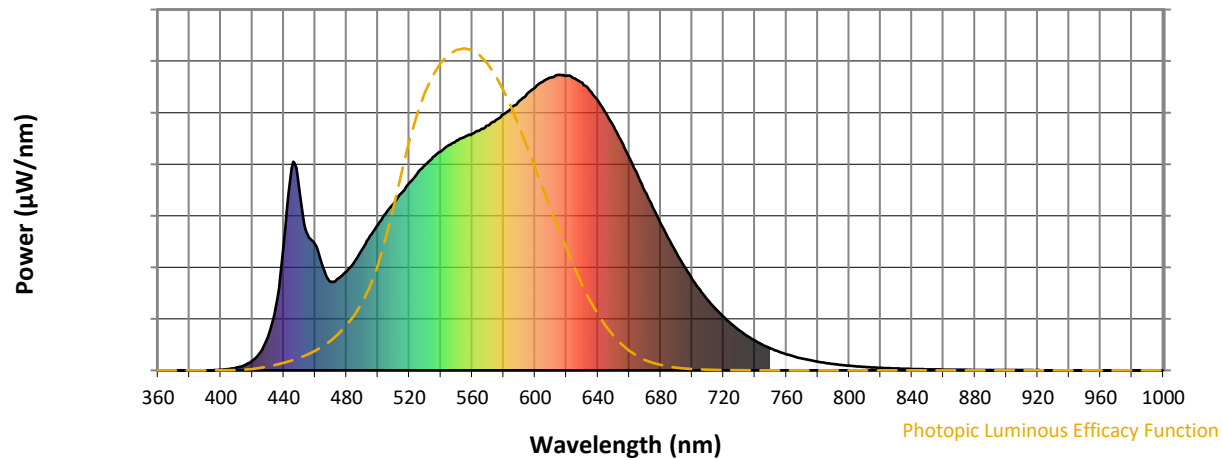
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 3500K 4-step quadrangle

REPORT NUMBER: SP1-2407-184-15

### Photopic Flux vs. Wavelength

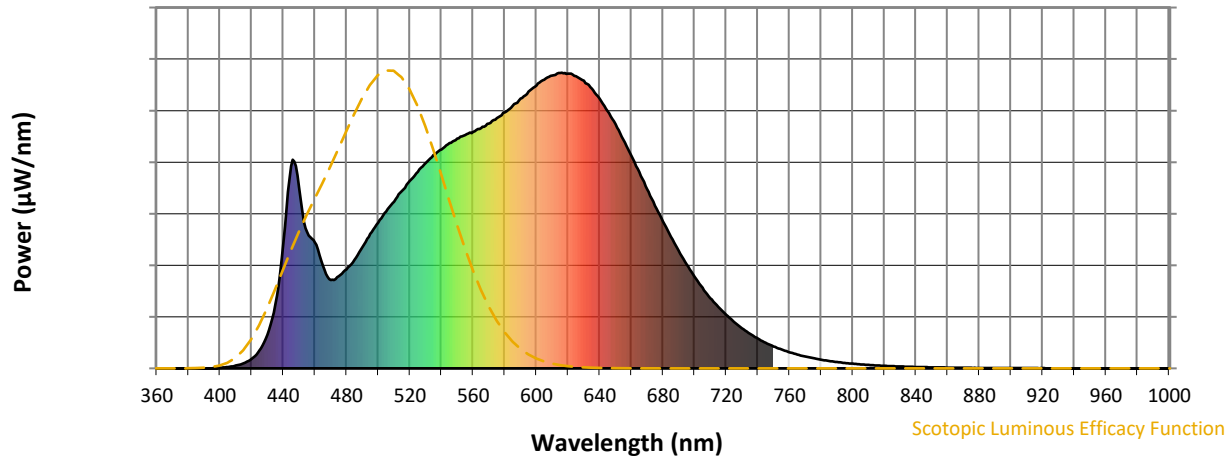


### Photopic Lumens: NR

| $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|
| 360               | 0                                      | NR                             | 490               | 410                                    | NR                             | 620               | 997                                    | NR                             | 750               | 74                                     | NR                             | 880               | 1                                      | NR                             |
| 365               | 0                                      | NR                             | 495               | 454                                    | NR                             | 625               | 988                                    | NR                             | 755               | 64                                     | NR                             | 885               | 1                                      | NR                             |
| 370               | 0                                      | NR                             | 500               | 493                                    | NR                             | 630               | 973                                    | NR                             | 760               | 54                                     | NR                             | 890               | 1                                      | NR                             |
| 375               | 0                                      | NR                             | 505               | 530                                    | NR                             | 635               | 946                                    | NR                             | 765               | 47                                     | NR                             | 895               | 1                                      | NR                             |
| 380               | 0                                      | NR                             | 510               | 564                                    | NR                             | 640               | 913                                    | NR                             | 770               | 40                                     | NR                             | 900               | 1                                      | NR                             |
| 385               | 0                                      | NR                             | 515               | 599                                    | NR                             | 645               | 870                                    | NR                             | 775               | 34                                     | NR                             | 905               | 1                                      | NR                             |
| 390               | 0                                      | NR                             | 520               | 634                                    | NR                             | 650               | 826                                    | NR                             | 780               | 29                                     | NR                             | 910               | 1                                      | NR                             |
| 395               | 0                                      | NR                             | 525               | 664                                    | NR                             | 655               | 774                                    | NR                             | 785               | 25                                     | NR                             | 915               | 1                                      | NR                             |
| 400               | 2                                      | NR                             | 530               | 695                                    | NR                             | 660               | 720                                    | NR                             | 790               | 21                                     | NR                             | 920               | 1                                      | NR                             |
| 405               | 4                                      | NR                             | 535               | 722                                    | NR                             | 665               | 664                                    | NR                             | 795               | 18                                     | NR                             | 925               | 1                                      | NR                             |
| 410               | 9                                      | NR                             | 540               | 741                                    | NR                             | 670               | 605                                    | NR                             | 800               | 16                                     | NR                             | 930               | 0                                      | NR                             |
| 415               | 17                                     | NR                             | 545               | 762                                    | NR                             | 675               | 550                                    | NR                             | 805               | 13                                     | NR                             | 935               | 0                                      | NR                             |
| 420               | 32                                     | NR                             | 550               | 777                                    | NR                             | 680               | 497                                    | NR                             | 810               | 12                                     | NR                             | 940               | 0                                      | NR                             |
| 425               | 61                                     | NR                             | 555               | 789                                    | NR                             | 685               | 445                                    | NR                             | 815               | 10                                     | NR                             | 945               | 0                                      | NR                             |
| 430               | 114                                    | NR                             | 560               | 800                                    | NR                             | 690               | 398                                    | NR                             | 820               | 9                                      | NR                             | 950               | 0                                      | NR                             |
| 435               | 218                                    | NR                             | 565               | 813                                    | NR                             | 695               | 352                                    | NR                             | 825               | 7                                      | NR                             | 955               | 0                                      | NR                             |
| 440               | 427                                    | NR                             | 570               | 828                                    | NR                             | 700               | 309                                    | NR                             | 830               | 6                                      | NR                             | 960               | 0                                      | NR                             |
| 445               | 684                                    | NR                             | 575               | 846                                    | NR                             | 705               | 273                                    | NR                             | 835               | 5                                      | NR                             | 965               | 0                                      | NR                             |
| 450               | 611                                    | NR                             | 580               | 866                                    | NR                             | 710               | 237                                    | NR                             | 840               | 5                                      | NR                             | 970               | 0                                      | NR                             |
| 455               | 461                                    | NR                             | 585               | 888                                    | NR                             | 715               | 208                                    | NR                             | 845               | 4                                      | NR                             | 975               | 0                                      | NR                             |
| 460               | 427                                    | NR                             | 590               | 913                                    | NR                             | 720               | 181                                    | NR                             | 850               | 4                                      | NR                             | 980               | 0                                      | NR                             |
| 465               | 349                                    | NR                             | 595               | 936                                    | NR                             | 725               | 157                                    | NR                             | 855               | 3                                      | NR                             | 985               | 0                                      | NR                             |
| 470               | 298                                    | NR                             | 600               | 957                                    | NR                             | 730               | 136                                    | NR                             | 860               | 3                                      | NR                             | 990               | 1                                      | NR                             |
| 475               | 312                                    | NR                             | 605               | 976                                    | NR                             | 735               | 117                                    | NR                             | 865               | 2                                      | NR                             | 995               | 0                                      | NR                             |
| 480               | 335                                    | NR                             | 610               | 990                                    | NR                             | 740               | 100                                    | NR                             | 870               | 2                                      | NR                             | 1000              | 0                                      | NR                             |
| 485               | 367                                    | NR                             | 615               | 999                                    | NR                             | 745               | 86                                     | NR                             | 875               | 2                                      | NR                             |                   |                                        |                                |

REPORT NUMBER: SP1-2407-184-15

### Scotopic Flux vs. Wavelength



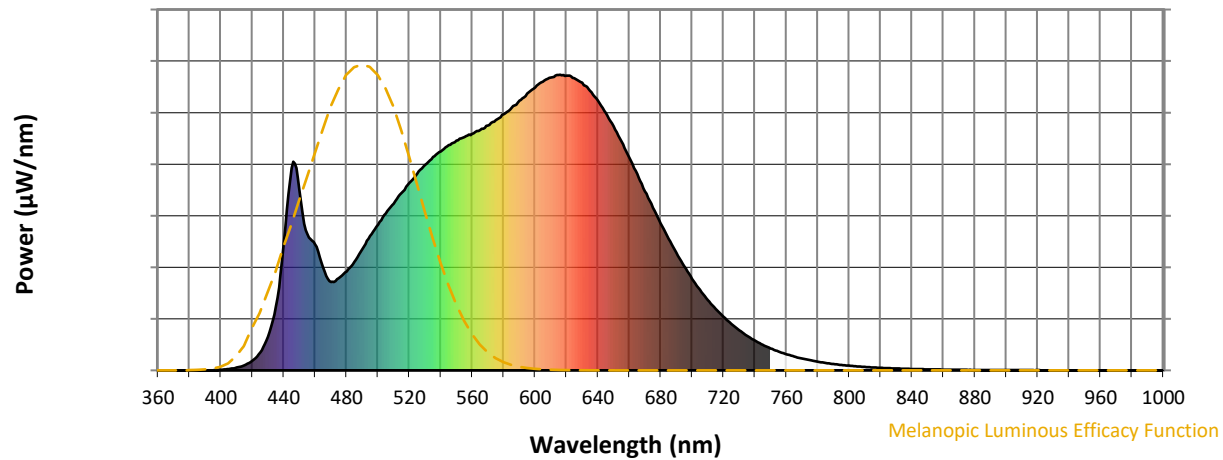
Scotopic Lumens: NR

S/P: 1.58

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (Φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 410                      | NR            | 620    | 997                      | NR            | 750    | 74                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 454                      | NR            | 625    | 988                      | NR            | 755    | 64                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 493                      | NR            | 630    | 973                      | NR            | 760    | 54                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 530                      | NR            | 635    | 946                      | NR            | 765    | 47                       | NR            | 895    | 1                        | NR            |
| 380    | 0                        | NR            | 510    | 564                      | NR            | 640    | 913                      | NR            | 770    | 40                       | NR            | 900    | 1                        | NR            |
| 385    | 0                        | NR            | 515    | 599                      | NR            | 645    | 870                      | NR            | 775    | 34                       | NR            | 905    | 1                        | NR            |
| 390    | 0                        | NR            | 520    | 634                      | NR            | 650    | 826                      | NR            | 780    | 29                       | NR            | 910    | 1                        | NR            |
| 395    | 0                        | NR            | 525    | 664                      | NR            | 655    | 774                      | NR            | 785    | 25                       | NR            | 915    | 1                        | NR            |
| 400    | 2                        | NR            | 530    | 695                      | NR            | 660    | 720                      | NR            | 790    | 21                       | NR            | 920    | 1                        | NR            |
| 405    | 4                        | NR            | 535    | 722                      | NR            | 665    | 664                      | NR            | 795    | 18                       | NR            | 925    | 1                        | NR            |
| 410    | 9                        | NR            | 540    | 741                      | NR            | 670    | 605                      | NR            | 800    | 16                       | NR            | 930    | 0                        | NR            |
| 415    | 17                       | NR            | 545    | 762                      | NR            | 675    | 550                      | NR            | 805    | 13                       | NR            | 935    | 0                        | NR            |
| 420    | 32                       | NR            | 550    | 777                      | NR            | 680    | 497                      | NR            | 810    | 12                       | NR            | 940    | 0                        | NR            |
| 425    | 61                       | NR            | 555    | 789                      | NR            | 685    | 445                      | NR            | 815    | 10                       | NR            | 945    | 0                        | NR            |
| 430    | 114                      | NR            | 560    | 800                      | NR            | 690    | 398                      | NR            | 820    | 9                        | NR            | 950    | 0                        | NR            |
| 435    | 218                      | NR            | 565    | 813                      | NR            | 695    | 352                      | NR            | 825    | 7                        | NR            | 955    | 0                        | NR            |
| 440    | 427                      | NR            | 570    | 828                      | NR            | 700    | 309                      | NR            | 830    | 6                        | NR            | 960    | 0                        | NR            |
| 445    | 684                      | NR            | 575    | 846                      | NR            | 705    | 273                      | NR            | 835    | 5                        | NR            | 965    | 0                        | NR            |
| 450    | 611                      | NR            | 580    | 866                      | NR            | 710    | 237                      | NR            | 840    | 5                        | NR            | 970    | 0                        | NR            |
| 455    | 461                      | NR            | 585    | 888                      | NR            | 715    | 208                      | NR            | 845    | 4                        | NR            | 975    | 0                        | NR            |
| 460    | 427                      | NR            | 590    | 913                      | NR            | 720    | 181                      | NR            | 850    | 4                        | NR            | 980    | 0                        | NR            |
| 465    | 349                      | NR            | 595    | 936                      | NR            | 725    | 157                      | NR            | 855    | 3                        | NR            | 985    | 0                        | NR            |
| 470    | 298                      | NR            | 600    | 957                      | NR            | 730    | 136                      | NR            | 860    | 3                        | NR            | 990    | 1                        | NR            |
| 475    | 312                      | NR            | 605    | 976                      | NR            | 735    | 117                      | NR            | 865    | 2                        | NR            | 995    | 0                        | NR            |
| 480    | 335                      | NR            | 610    | 990                      | NR            | 740    | 100                      | NR            | 870    | 2                        | NR            | 1000   | 0                        | NR            |
| 485    | 367                      | NR            | 615    | 999                      | NR            | 745    | 86                       | NR            | 875    | 2                        | NR            |        |                          |               |

REPORT NUMBER: SP1-2407-184-15

### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 3.14

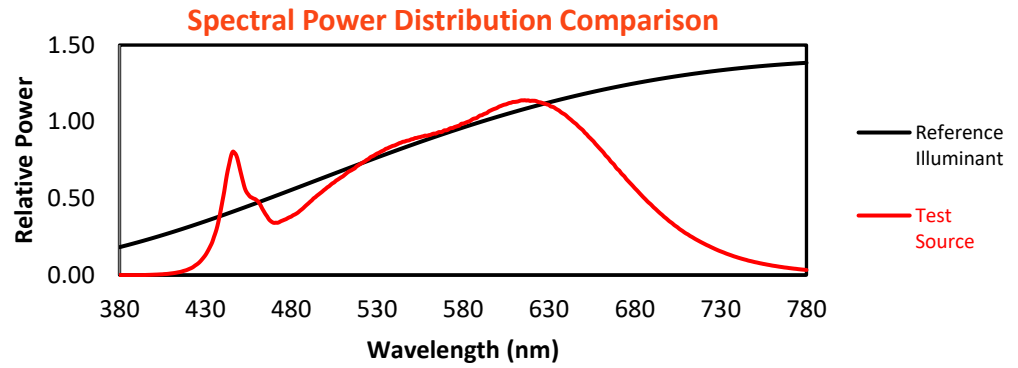
| $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | 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               | 410                                    | NR                             | 620               | 997                                    | NR                             | 750               | 74                                     | NR                             | 880               | 1                                      | NR                             |
| 365               | 0                                      | NR                             | 495               | 454                                    | NR                             | 625               | 988                                    | NR                             | 755               | 64                                     | NR                             | 885               | 1                                      | NR                             |
| 370               | 0                                      | NR                             | 500               | 493                                    | NR                             | 630               | 973                                    | NR                             | 760               | 54                                     | NR                             | 890               | 1                                      | NR                             |
| 375               | 0                                      | NR                             | 505               | 530                                    | NR                             | 635               | 946                                    | NR                             | 765               | 47                                     | NR                             | 895               | 1                                      | NR                             |
| 380               | 0                                      | NR                             | 510               | 564                                    | NR                             | 640               | 913                                    | NR                             | 770               | 40                                     | NR                             | 900               | 1                                      | NR                             |
| 385               | 0                                      | NR                             | 515               | 599                                    | NR                             | 645               | 870                                    | NR                             | 775               | 34                                     | NR                             | 905               | 1                                      | NR                             |
| 390               | 0                                      | NR                             | 520               | 634                                    | NR                             | 650               | 826                                    | NR                             | 780               | 29                                     | NR                             | 910               | 1                                      | NR                             |
| 395               | 0                                      | NR                             | 525               | 664                                    | NR                             | 655               | 774                                    | NR                             | 785               | 25                                     | NR                             | 915               | 1                                      | NR                             |
| 400               | 2                                      | NR                             | 530               | 695                                    | NR                             | 660               | 720                                    | NR                             | 790               | 21                                     | NR                             | 920               | 1                                      | NR                             |
| 405               | 4                                      | NR                             | 535               | 722                                    | NR                             | 665               | 664                                    | NR                             | 795               | 18                                     | NR                             | 925               | 1                                      | NR                             |
| 410               | 9                                      | NR                             | 540               | 741                                    | NR                             | 670               | 605                                    | NR                             | 800               | 16                                     | NR                             | 930               | 0                                      | NR                             |
| 415               | 17                                     | NR                             | 545               | 762                                    | NR                             | 675               | 550                                    | NR                             | 805               | 13                                     | NR                             | 935               | 0                                      | NR                             |
| 420               | 32                                     | NR                             | 550               | 777                                    | NR                             | 680               | 497                                    | NR                             | 810               | 12                                     | NR                             | 940               | 0                                      | NR                             |
| 425               | 61                                     | NR                             | 555               | 789                                    | NR                             | 685               | 445                                    | NR                             | 815               | 10                                     | NR                             | 945               | 0                                      | NR                             |
| 430               | 114                                    | NR                             | 560               | 800                                    | NR                             | 690               | 398                                    | NR                             | 820               | 9                                      | NR                             | 950               | 0                                      | NR                             |
| 435               | 218                                    | NR                             | 565               | 813                                    | NR                             | 695               | 352                                    | NR                             | 825               | 7                                      | NR                             | 955               | 0                                      | NR                             |
| 440               | 427                                    | NR                             | 570               | 828                                    | NR                             | 700               | 309                                    | NR                             | 830               | 6                                      | NR                             | 960               | 0                                      | NR                             |
| 445               | 684                                    | NR                             | 575               | 846                                    | NR                             | 705               | 273                                    | NR                             | 835               | 5                                      | NR                             | 965               | 0                                      | NR                             |
| 450               | 611                                    | NR                             | 580               | 866                                    | NR                             | 710               | 237                                    | NR                             | 840               | 5                                      | NR                             | 970               | 0                                      | NR                             |
| 455               | 461                                    | NR                             | 585               | 888                                    | NR                             | 715               | 208                                    | NR                             | 845               | 4                                      | NR                             | 975               | 0                                      | NR                             |
| 460               | 427                                    | NR                             | 590               | 913                                    | NR                             | 720               | 181                                    | NR                             | 850               | 4                                      | NR                             | 980               | 0                                      | NR                             |
| 465               | 349                                    | NR                             | 595               | 936                                    | NR                             | 725               | 157                                    | NR                             | 855               | 3                                      | NR                             | 985               | 0                                      | NR                             |
| 470               | 298                                    | NR                             | 600               | 957                                    | NR                             | 730               | 136                                    | NR                             | 860               | 3                                      | NR                             | 990               | 1                                      | NR                             |
| 475               | 312                                    | NR                             | 605               | 976                                    | NR                             | 735               | 117                                    | NR                             | 865               | 2                                      | NR                             | 995               | 0                                      | NR                             |
| 480               | 335                                    | NR                             | 610               | 990                                    | NR                             | 740               | 100                                    | NR                             | 870               | 2                                      | NR                             | 1000              | 0                                      | NR                             |
| 485               | 367                                    | NR                             | 615               | 999                                    | NR                             | 745               | 86                                     | NR                             | 875               | 2                                      | NR                             |                   |                                        |                                |

REPORT NUMBER: SP1-2407-184-15

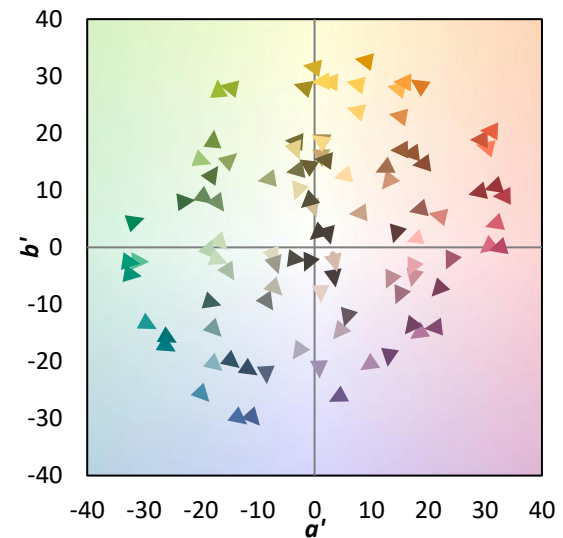
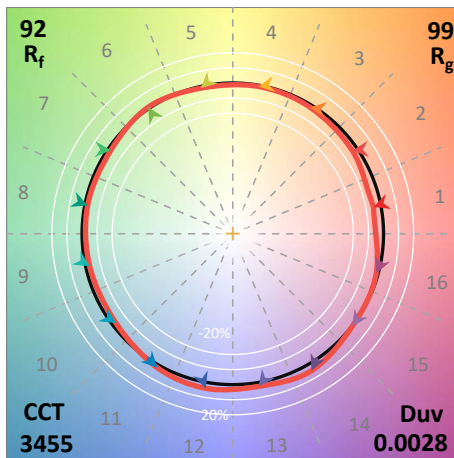
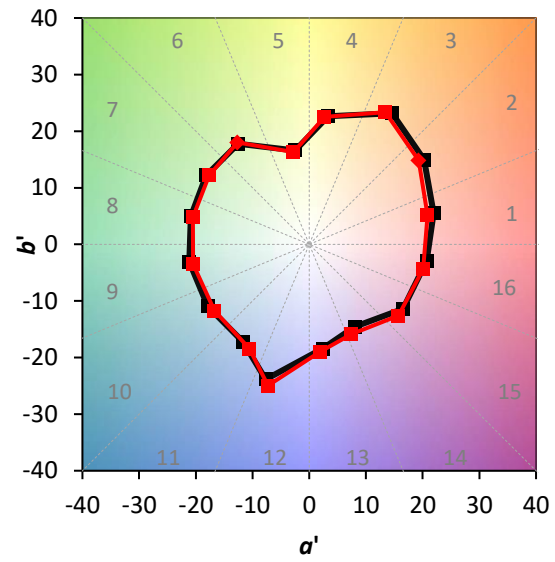
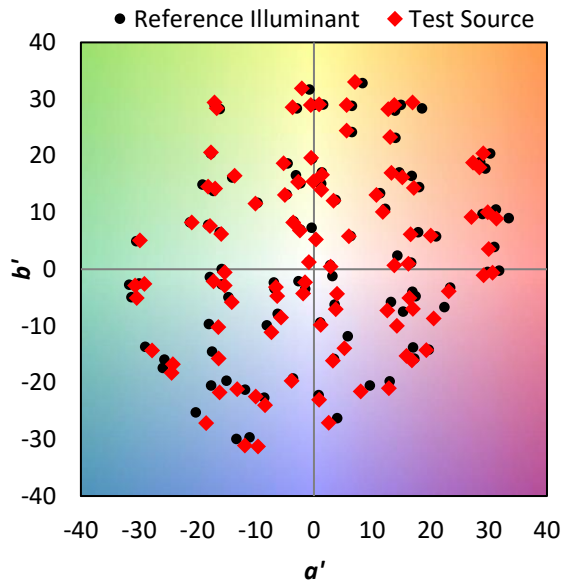
TM-30-18

### Summary

$R_f = 92.3$   
 $R_g = 98.5$   
 $\text{CIE } R_a = 92.2$   
 $R_9 = 59.8$

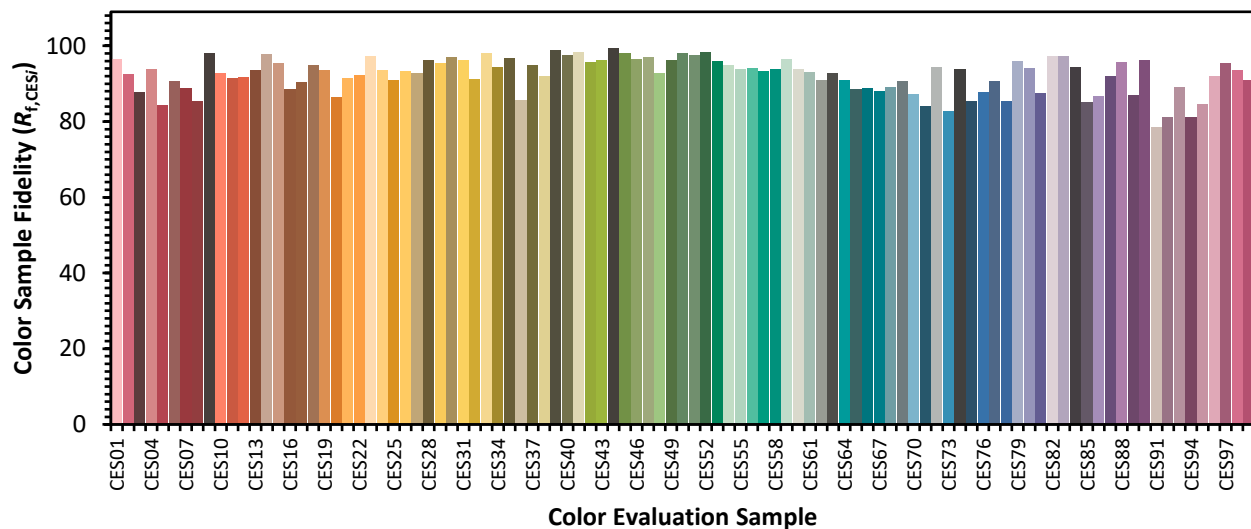


### Color Vector Graphics

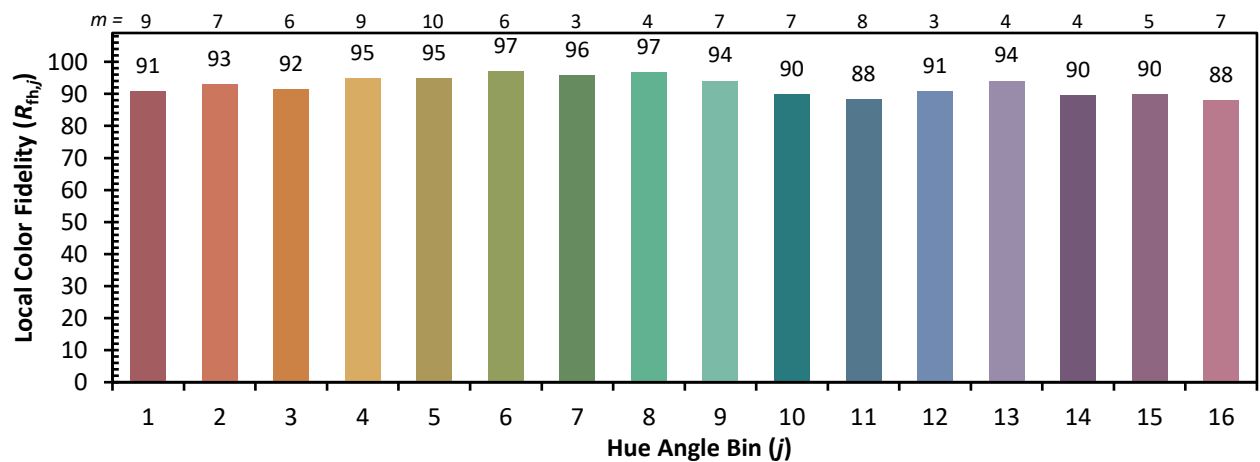
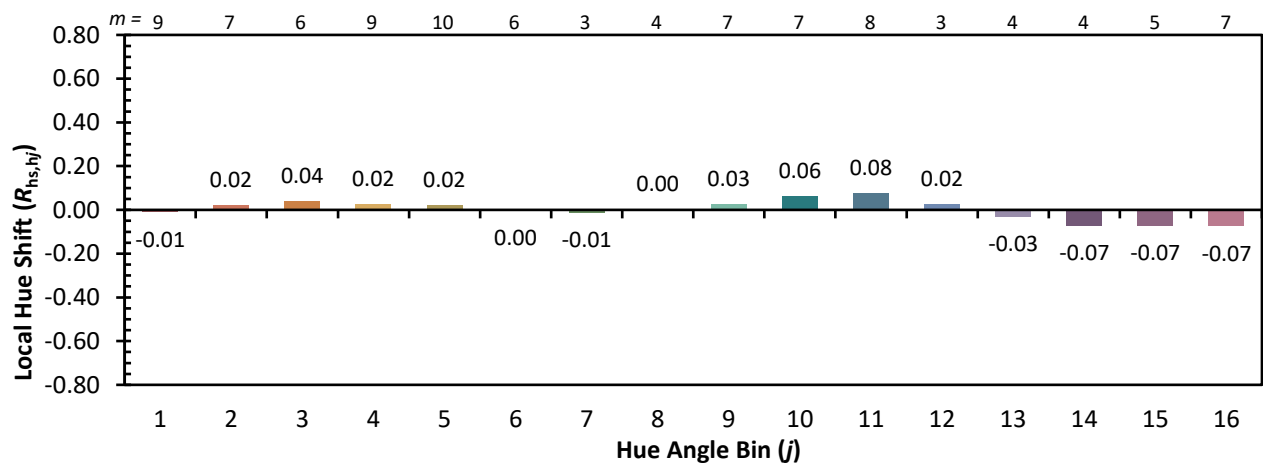
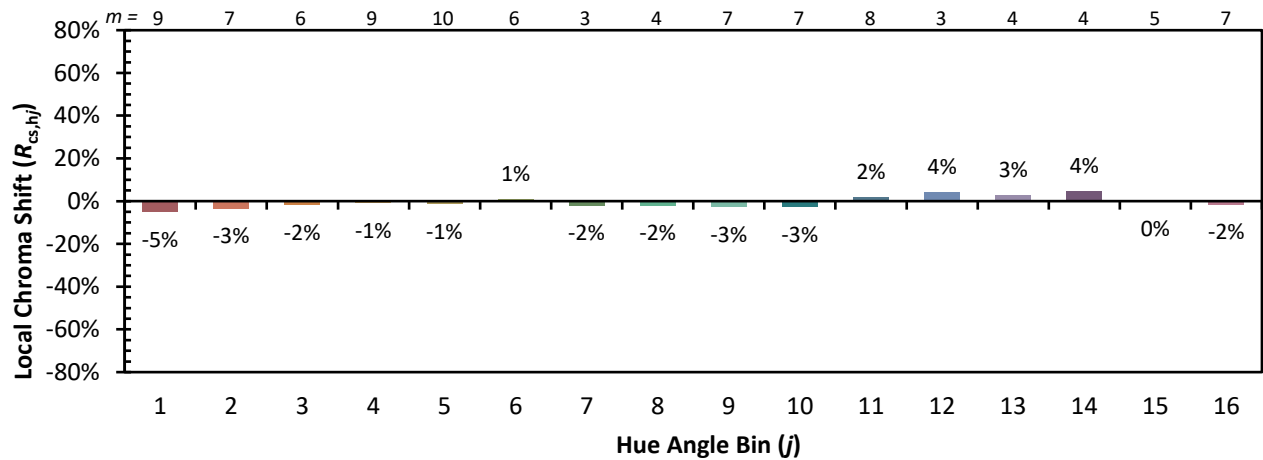


Individual Sample Fidelity Index ( $R_{f,i}$ )

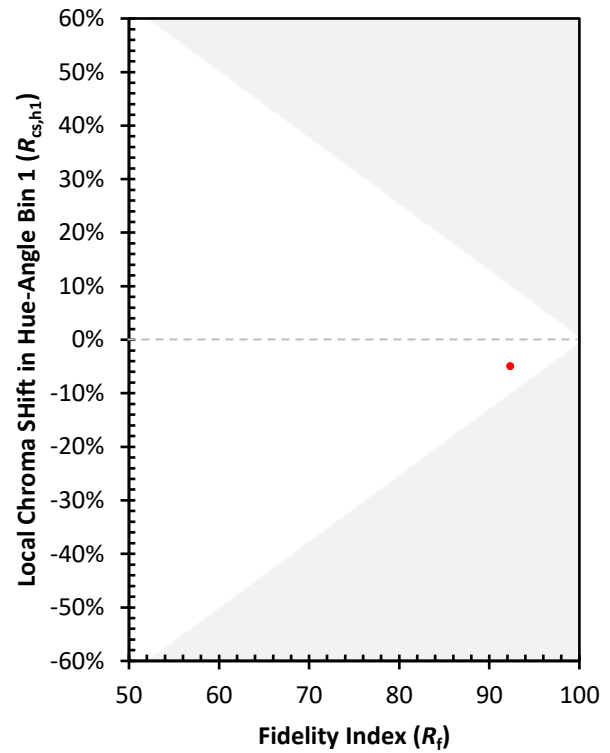
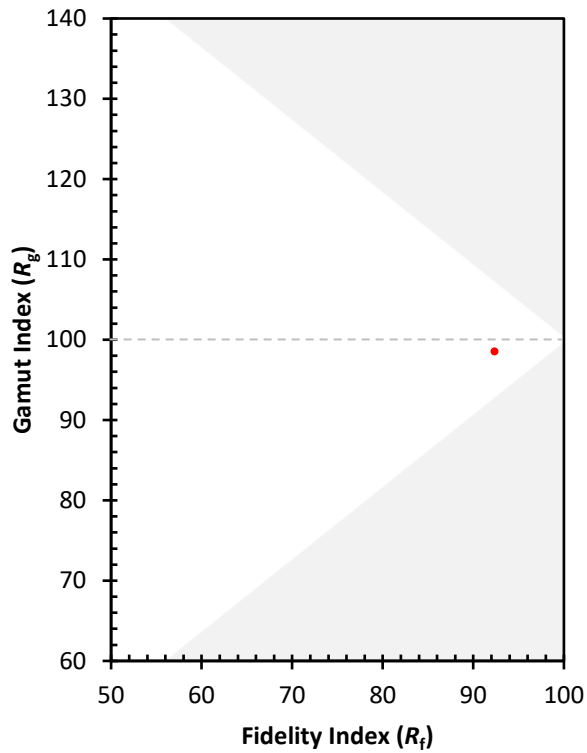
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 93 | CES51 = 97 | CES76 = 88 |
| CES02 = 62 | CES27 = 93 | CES52 = 98 | CES77 = 91 |
| CES03 = 31 | CES28 = 96 | CES53 = 96 | CES78 = 85 |
| CES04 = 70 | CES29 = 95 | CES54 = 95 | CES79 = 96 |
| CES05 = 50 | CES30 = 97 | CES55 = 94 | CES80 = 94 |
| CES06 = 51 | CES31 = 96 | CES56 = 94 | CES81 = 87 |
| CES07 = 42 | CES32 = 91 | CES57 = 93 | CES82 = 97 |
| CES08 = 41 | CES33 = 98 | CES58 = 94 | CES83 = 97 |
| CES09 = 29 | CES34 = 94 | CES59 = 96 | CES84 = 94 |
| CES10 = 75 | CES35 = 97 | CES60 = 94 | CES85 = 85 |
| CES11 = 58 | CES36 = 86 | CES61 = 93 | CES86 = 87 |
| CES12 = 64 | CES37 = 95 | CES62 = 91 | CES87 = 92 |
| CES13 = 43 | CES38 = 92 | CES63 = 93 | CES88 = 96 |
| CES14 = 74 | CES39 = 99 | CES64 = 91 | CES89 = 87 |
| CES15 = 71 | CES40 = 98 | CES65 = 89 | CES90 = 96 |
| CES16 = 47 | CES41 = 98 | CES66 = 89 | CES91 = 78 |
| CES17 = 49 | CES42 = 96 | CES67 = 88 | CES92 = 81 |
| CES18 = 56 | CES43 = 96 | CES68 = 89 | CES93 = 89 |
| CES19 = 71 | CES44 = 99 | CES69 = 91 | CES94 = 81 |
| CES20 = 66 | CES45 = 98 | CES70 = 87 | CES95 = 85 |
| CES21 = 86 | CES46 = 97 | CES71 = 84 | CES96 = 92 |
| CES22 = 78 | CES47 = 97 | CES72 = 95 | CES97 = 95 |
| CES23 = 91 | CES48 = 93 | CES73 = 83 | CES98 = 94 |
| CES24 = 90 | CES49 = 96 | CES74 = 94 | CES99 = 91 |
| CES25 = 71 | CES50 = 98 | CES75 = 85 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)