

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: P1048121

Luminaire Tested: **GALN-SA8A-930-U-T2BC**

Issue Date: 07/10/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1048121  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 07/10/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GALN-SA8A-930-U-T2BC  
Description: GALLEON II AREA AND ROADWAY LUMINAIRE 615mA 8xLight Square PACKAGE  
90CRI 3000K FIXTURE w/ TYPE II ANGLED BACKLIGHT CONTROL  
Light Source: (112) 3000K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 19703.4 lumens  
Efficiency: N/A  
Efficacy: 90.5 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1.5' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B0 - U0 - G3

Input Watts (W): 217.6  
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

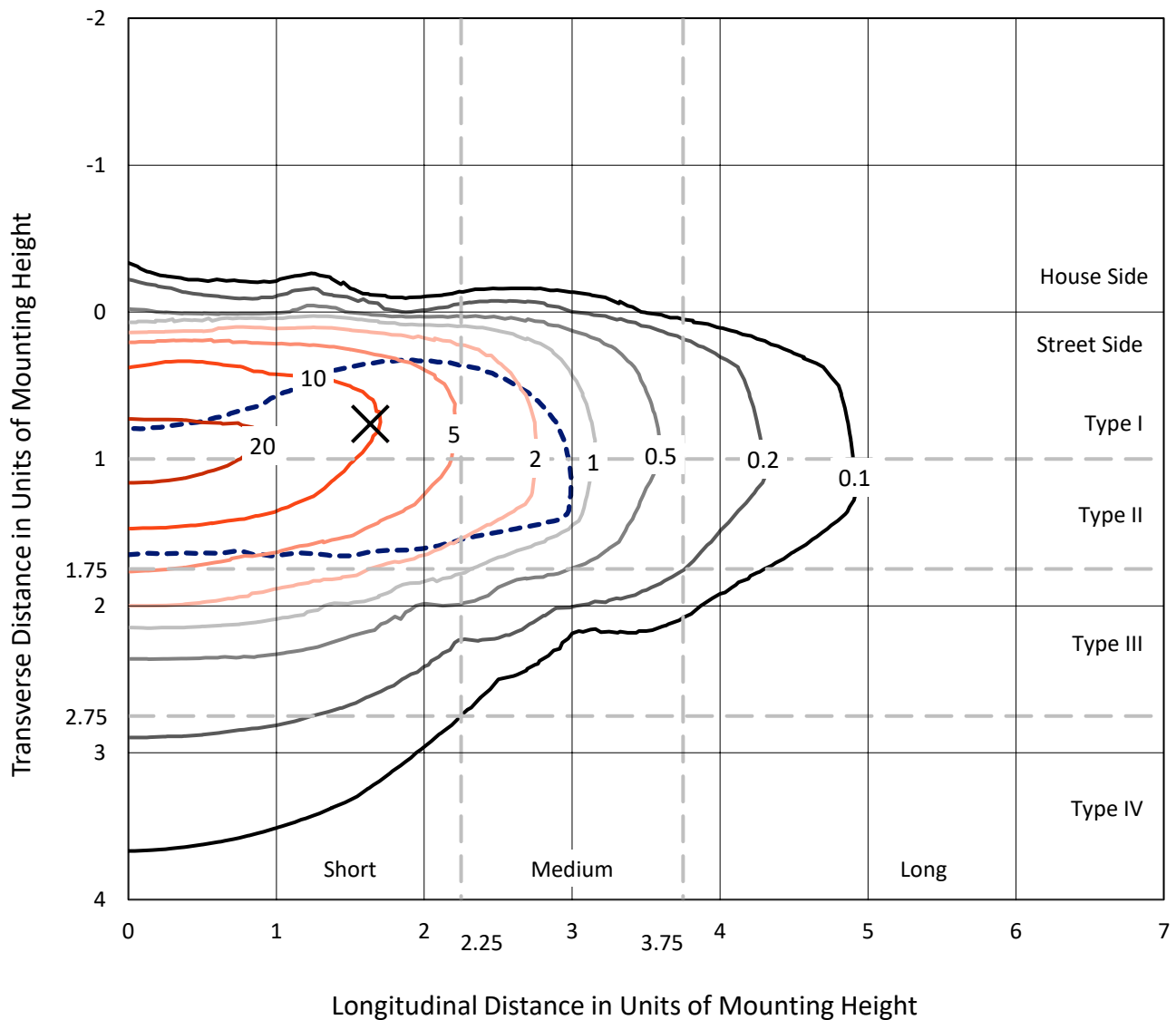


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## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd  
 - - - 1/2 Max cd

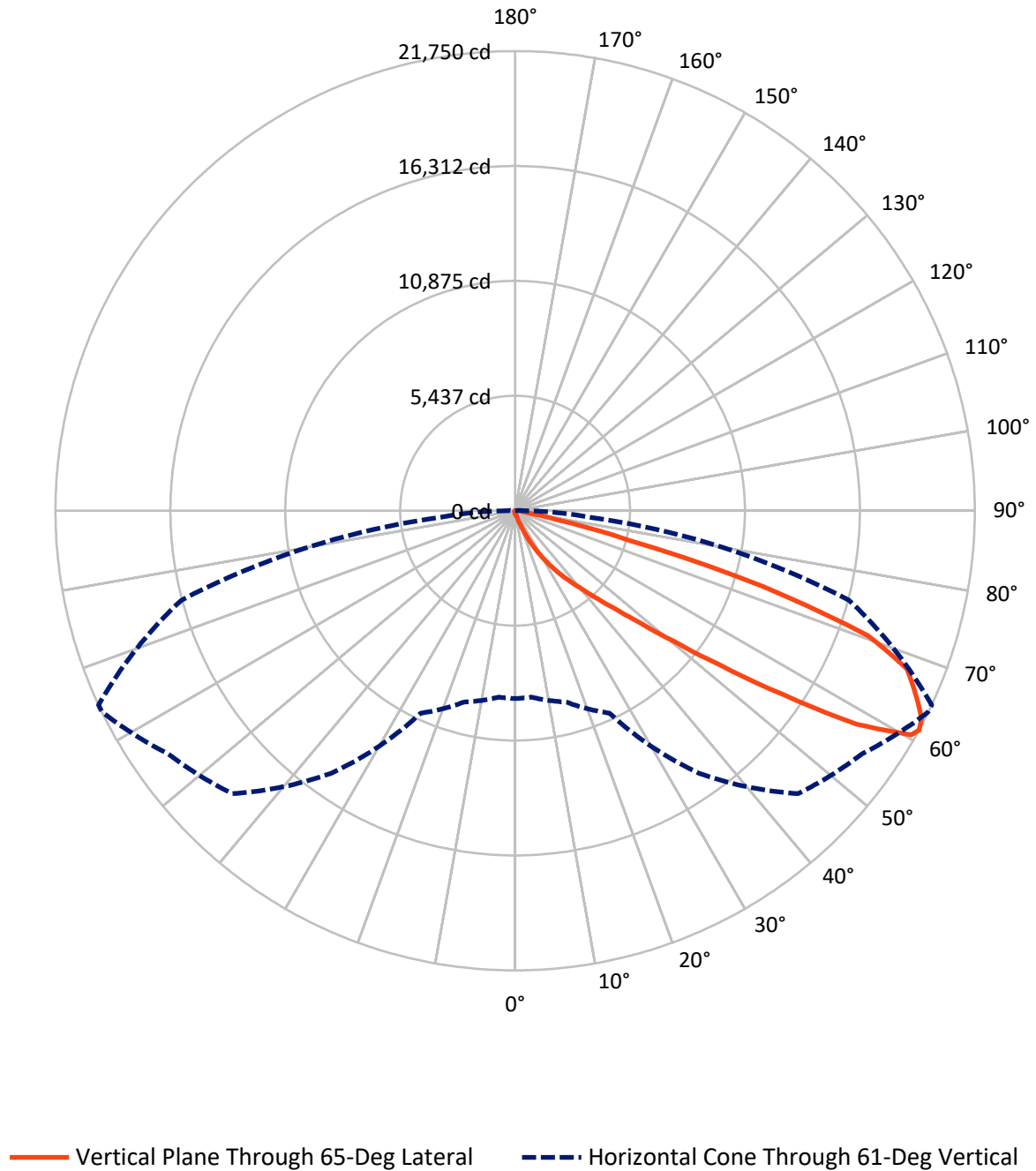


Based on 15 foot mounting height. Maximum calculated value = 26.1 fc  
 Type II - Short - N/A

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## Luminous Intensity Polar Plot



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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 84.1     | 0.0    | 84.1    |
|                    | % Fixture | 0.4      | 0.0    | 0.4     |
| <b>Street Side</b> | Lumens    | 19619.3  | 0.0    | 19619.3 |
|                    | % Fixture | 99.6     | 0.0    | 99.6    |
| <b>Total</b>       | Lumens    | 19703.4  | 0.0    | 19703.4 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 15.3    | 0.1       |
| 10°-20°   | 162.0   | 0.8       |
| 20°-30°   | 581.5   | 3.0       |
| 30°-40°   | 1548.1  | 7.9       |
| 40°-50°   | 4066.9  | 20.6      |
| 50°-60°   | 6300.4  | 32.0      |
| 60°-70°   | 5282.8  | 26.8      |
| 70°-80°   | 1554.6  | 7.9       |
| 80°-90°   | 191.8   | 1.0       |
| 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°    | 19703.4 | 100.0     |
| 0°-180°   | 19703.4 | 100.0     |



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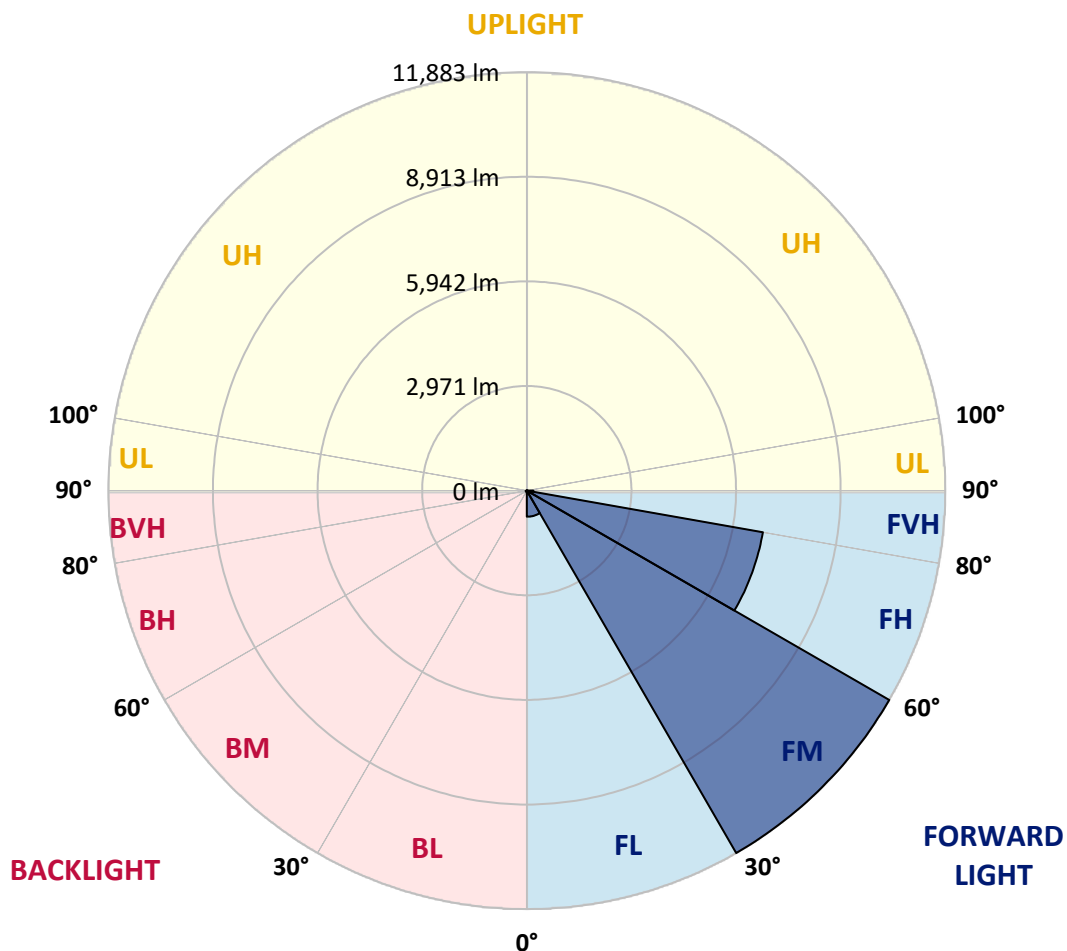
CATALOG NUMBER: GALN-SA8A-930-U-T2BC

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 740.0   | 3.8       |                         |      |         |
| FM   | (30°-60°)   | 11883.4 | 60.3      |                         |      |         |
| FH   | (60°-80°)   | 6807.7  | 34.6      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 188.2   | 1.0       |                         |      | G2/225  |
| BL   | (0°-30°)    | 18.9    | 0.1       | B0/110                  |      |         |
| BM   | (30°-60°)   | 32.0    | 0.2       | B0/220                  |      |         |
| BH   | (60°-80°)   | 29.7    | 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-G3**

Type II Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 64°     | 65°     | 75°     | 85°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|
| 0°    | 120.6   | 120.6   | 120.6   | 120.6   | 120.6   | 120.6   | 120.6   | 120.6   | 120.6   | 120.6   | 120.6  |
| 2.5°  | 146.4   | 147.7   | 145.0   | 139.6   | 135.5   | 135.5   | 134.2   | 130.1   | 130.1   | 126.1   | 123.3  |
| 5°    | 204.7   | 202.0   | 196.5   | 185.7   | 176.2   | 166.7   | 157.2   | 147.7   | 146.4   | 134.2   | 126.1  |
| 7.5°  | 334.8   | 337.5   | 319.9   | 286.0   | 257.5   | 220.9   | 187.0   | 166.7   | 164.0   | 143.7   | 127.4  |
| 10°   | 734.6   | 714.3   | 673.6   | 542.2   | 445.9   | 336.1   | 249.4   | 193.8   | 191.1   | 154.5   | 130.1  |
| 12.5° | 1339.1  | 1322.9  | 1248.3  | 1112.8  | 864.7   | 601.8   | 364.6   | 239.9   | 231.8   | 164.0   | 131.5  |
| 15°   | 1930.1  | 1904.3  | 1863.7  | 1726.8  | 1436.7  | 1078.9  | 596.4   | 328.0   | 306.3   | 177.6   | 130.1  |
| 17.5° | 2306.9  | 2310.9  | 2274.3  | 2216.1  | 2029.0  | 1596.6  | 1030.1  | 489.3   | 447.3   | 202.0   | 127.4  |
| 20°   | 2636.2  | 2626.7  | 2647.1  | 2615.9  | 2484.4  | 2170.0  | 1499.1  | 775.3   | 703.4   | 241.3   | 128.8  |
| 22.5° | 3015.7  | 3038.8  | 3053.7  | 3046.9  | 2901.9  | 2633.5  | 2031.7  | 1160.2  | 1069.4  | 313.1   | 132.8  |
| 25°   | 3524.0  | 3521.3  | 3522.6  | 3505.0  | 3364.1  | 3065.9  | 2565.7  | 1638.7  | 1546.5  | 429.7   | 142.3  |
| 27.5° | 4056.7  | 4072.9  | 4079.7  | 4016.0  | 3831.7  | 3538.9  | 3060.5  | 2161.8  | 2053.4  | 616.7   | 154.5  |
| 30°   | 4784.5  | 4771.0  | 4739.8  | 4609.7  | 4386.0  | 4022.8  | 3548.4  | 2710.8  | 2596.9  | 878.3   | 173.5  |
| 32.5° | 5765.8  | 5750.9  | 5593.7  | 5306.3  | 4971.5  | 4527.0  | 4039.0  | 3261.1  | 3122.8  | 1204.9  | 199.2  |
| 35°   | 7382.8  | 7405.8  | 7019.5  | 6275.4  | 5675.0  | 5132.8  | 4582.6  | 3808.6  | 3686.6  | 1607.5  | 234.5  |
| 37.5° | 9859.1  | 9733.0  | 9208.5  | 7893.8  | 6600.7  | 5889.1  | 5101.7  | 4361.6  | 4255.9  | 2103.6  | 280.6  |
| 40°   | 12264.9 | 12140.2 | 11988.4 | 10742.8 | 8209.6  | 6722.7  | 5828.2  | 5010.9  | 4874.0  | 2663.3  | 348.3  |
| 42.5° | 14794.0 | 14724.9 | 14718.1 | 13778.8 | 11145.3 | 8033.4  | 6702.4  | 5771.2  | 5654.7  | 3277.3  | 459.5  |
| 45°   | 16585.8 | 16516.7 | 16661.7 | 16825.7 | 15143.7 | 10841.7 | 8224.5  | 6759.3  | 6589.9  | 4022.8  | 637.0  |
| 47.5° | 16827.1 | 16829.8 | 17217.4 | 17731.1 | 18114.7 | 15185.7 | 10252.1 | 8068.6  | 7862.6  | 5089.5  | 935.2  |
| 50°   | 16024.7 | 16055.9 | 16672.6 | 17591.5 | 18624.3 | 18830.3 | 13827.6 | 9968.8  | 9663.9  | 6354.0  | 1358.1 |
| 52.5° | 14497.2 | 14532.4 | 15391.7 | 16903.0 | 18155.4 | 19705.9 | 18037.4 | 12454.6 | 12103.6 | 7931.7  | 1954.5 |
| 55°   | 13121.5 | 13143.2 | 14128.5 | 16038.3 | 17590.2 | 19230.2 | 20536.8 | 15774.0 | 15313.1 | 9872.6  | 2542.7 |
| 57.5° | 11759.3 | 11709.2 | 12350.3 | 14536.5 | 17493.9 | 18646.0 | 20905.4 | 19556.8 | 19048.6 | 11993.8 | 3000.8 |
| 60°   | 9937.7  | 9853.6  | 10368.7 | 11759.3 | 16228.0 | 19029.6 | 20215.6 | 21649.5 | 21534.3 | 14947.2 | 3354.6 |
| 61°   | 8890.0  | 8854.7  | 9372.5  | 10565.2 | 15162.7 | 18932.0 | 20050.2 | 21737.6 | 21749.8 | 16344.6 | 3513.2 |
| 62.5° | 6348.6  | 6448.9  | 7240.5  | 8791.0  | 12699.9 | 18299.0 | 20071.9 | 21465.2 | 21585.8 | 18201.5 | 3923.8 |
| 65°   | 2821.9  | 2983.2  | 3598.5  | 4860.4  | 7385.5  | 15222.3 | 19879.4 | 20867.5 | 20807.9 | 18711.1 | 5338.9 |
| 67.5° | 1673.9  | 1698.3  | 2004.6  | 2754.1  | 3911.6  | 8187.9  | 17542.7 | 20077.3 | 19997.3 | 16289.0 | 6642.7 |
| 70°   | 1318.8  | 1331.0  | 1428.6  | 1728.1  | 2270.3  | 3136.4  | 10012.2 | 17370.6 | 17718.9 | 13208.2 | 6503.1 |
| 72.5° | 1251.0  | 1248.3  | 1261.9  | 1314.7  | 1429.9  | 1556.0  | 3876.4  | 11546.5 | 12255.4 | 9512.1  | 5452.7 |
| 75°   | 1234.8  | 1229.3  | 1215.8  | 1195.4  | 1035.5  | 916.2   | 1200.9  | 5107.1  | 5517.8  | 6499.1  | 4105.5 |
| 77.5° | 1198.2  | 1199.5  | 1202.2  | 1146.7  | 887.8   | 647.9   | 581.5   | 1638.7  | 2015.5  | 4124.4  | 2918.1 |
| 80°   | 810.5   | 822.7   | 843.0   | 821.4   | 798.3   | 469.0   | 410.7   | 582.8   | 590.9   | 2315.0  | 1927.4 |
| 82.5° | 410.7   | 410.7   | 401.2   | 357.8   | 309.0   | 305.0   | 326.6   | 422.9   | 428.3   | 1171.1  | 906.8  |
| 85°   | 248.0   | 261.6   | 267.0   | 242.6   | 222.3   | 204.7   | 249.4   | 336.1   | 348.3   | 454.1   | 211.4  |
| 87.5° | 55.6    | 56.9    | 62.3    | 82.7    | 120.6   | 164.0   | 231.8   | 307.7   | 313.1   | 291.4   | 25.8   |
| 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-SA8A-930-U-T2BC

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 120.6  | 120.6 | 120.6 | 120.6 | 120.6 | 120.6 | 120.6 | 120.6 | 120.6 | 120.6 | 120.6 |
| 2.5°  | 122.0  | 119.3 | 117.9 | 113.9 | 109.8 | 105.7 | 103.0 | 101.7 | 103.0 | 104.4 | 104.4 |
| 5°    | 120.6  | 116.6 | 109.8 | 103.0 | 97.6  | 92.2  | 86.7  | 85.4  | 85.4  | 86.7  | 86.7  |
| 7.5°  | 120.6  | 113.9 | 104.4 | 96.2  | 88.1  | 80.0  | 75.9  | 73.2  | 74.5  | 74.5  | 74.5  |
| 10°   | 120.6  | 112.5 | 100.3 | 88.1  | 78.6  | 69.1  | 62.3  | 59.6  | 59.6  | 59.6  | 59.6  |
| 12.5° | 119.3  | 111.1 | 96.2  | 81.3  | 67.8  | 56.9  | 48.8  | 44.7  | 46.1  | 46.1  | 46.1  |
| 15°   | 116.6  | 107.1 | 90.8  | 69.1  | 54.2  | 43.4  | 35.2  | 31.2  | 32.5  | 35.2  | 36.6  |
| 17.5° | 112.5  | 103.0 | 81.3  | 58.3  | 43.4  | 32.5  | 24.4  | 21.7  | 23.0  | 27.1  | 27.1  |
| 20°   | 111.1  | 98.9  | 71.8  | 47.4  | 32.5  | 23.0  | 16.3  | 13.6  | 14.9  | 20.3  | 21.7  |
| 22.5° | 111.1  | 96.2  | 65.1  | 39.3  | 24.4  | 14.9  | 9.5   | 5.4   | 5.4   | 9.5   | 9.5   |
| 25°   | 112.5  | 94.9  | 59.6  | 32.5  | 17.6  | 10.8  | 5.4   | 2.7   | 5.4   | 14.9  | 17.6  |
| 27.5° | 115.2  | 93.5  | 56.9  | 27.1  | 13.6  | 9.5   | 4.1   | 9.5   | 16.3  | 16.3  | 16.3  |
| 30°   | 117.9  | 90.8  | 52.9  | 23.0  | 12.2  | 6.8   | 6.8   | 13.6  | 13.6  | 16.3  | 17.6  |
| 32.5° | 122.0  | 89.5  | 50.1  | 20.3  | 9.5   | 5.4   | 9.5   | 8.1   | 8.1   | 9.5   | 10.8  |
| 35°   | 130.1  | 90.8  | 47.4  | 20.3  | 9.5   | 6.8   | 8.1   | 4.1   | 2.7   | 2.7   | 2.7   |
| 37.5° | 141.0  | 92.2  | 43.4  | 17.6  | 8.1   | 8.1   | 4.1   | 0.0   | 0.0   | 0.0   | 0.0   |
| 40°   | 158.6  | 96.2  | 40.7  | 16.3  | 6.8   | 6.8   | 1.4   | 0.0   | 0.0   | 0.0   | 0.0   |
| 42.5° | 188.4  | 104.4 | 39.3  | 14.9  | 6.8   | 5.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 45°   | 248.0  | 123.3 | 36.6  | 13.6  | 6.8   | 2.7   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 47.5° | 356.5  | 168.1 | 35.2  | 10.8  | 4.1   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 50°   | 520.5  | 227.7 | 33.9  | 9.5   | 1.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 52.5° | 664.1  | 239.9 | 23.0  | 8.1   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 55°   | 680.4  | 165.4 | 17.6  | 5.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 57.5° | 542.2  | 107.1 | 14.9  | 4.1   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 60°   | 410.7  | 81.3  | 13.6  | 1.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 61°   | 394.4  | 73.2  | 13.6  | 1.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 62.5° | 435.1  | 63.7  | 12.2  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 65°   | 707.5  | 52.9  | 10.8  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 67.5° | 1229.3 | 46.1  | 9.5   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 70°   | 1553.3 | 43.4  | 8.1   | 1.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 72.5° | 1354.0 | 39.3  | 8.1   | 2.7   | 1.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 75°   | 814.6  | 33.9  | 8.1   | 5.4   | 2.7   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 77.5° | 426.9  | 25.8  | 8.1   | 6.8   | 4.1   | 1.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80°   | 207.4  | 23.0  | 9.5   | 6.8   | 5.4   | 2.7   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 81.3   | 19.0  | 10.8  | 9.5   | 6.8   | 4.1   | 1.4   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 36.6   | 16.3  | 12.2  | 10.8  | 9.5   | 5.4   | 1.4   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 19.0   | 14.9  | 13.6  | 12.2  | 9.5   | 6.8   | 2.7   | 0.0   | 0.0   | 0.0   | 0.0   |
| 90°   | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |

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

Report Prepared for

Cooper Lighting Solutions

McGraw-Edison

Report Number: SP1-2407-184-14

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

**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

REPORT NUMBER: SP1-2407-184-14

### Photopic Flux vs. Wavelength

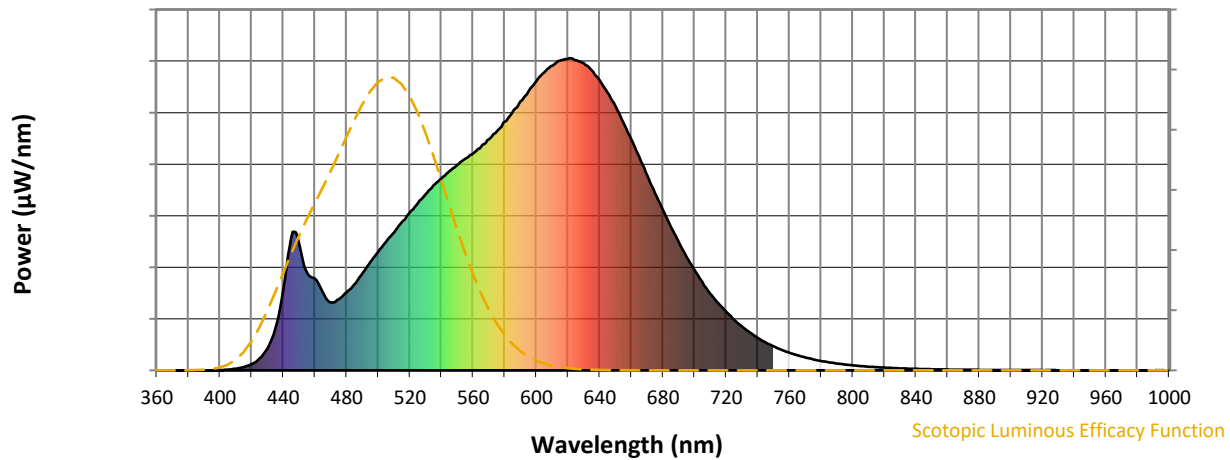


### Photopic Lumens: NR

| 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



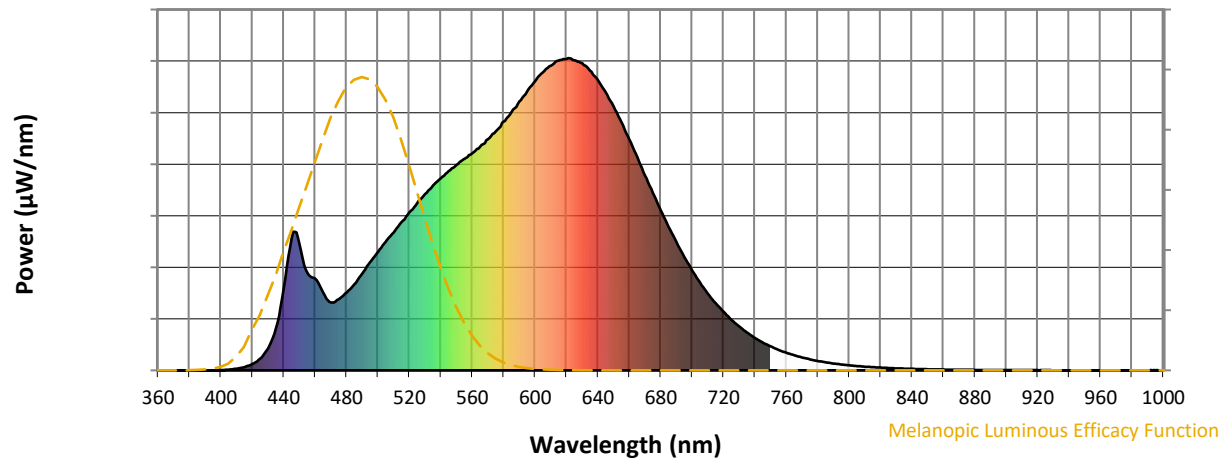
Scotopic Lumens: NR

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

| $\lambda$<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               | 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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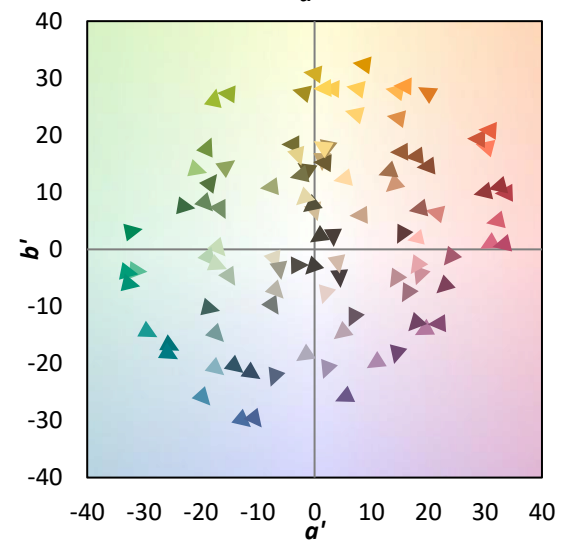
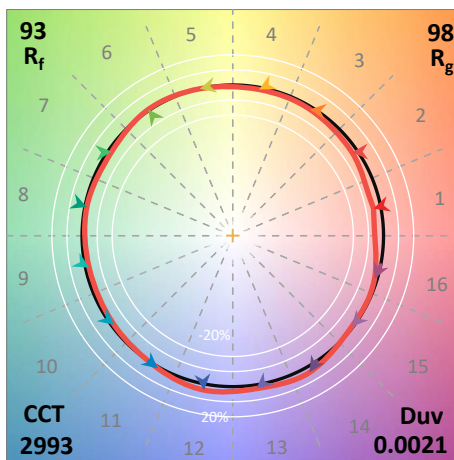
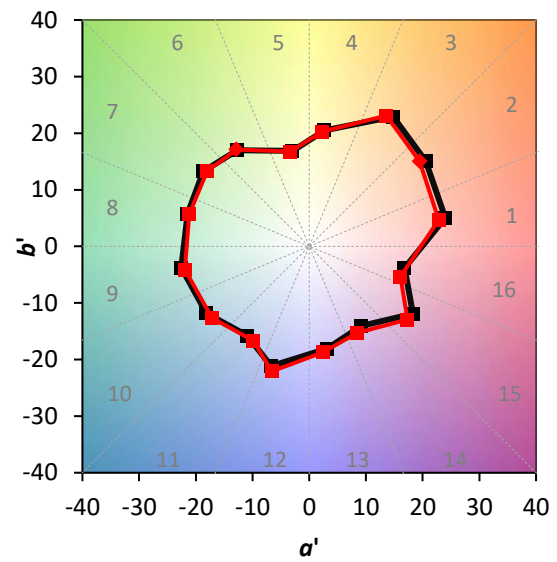
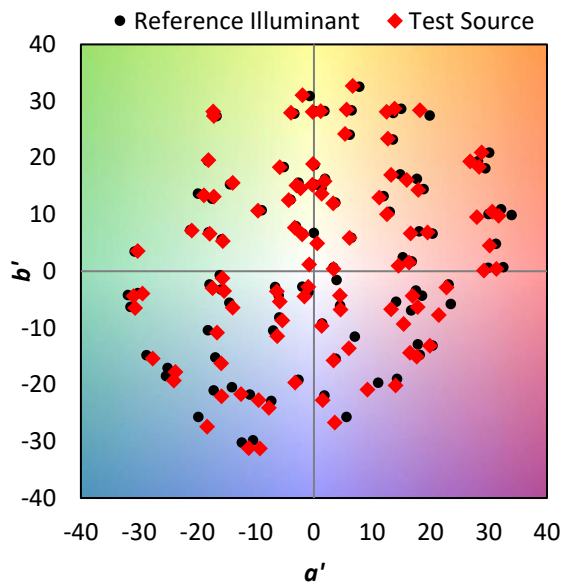
TM-30-18

### Summary

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

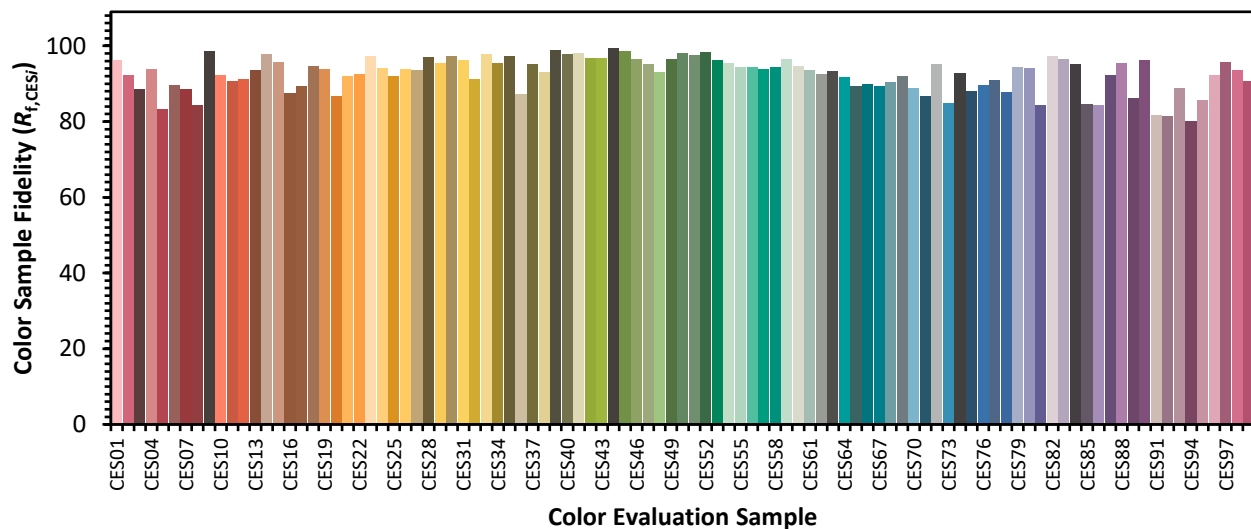


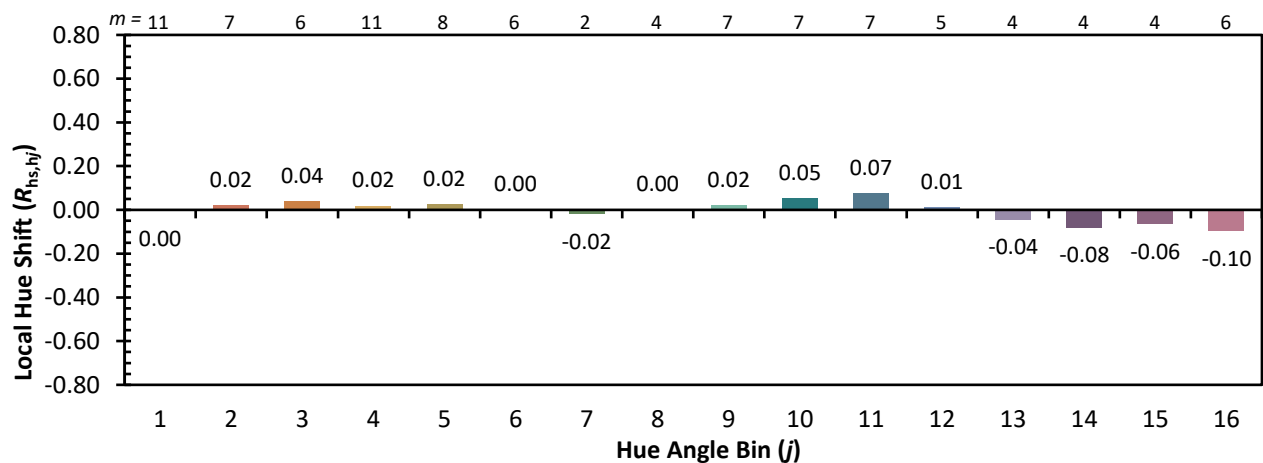
### Color Vector Graphics



**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)