

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: P1048374

Luminaire Tested: **GALN-SA8B-730-U-T4BC**

Issue Date: 07/10/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1048374  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 07/10/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GALN-SA8B-730-U-T4BC  
Description: GALLEON II AREA AND ROADWAY LUMINAIRE 800mA 8xLight Square PACKAGE  
70CRI 3000K FIXTURE w/ TYPE IV ANGLED BACKLIGHT CONTROL  
Light Source: (112) 3000K CCT, 70 CRI LEDs  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 35188.3 lumens  
Efficiency: N/A  
Efficacy: 124.4 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1.5' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B0 - U0 - G5

Input Watts (W): 282.8  
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

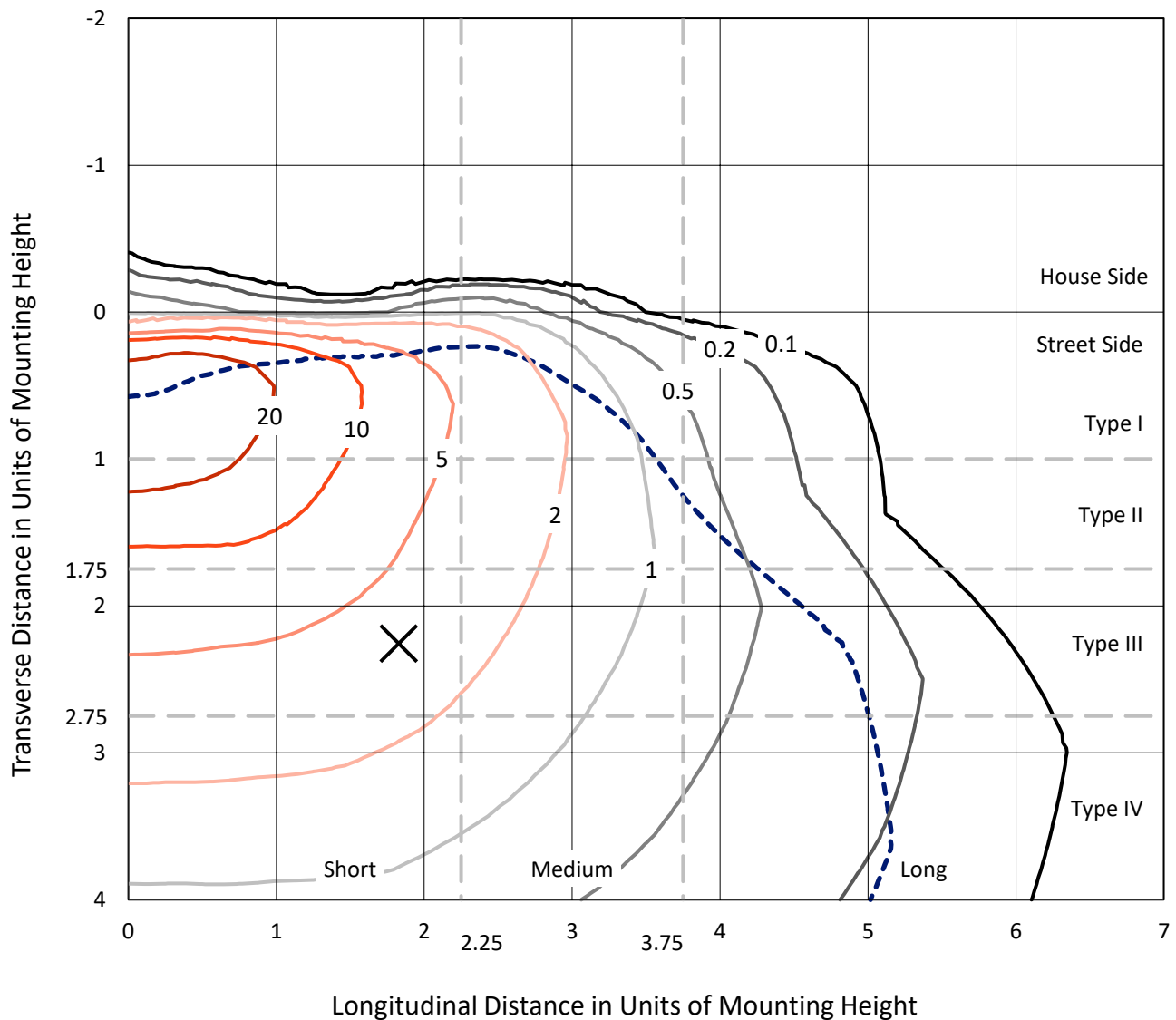


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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
- - - 1/2 Max cd

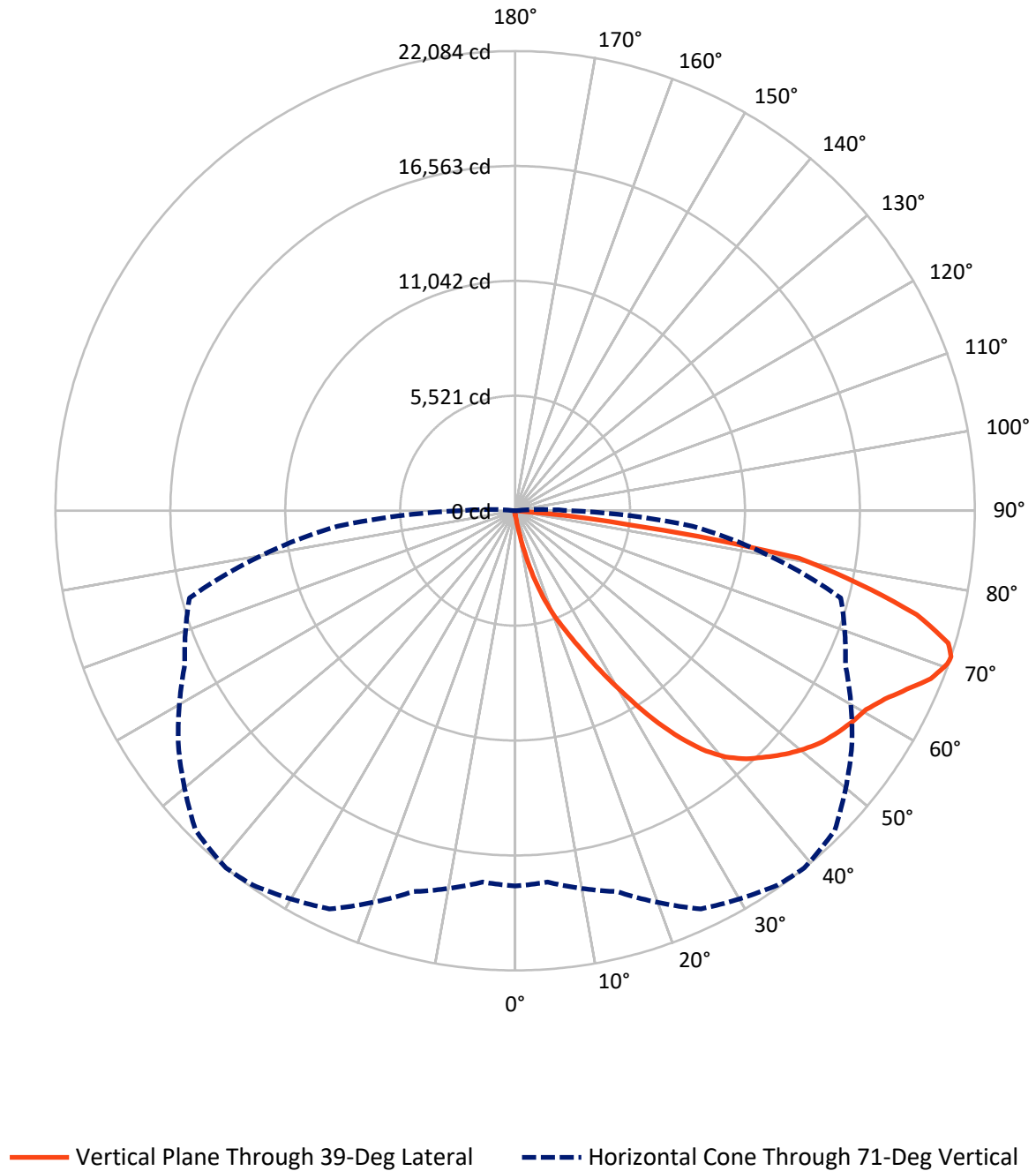


Based on 15 foot mounting height. Maximum calculated value = 36.2 fc  
Type IV - Short - N/A

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CATALOG NUMBER: GALN-SA8B-730-U-T4BC

## Luminous Intensity Polar Plot



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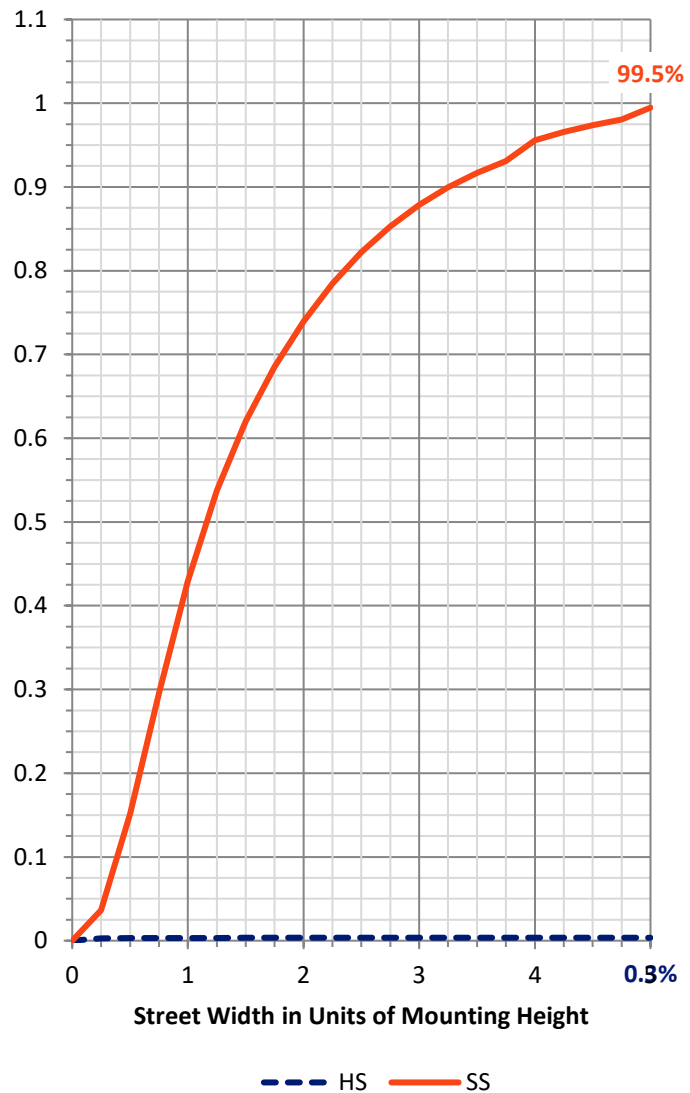
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 125.0    | 0.0    | 125.0   |
|                    | % Fixture | 0.4      | 0.0    | 0.4     |
| <b>Street Side</b> | Lumens    | 35063.3  | 0.0    | 35063.3 |
|                    | % Fixture | 99.6     | 0.0    | 99.6    |
| <b>Total</b>       | Lumens    | 35188.3  | 0.0    | 35188.3 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 29.4    | 0.1       |
| 10°-20°   | 376.1   | 1.1       |
| 20°-30°   | 1339.4  | 3.8       |
| 30°-40°   | 3228.0  | 9.2       |
| 40°-50°   | 5402.3  | 15.4      |
| 50°-60°   | 6938.6  | 19.7      |
| 60°-70°   | 8780.8  | 25.0      |
| 70°-80°   | 7828.4  | 22.2      |
| 80°-90°   | 1265.4  | 3.6       |
| 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°    | 35188.3 | 100.0     |
| 0°-180°   | 35188.3 | 100.0     |



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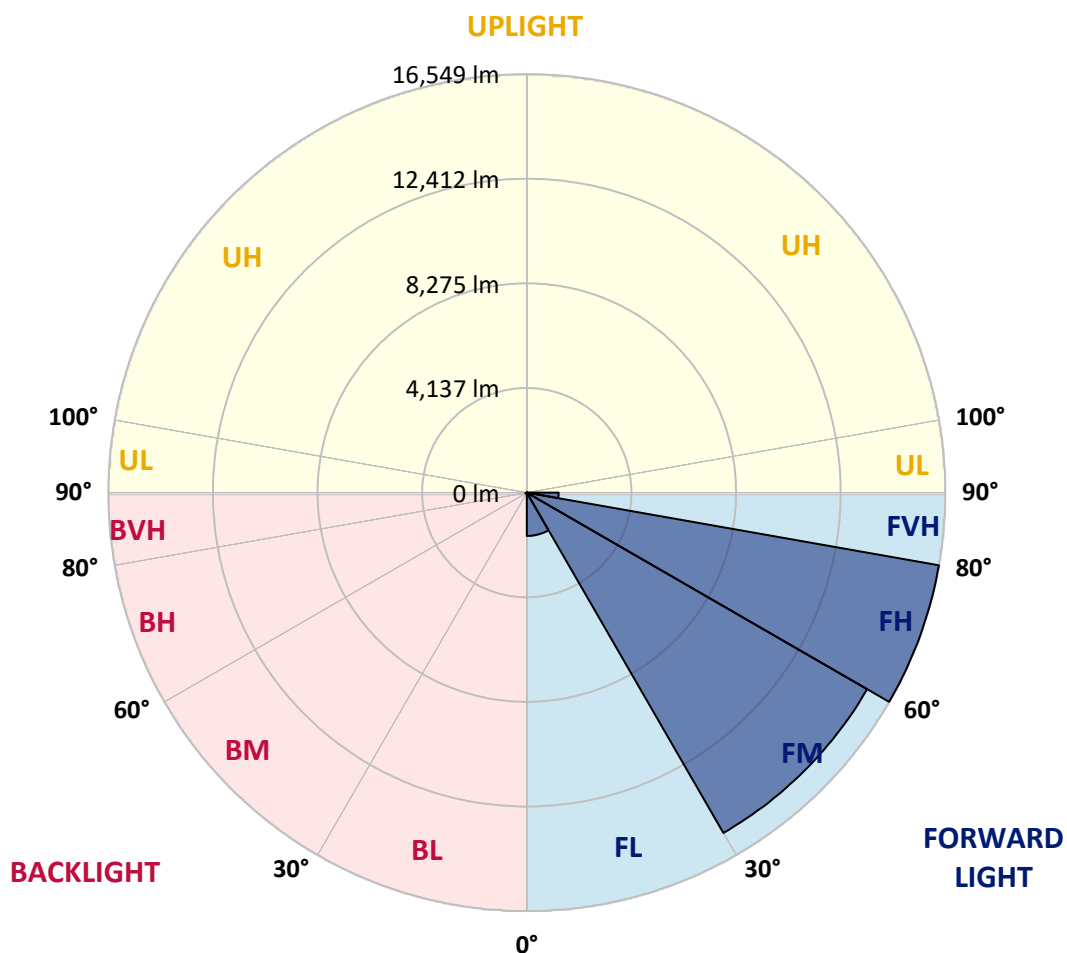
CATALOG NUMBER: GALN-SA8B-730-U-T4BC

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |        |
|------|-------------|---------|-----------|-------------------------|------|--------|
|      |             |         |           | B                       | U    | G      |
| FL   | (0°-30°)    | 1714.6  | 4.9       |                         |      |        |
| FM   | (30°-60°)   | 15539.9 | 44.2      |                         |      |        |
| FH   | (60°-80°)   | 16549.1 | 47.0      |                         |      | G5     |
| FVH  | (80°-90°)   | 1259.7  | 3.6       |                         |      | G5     |
| BL   | (0°-30°)    | 30.2    | 0.1       | B0/110                  |      |        |
| BM   | (30°-60°)   | 28.9    | 0.1       | B0/220                  |      |        |
| BH   | (60°-80°)   | 60.1    | 0.2       | B0/110                  |      | G0/110 |
| BVH  | (80°-90°)   | 5.7     | 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-G5**

Type IV Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 39°     | 45°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 192.9   | 192.9   | 192.9   | 192.9   | 192.9   | 192.9   | 192.9   | 192.9   | 192.9   | 192.9   | 192.9   |
| 2.5°  | 221.5   | 221.5   | 221.5   | 214.4   | 214.4   | 212.0   | 209.6   | 209.6   | 204.9   | 202.5   | 197.7   |
| 5°    | 335.9   | 328.7   | 312.1   | 302.5   | 283.5   | 271.6   | 259.6   | 243.0   | 226.3   | 214.4   | 200.1   |
| 7.5°  | 759.9   | 776.6   | 721.8   | 619.3   | 514.5   | 469.3   | 393.0   | 316.8   | 262.0   | 226.3   | 202.5   |
| 10°   | 1936.6  | 1927.1  | 1741.3  | 1536.4  | 1186.3  | 1045.7  | 819.4   | 516.9   | 338.3   | 247.7   | 204.9   |
| 12.5° | 3294.4  | 3284.9  | 3065.7  | 2787.0  | 2324.9  | 2031.9  | 1603.1  | 964.7   | 485.9   | 281.1   | 204.9   |
| 15°   | 4435.4  | 4397.3  | 4328.2  | 4051.9  | 3511.2  | 3265.8  | 2698.9  | 1705.6  | 786.1   | 338.3   | 209.6   |
| 17.5° | 5190.5  | 5157.2  | 5092.8  | 4992.8  | 4649.8  | 4359.2  | 3904.2  | 2679.8  | 1272.0  | 438.3   | 219.1   |
| 20°   | 5883.7  | 5859.9  | 5807.5  | 5788.4  | 5566.9  | 5412.0  | 5035.7  | 3799.4  | 1981.9  | 595.5   | 233.4   |
| 22.5° | 6836.5  | 6786.5  | 6807.9  | 6693.6  | 6476.8  | 6291.0  | 6060.0  | 4971.4  | 2848.9  | 857.5   | 259.6   |
| 25°   | 8003.7  | 7979.9  | 7920.4  | 7839.4  | 7539.2  | 7377.2  | 7022.3  | 6076.6  | 3818.4  | 1200.6  | 288.2   |
| 27.5° | 9413.9  | 9387.7  | 9373.4  | 9187.6  | 8842.2  | 8665.9  | 8170.5  | 7120.0  | 4909.4  | 1681.7  | 326.3   |
| 30°   | 11038.5 | 11050.4 | 10957.5 | 10719.3 | 10316.7 | 10069.0 | 9559.2  | 8213.3  | 6026.6  | 2246.3  | 366.8   |
| 32.5° | 12720.2 | 12696.4 | 12553.5 | 12272.4 | 11912.7 | 11681.6 | 11033.7 | 9411.5  | 7198.6  | 2991.9  | 414.5   |
| 35°   | 14533.0 | 14487.7 | 14111.3 | 13789.8 | 13482.5 | 13191.9 | 12601.1 | 10802.7 | 8370.6  | 3828.0  | 478.8   |
| 37.5° | 16362.4 | 16150.4 | 15395.3 | 14987.9 | 14775.9 | 14537.7 | 13987.5 | 12286.7 | 9535.4  | 4761.7  | 557.4   |
| 40°   | 17744.0 | 17579.6 | 16684.0 | 15933.6 | 15764.5 | 15562.0 | 15152.3 | 13568.2 | 10774.1 | 5764.6  | 652.7   |
| 42.5° | 18508.6 | 18418.1 | 17613.0 | 16872.1 | 16474.3 | 16295.7 | 15945.5 | 14687.8 | 11998.4 | 6872.2  | 790.8   |
| 45°   | 18835.0 | 18694.4 | 18156.1 | 17810.7 | 17177.0 | 16881.7 | 16464.8 | 15533.4 | 13277.6 | 8130.0  | 983.8   |
| 47.5° | 18734.9 | 18653.9 | 18268.0 | 18394.3 | 17934.5 | 17474.8 | 16862.6 | 16181.3 | 14371.0 | 9573.5  | 1248.2  |
| 50°   | 18106.1 | 18037.0 | 17917.9 | 18601.5 | 18544.4 | 18001.2 | 17377.1 | 16693.5 | 15264.3 | 11062.3 | 1657.9  |
| 52.5° | 16910.3 | 16881.7 | 17186.6 | 18439.5 | 18889.8 | 18465.7 | 17872.6 | 17146.1 | 16098.0 | 12617.8 | 2243.9  |
| 55°   | 15369.1 | 15485.8 | 16357.6 | 18187.0 | 19066.0 | 18808.8 | 18310.9 | 17570.1 | 16767.3 | 14008.9 | 3108.6  |
| 57.5° | 14735.4 | 14766.4 | 15855.0 | 18008.4 | 19144.6 | 19111.3 | 18737.3 | 17975.0 | 17381.9 | 15121.3 | 4428.3  |
| 60°   | 15476.3 | 15428.6 | 16002.7 | 18144.2 | 19301.8 | 19382.8 | 19116.0 | 18351.4 | 17915.5 | 16076.5 | 6186.2  |
| 62.5° | 16815.0 | 16788.8 | 16972.2 | 18723.0 | 19761.6 | 19925.9 | 19642.5 | 18623.0 | 18387.1 | 16705.4 | 8191.9  |
| 65°   | 18010.8 | 17956.0 | 18296.6 | 19749.7 | 20569.1 | 20685.8 | 20438.1 | 19087.5 | 18594.4 | 17162.8 | 10076.1 |
| 67.5° | 18527.7 | 18515.8 | 19063.6 | 20726.3 | 21417.1 | 21543.4 | 21326.6 | 19728.2 | 18546.7 | 17308.1 | 10907.5 |
| 70°   | 18291.9 | 18246.6 | 19123.2 | 21140.8 | 21895.9 | 22038.8 | 21829.2 | 19966.4 | 18029.8 | 16848.3 | 9675.9  |
| 71°   | 18032.2 | 17910.7 | 18944.5 | 21112.2 | 21962.6 | 22084.1 | 21717.3 | 19749.7 | 17510.5 | 16195.6 | 8558.7  |
| 72.5° | 17227.1 | 17248.5 | 18453.8 | 20814.5 | 21803.0 | 21767.3 | 21083.6 | 18973.1 | 16884.1 | 14714.0 | 6874.6  |
| 75°   | 15245.2 | 15371.4 | 16865.0 | 19563.9 | 20378.5 | 19923.6 | 18877.8 | 17489.1 | 15626.3 | 10550.2 | 4773.7  |
| 77.5° | 12458.2 | 12646.4 | 14287.6 | 17158.0 | 16926.9 | 16881.7 | 16838.8 | 15409.6 | 13344.3 | 5666.9  | 3320.6  |
| 80°   | 5948.0  | 6355.3  | 8618.3  | 12248.6 | 13306.2 | 13818.3 | 13496.8 | 12417.7 | 10319.1 | 2698.9  | 1984.3  |
| 82.5° | 388.3   | 383.5   | 543.1   | 1029.1  | 4337.7  | 5607.4  | 8908.9  | 8875.6  | 7193.8  | 1314.9  | 809.9   |
| 85°   | 183.4   | 188.2   | 207.2   | 235.8   | 273.9   | 300.1   | 414.5   | 2429.7  | 3442.1  | 626.5   | 176.3   |
| 87.5° | 107.2   | 109.6   | 128.6   | 164.4   | 214.4   | 238.2   | 283.5   | 364.5   | 447.8   | 345.4   | 38.1    |
| 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: GALN-SA8B-730-U-T4BC

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 192.9  | 192.9 | 192.9 | 192.9 | 192.9 | 192.9 | 192.9 | 192.9 | 192.9 | 192.9 | 192.9 |
| 2.5°  | 195.3  | 192.9 | 185.8 | 178.7 | 171.5 | 166.7 | 164.4 | 166.7 | 166.7 | 169.1 | 169.1 |
| 5°    | 195.3  | 188.2 | 176.3 | 162.0 | 152.5 | 142.9 | 138.2 | 135.8 | 138.2 | 138.2 | 138.2 |
| 7.5°  | 192.9  | 181.0 | 164.4 | 147.7 | 135.8 | 123.9 | 119.1 | 116.7 | 116.7 | 119.1 | 119.1 |
| 10°   | 188.2  | 176.3 | 154.8 | 135.8 | 121.5 | 107.2 | 100.0 | 92.9  | 92.9  | 92.9  | 95.3  |
| 12.5° | 185.8  | 169.1 | 142.9 | 123.9 | 104.8 | 88.1  | 73.8  | 66.7  | 69.1  | 69.1  | 69.1  |
| 15°   | 181.0  | 162.0 | 135.8 | 112.0 | 88.1  | 66.7  | 54.8  | 47.6  | 50.0  | 52.4  | 50.0  |
| 17.5° | 181.0  | 159.6 | 126.2 | 97.7  | 69.1  | 50.0  | 40.5  | 35.7  | 35.7  | 38.1  | 38.1  |
| 20°   | 181.0  | 154.8 | 119.1 | 83.4  | 52.4  | 38.1  | 28.6  | 26.2  | 26.2  | 31.0  | 33.3  |
| 22.5° | 185.8  | 154.8 | 109.6 | 69.1  | 42.9  | 28.6  | 21.4  | 19.1  | 21.4  | 26.2  | 28.6  |
| 25°   | 192.9  | 152.5 | 100.0 | 61.9  | 35.7  | 21.4  | 16.7  | 11.9  | 14.3  | 19.1  | 21.4  |
| 27.5° | 200.1  | 150.1 | 90.5  | 54.8  | 28.6  | 16.7  | 11.9  | 9.5   | 7.1   | 9.5   | 9.5   |
| 30°   | 207.2  | 150.1 | 81.0  | 45.3  | 23.8  | 11.9  | 7.1   | 4.8   | 2.4   | 0.0   | 0.0   |
| 32.5° | 212.0  | 145.3 | 73.8  | 35.7  | 19.1  | 9.5   | 4.8   | 2.4   | 0.0   | 0.0   | 0.0   |
| 35°   | 216.8  | 140.5 | 64.3  | 28.6  | 14.3  | 7.1   | 2.4   | 0.0   | 0.0   | 0.0   | 0.0   |
| 37.5° | 221.5  | 133.4 | 54.8  | 23.8  | 11.9  | 4.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 40°   | 226.3  | 123.9 | 45.3  | 21.4  | 7.1   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 42.5° | 231.1  | 116.7 | 38.1  | 16.7  | 4.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 45°   | 243.0  | 112.0 | 31.0  | 14.3  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 47.5° | 264.4  | 107.2 | 28.6  | 9.5   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 50°   | 295.4  | 102.4 | 26.2  | 7.1   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 52.5° | 338.3  | 100.0 | 23.8  | 4.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 55°   | 414.5  | 97.7  | 21.4  | 4.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 57.5° | 545.5  | 95.3  | 21.4  | 4.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 60°   | 836.1  | 90.5  | 21.4  | 4.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 62.5° | 1493.6 | 88.1  | 19.1  | 4.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 65°   | 2603.6 | 90.5  | 19.1  | 4.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 67.5° | 3732.7 | 95.3  | 16.7  | 7.1   | 2.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 70°   | 3194.3 | 83.4  | 16.7  | 9.5   | 4.8   | 2.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 71°   | 2603.6 | 73.8  | 16.7  | 9.5   | 4.8   | 2.4   | 2.4   | 0.0   | 0.0   | 0.0   | 0.0   |
| 72.5° | 1674.6 | 57.2  | 14.3  | 9.5   | 4.8   | 4.8   | 2.4   | 0.0   | 0.0   | 0.0   | 0.0   |
| 75°   | 707.5  | 47.6  | 14.3  | 9.5   | 7.1   | 4.8   | 4.8   | 2.4   | 0.0   | 0.0   | 0.0   |
| 77.5° | 302.5  | 35.7  | 14.3  | 11.9  | 9.5   | 7.1   | 7.1   | 4.8   | 2.4   | 0.0   | 0.0   |
| 80°   | 114.3  | 28.6  | 16.7  | 14.3  | 11.9  | 11.9  | 9.5   | 4.8   | 2.4   | 0.0   | 0.0   |
| 82.5° | 52.4   | 23.8  | 16.7  | 14.3  | 14.3  | 11.9  | 9.5   | 7.1   | 4.8   | 0.0   | 0.0   |
| 85°   | 33.3   | 21.4  | 16.7  | 14.3  | 14.3  | 11.9  | 11.9  | 7.1   | 4.8   | 0.0   | 0.0   |
| 87.5° | 26.2   | 21.4  | 16.7  | 16.7  | 14.3  | 14.3  | 9.5   | 7.1   | 2.4   | 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: SP1-2407-184-4

Test Date: 10/10/2024

Luminaire Tested: GSS-SB1A-730-U-5WQ

Data in this report applies to families of products including GSS-SB1A-730-U-5WQ

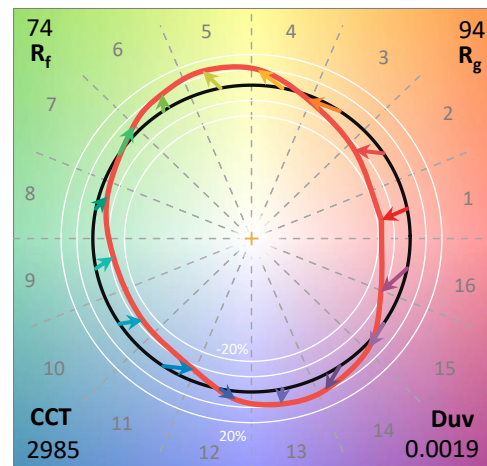
### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-4  
 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-730-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 70 CRI  
 3000K CCT 26 LEDS

### Spectral Parameters

CCT (K): 2985  
 CIE  $u'$ : 0.2504  
 CIE  $v'$ : 0.5243  
 Duv: 0.0019  
 CIE x: 0.4408  
 CIE y: 0.4101  
 CIE z: 0.1491  
 Peak Wavelength (nm): 595  
 Dominant Wavelength (nm): 582  
 Purity: 55.41818  
 R<sub>f</sub>: 73.8  
 R<sub>g</sub>: 94.4

CRI (Ra): 70.8  
 R1: 66.3  
 R2: 80.6  
 R3: 94.5  
 R4: 68.2  
 R5: 66.5  
 R6: 74.7  
 R7: 76.2  
 R8: 39.6  
 R9: -43.2  
 R10: 57.6  
 R11: 64.8  
 R12: 53.5  
 R13: 68.7  
 R14: 97.0  
 R15: 56.4



### Test Conditions

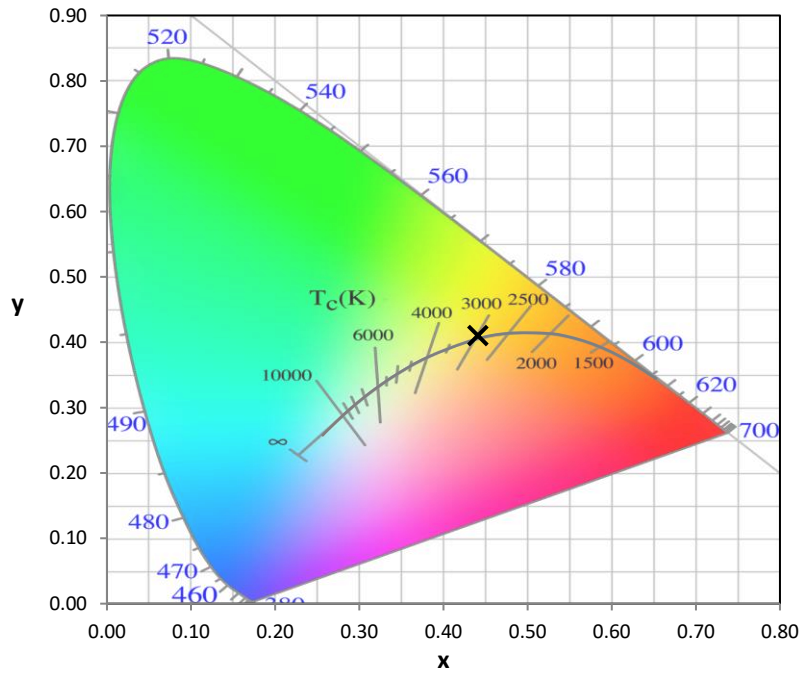
Stabilization Time: 36M  
 Operation Time: 1H 36M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-184-4

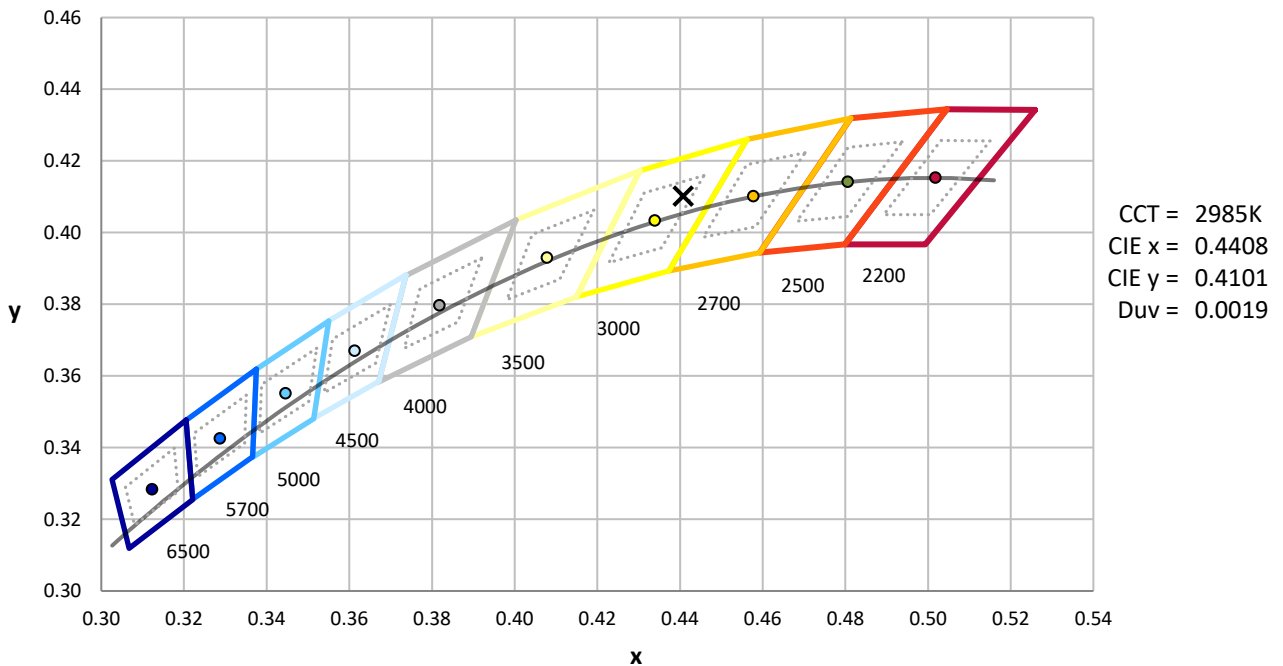
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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



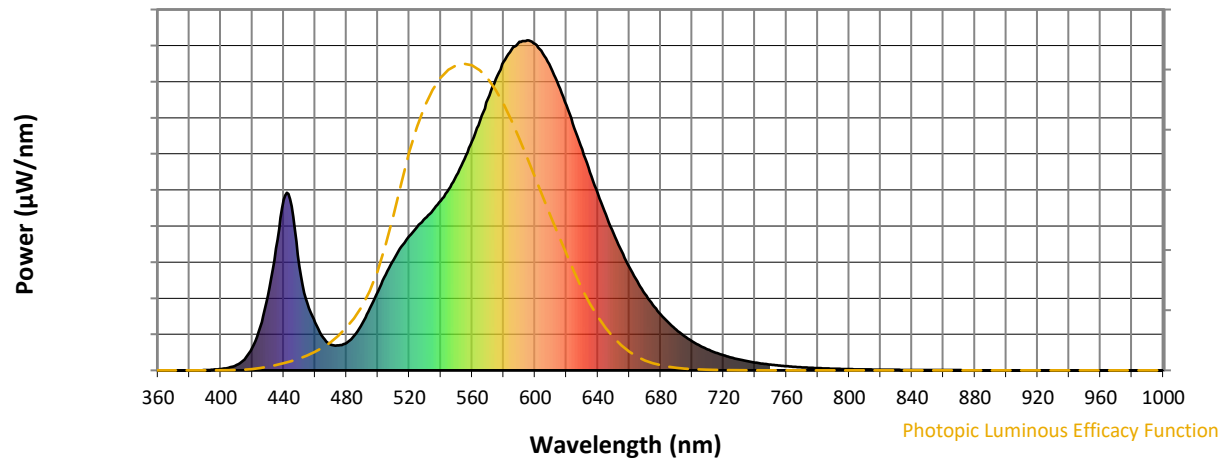
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 3000K 4-step quadrangle

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### Photopic Flux vs. Wavelength

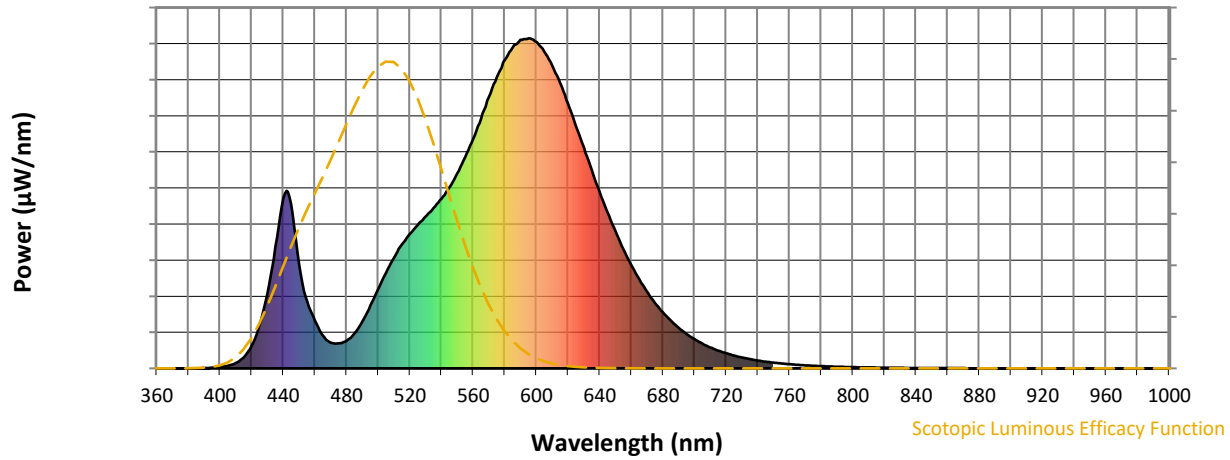


### Photopic Lumens: NR

| λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 142                         | NR               | 620       | 803                         | NR               | 750       | 17                          | NR               | 880       | 0                           | NR               |
| 365       | 0                           | NR               | 495       | 189                         | NR               | 625       | 734                         | NR               | 755       | 15                          | NR               | 885       | 0                           | NR               |
| 370       | 0                           | NR               | 500       | 240                         | NR               | 630       | 670                         | NR               | 760       | 13                          | NR               | 890       | 0                           | NR               |
| 375       | 0                           | NR               | 505       | 290                         | NR               | 635       | 600                         | NR               | 765       | 11                          | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 335                         | NR               | 640       | 535                         | NR               | 770       | 9                           | NR               | 900       | 0                           | NR               |
| 385       | 0                           | NR               | 515       | 375                         | NR               | 645       | 473                         | NR               | 775       | 8                           | NR               | 905       | 0                           | NR               |
| 390       | 1                           | NR               | 520       | 408                         | NR               | 650       | 415                         | NR               | 780       | 7                           | NR               | 910       | 0                           | NR               |
| 395       | 2                           | NR               | 525       | 434                         | NR               | 655       | 362                         | NR               | 785       | 6                           | NR               | 915       | 0                           | NR               |
| 400       | 4                           | NR               | 530       | 461                         | NR               | 660       | 313                         | NR               | 790       | 5                           | NR               | 920       | 0                           | NR               |
| 405       | 8                           | NR               | 535       | 486                         | NR               | 665       | 271                         | NR               | 795       | 4                           | NR               | 925       | 0                           | NR               |
| 410       | 16                          | NR               | 540       | 514                         | NR               | 670       | 231                         | NR               | 800       | 4                           | NR               | 930       | 0                           | NR               |
| 415       | 33                          | NR               | 545       | 549                         | NR               | 675       | 198                         | NR               | 805       | 3                           | NR               | 935       | 0                           | NR               |
| 420       | 69                          | NR               | 550       | 591                         | NR               | 680       | 169                         | NR               | 810       | 3                           | NR               | 940       | 0                           | NR               |
| 425       | 131                         | NR               | 555       | 640                         | NR               | 685       | 144                         | NR               | 815       | 2                           | NR               | 945       | 0                           | NR               |
| 430       | 227                         | NR               | 560       | 695                         | NR               | 690       | 123                         | NR               | 820       | 2                           | NR               | 950       | 0                           | NR               |
| 435       | 369                         | NR               | 565       | 757                         | NR               | 695       | 104                         | NR               | 825       | 2                           | NR               | 955       | 0                           | NR               |
| 440       | 517                         | NR               | 570       | 822                         | NR               | 700       | 88                          | NR               | 830       | 2                           | NR               | 960       | 0                           | NR               |
| 445       | 498                         | NR               | 575       | 882                         | NR               | 705       | 75                          | NR               | 835       | 1                           | NR               | 965       | 0                           | NR               |
| 450       | 315                         | NR               | 580       | 935                         | NR               | 710       | 63                          | NR               | 840       | 1                           | NR               | 970       | 0                           | NR               |
| 455       | 204                         | NR               | 585       | 972                         | NR               | 715       | 54                          | NR               | 845       | 1                           | NR               | 975       | 0                           | NR               |
| 460       | 145                         | NR               | 590       | 996                         | NR               | 720       | 46                          | NR               | 850       | 1                           | NR               | 980       | 0                           | NR               |
| 465       | 100                         | NR               | 595       | 1000                        | NR               | 725       | 39                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 78                          | NR               | 600       | 989                         | NR               | 730       | 33                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 76                          | NR               | 605       | 960                         | NR               | 735       | 28                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 83                          | NR               | 610       | 918                         | NR               | 740       | 24                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 105                         | NR               | 615       | 864                         | NR               | 745       | 20                          | NR               | 875       | 1                           | NR               |           |                             |                  |

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### Scotopic Flux vs. Wavelength



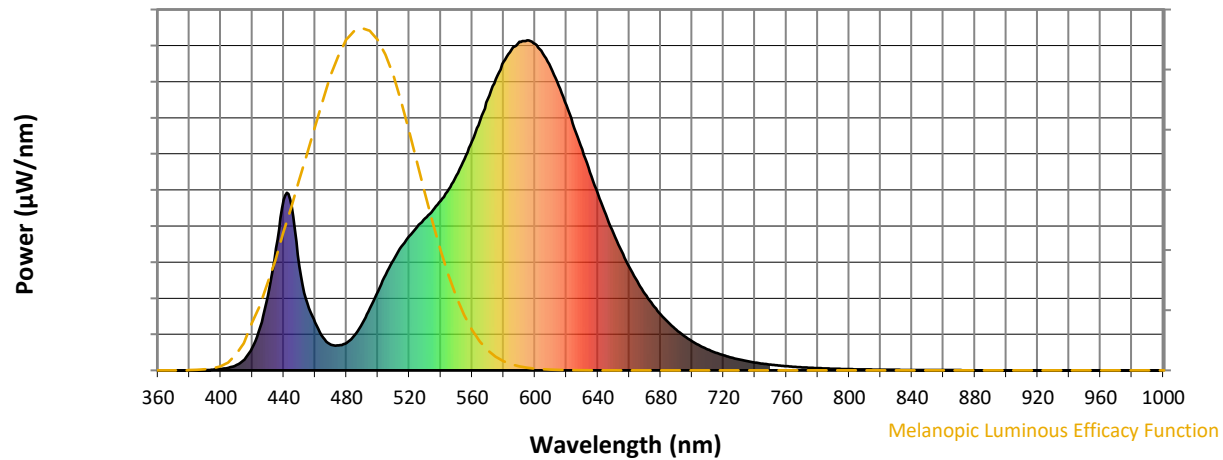
Scotopic Lumens: NR

S/P: 1.19

| $\lambda$<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               | 142                                  | NR                           | 620               | 803                                  | NR                           | 750               | 17                                   | NR                           | 880               | 0                                    | NR                           |
| 365               | 0                                    | NR                           | 495               | 189                                  | NR                           | 625               | 734                                  | NR                           | 755               | 15                                   | NR                           | 885               | 0                                    | NR                           |
| 370               | 0                                    | NR                           | 500               | 240                                  | NR                           | 630               | 670                                  | NR                           | 760               | 13                                   | NR                           | 890               | 0                                    | NR                           |
| 375               | 0                                    | NR                           | 505               | 290                                  | NR                           | 635               | 600                                  | NR                           | 765               | 11                                   | NR                           | 895               | 0                                    | NR                           |
| 380               | 0                                    | NR                           | 510               | 335                                  | NR                           | 640               | 535                                  | NR                           | 770               | 9                                    | NR                           | 900               | 0                                    | NR                           |
| 385               | 0                                    | NR                           | 515               | 375                                  | NR                           | 645               | 473                                  | NR                           | 775               | 8                                    | NR                           | 905               | 0                                    | NR                           |
| 390               | 1                                    | NR                           | 520               | 408                                  | NR                           | 650               | 415                                  | NR                           | 780               | 7                                    | NR                           | 910               | 0                                    | NR                           |
| 395               | 2                                    | NR                           | 525               | 434                                  | NR                           | 655               | 362                                  | NR                           | 785               | 6                                    | NR                           | 915               | 0                                    | NR                           |
| 400               | 4                                    | NR                           | 530               | 461                                  | NR                           | 660               | 313                                  | NR                           | 790               | 5                                    | NR                           | 920               | 0                                    | NR                           |
| 405               | 8                                    | NR                           | 535               | 486                                  | NR                           | 665               | 271                                  | NR                           | 795               | 4                                    | NR                           | 925               | 0                                    | NR                           |
| 410               | 16                                   | NR                           | 540               | 514                                  | NR                           | 670               | 231                                  | NR                           | 800               | 4                                    | NR                           | 930               | 0                                    | NR                           |
| 415               | 33                                   | NR                           | 545               | 549                                  | NR                           | 675               | 198                                  | NR                           | 805               | 3                                    | NR                           | 935               | 0                                    | NR                           |
| 420               | 69                                   | NR                           | 550               | 591                                  | NR                           | 680               | 169                                  | NR                           | 810               | 3                                    | NR                           | 940               | 0                                    | NR                           |
| 425               | 131                                  | NR                           | 555               | 640                                  | NR                           | 685               | 144                                  | NR                           | 815               | 2                                    | NR                           | 945               | 0                                    | NR                           |
| 430               | 227                                  | NR                           | 560               | 695                                  | NR                           | 690               | 123                                  | NR                           | 820               | 2                                    | NR                           | 950               | 0                                    | NR                           |
| 435               | 369                                  | NR                           | 565               | 757                                  | NR                           | 695               | 104                                  | NR                           | 825               | 2                                    | NR                           | 955               | 0                                    | NR                           |
| 440               | 517                                  | NR                           | 570               | 822                                  | NR                           | 700               | 88                                   | NR                           | 830               | 2                                    | NR                           | 960               | 0                                    | NR                           |
| 445               | 498                                  | NR                           | 575               | 882                                  | NR                           | 705               | 75                                   | NR                           | 835               | 1                                    | NR                           | 965               | 0                                    | NR                           |
| 450               | 315                                  | NR                           | 580               | 935                                  | NR                           | 710               | 63                                   | NR                           | 840               | 1                                    | NR                           | 970               | 0                                    | NR                           |
| 455               | 204                                  | NR                           | 585               | 972                                  | NR                           | 715               | 54                                   | NR                           | 845               | 1                                    | NR                           | 975               | 0                                    | NR                           |
| 460               | 145                                  | NR                           | 590               | 996                                  | NR                           | 720               | 46                                   | NR                           | 850               | 1                                    | NR                           | 980               | 0                                    | NR                           |
| 465               | 100                                  | NR                           | 595               | 1000                                 | NR                           | 725               | 39                                   | NR                           | 855               | 1                                    | NR                           | 985               | 0                                    | NR                           |
| 470               | 78                                   | NR                           | 600               | 989                                  | NR                           | 730               | 33                                   | NR                           | 860               | 1                                    | NR                           | 990               | 0                                    | NR                           |
| 475               | 76                                   | NR                           | 605               | 960                                  | NR                           | 735               | 28                                   | NR                           | 865               | 1                                    | NR                           | 995               | 0                                    | NR                           |
| 480               | 83                                   | NR                           | 610               | 918                                  | NR                           | 740               | 24                                   | NR                           | 870               | 1                                    | NR                           | 1000              | 0                                    | NR                           |
| 485               | 105                                  | NR                           | 615               | 864                                  | NR                           | 745               | 20                                   | NR                           | 875               | 1                                    | NR                           |                   |                                      |                              |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.13

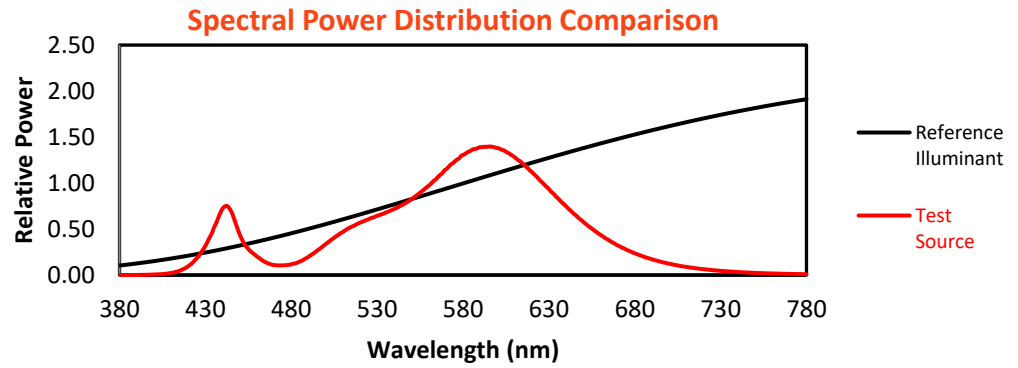
| $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | 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               | 142                                    | NR                             | 620               | 803                                    | NR                             | 750               | 17                                     | NR                             | 880               | 0                                      | NR                             |
| 365               | 0                                      | NR                             | 495               | 189                                    | NR                             | 625               | 734                                    | NR                             | 755               | 15                                     | NR                             | 885               | 0                                      | NR                             |
| 370               | 0                                      | NR                             | 500               | 240                                    | NR                             | 630               | 670                                    | NR                             | 760               | 13                                     | NR                             | 890               | 0                                      | NR                             |
| 375               | 0                                      | NR                             | 505               | 290                                    | NR                             | 635               | 600                                    | NR                             | 765               | 11                                     | NR                             | 895               | 0                                      | NR                             |
| 380               | 0                                      | NR                             | 510               | 335                                    | NR                             | 640               | 535                                    | NR                             | 770               | 9                                      | NR                             | 900               | 0                                      | NR                             |
| 385               | 0                                      | NR                             | 515               | 375                                    | NR                             | 645               | 473                                    | NR                             | 775               | 8                                      | NR                             | 905               | 0                                      | NR                             |
| 390               | 1                                      | NR                             | 520               | 408                                    | NR                             | 650               | 415                                    | NR                             | 780               | 7                                      | NR                             | 910               | 0                                      | NR                             |
| 395               | 2                                      | NR                             | 525               | 434                                    | NR                             | 655               | 362                                    | NR                             | 785               | 6                                      | NR                             | 915               | 0                                      | NR                             |
| 400               | 4                                      | NR                             | 530               | 461                                    | NR                             | 660               | 313                                    | NR                             | 790               | 5                                      | NR                             | 920               | 0                                      | NR                             |
| 405               | 8                                      | NR                             | 535               | 486                                    | NR                             | 665               | 271                                    | NR                             | 795               | 4                                      | NR                             | 925               | 0                                      | NR                             |
| 410               | 16                                     | NR                             | 540               | 514                                    | NR                             | 670               | 231                                    | NR                             | 800               | 4                                      | NR                             | 930               | 0                                      | NR                             |
| 415               | 33                                     | NR                             | 545               | 549                                    | NR                             | 675               | 198                                    | NR                             | 805               | 3                                      | NR                             | 935               | 0                                      | NR                             |
| 420               | 69                                     | NR                             | 550               | 591                                    | NR                             | 680               | 169                                    | NR                             | 810               | 3                                      | NR                             | 940               | 0                                      | NR                             |
| 425               | 131                                    | NR                             | 555               | 640                                    | NR                             | 685               | 144                                    | NR                             | 815               | 2                                      | NR                             | 945               | 0                                      | NR                             |
| 430               | 227                                    | NR                             | 560               | 695                                    | NR                             | 690               | 123                                    | NR                             | 820               | 2                                      | NR                             | 950               | 0                                      | NR                             |
| 435               | 369                                    | NR                             | 565               | 757                                    | NR                             | 695               | 104                                    | NR                             | 825               | 2                                      | NR                             | 955               | 0                                      | NR                             |
| 440               | 517                                    | NR                             | 570               | 822                                    | NR                             | 700               | 88                                     | NR                             | 830               | 2                                      | NR                             | 960               | 0                                      | NR                             |
| 445               | 498                                    | NR                             | 575               | 882                                    | NR                             | 705               | 75                                     | NR                             | 835               | 1                                      | NR                             | 965               | 0                                      | NR                             |
| 450               | 315                                    | NR                             | 580               | 935                                    | NR                             | 710               | 63                                     | NR                             | 840               | 1                                      | NR                             | 970               | 0                                      | NR                             |
| 455               | 204                                    | NR                             | 585               | 972                                    | NR                             | 715               | 54                                     | NR                             | 845               | 1                                      | NR                             | 975               | 0                                      | NR                             |
| 460               | 145                                    | NR                             | 590               | 996                                    | NR                             | 720               | 46                                     | NR                             | 850               | 1                                      | NR                             | 980               | 0                                      | NR                             |
| 465               | 100                                    | NR                             | 595               | 1000                                   | NR                             | 725               | 39                                     | NR                             | 855               | 1                                      | NR                             | 985               | 0                                      | NR                             |
| 470               | 78                                     | NR                             | 600               | 989                                    | NR                             | 730               | 33                                     | NR                             | 860               | 1                                      | NR                             | 990               | 0                                      | NR                             |
| 475               | 76                                     | NR                             | 605               | 960                                    | NR                             | 735               | 28                                     | NR                             | 865               | 1                                      | NR                             | 995               | 0                                      | NR                             |
| 480               | 83                                     | NR                             | 610               | 918                                    | NR                             | 740               | 24                                     | NR                             | 870               | 1                                      | NR                             | 1000              | 0                                      | NR                             |
| 485               | 105                                    | NR                             | 615               | 864                                    | NR                             | 745               | 20                                     | NR                             | 875               | 1                                      | NR                             |                   |                                        |                                |

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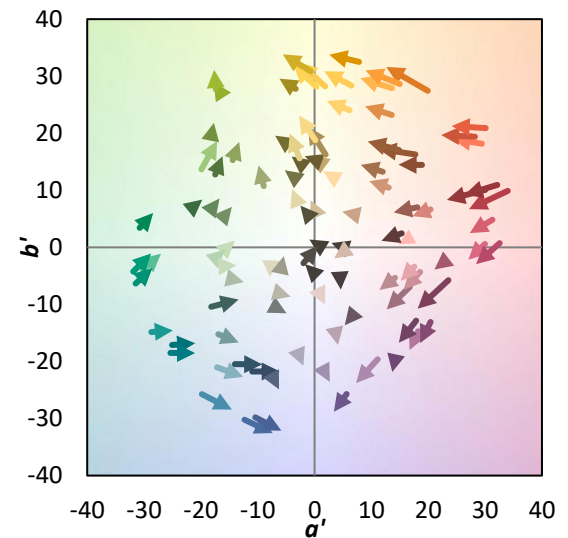
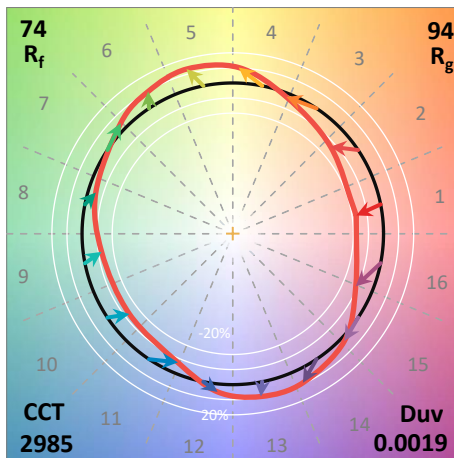
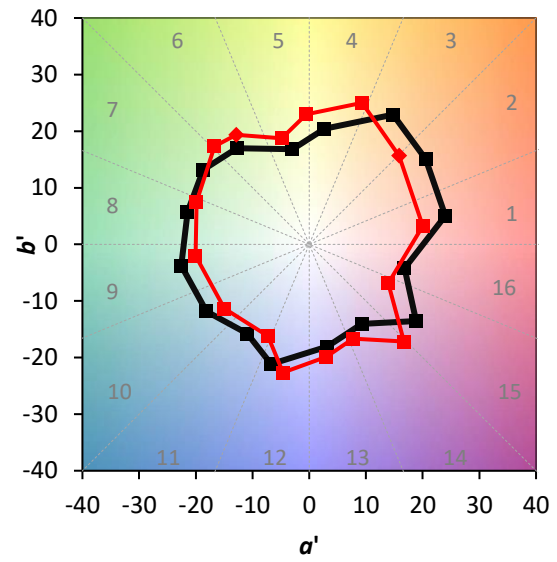
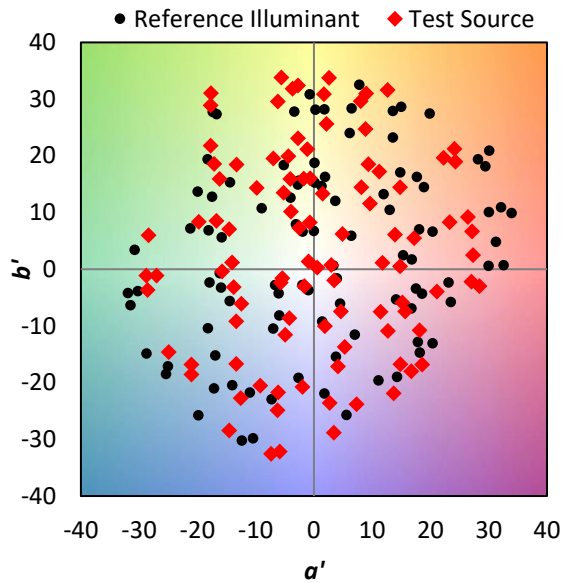
TM-30-18

### Summary

$R_f = 73.8$   
 $R_g = 94.4$   
 $CIE\ R_a = 70.8$   
 $R_g = -43.2$



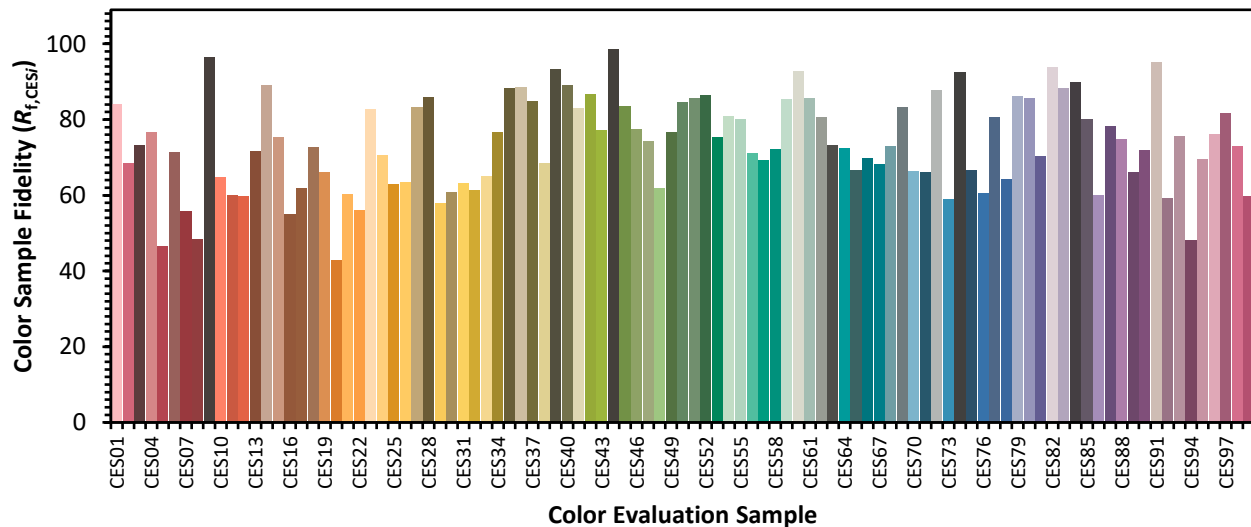
### Color Vector Graphics



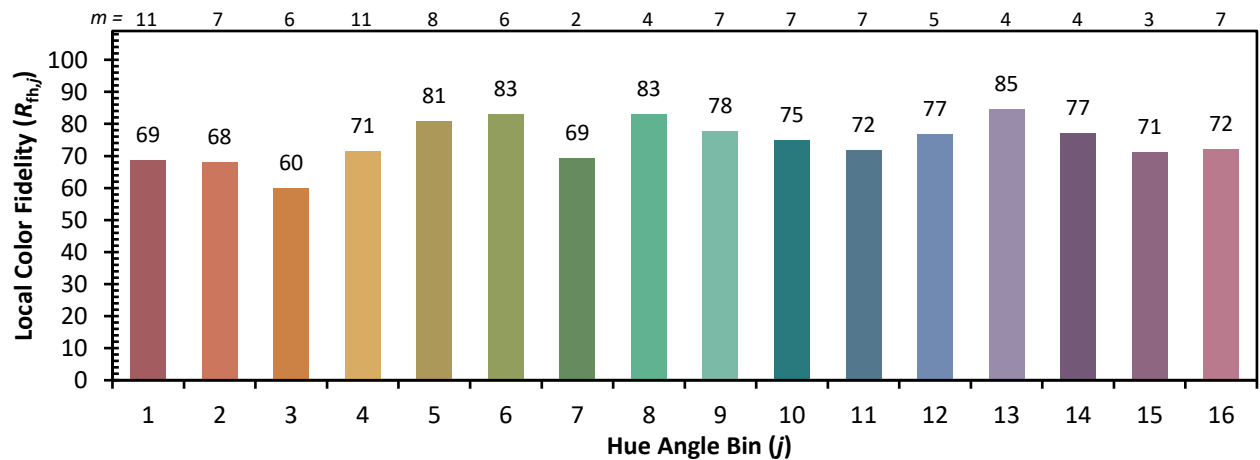
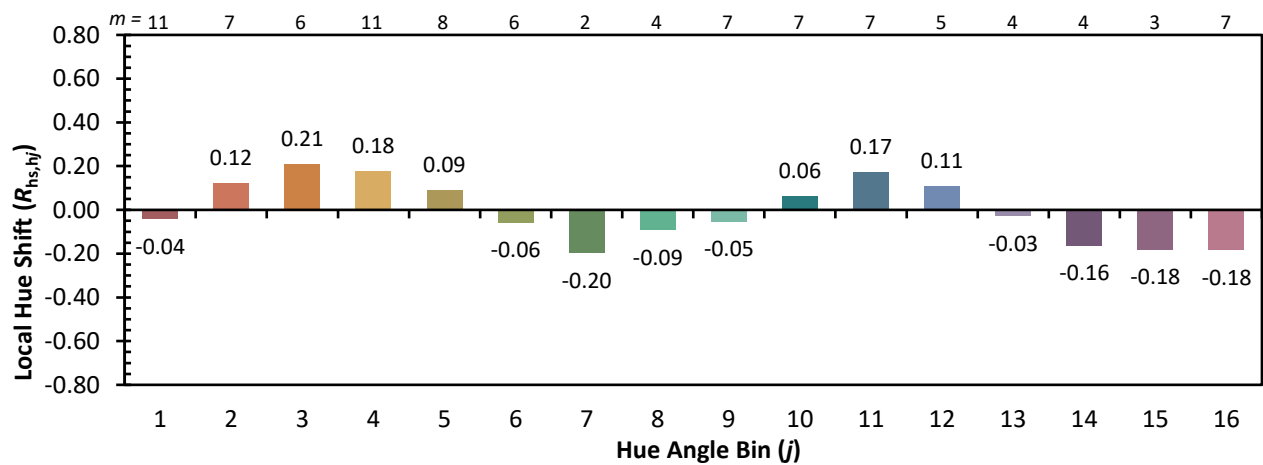
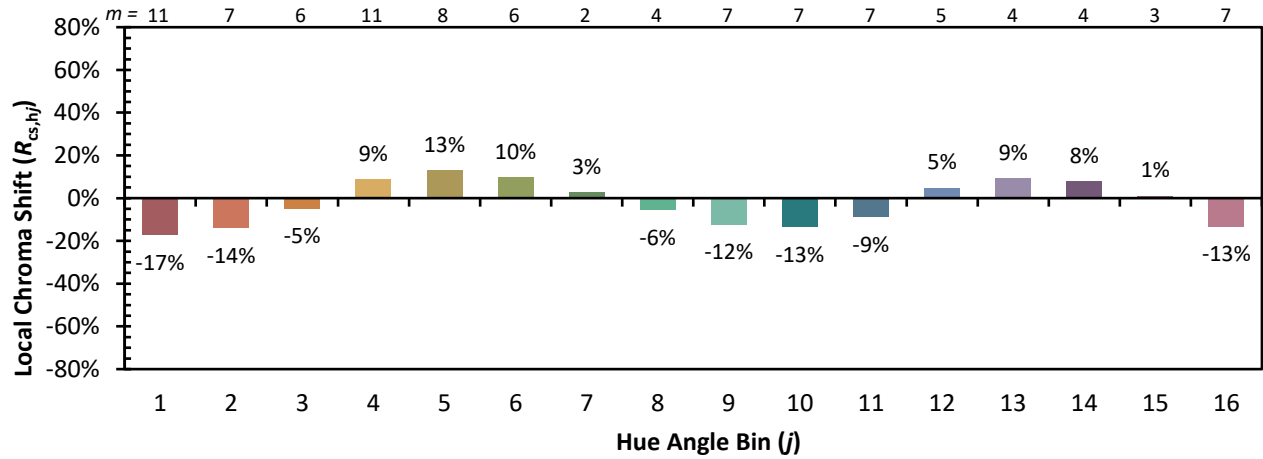


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

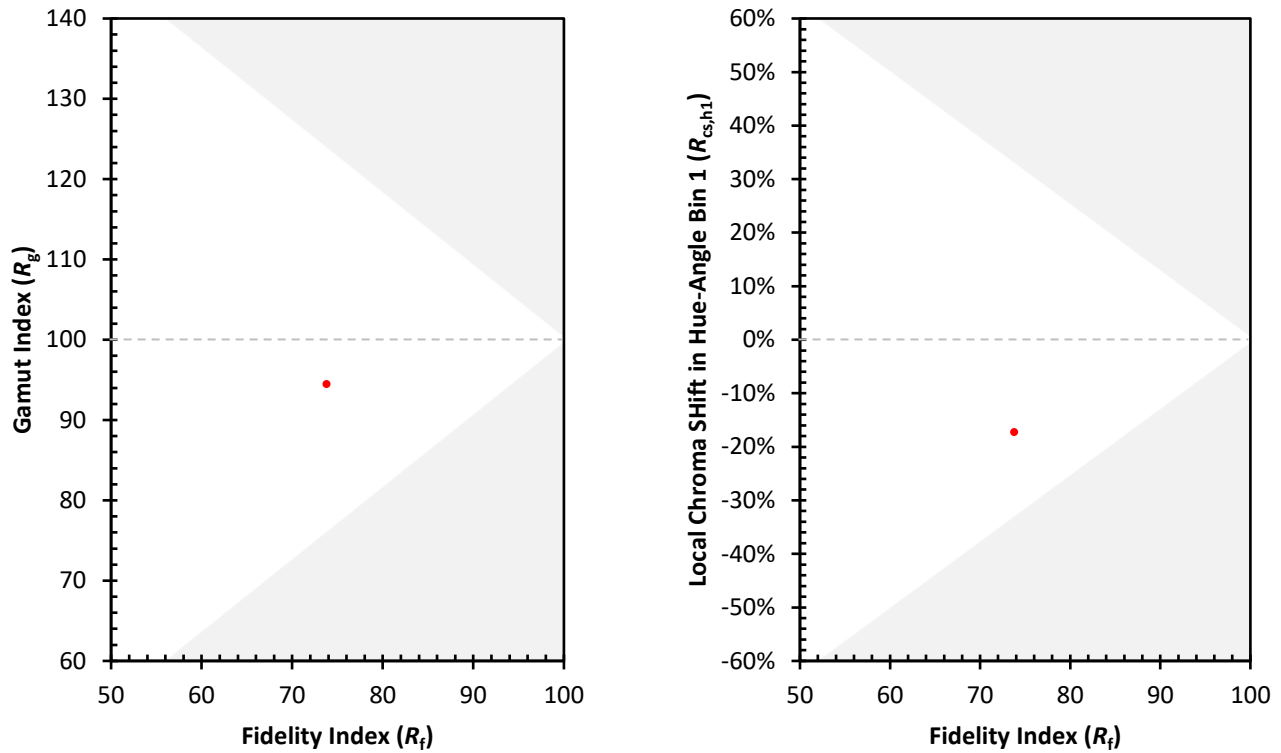
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 63 | CES51 = 86 | CES76 = 61 |
| CES02 = 62 | CES27 = 83 | CES52 = 86 | CES77 = 81 |
| CES03 = 31 | CES28 = 86 | CES53 = 75 | CES78 = 64 |
| CES04 = 71 | CES29 = 58 | CES54 = 81 | CES79 = 86 |
| CES05 = 49 | CES30 = 61 | CES55 = 80 | CES80 = 86 |
| CES06 = 51 | CES31 = 63 | CES56 = 71 | CES81 = 70 |
| CES07 = 41 | CES32 = 61 | CES57 = 69 | CES82 = 94 |
| CES08 = 40 | CES33 = 65 | CES58 = 72 | CES83 = 88 |
| CES09 = 29 | CES34 = 77 | CES59 = 85 | CES84 = 90 |
| CES10 = 76 | CES35 = 88 | CES60 = 93 | CES85 = 80 |
| CES11 = 59 | CES36 = 89 | CES61 = 86 | CES86 = 60 |
| CES12 = 65 | CES37 = 85 | CES62 = 81 | CES87 = 78 |
| CES13 = 43 | CES38 = 69 | CES63 = 73 | CES88 = 75 |
| CES14 = 74 | CES39 = 93 | CES64 = 72 | CES89 = 66 |
| CES15 = 71 | CES40 = 89 | CES65 = 67 | CES90 = 72 |
| CES16 = 47 | CES41 = 83 | CES66 = 70 | CES91 = 95 |
| CES17 = 50 | CES42 = 87 | CES67 = 68 | CES92 = 59 |
| CES18 = 56 | CES43 = 77 | CES68 = 73 | CES93 = 76 |
| CES19 = 73 | CES44 = 99 | CES69 = 83 | CES94 = 48 |
| CES20 = 66 | CES45 = 83 | CES70 = 66 | CES95 = 70 |
| CES21 = 87 | CES46 = 77 | CES71 = 66 | CES96 = 76 |
| CES22 = 79 | CES47 = 74 | CES72 = 88 | CES97 = 82 |
| CES23 = 92 | CES48 = 62 | CES73 = 59 | CES98 = 73 |
| CES24 = 91 | CES49 = 77 | CES74 = 93 | CES99 = 60 |
| CES25 = 73 | CES50 = 85 | CES75 = 67 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)