

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: P1048730

Luminaire Tested: **GALN-SA7B-930-U-T4BC**

Issue Date: 07/10/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1048730  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 07/10/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GALN-SA7B-930-U-T4BC  
Description: GALLEON II AREA AND ROADWAY LUMINAIRE 800mA 7xLight Square PACKAGE  
90CRI 3000K FIXTURE w/ TYPE IV ANGLED BACKLIGHT CONTROL  
Light Source: (98) 3000K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 21873.6 lumens  
Efficiency: N/A  
Efficacy: 87.7 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): 249.5  
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

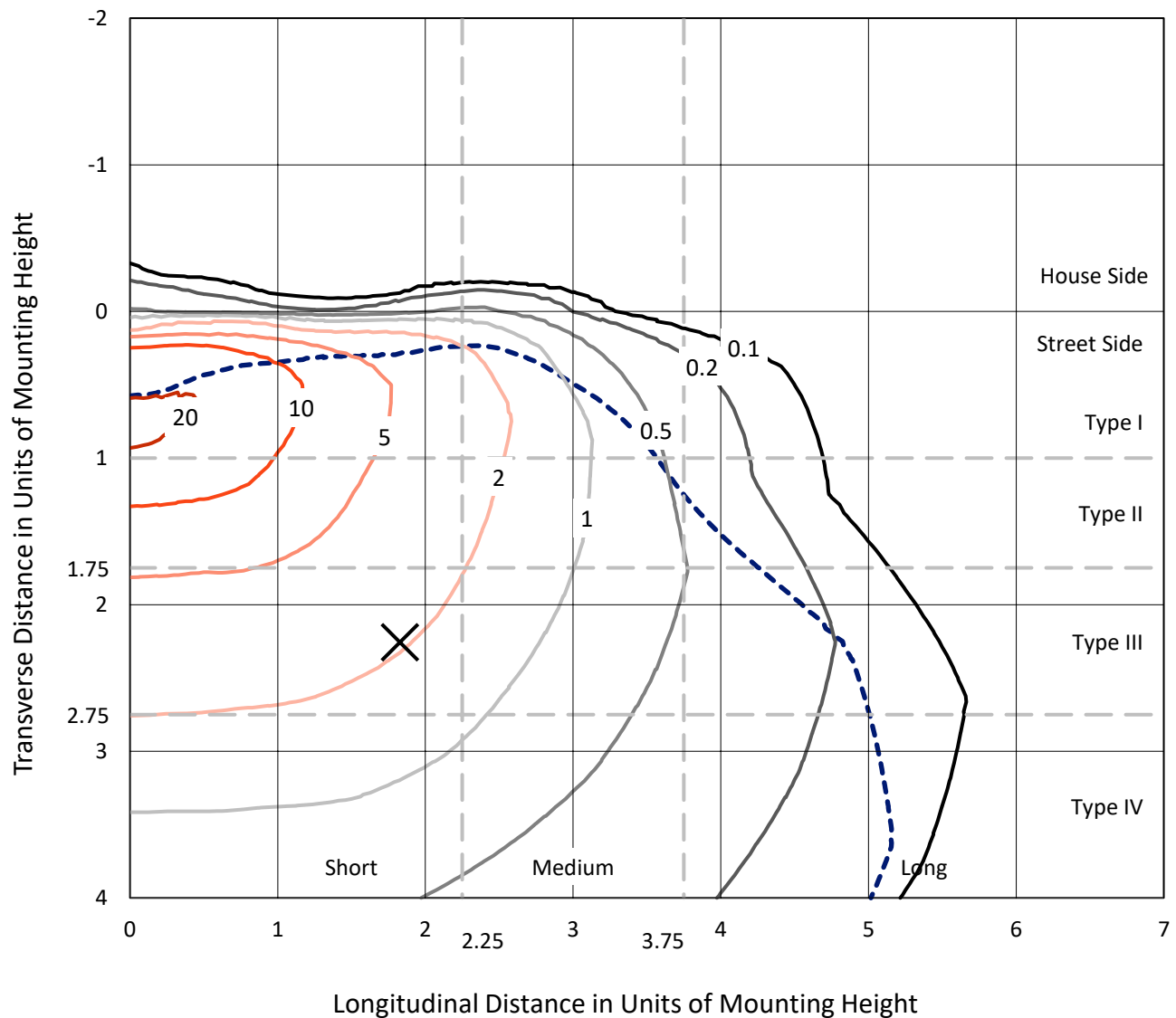


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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 - - - 1/2 Max cd

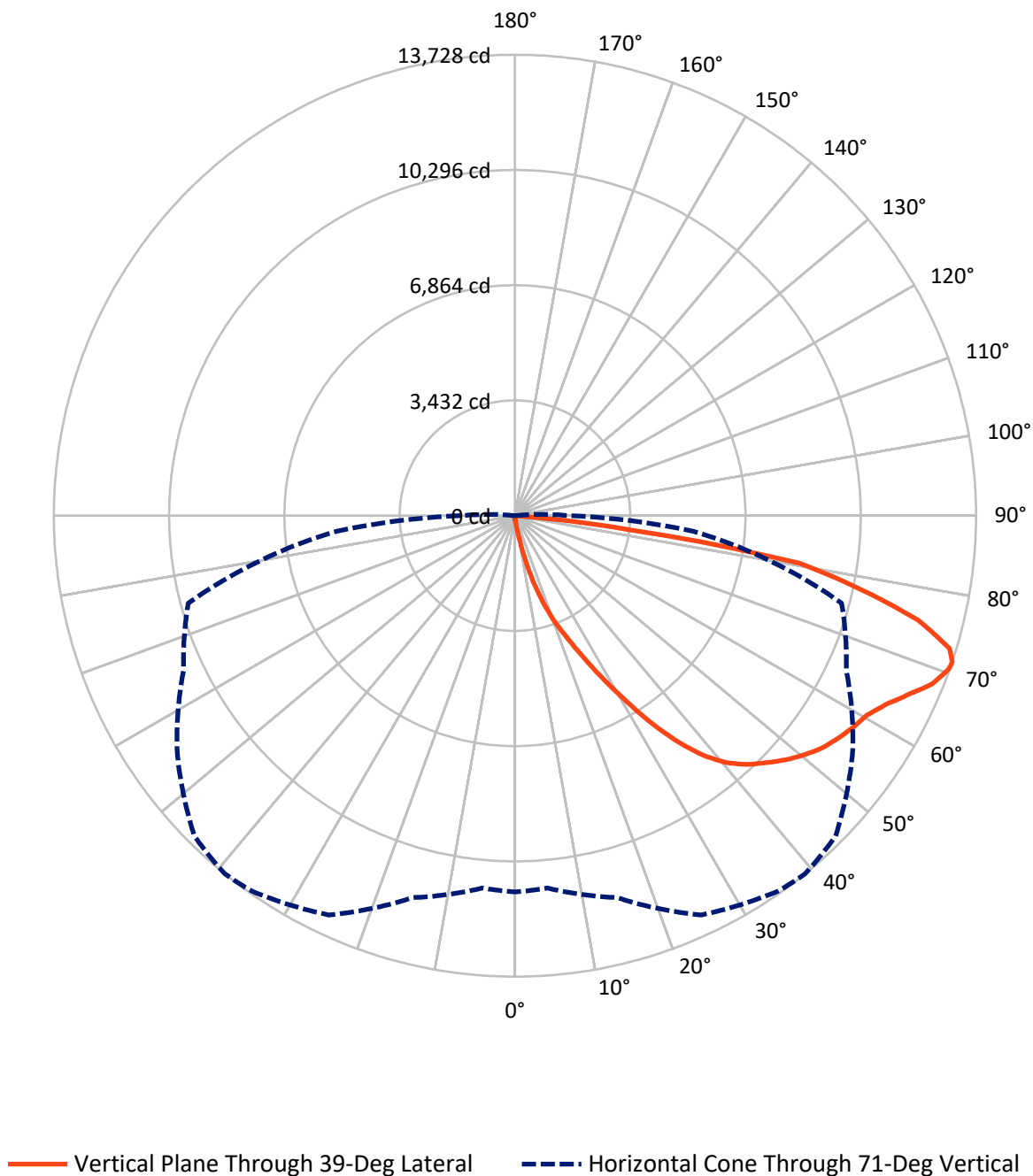


Based on 15 foot mounting height. Maximum calculated value = 22.5 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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CATALOG NUMBER: GALN-SA7B-930-U-T4BC

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 77.7     | 0.0    | 77.7    |
|                    | % Fixture | 0.4      | 0.0    | 0.4     |
| <b>Street Side</b> | Lumens    | 21795.8  | 0.0    | 21795.8 |
|                    | % Fixture | 99.6     | 0.0    | 99.6    |
| <b>Total</b>       | Lumens    | 21873.6  | 0.0    | 21873.6 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 18.3    | 0.1       |
| 10°-20°   | 233.8   | 1.1       |
| 20°-30°   | 832.6   | 3.8       |
| 30°-40°   | 2006.6  | 9.2       |
| 40°-50°   | 3358.1  | 15.4      |
| 50°-60°   | 4313.1  | 19.7      |
| 60°-70°   | 5458.3  | 25.0      |
| 70°-80°   | 4866.3  | 22.2      |
| 80°-90°   | 786.6   | 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°    | 21873.6 | 100.0     |
| 0°-180°   | 21873.6 | 100.0     |



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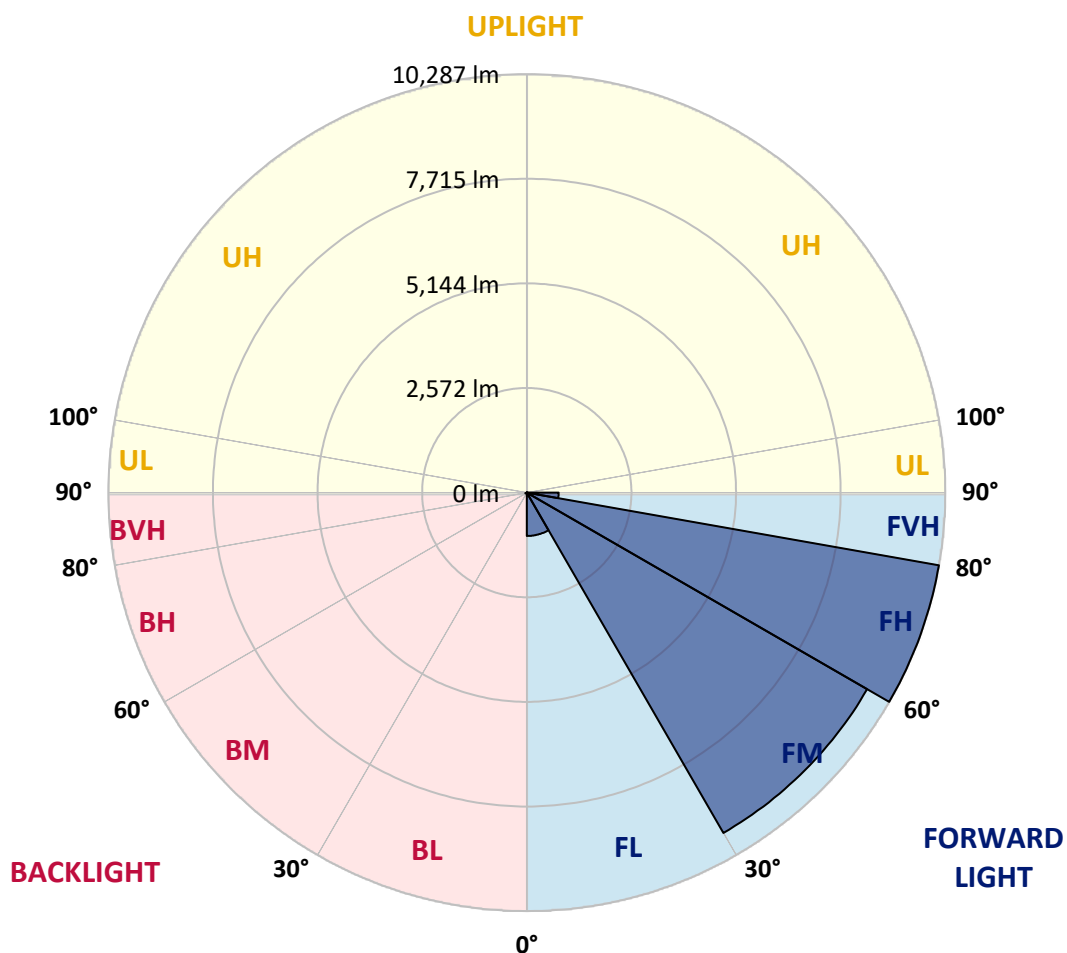
CATALOG NUMBER: GALN-SA7B-930-U-T4BC

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 1065.8  | 4.9       |                         |      |          |
| FM   | (30°-60°)   | 9659.8  | 44.2      |                         |      |          |
| FH   | (60°-80°)   | 10287.2 | 47.0      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 783.0   | 3.6       |                         |      | G5       |
| BL   | (0°-30°)    | 18.8    | 0.1       | B0/110                  |      |          |
| BM   | (30°-60°)   | 18.0    | 0.1       | B0/220                  |      |          |
| BH   | (60°-80°)   | 37.4    | 0.2       | B0/110                  |      | G0/110   |
| BVH  | (80°-90°)   | 3.6     | 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°    | 119.9   | 119.9   | 119.9   | 119.9   | 119.9   | 119.9   | 119.9   | 119.9   | 119.9   | 119.9   | 119.9  |
| 2.5°  | 137.7   | 137.7   | 137.7   | 133.3   | 133.3   | 131.8   | 130.3   | 130.3   | 127.3   | 125.9   | 122.9  |
| 5°    | 208.8   | 204.3   | 194.0   | 188.1   | 176.2   | 168.8   | 161.4   | 151.0   | 140.7   | 133.3   | 124.4  |
| 7.5°  | 472.4   | 482.7   | 448.7   | 385.0   | 319.8   | 291.7   | 244.3   | 196.9   | 162.9   | 140.7   | 125.9  |
| 10°   | 1203.8  | 1197.9  | 1082.4  | 955.1   | 737.4   | 650.0   | 509.4   | 321.3   | 210.3   | 154.0   | 127.3  |
| 12.5° | 2047.8  | 2041.9  | 1905.7  | 1732.4  | 1445.2  | 1263.1  | 996.5   | 599.7   | 302.1   | 174.7   | 127.3  |
| 15°   | 2757.1  | 2733.4  | 2690.5  | 2518.7  | 2182.6  | 2030.1  | 1677.7  | 1060.2  | 488.6   | 210.3   | 130.3  |
| 17.5° | 3226.5  | 3205.8  | 3165.8  | 3103.6  | 2890.4  | 2709.7  | 2426.9  | 1665.8  | 790.7   | 272.5   | 136.2  |
| 20°   | 3657.4  | 3642.6  | 3610.0  | 3598.2  | 3460.5  | 3364.2  | 3130.3  | 2361.8  | 1232.0  | 370.2   | 145.1  |
| 22.5° | 4249.7  | 4218.6  | 4231.9  | 4160.8  | 4026.1  | 3910.6  | 3767.0  | 3090.3  | 1770.9  | 533.1   | 161.4  |
| 25°   | 4975.2  | 4960.4  | 4923.4  | 4873.1  | 4686.5  | 4585.8  | 4365.2  | 3777.3  | 2373.6  | 746.3   | 179.2  |
| 27.5° | 5851.8  | 5835.5  | 5826.6  | 5711.2  | 5496.4  | 5386.9  | 5078.9  | 4425.9  | 3051.8  | 1045.4  | 202.9  |
| 30°   | 6861.7  | 6869.1  | 6811.3  | 6663.3  | 6413.0  | 6259.0  | 5942.1  | 5105.5  | 3746.2  | 1396.3  | 228.0  |
| 32.5° | 7907.1  | 7892.3  | 7803.4  | 7628.7  | 7405.1  | 7261.5  | 6858.7  | 5850.3  | 4474.7  | 1859.8  | 257.6  |
| 35°   | 9033.9  | 9005.8  | 8771.8  | 8571.9  | 8380.9  | 8200.2  | 7833.0  | 6715.1  | 5203.3  | 2379.5  | 297.6  |
| 37.5° | 10171.1 | 10039.3 | 9569.9  | 9316.7  | 9184.9  | 9036.9  | 8694.8  | 7637.6  | 5927.3  | 2960.0  | 346.5  |
| 40°   | 11029.9 | 10927.7 | 10371.0 | 9904.6  | 9799.4  | 9673.6  | 9418.9  | 8434.2  | 6697.3  | 3583.4  | 405.7  |
| 42.5° | 11505.2 | 11449.0 | 10948.5 | 10488.0 | 10240.7 | 10129.6 | 9912.0  | 9130.1  | 7458.4  | 4271.9  | 491.6  |
| 45°   | 11708.1 | 11620.7 | 11286.1 | 11071.4 | 10677.5 | 10493.9 | 10234.8 | 9655.8  | 8253.6  | 5053.7  | 611.5  |
| 47.5° | 11645.9 | 11595.5 | 11355.7 | 11434.1 | 11148.4 | 10862.6 | 10482.0 | 10058.6 | 8933.2  | 5951.0  | 775.9  |
| 50°   | 11255.0 | 11212.0 | 11138.0 | 11563.0 | 11527.4 | 11189.8 | 10801.9 | 10376.9 | 9488.5  | 6876.5  | 1030.6 |
| 52.5° | 10511.7 | 10493.9 | 10683.4 | 11462.3 | 11742.1 | 11478.6 | 11109.9 | 10658.3 | 10006.7 | 7843.4  | 1394.8 |
| 55°   | 9553.6  | 9626.2  | 10168.1 | 11305.3 | 11851.7 | 11691.8 | 11382.3 | 10921.8 | 10422.8 | 8708.1  | 1932.3 |
| 57.5° | 9159.8  | 9179.0  | 9855.7  | 11194.3 | 11900.6 | 11879.8 | 11647.4 | 11173.5 | 10804.8 | 9399.6  | 2752.7 |
| 60°   | 9620.3  | 9590.6  | 9947.5  | 11278.7 | 11998.3 | 12048.7 | 11882.8 | 11407.5 | 11136.5 | 9993.4  | 3845.4 |
| 62.5° | 10452.4 | 10436.1 | 10550.2 | 11638.5 | 12284.1 | 12386.3 | 12210.0 | 11576.3 | 11429.7 | 10384.3 | 5092.2 |
| 65°   | 11195.8 | 11161.7 | 11373.4 | 12276.7 | 12786.1 | 12858.6 | 12704.6 | 11865.0 | 11558.5 | 10668.6 | 6263.5 |
| 67.5° | 11517.1 | 11509.7 | 11850.2 | 12883.8 | 13313.2 | 13391.7 | 13256.9 | 12263.4 | 11528.9 | 10758.9 | 6780.2 |
| 70°   | 11370.5 | 11342.3 | 11887.3 | 13141.4 | 13610.8 | 13699.7 | 13569.4 | 12411.4 | 11207.6 | 10473.2 | 6014.7 |
| 71°   | 11209.1 | 11133.6 | 11776.2 | 13123.7 | 13652.3 | 13727.8 | 13499.8 | 12276.7 | 10884.8 | 10067.4 | 5320.2 |
| 72.5° | 10708.6 | 10721.9 | 11471.2 | 12938.6 | 13553.1 | 13530.9 | 13105.9 | 11794.0 | 10495.4 | 9146.4  | 4273.4 |
| 75°   | 9476.6  | 9555.1  | 10483.5 | 12161.2 | 12667.6 | 12384.8 | 11734.7 | 10871.5 | 9713.5  | 6558.1  | 2967.4 |
| 77.5° | 7744.2  | 7861.2  | 8881.4  | 10665.7 | 10522.0 | 10493.9 | 10467.2 | 9578.8  | 8295.0  | 3522.6  | 2064.1 |
| 80°   | 3697.4  | 3950.6  | 5357.3  | 7613.9  | 8271.3  | 8589.7  | 8389.8  | 7719.0  | 6414.5  | 1677.7  | 1233.4 |
| 82.5° | 241.4   | 238.4   | 337.6   | 639.7   | 2696.4  | 3485.6  | 5537.9  | 5517.2  | 4471.8  | 817.4   | 503.4  |
| 85°   | 114.0   | 117.0   | 128.8   | 146.6   | 170.3   | 186.6   | 257.6   | 1510.3  | 2139.6  | 389.4   | 109.6  |
| 87.5° | 66.6    | 68.1    | 80.0    | 102.2   | 133.3   | 148.1   | 176.2   | 226.6   | 278.4   | 214.7   | 23.7   |
| 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: P1048730

CATALOG NUMBER: GALN-SA7B-930-U-T4BC

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 119.9  | 119.9 | 119.9 | 119.9 | 119.9 | 119.9 | 119.9 | 119.9 | 119.9 | 119.9 | 119.9 |
| 2.5°  | 121.4  | 119.9 | 115.5 | 111.1 | 106.6 | 103.7 | 102.2 | 103.7 | 103.7 | 105.1 | 105.1 |
| 5°    | 121.4  | 117.0 | 109.6 | 100.7 | 94.8  | 88.8  | 85.9  | 84.4  | 85.9  | 85.9  | 85.9  |
| 7.5°  | 119.9  | 112.5 | 102.2 | 91.8  | 84.4  | 77.0  | 74.0  | 72.6  | 72.6  | 74.0  | 74.0  |
| 10°   | 117.0  | 109.6 | 96.2  | 84.4  | 75.5  | 66.6  | 62.2  | 57.7  | 57.7  | 57.7  | 59.2  |
| 12.5° | 115.5  | 105.1 | 88.8  | 77.0  | 65.2  | 54.8  | 45.9  | 41.5  | 42.9  | 42.9  | 42.9  |
| 15°   | 112.5  | 100.7 | 84.4  | 69.6  | 54.8  | 41.5  | 34.1  | 29.6  | 31.1  | 32.6  | 31.1  |
| 17.5° | 112.5  | 99.2  | 78.5  | 60.7  | 42.9  | 31.1  | 25.2  | 22.2  | 22.2  | 23.7  | 23.7  |
| 20°   | 112.5  | 96.2  | 74.0  | 51.8  | 32.6  | 23.7  | 17.8  | 16.3  | 16.3  | 19.2  | 20.7  |
| 22.5° | 115.5  | 96.2  | 68.1  | 42.9  | 26.7  | 17.8  | 13.3  | 11.8  | 13.3  | 16.3  | 17.8  |
| 25°   | 119.9  | 94.8  | 62.2  | 38.5  | 22.2  | 13.3  | 10.4  | 7.4   | 8.9   | 11.8  | 13.3  |
| 27.5° | 124.4  | 93.3  | 56.3  | 34.1  | 17.8  | 10.4  | 7.4   | 5.9   | 4.4   | 5.9   | 5.9   |
| 30°   | 128.8  | 93.3  | 50.3  | 28.1  | 14.8  | 7.4   | 4.4   | 3.0   | 1.5   | 0.0   | 0.0   |
| 32.5° | 131.8  | 90.3  | 45.9  | 22.2  | 11.8  | 5.9   | 3.0   | 1.5   | 0.0   | 0.0   | 0.0   |
| 35°   | 134.7  | 87.4  | 40.0  | 17.8  | 8.9   | 4.4   | 1.5   | 0.0   | 0.0   | 0.0   | 0.0   |
| 37.5° | 137.7  | 82.9  | 34.1  | 14.8  | 7.4   | 3.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 40°   | 140.7  | 77.0  | 28.1  | 13.3  | 4.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 42.5° | 143.6  | 72.6  | 23.7  | 10.4  | 3.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 45°   | 151.0  | 69.6  | 19.2  | 8.9   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 47.5° | 164.4  | 66.6  | 17.8  | 5.9   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 50°   | 183.6  | 63.7  | 16.3  | 4.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 52.5° | 210.3  | 62.2  | 14.8  | 3.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 55°   | 257.6  | 60.7  | 13.3  | 3.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 57.5° | 339.1  | 59.2  | 13.3  | 3.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 60°   | 519.7  | 56.3  | 13.3  | 3.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 62.5° | 928.4  | 54.8  | 11.8  | 3.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 65°   | 1618.4 | 56.3  | 11.8  | 3.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 67.5° | 2320.3 | 59.2  | 10.4  | 4.4   | 1.5   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 70°   | 1985.7 | 51.8  | 10.4  | 5.9   | 3.0   | 1.5   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 71°   | 1618.4 | 45.9  | 10.4  | 5.9   | 3.0   | 1.5   | 1.5   | 0.0   | 0.0   | 0.0   | 0.0   |
| 72.5° | 1040.9 | 35.5  | 8.9   | 5.9   | 3.0   | 3.0   | 1.5   | 0.0   | 0.0   | 0.0   | 0.0   |
| 75°   | 439.8  | 29.6  | 8.9   | 5.9   | 4.4   | 3.0   | 3.0   | 1.5   | 0.0   | 0.0   | 0.0   |
| 77.5° | 188.1  | 22.2  | 8.9   | 7.4   | 5.9   | 4.4   | 4.4   | 3.0   | 1.5   | 0.0   | 0.0   |
| 80°   | 71.1   | 17.8  | 10.4  | 8.9   | 7.4   | 7.4   | 5.9   | 3.0   | 1.5   | 0.0   | 0.0   |
| 82.5° | 32.6   | 14.8  | 10.4  | 8.9   | 8.9   | 7.4   | 5.9   | 4.4   | 3.0   | 0.0   | 0.0   |
| 85°   | 20.7   | 13.3  | 10.4  | 8.9   | 8.9   | 7.4   | 7.4   | 4.4   | 3.0   | 0.0   | 0.0   |
| 87.5° | 16.3   | 13.3  | 10.4  | 10.4  | 8.9   | 8.9   | 5.9   | 4.4   | 1.5   | 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: SP1-2407-184-14

Test Date: 10/11/2024

Luminaire Tested: GSS-SB1A-930-U-5WQ

Data in this report applies to families of products including GSS-SB1A-930-U-5WQ

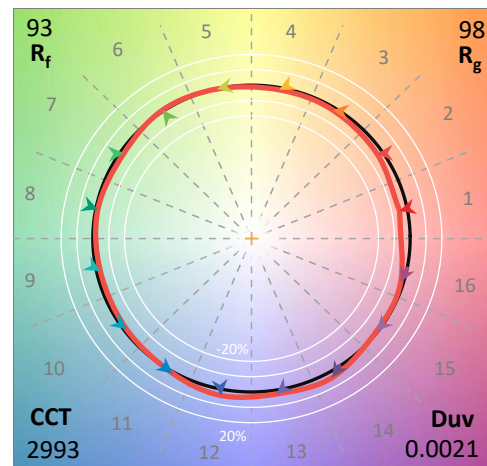
### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-14  
 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-930-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 90 CRI  
 3000K CCT 26 LEDS

### Spectral Parameters

CCT (K): 2993  
 CIE  $u'$ : 0.2501  
 CIE  $v'$ : 0.5245  
 Duv: 0.0021  
 CIE x: 0.4406  
 CIE y: 0.4107  
 CIE z: 0.1487  
 Peak Wavelength (nm): 621  
 Dominant Wavelength (nm): 582  
 Purity: 55.53327  
 R<sub>f</sub>: 92.6  
 R<sub>g</sub>: 98.5

CRI (Ra): 92.4  
 R1: 92.2  
 R2: 95.2  
 R3: 97.0  
 R4: 93.1  
 R5: 91.7  
 R6: 94.2  
 R7: 93.3  
 R8: 82.3  
 R9: 58.2  
 R10: 87.7  
 R11: 93.5  
 R12: 81.7  
 R13: 92.9  
 R14: 97.6  
 R15: 88.1



### Test Conditions

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

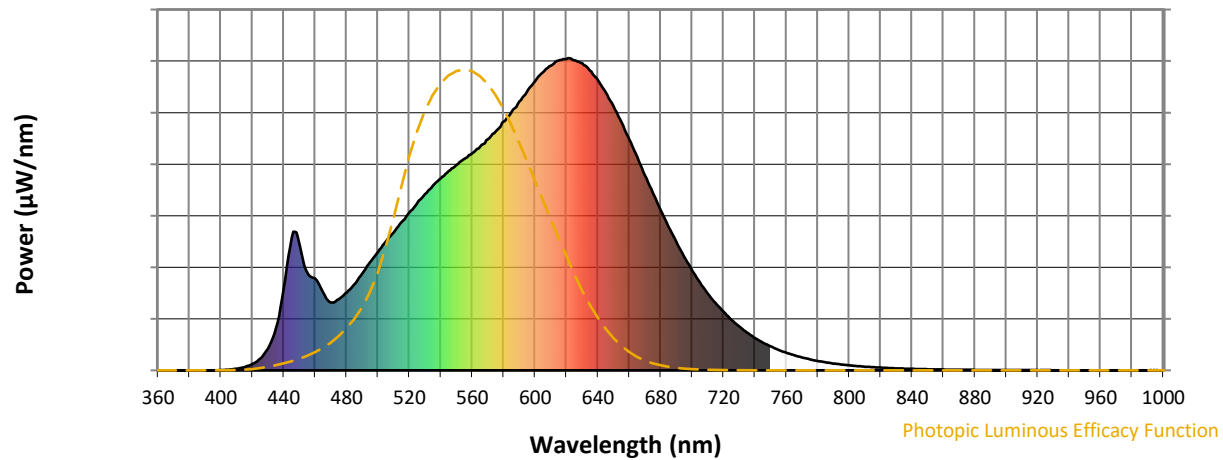
REPORT NUMBER: SP1-2407-184-14

| 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: SP1-2407-184-14

### Photopic Flux vs. Wavelength

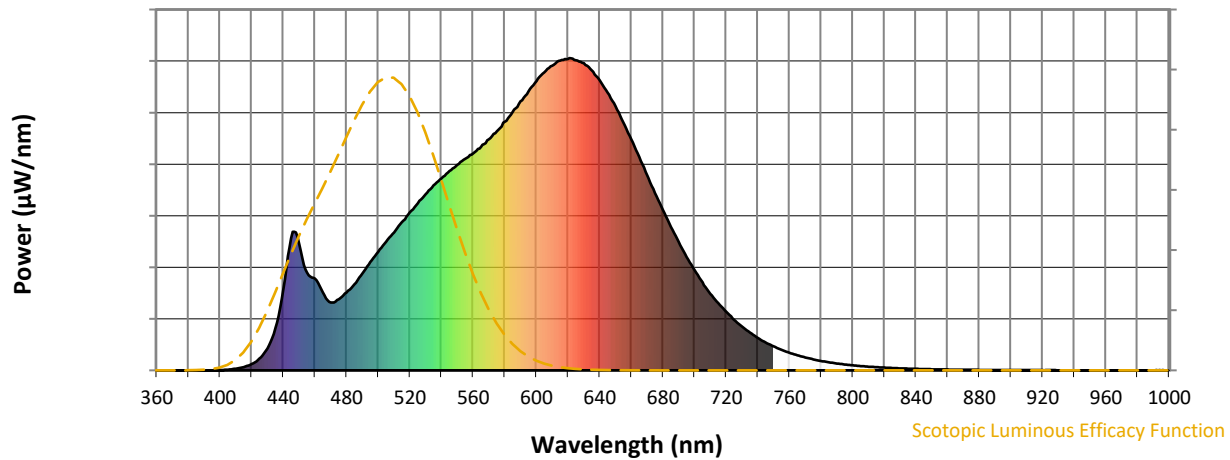


### Photopic Lumens: NR

| 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       | 310                         | NR               | 620       | 998                         | NR               | 750       | 77                          | NR               | 880       | 2                           | NR               |
| 365       | 0                           | NR               | 495       | 347                         | NR               | 625       | 993                         | NR               | 755       | 66                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 379                         | NR               | 630       | 983                         | NR               | 760       | 56                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 412                         | NR               | 635       | 960                         | NR               | 765       | 48                          | NR               | 895       | 1                           | NR               |
| 380       | 0                           | NR               | 510       | 442                         | NR               | 640       | 930                         | NR               | 770       | 41                          | NR               | 900       | 1                           | NR               |
| 385       | 0                           | NR               | 515       | 475                         | NR               | 645       | 889                         | NR               | 775       | 35                          | NR               | 905       | 1                           | NR               |
| 390       | 0                           | NR               | 520       | 506                         | NR               | 650       | 846                         | NR               | 780       | 30                          | NR               | 910       | 1                           | NR               |
| 395       | 0                           | NR               | 525       | 535                         | NR               | 655       | 794                         | NR               | 785       | 26                          | NR               | 915       | 1                           | NR               |
| 400       | 1                           | NR               | 530       | 565                         | NR               | 660       | 740                         | NR               | 790       | 22                          | NR               | 920       | 1                           | NR               |
| 405       | 2                           | NR               | 535       | 592                         | NR               | 665       | 684                         | NR               | 795       | 19                          | NR               | 925       | 1                           | NR               |
| 410       | 6                           | NR               | 540       | 615                         | NR               | 670       | 624                         | NR               | 800       | 16                          | NR               | 930       | 0                           | NR               |
| 415       | 10                          | NR               | 545       | 638                         | NR               | 675       | 567                         | NR               | 805       | 14                          | NR               | 935       | 0                           | NR               |
| 420       | 20                          | NR               | 550       | 658                         | NR               | 680       | 513                         | NR               | 810       | 12                          | NR               | 940       | 0                           | NR               |
| 425       | 38                          | NR               | 555       | 678                         | NR               | 685       | 459                         | NR               | 815       | 10                          | NR               | 945       | 0                           | NR               |
| 430       | 70                          | NR               | 560       | 695                         | NR               | 690       | 412                         | NR               | 820       | 9                           | NR               | 950       | 0                           | NR               |
| 435       | 136                         | NR               | 565       | 716                         | NR               | 695       | 363                         | NR               | 825       | 8                           | NR               | 955       | 0                           | NR               |
| 440       | 262                         | NR               | 570       | 740                         | NR               | 700       | 320                         | NR               | 830       | 7                           | NR               | 960       | 0                           | NR               |
| 445       | 424                         | NR               | 575       | 765                         | NR               | 705       | 281                         | NR               | 835       | 6                           | NR               | 965       | 0                           | NR               |
| 450       | 406                         | NR               | 580       | 796                         | NR               | 710       | 245                         | NR               | 840       | 5                           | NR               | 970       | 0                           | NR               |
| 455       | 313                         | NR               | 585       | 827                         | NR               | 715       | 215                         | NR               | 845       | 4                           | NR               | 975       | 0                           | NR               |
| 460       | 294                         | NR               | 590       | 861                         | NR               | 720       | 188                         | NR               | 850       | 4                           | NR               | 980       | 0                           | NR               |
| 465       | 250                         | NR               | 595       | 894                         | NR               | 725       | 162                         | NR               | 855       | 3                           | NR               | 985       | 0                           | NR               |
| 470       | 217                         | NR               | 600       | 927                         | NR               | 730       | 140                         | NR               | 860       | 3                           | NR               | 990       | 0                           | NR               |
| 475       | 228                         | NR               | 605       | 954                         | NR               | 735       | 121                         | NR               | 865       | 2                           | NR               | 995       | 0                           | NR               |
| 480       | 249                         | NR               | 610       | 976                         | NR               | 740       | 104                         | NR               | 870       | 2                           | NR               | 1000      | 0                           | NR               |
| 485       | 276                         | NR               | 615       | 992                         | NR               | 745       | 89                          | NR               | 875       | 2                           | NR               |           |                             |                  |

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### Scotopic Flux vs. Wavelength



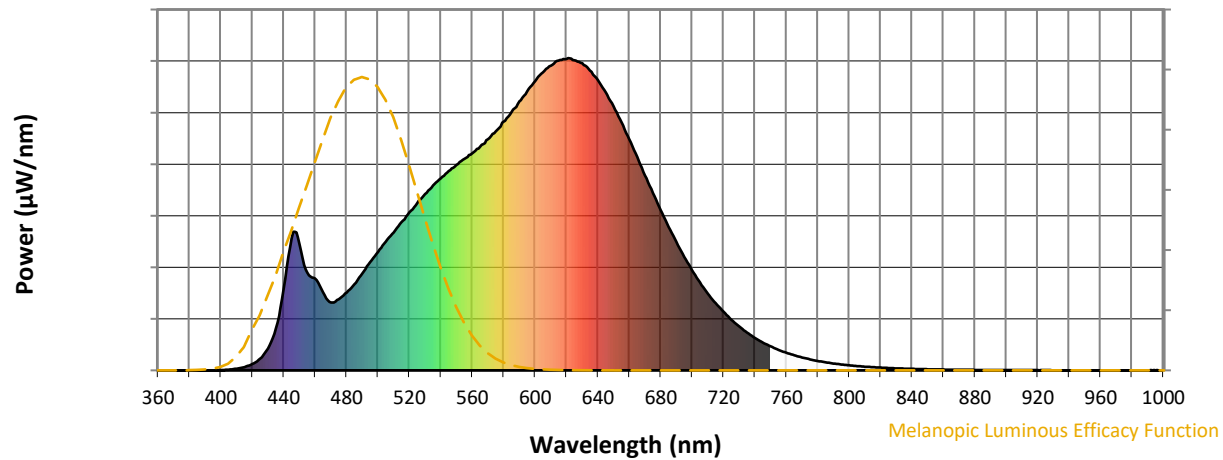
Scotopic Lumens: NR

S/P: 1.39

| 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       | 310                         | NR               | 620       | 998                         | NR               | 750       | 77                          | NR               | 880       | 2                           | NR               |
| 365       | 0                           | NR               | 495       | 347                         | NR               | 625       | 993                         | NR               | 755       | 66                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 379                         | NR               | 630       | 983                         | NR               | 760       | 56                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 412                         | NR               | 635       | 960                         | NR               | 765       | 48                          | NR               | 895       | 1                           | NR               |
| 380       | 0                           | NR               | 510       | 442                         | NR               | 640       | 930                         | NR               | 770       | 41                          | NR               | 900       | 1                           | NR               |
| 385       | 0                           | NR               | 515       | 475                         | NR               | 645       | 889                         | NR               | 775       | 35                          | NR               | 905       | 1                           | NR               |
| 390       | 0                           | NR               | 520       | 506                         | NR               | 650       | 846                         | NR               | 780       | 30                          | NR               | 910       | 1                           | NR               |
| 395       | 0                           | NR               | 525       | 535                         | NR               | 655       | 794                         | NR               | 785       | 26                          | NR               | 915       | 1                           | NR               |
| 400       | 1                           | NR               | 530       | 565                         | NR               | 660       | 740                         | NR               | 790       | 22                          | NR               | 920       | 1                           | NR               |
| 405       | 2                           | NR               | 535       | 592                         | NR               | 665       | 684                         | NR               | 795       | 19                          | NR               | 925       | 1                           | NR               |
| 410       | 6                           | NR               | 540       | 615                         | NR               | 670       | 624                         | NR               | 800       | 16                          | NR               | 930       | 0                           | NR               |
| 415       | 10                          | NR               | 545       | 638                         | NR               | 675       | 567                         | NR               | 805       | 14                          | NR               | 935       | 0                           | NR               |
| 420       | 20                          | NR               | 550       | 658                         | NR               | 680       | 513                         | NR               | 810       | 12                          | NR               | 940       | 0                           | NR               |
| 425       | 38                          | NR               | 555       | 678                         | NR               | 685       | 459                         | NR               | 815       | 10                          | NR               | 945       | 0                           | NR               |
| 430       | 70                          | NR               | 560       | 695                         | NR               | 690       | 412                         | NR               | 820       | 9                           | NR               | 950       | 0                           | NR               |
| 435       | 136                         | NR               | 565       | 716                         | NR               | 695       | 363                         | NR               | 825       | 8                           | NR               | 955       | 0                           | NR               |
| 440       | 262                         | NR               | 570       | 740                         | NR               | 700       | 320                         | NR               | 830       | 7                           | NR               | 960       | 0                           | NR               |
| 445       | 424                         | NR               | 575       | 765                         | NR               | 705       | 281                         | NR               | 835       | 6                           | NR               | 965       | 0                           | NR               |
| 450       | 406                         | NR               | 580       | 796                         | NR               | 710       | 245                         | NR               | 840       | 5                           | NR               | 970       | 0                           | NR               |
| 455       | 313                         | NR               | 585       | 827                         | NR               | 715       | 215                         | NR               | 845       | 4                           | NR               | 975       | 0                           | NR               |
| 460       | 294                         | NR               | 590       | 861                         | NR               | 720       | 188                         | NR               | 850       | 4                           | NR               | 980       | 0                           | NR               |
| 465       | 250                         | NR               | 595       | 894                         | NR               | 725       | 162                         | NR               | 855       | 3                           | NR               | 985       | 0                           | NR               |
| 470       | 217                         | NR               | 600       | 927                         | NR               | 730       | 140                         | NR               | 860       | 3                           | NR               | 990       | 0                           | NR               |
| 475       | 228                         | NR               | 605       | 954                         | NR               | 735       | 121                         | NR               | 865       | 2                           | NR               | 995       | 0                           | NR               |
| 480       | 249                         | NR               | 610       | 976                         | NR               | 740       | 104                         | NR               | 870       | 2                           | NR               | 1000      | 0                           | NR               |
| 485       | 276                         | NR               | 615       | 992                         | NR               | 745       | 89                          | NR               | 875       | 2                           | NR               |           |                             |                  |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.69

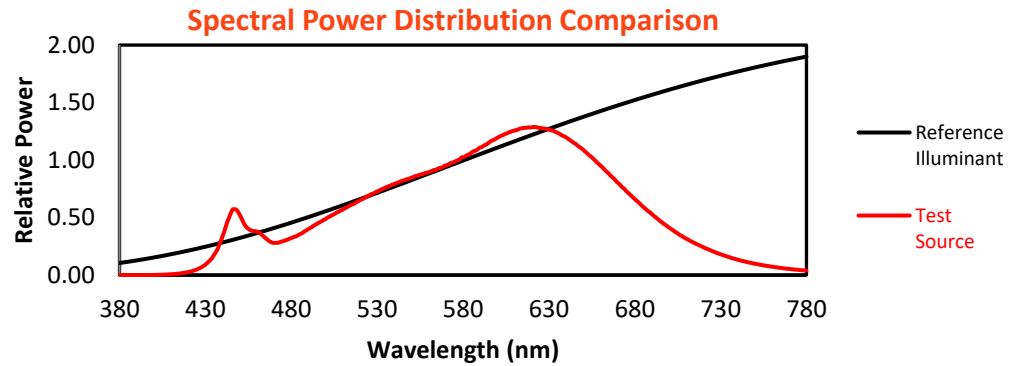
| λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 310                         | NR               | 620       | 998                         | NR               | 750       | 77                          | NR               | 880       | 2                           | NR               |
| 365       | 0                           | NR               | 495       | 347                         | NR               | 625       | 993                         | NR               | 755       | 66                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 379                         | NR               | 630       | 983                         | NR               | 760       | 56                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 412                         | NR               | 635       | 960                         | NR               | 765       | 48                          | NR               | 895       | 1                           | NR               |
| 380       | 0                           | NR               | 510       | 442                         | NR               | 640       | 930                         | NR               | 770       | 41                          | NR               | 900       | 1                           | NR               |
| 385       | 0                           | NR               | 515       | 475                         | NR               | 645       | 889                         | NR               | 775       | 35                          | NR               | 905       | 1                           | NR               |
| 390       | 0                           | NR               | 520       | 506                         | NR               | 650       | 846                         | NR               | 780       | 30                          | NR               | 910       | 1                           | NR               |
| 395       | 0                           | NR               | 525       | 535                         | NR               | 655       | 794                         | NR               | 785       | 26                          | NR               | 915       | 1                           | NR               |
| 400       | 1                           | NR               | 530       | 565                         | NR               | 660       | 740                         | NR               | 790       | 22                          | NR               | 920       | 1                           | NR               |
| 405       | 2                           | NR               | 535       | 592                         | NR               | 665       | 684                         | NR               | 795       | 19                          | NR               | 925       | 1                           | NR               |
| 410       | 6                           | NR               | 540       | 615                         | NR               | 670       | 624                         | NR               | 800       | 16                          | NR               | 930       | 0                           | NR               |
| 415       | 10                          | NR               | 545       | 638                         | NR               | 675       | 567                         | NR               | 805       | 14                          | NR               | 935       | 0                           | NR               |
| 420       | 20                          | NR               | 550       | 658                         | NR               | 680       | 513                         | NR               | 810       | 12                          | NR               | 940       | 0                           | NR               |
| 425       | 38                          | NR               | 555       | 678                         | NR               | 685       | 459                         | NR               | 815       | 10                          | NR               | 945       | 0                           | NR               |
| 430       | 70                          | NR               | 560       | 695                         | NR               | 690       | 412                         | NR               | 820       | 9                           | NR               | 950       | 0                           | NR               |
| 435       | 136                         | NR               | 565       | 716                         | NR               | 695       | 363                         | NR               | 825       | 8                           | NR               | 955       | 0                           | NR               |
| 440       | 262                         | NR               | 570       | 740                         | NR               | 700       | 320                         | NR               | 830       | 7                           | NR               | 960       | 0                           | NR               |
| 445       | 424                         | NR               | 575       | 765                         | NR               | 705       | 281                         | NR               | 835       | 6                           | NR               | 965       | 0                           | NR               |
| 450       | 406                         | NR               | 580       | 796                         | NR               | 710       | 245                         | NR               | 840       | 5                           | NR               | 970       | 0                           | NR               |
| 455       | 313                         | NR               | 585       | 827                         | NR               | 715       | 215                         | NR               | 845       | 4                           | NR               | 975       | 0                           | NR               |
| 460       | 294                         | NR               | 590       | 861                         | NR               | 720       | 188                         | NR               | 850       | 4                           | NR               | 980       | 0                           | NR               |
| 465       | 250                         | NR               | 595       | 894                         | NR               | 725       | 162                         | NR               | 855       | 3                           | NR               | 985       | 0                           | NR               |
| 470       | 217                         | NR               | 600       | 927                         | NR               | 730       | 140                         | NR               | 860       | 3                           | NR               | 990       | 0                           | NR               |
| 475       | 228                         | NR               | 605       | 954                         | NR               | 735       | 121                         | NR               | 865       | 2                           | NR               | 995       | 0                           | NR               |
| 480       | 249                         | NR               | 610       | 976                         | NR               | 740       | 104                         | NR               | 870       | 2                           | NR               | 1000      | 0                           | NR               |
| 485       | 276                         | NR               | 615       | 992                         | NR               | 745       | 89                          | NR               | 875       | 2                           | NR               |           |                             |                  |

REPORT NUMBER: SP1-2407-184-14

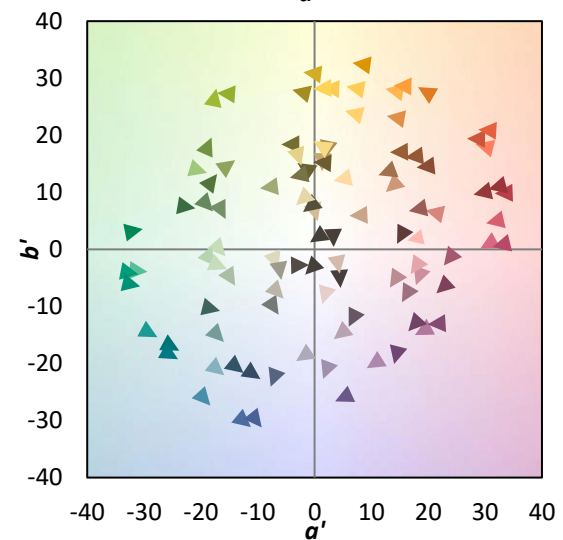
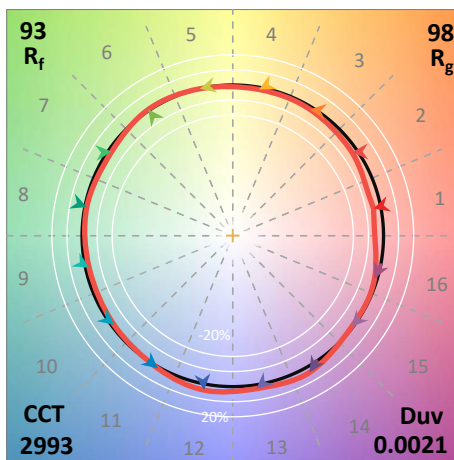
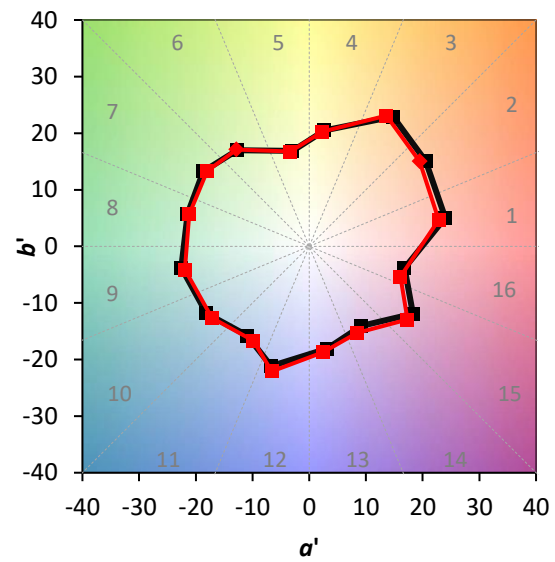
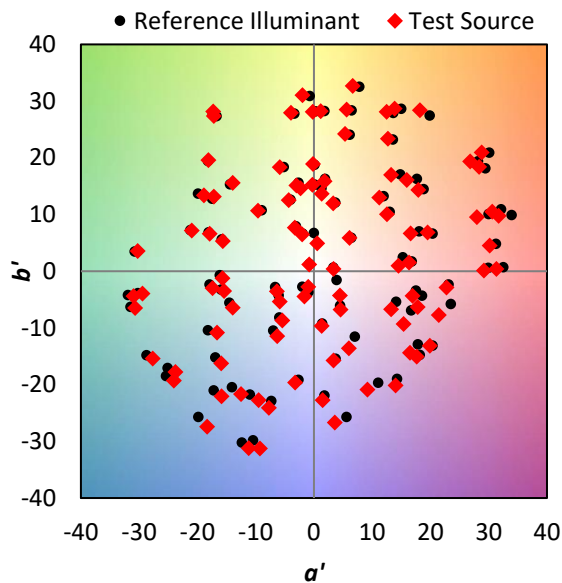
TM-30-18

### Summary

$R_f = 92.6$   
 $R_g = 98.5$   
 $CIE R_a = 92.4$   
 $R_9 = 58.2$

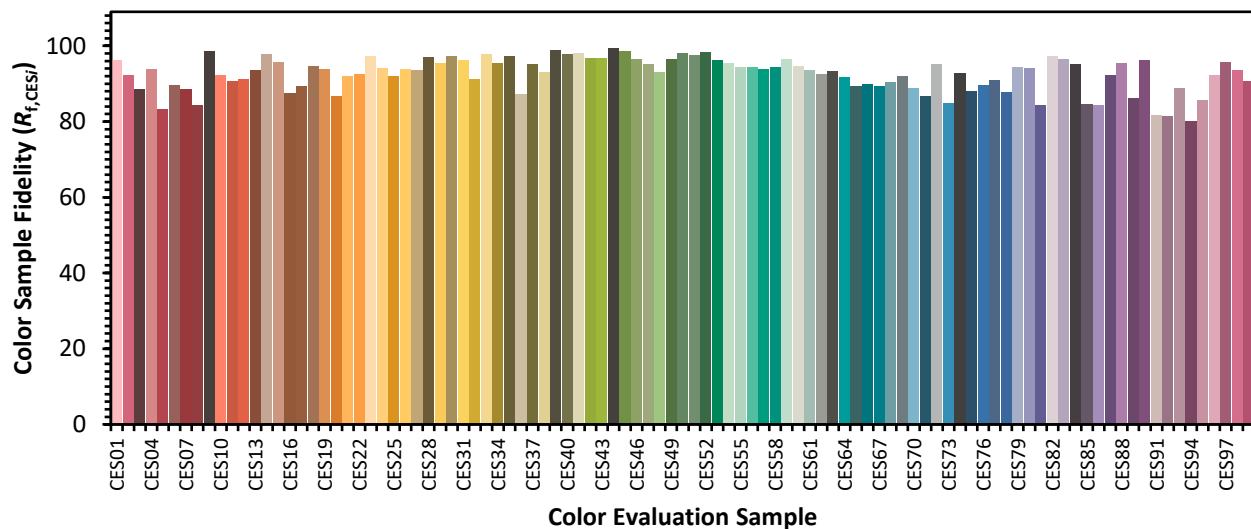


### Color Vector Graphics

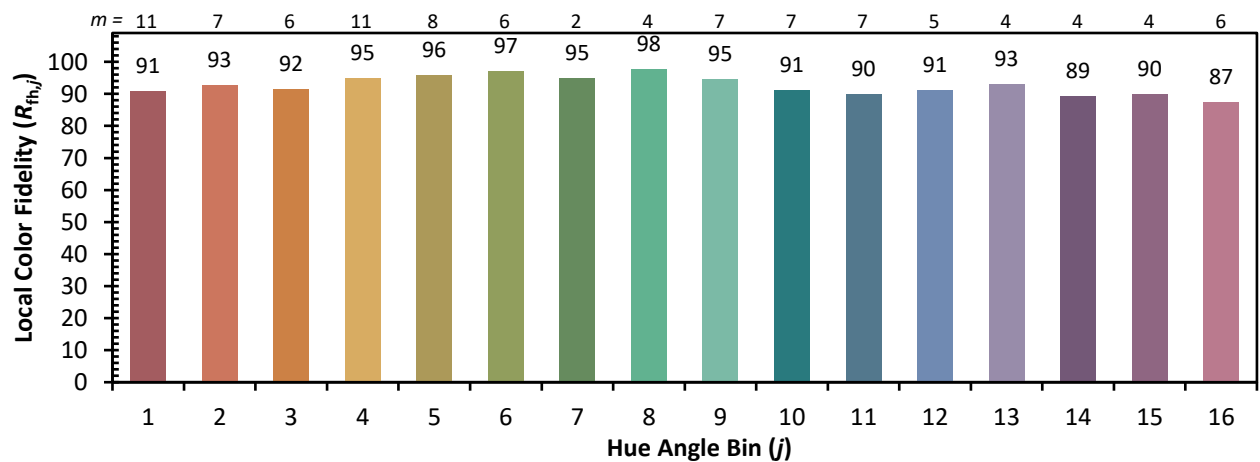
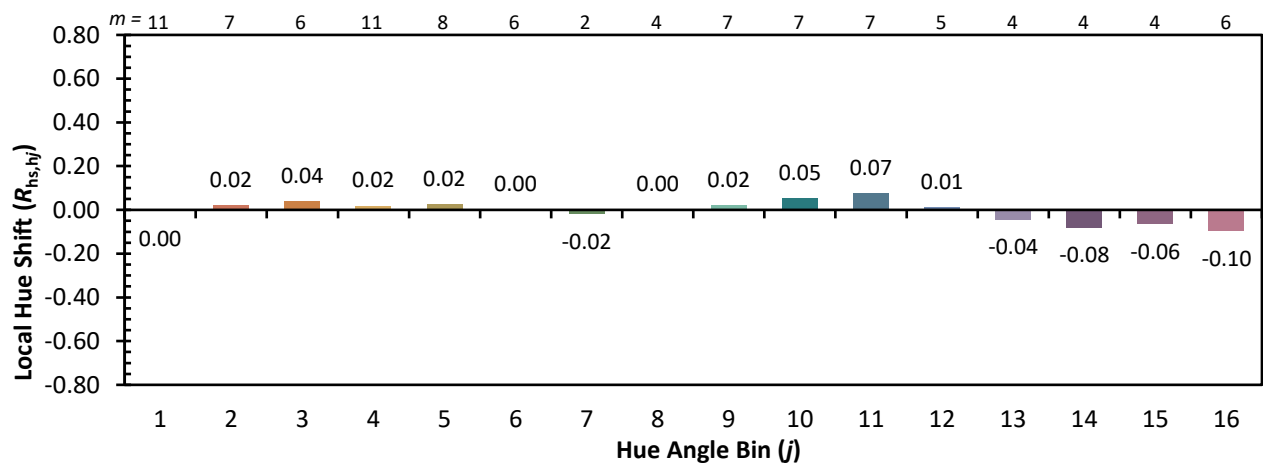
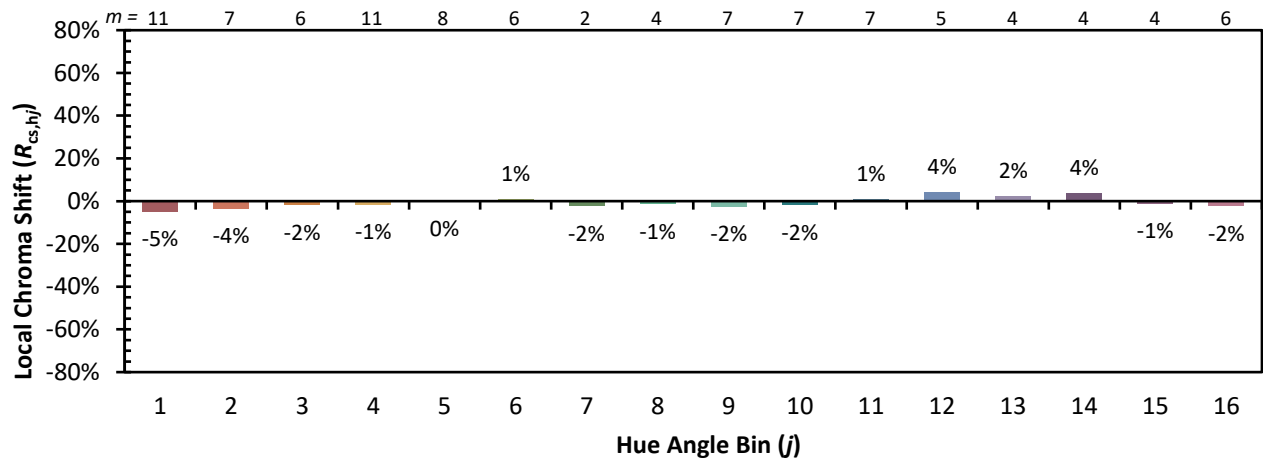


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

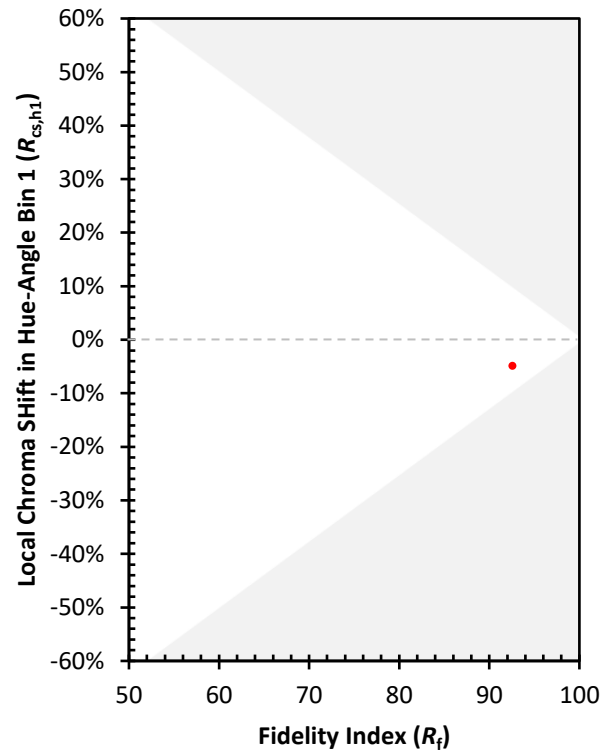
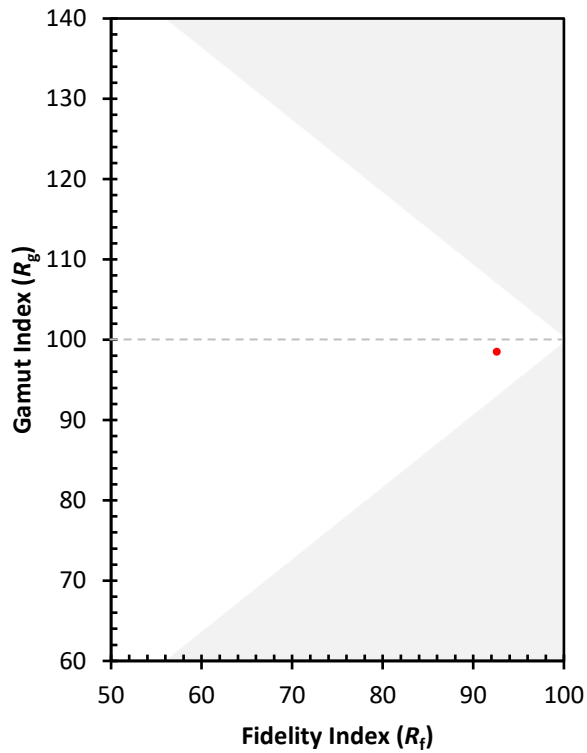
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 94 | CES51 = 98 | CES76 = 90 |
| CES02 = 63 | CES27 = 94 | CES52 = 98 | CES77 = 91 |
| CES03 = 32 | CES28 = 97 | CES53 = 96 | CES78 = 88 |
| CES04 = 70 | CES29 = 95 | CES54 = 95 | CES79 = 94 |
| CES05 = 51 | CES30 = 97 | CES55 = 94 | CES80 = 94 |
| CES06 = 51 | CES31 = 96 | CES56 = 94 | CES81 = 84 |
| CES07 = 43 | CES32 = 91 | CES57 = 94 | CES82 = 97 |
| CES08 = 42 | CES33 = 98 | CES58 = 94 | CES83 = 97 |
| CES09 = 29 | CES34 = 96 | CES59 = 97 | CES84 = 95 |
| CES10 = 76 | CES35 = 97 | CES60 = 95 | CES85 = 85 |
| CES11 = 59 | CES36 = 87 | CES61 = 94 | CES86 = 84 |
| CES12 = 65 | CES37 = 95 | CES62 = 92 | CES87 = 92 |
| CES13 = 44 | CES38 = 93 | CES63 = 93 | CES88 = 95 |
| CES14 = 74 | CES39 = 99 | CES64 = 92 | CES89 = 86 |
| CES15 = 72 | CES40 = 98 | CES65 = 89 | CES90 = 96 |
| CES16 = 48 | CES41 = 98 | CES66 = 90 | CES91 = 82 |
| CES17 = 50 | CES42 = 97 | CES67 = 89 | CES92 = 81 |
| CES18 = 57 | CES43 = 97 | CES68 = 90 | CES93 = 89 |
| CES19 = 72 | CES44 = 99 | CES69 = 92 | CES94 = 80 |
| CES20 = 67 | CES45 = 99 | CES70 = 89 | CES95 = 86 |
| CES21 = 86 | CES46 = 96 | CES71 = 87 | CES96 = 92 |
| CES22 = 79 | CES47 = 95 | CES72 = 95 | CES97 = 96 |
| CES23 = 92 | CES48 = 93 | CES73 = 85 | CES98 = 94 |
| CES24 = 91 | CES49 = 97 | CES74 = 93 | CES99 = 91 |
| CES25 = 72 | CES50 = 98 | CES75 = 88 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)