

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: P382840

Luminaire Tested: **GLEON-SA2A-735-U-T2R-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P382840  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-9)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA2A-735-U-T2R-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(2) 70 CRI, 3500K, 615mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II  
ROADWAY OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 7170.1 lumens  
Efficiency: N/A  
Efficacy: 108.6 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 1' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B1 - U0 - G2

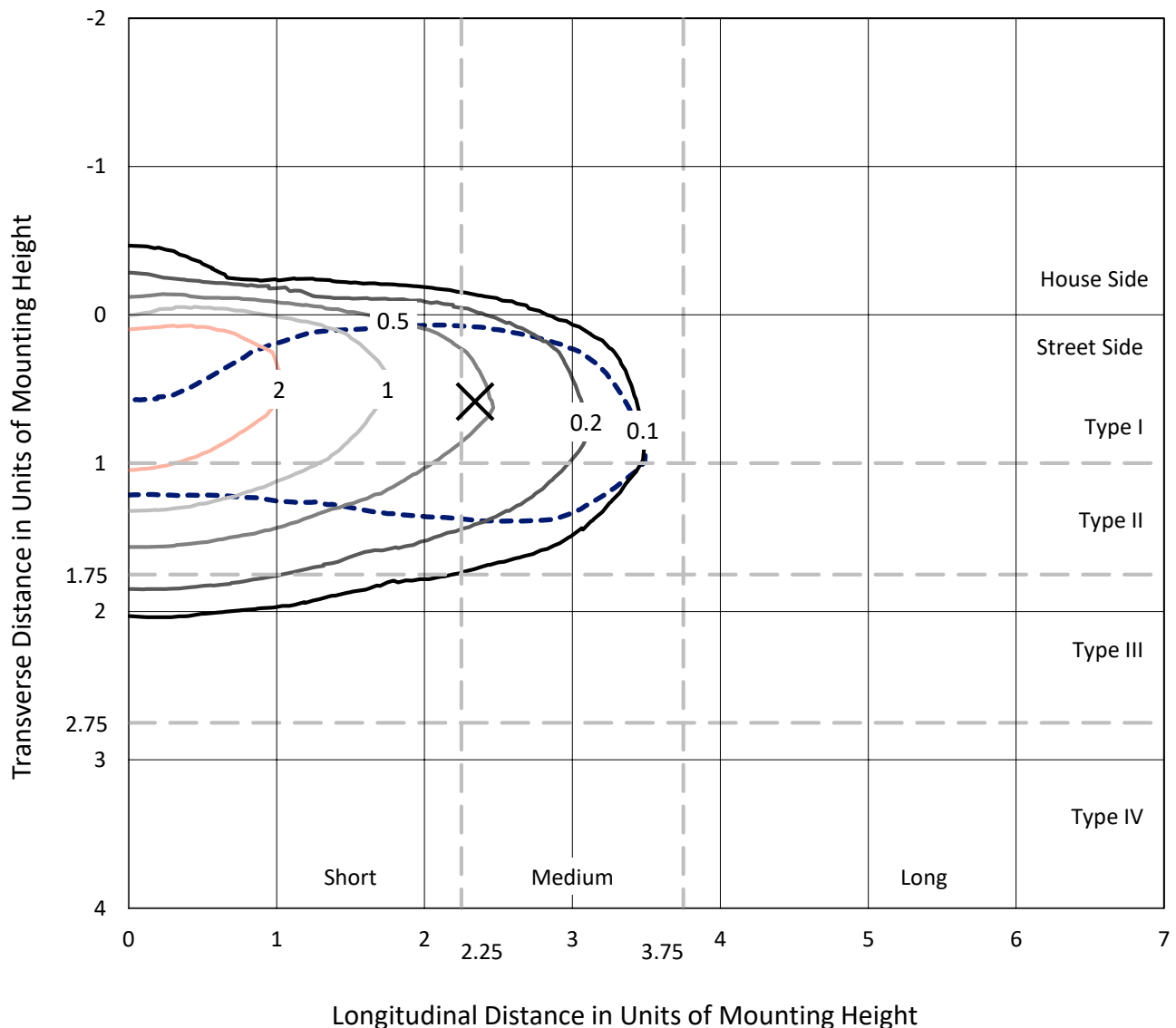
Input Watts (W): 66  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P382840  
 CATALOG NUMBER: GLEON-SA2A-735-U-T2R-HSS

## Iso-Footcandle Lines of Horizontal Illumination

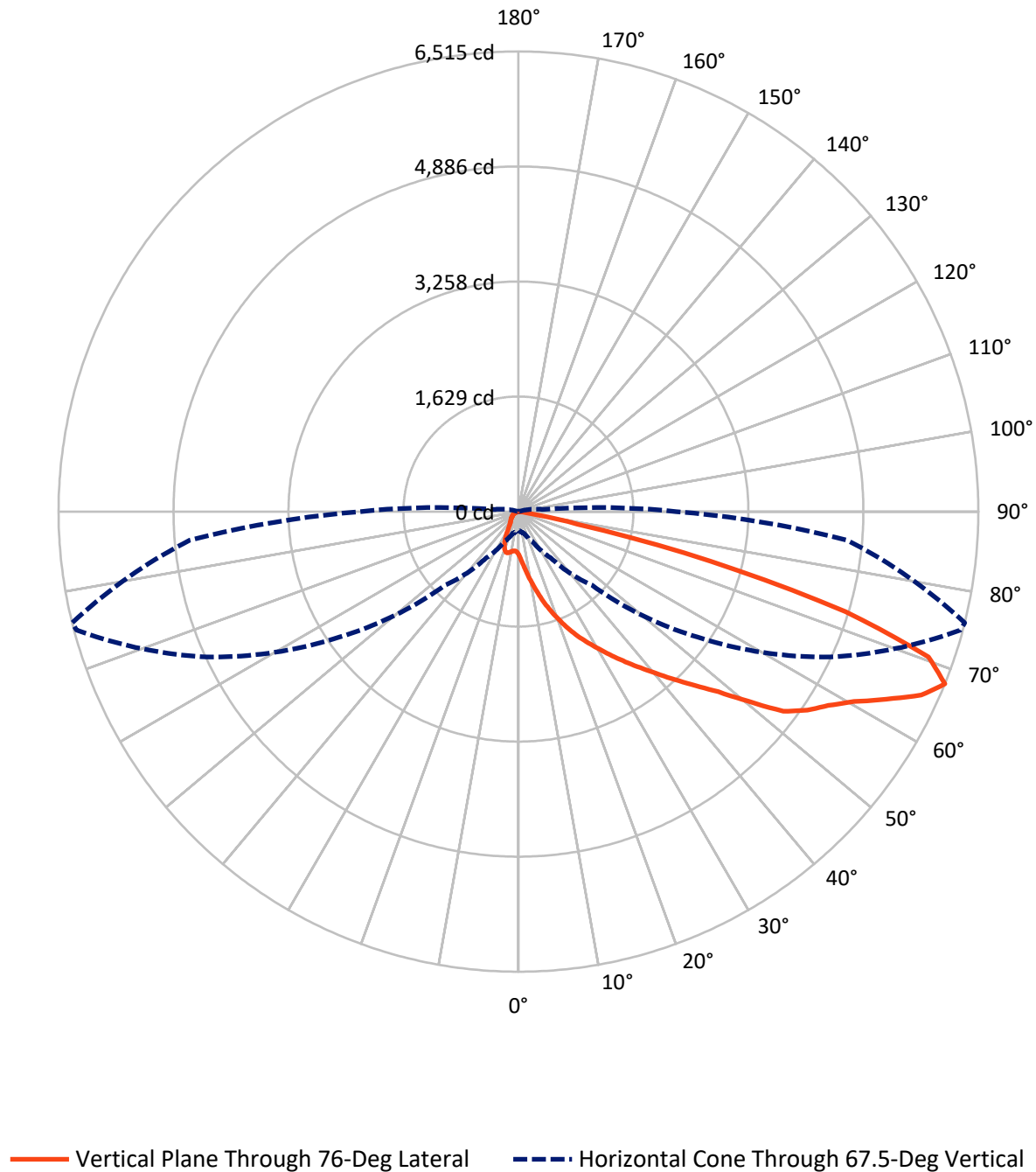
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 3.4 fc  
 Type II - Medium - N/A

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## Luminous Intensity Polar Plot



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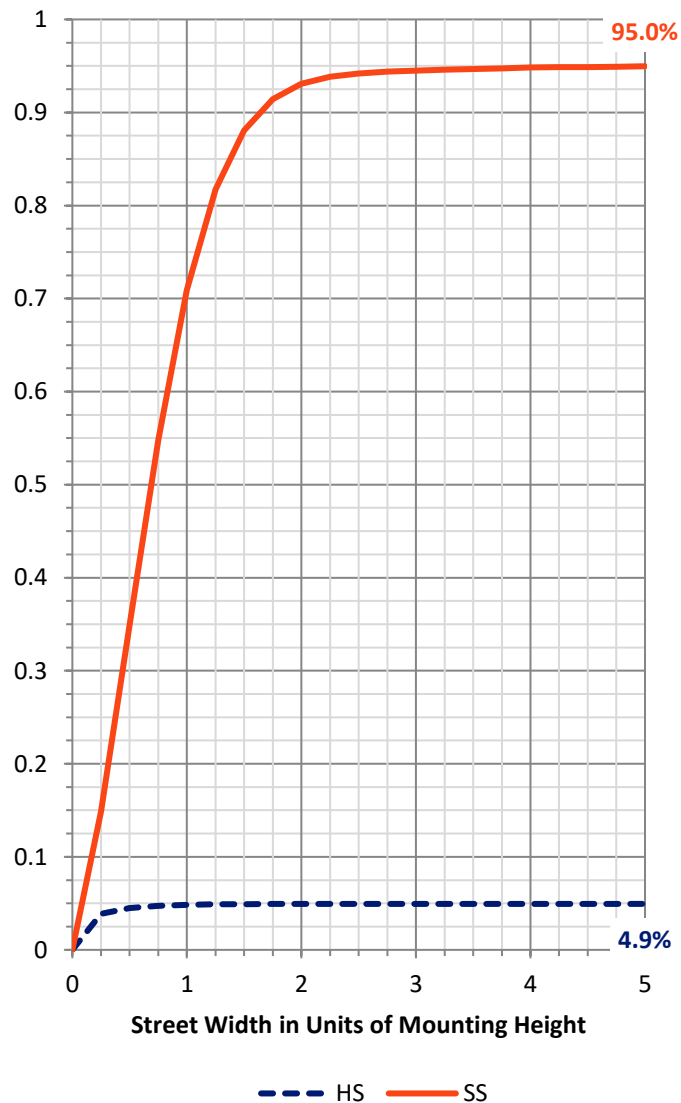
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 356.1    | 0.0    | 356.1  |
|                    | % Fixture | 5.0      | 0.0    | 5.0    |
| <b>Street Side</b> | Lumens    | 6814.1   | 0.0    | 6814.1 |
|                    | % Fixture | 95.0     | 0.0    | 95.0   |
| <b>Total</b>       | Lumens    | 7170.1   | 0.0    | 7170.1 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 75.6   | 1.1       |
| 10°-20°   | 299.8  | 4.2       |
| 20°-30°   | 610.0  | 8.5       |
| 30°-40°   | 1058.8 | 14.8      |
| 40°-50°   | 1496.0 | 20.9      |
| 50°-60°   | 1696.5 | 23.7      |
| 60°-70°   | 1407.1 | 19.6      |
| 70°-80°   | 509.7  | 7.1       |
| 80°-90°   | 16.5   | 0.2       |
| 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°    | 7170.1 | 100.0     |
| 0°-180°   | 7170.1 | 100.0     |

**Coefficient of Utilization**



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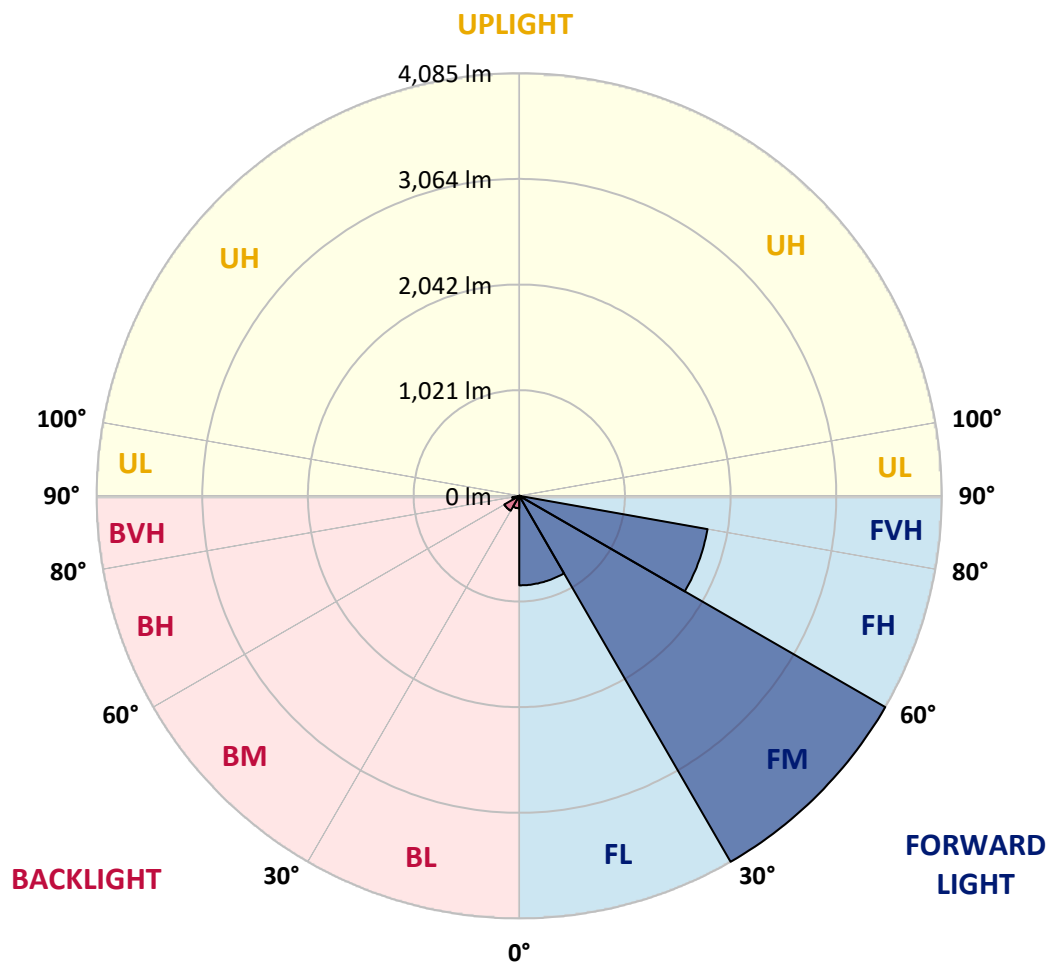
CATALOG NUMBER: GLEON-SA2A-735-U-T2R-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 865.4  | 12.1      |                         |      |         |
| FM   | (30°-60°)   | 4084.7 | 57.0      |                         |      |         |
| FH   | (60°-80°)   | 1848.0 | 25.8      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 16.0   | 0.2       |                         |      | G1/100  |
| BL   | (0°-30°)    | 120.1  | 1.7       | B1/500                  |      |         |
| BM   | (30°-60°)   | 166.6  | 2.3       | B0/220                  |      |         |
| BH   | (60°-80°)   | 68.8   | 1.0       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 0.5    | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G2**

Type II Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 76°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 608.2  | 608.2  | 608.2  | 608.2  | 608.2  | 608.2  | 608.2  | 608.2  | 608.2  | 608.2  | 608.2  |
| 2.5°  | 908.0  | 887.5  | 892.2  | 879.0  | 855.2  | 806.2  | 764.3  | 724.8  | 678.6  | 677.0  | 639.0  |
| 5°    | 1224.3 | 1207.0 | 1204.9 | 1178.1 | 1134.8 | 1051.5 | 970.5  | 878.1  | 775.0  | 767.5  | 686.7  |
| 7.5°  | 1511.4 | 1497.6 | 1492.6 | 1460.9 | 1380.2 | 1299.1 | 1193.5 | 1057.8 | 896.6  | 882.8  | 751.2  |
| 10°   | 1732.0 | 1725.4 | 1726.7 | 1704.1 | 1635.0 | 1559.5 | 1421.0 | 1247.9 | 1034.6 | 1013.2 | 828.4  |
| 12.5° | 1899.1 | 1900.7 | 1912.0 | 1898.2 | 1859.6 | 1803.7 | 1655.6 | 1450.5 | 1187.3 | 1158.0 | 916.7  |
| 15°   | 2022.0 | 2029.8 | 2050.6 | 2067.8 | 2065.1 | 2016.6 | 1881.0 | 1656.3 | 1349.3 | 1317.0 | 1015.1 |
| 17.5° | 2101.5 | 2110.3 | 2140.4 | 2178.8 | 2213.9 | 2202.6 | 2098.3 | 1854.9 | 1513.4 | 1475.9 | 1120.4 |
| 20°   | 2171.3 | 2181.6 | 2213.9 | 2264.5 | 2330.2 | 2344.3 | 2275.9 | 2047.4 | 1677.1 | 1631.5 | 1229.0 |
| 22.5° | 2322.3 | 2322.1 | 2341.8 | 2371.3 | 2433.9 | 2470.3 | 2427.0 | 2226.2 | 1838.9 | 1791.4 | 1339.9 |
| 25°   | 2595.7 | 2585.3 | 2578.4 | 2555.1 | 2568.9 | 2591.6 | 2567.4 | 2393.3 | 2001.6 | 1953.5 | 1452.4 |
| 27.5° | 2920.5 | 2926.8 | 2870.8 | 2808.3 | 2760.0 | 2736.7 | 2697.1 | 2548.2 | 2158.0 | 2105.3 | 1562.4 |
| 30°   | 3263.3 | 3265.2 | 3199.2 | 3119.4 | 3012.9 | 2924.6 | 2856.1 | 2696.2 | 2318.9 | 2261.4 | 1669.1 |
| 32.5° | 3572.4 | 3560.2 | 3494.8 | 3386.2 | 3251.7 | 3152.4 | 3010.1 | 2861.4 | 2489.2 | 2433.6 | 1787.9 |
| 35°   | 3817.5 | 3803.0 | 3723.6 | 3624.6 | 3485.1 | 3385.2 | 3213.9 | 3026.4 | 2668.2 | 2613.9 | 1907.0 |
| 37.5° | 3996.5 | 3979.6 | 3897.9 | 3796.1 | 3675.8 | 3617.7 | 3450.5 | 3205.8 | 2863.7 | 2805.3 | 2032.4 |
| 40°   | 4058.8 | 4044.0 | 3992.8 | 3918.4 | 3821.6 | 3808.4 | 3701.6 | 3412.2 | 3076.3 | 3014.1 | 2174.4 |
| 42.5° | 4021.7 | 4007.2 | 3989.0 | 3963.9 | 3923.7 | 3936.3 | 3938.4 | 3647.5 | 3312.6 | 3251.4 | 2331.1 |
| 45°   | 3874.7 | 3861.8 | 3880.6 | 3917.4 | 3967.4 | 4029.6 | 4154.6 | 3900.4 | 3576.5 | 3511.2 | 2512.4 |
| 47.5° | 3658.2 | 3648.8 | 3700.9 | 3792.7 | 3938.8 | 4110.3 | 4352.2 | 4166.3 | 3872.8 | 3812.2 | 2738.7 |
| 50°   | 3350.3 | 3348.7 | 3453.1 | 3620.5 | 3845.1 | 4149.2 | 4556.4 | 4468.4 | 4284.4 | 4220.6 | 3053.1 |
| 52.5° | 2870.8 | 2874.0 | 3079.2 | 3347.1 | 3680.8 | 4122.8 | 4687.7 | 4856.7 | 4763.1 | 4696.9 | 3325.5 |
| 55°   | 2414.4 | 2433.3 | 2578.7 | 2965.1 | 3428.8 | 4024.8 | 4733.0 | 5038.0 | 5027.4 | 4964.5 | 3476.9 |
| 57.5° | 1967.3 | 2001.6 | 2141.7 | 2502.7 | 3061.0 | 3798.9 | 4708.1 | 5116.6 | 5224.0 | 5176.0 | 3676.7 |
| 60°   | 1482.9 | 1498.6 | 1660.1 | 1997.5 | 2588.8 | 3386.7 | 4528.2 | 5159.3 | 5493.0 | 5459.6 | 3966.7 |
| 62.5° | 943.5  | 982.7  | 1126.0 | 1451.4 | 2015.7 | 2814.3 | 4224.7 | 5158.7 | 5829.4 | 5847.7 | 4340.9 |
| 65°   | 497.0  | 542.9  | 618.9  | 899.5  | 1385.2 | 2175.0 | 3768.2 | 5110.3 | 6242.2 | 6267.7 | 4633.4 |
| 67.5° | 268.0  | 281.1  | 321.4  | 466.9  | 803.4  | 1473.4 | 3097.4 | 4871.5 | 6481.3 | 6515.0 | 4674.2 |
| 70°   | 196.0  | 203.3  | 218.4  | 258.2  | 404.3  | 855.8  | 2260.1 | 4330.2 | 6173.2 | 6160.6 | 4153.0 |
| 72.5° | 150.4  | 161.8  | 173.1  | 189.1  | 232.5  | 456.8  | 1407.2 | 3390.8 | 4925.6 | 4842.7 | 3104.3 |
| 75°   | 118.8  | 120.6  | 136.7  | 151.1  | 174.4  | 260.1  | 624.9  | 1974.9 | 3006.3 | 2809.9 | 1609.8 |
| 77.5° | 94.9   | 96.1   | 105.5  | 118.1  | 140.1  | 170.9  | 193.5  | 776.9  | 959.8  | 856.5  | 349.3  |
| 80°   | 56.3   | 59.3   | 78.5   | 91.1   | 116.3  | 107.8  | 70.7   | 168.7  | 149.9  | 135.7  | 58.8   |
| 82.5° | 31.4   | 33.9   | 44.3   | 71.9   | 81.0   | 51.5   | 35.2   | 45.6   | 35.2   | 34.3   | 16.7   |
| 85°   | 0.0    | 1.6    | 28.6   | 44.6   | 33.0   | 11.3   | 14.8   | 15.1   | 10.3   | 9.8    | 6.6    |
| 87.5° | 0.0    | 0.0    | 8.8    | 8.5    | 1.2    | 1.9    | 3.4    | 5.0    | 4.1    | 4.1    | 3.4    |
| 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: GLEON-SA2A-735-U-T2R-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 608.2  | 608.2 | 608.2 | 608.2 | 608.2 | 608.2 | 608.2 | 608.2 | 608.2 | 608.2 | 608.2 |
| 2.5°  | 620.1  | 603.2 | 571.1 | 539.7 | 513.4 | 491.7 | 472.2 | 464.4 | 458.0 | 457.1 | 452.1 |
| 5°    | 647.8  | 613.6 | 552.3 | 502.0 | 468.4 | 444.5 | 424.1 | 411.6 | 401.9 | 398.1 | 394.6 |
| 7.5°  | 689.6  | 637.7 | 549.8 | 492.0 | 451.8 | 411.6 | 373.8 | 333.0 | 307.6 | 297.8 | 292.1 |
| 10°   | 740.5  | 669.8 | 559.2 | 489.2 | 418.8 | 334.0 | 271.5 | 219.6 | 198.5 | 191.6 | 189.8 |
| 12.5° | 799.9  | 709.7 | 575.6 | 471.5 | 348.4 | 237.2 | 187.2 | 169.6 | 165.0 | 162.7 | 162.7 |
| 15°   | 868.0  | 753.3 | 587.2 | 420.7 | 257.7 | 179.4 | 162.1 | 154.0 | 149.0 | 146.1 | 146.4 |
| 17.5° | 937.8  | 796.1 | 581.6 | 346.8 | 190.0 | 159.6 | 146.7 | 138.0 | 131.0 | 128.2 | 127.5 |
| 20°   | 1008.2 | 835.7 | 550.1 | 258.2 | 160.9 | 144.9 | 130.4 | 120.6 | 113.7 | 110.9 | 110.3 |
| 22.5° | 1081.1 | 869.3 | 494.8 | 189.5 | 144.5 | 128.5 | 114.4 | 104.6 | 98.0  | 95.5  | 94.3  |
| 25°   | 1152.0 | 896.6 | 417.5 | 153.3 | 129.1 | 113.1 | 99.6  | 90.5  | 84.5  | 82.0  | 81.7  |
| 27.5° | 1218.4 | 913.9 | 328.0 | 135.4 | 115.6 | 99.3  | 87.0  | 78.9  | 73.9  | 71.9  | 71.6  |
| 30°   | 1278.1 | 915.5 | 242.6 | 122.2 | 103.7 | 87.4  | 76.0  | 68.8  | 64.4  | 62.5  | 61.9  |
| 32.5° | 1338.4 | 902.3 | 176.5 | 110.3 | 92.7  | 76.9  | 66.0  | 60.4  | 57.2  | 55.6  | 55.6  |
| 35°   | 1395.3 | 871.8 | 137.6 | 99.9  | 82.0  | 66.9  | 58.1  | 54.0  | 52.2  | 50.6  | 50.6  |
| 37.5° | 1450.9 | 828.1 | 116.9 | 90.8  | 71.9  | 58.4  | 51.2  | 48.7  | 47.1  | 45.6  | 45.6  |
| 40°   | 1507.4 | 773.2 | 106.2 | 82.3  | 63.8  | 51.8  | 45.6  | 43.3  | 41.8  | 40.5  | 40.2  |
| 42.5° | 1576.8 | 709.7 | 99.3  | 74.4  | 56.5  | 45.8  | 40.2  | 37.7  | 36.4  | 35.2  | 34.6  |
| 45°   | 1657.2 | 655.1 | 93.6  | 66.6  | 50.6  | 40.8  | 34.8  | 32.3  | 30.5  | 28.9  | 28.6  |
| 47.5° | 1773.2 | 615.5 | 86.1  | 58.1  | 44.9  | 35.5  | 30.2  | 27.3  | 24.5  | 22.9  | 22.6  |
| 50°   | 1921.1 | 582.8 | 76.4  | 50.6  | 39.3  | 30.2  | 25.2  | 21.7  | 19.2  | 17.6  | 17.6  |
| 52.5° | 1994.6 | 540.0 | 67.5  | 44.0  | 33.0  | 25.4  | 20.4  | 16.3  | 15.1  | 13.5  | 13.5  |
| 55°   | 2024.2 | 507.4 | 58.8  | 37.4  | 27.3  | 21.1  | 16.0  | 12.6  | 11.6  | 10.7  | 10.3  |
| 57.5° | 2107.2 | 498.0 | 51.2  | 31.8  | 22.6  | 16.7  | 12.3  | 9.4   | 8.8   | 7.5   | 7.5   |
| 60°   | 2240.7 | 502.7 | 44.3  | 27.0  | 18.3  | 12.9  | 9.1   | 7.3   | 6.6   | 5.3   | 5.3   |
| 62.5° | 2384.9 | 496.7 | 37.4  | 23.3  | 14.2  | 9.4   | 6.2   | 5.3   | 5.3   | 3.2   | 2.8   |
| 65°   | 2412.5 | 442.4 | 32.0  | 19.2  | 11.0  | 6.9   | 4.1   | 3.4   | 4.8   | 0.7   | 0.0   |
| 67.5° | 2239.1 | 343.1 | 27.7  | 14.8  | 8.2   | 5.3   | 3.2   | 1.6   | 4.1   | 0.0   | 0.0   |
| 70°   | 1790.4 | 218.1 | 22.3  | 10.7  | 6.2   | 4.4   | 2.5   | 0.7   | 3.2   | 0.0   | 0.0   |
| 72.5° | 1266.1 | 126.6 | 17.6  | 7.5   | 5.3   | 3.4   | 1.9   | 0.0   | 1.9   | 0.0   | 0.0   |
| 75°   | 640.3  | 67.5  | 11.0  | 5.7   | 4.1   | 2.5   | 1.2   | 0.0   | 0.3   | 0.0   | 0.0   |
| 77.5° | 138.5  | 31.4  | 6.9   | 4.1   | 2.8   | 1.6   | 0.7   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80°   | 30.2   | 13.8  | 4.4   | 2.5   | 1.6   | 0.9   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 11.0   | 7.3   | 2.2   | 1.2   | 0.7   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 6.0    | 3.7   | 1.2   | 0.7   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 3.2    | 1.2   | 0.3   | 0.3   | 0.0   | 0.0   | 0.0   | 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-79-08: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

All Brands

Data applicable to all product families using SA light engines

Report Number: SP1-2101-121-7

Luminaire Tested: IFLD-S-SA2A-735-U-T2

Test Date: 03/04/2021

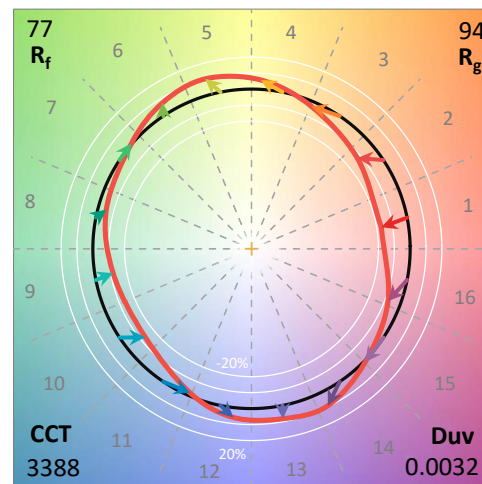
### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-7  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/04/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2A-735-U-T2**  
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 615mA.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 3388   | CRI (Ra): | 73.1 |      |       |
| CIE u':                   | 0.2371 | R1:       | 68.9 | R9:  | -34.6 |
| CIE v':                   | 0.5177 | R2:       | 81.1 | R10: | 57.8  |
| Duv:                      | 0.0032 | R3:       | 93.1 | R11: | 68.6  |
| CIE x:                    | 0.4153 | R4:       | 71.6 | R12: | 53.9  |
| CIE y:                    | 0.4030 | R5:       | 69.4 | R13: | 70.9  |
| CIE z:                    | 0.1817 | R6:       | 75.0 | R14: | 96.2  |
| Peak Wavelength (nm):     | 590    | R7:       | 79.5 |      |       |
| Dominant Wavelength (nm): | 580    | R8:       | 46.4 |      |       |
| Purity:                   | 45.7   |           |      |      |       |
| Rf:                       | 76.9   |           |      |      |       |
| Rg:                       | 94.4   |           |      |      |       |



### Test Conditions

Stabilization Time: 81M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0/30%  
 Sphere Temperature (°C): 24.1

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| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 1/31/2021        | 7/31/2021            |
| Power Meter                    | IN0071                | 12/1/2020        | 12/1/2021            |
| AC Power Source                | IN0063                | 12/1/2020        | 12/1/2021            |
| DC Power Source                | IN0208                | 12/1/2020        | 12/1/2021            |
| Sphere Thermometer             | IN0085                | 12/1/2020        | 12/1/2021            |
| Room Thermometer               | IN0046                | 12/1/2020        | 12/1/2021            |

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**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 3500K 4-step quadrangle

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### Photopic Flux vs. Wavelength

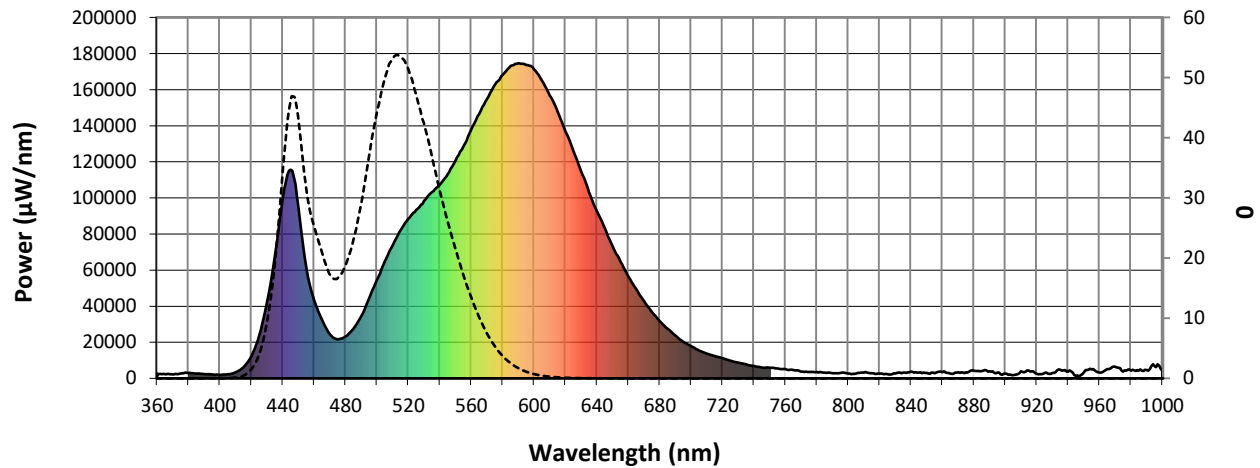


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| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2672             | 0.0              | 490       | 34553            | 4.9              | 620       | 136720           | 35.6             | 750       | 5870             | 0.0              | 880       | 4216             | 0.0              |
| 365       | 2252             | 0.0              | 495       | 44336            | 8.0              | 625       | 126308           | 27.9             | 755       | 5421             | 0.0              | 885       | 4132             | 0.0              |
| 370       | 2217             | 0.0              | 500       | 54643            | 12.1             | 630       | 114625           | 20.7             | 760       | 5097             | 0.0              | 890       | 3992             | 0.0              |
| 375       | 2697             | 0.0              | 505       | 64676            | 18.1             | 635       | 103216           | 15.5             | 765       | 4626             | 0.0              | 895       | 3214             | 0.0              |
| 380       | 3039             | 0.0              | 510       | 73825            | 25.4             | 640       | 92605            | 11.1             | 770       | 3782             | 0.0              | 900       | 2580             | 0.0              |
| 385       | 2655             | 0.0              | 515       | 81872            | 33.9             | 645       | 83234            | 8.0              | 775       | 3506             | 0.0              | 905       | 1776             | 0.0              |
| 390       | 2357             | 0.0              | 520       | 88574            | 43.0             | 650       | 73263            | 5.4              | 780       | 3507             | 0.0              | 910       | 3995             | 0.0              |
| 395       | 2186             | 0.0              | 525       | 93289            | 50.1             | 655       | 64627            | 3.7              | 785       | 3267             | 0.0              | 915       | 4288             | 0.0              |
| 400       | 2015             | 0.0              | 530       | 98393            | 57.9             | 660       | 56614            | 2.4              | 790       | 2849             | 0.0              | 920       | 2446             | 0.0              |
| 405       | 2234             | 0.0              | 535       | 103269           | 64.0             | 665       | 49537            | 1.6              | 795       | 3037             | 0.0              | 925       | 3009             | 0.0              |
| 410       | 3412             | 0.0              | 540       | 107316           | 69.9             | 670       | 42866            | 0.9              | 800       | 2716             | 0.0              | 930       | 3026             | 0.0              |
| 415       | 6135             | 0.0              | 545       | 113101           | 75.3             | 675       | 36708            | 0.6              | 805       | 2648             | 0.0              | 935       | 4734             | 0.0              |
| 420       | 12146            | 0.0              | 550       | 120690           | 82.0             | 680       | 31814            | 0.4              | 810       | 3187             | 0.0              | 940       | 3719             | 0.0              |
| 425       | 23983            | 0.1              | 555       | 128583           | 87.8             | 685       | 27485            | 0.2              | 815       | 2931             | 0.0              | 945       | 1480             | 0.0              |
| 430       | 42142            | 0.3              | 560       | 137796           | 93.6             | 690       | 23698            | 0.1              | 820       | 2717             | 0.0              | 950       | 3450             | 0.0              |
| 435       | 68228            | 0.8              | 565       | 146577           | 97.5             | 695       | 20309            | 0.1              | 825       | 2236             | 0.0              | 955       | 5051             | 0.0              |
| 440       | 99323            | 1.6              | 570       | 154581           | 100.5            | 700       | 17890            | 0.1              | 830       | 2628             | 0.0              | 960       | 3176             | 0.0              |
| 445       | 115584           | 2.4              | 575       | 162633           | 101.2            | 705       | 15500            | 0.0              | 835       | 3140             | 0.0              | 965       | 5178             | 0.0              |
| 450       | 94997            | 2.5              | 580       | 168101           | 99.9             | 710       | 13699            | 0.0              | 840       | 3675             | 0.0              | 970       | 6385             | 0.0              |
| 455       | 61433            | 2.1              | 585       | 173145           | 96.2             | 715       | 12398            | 0.0              | 845       | 3283             | 0.0              | 975       | 3810             | 0.0              |
| 460       | 43373            | 1.8              | 590       | 174675           | 90.3             | 720       | 11147            | 0.0              | 850       | 3055             | 0.0              | 980       | 4322             | 0.0              |
| 465       | 32472            | 1.7              | 595       | 173724           | 82.3             | 725       | 9761             | 0.0              | 855       | 2932             | 0.0              | 985       | 4200             | 0.0              |
| 470       | 24257            | 1.5              | 600       | 171241           | 73.8             | 730       | 8651             | 0.0              | 860       | 3382             | 0.0              | 990       | 4661             | 0.0              |
| 475       | 21690            | 1.7              | 605       | 165134           | 64.0             | 735       | 7730             | 0.0              | 865       | 2605             | 0.0              | 995       | 6746             | 0.0              |
| 480       | 23173            | 2.2              | 610       | 156652           | 53.8             | 740       | 6847             | 0.0              | 870       | 3325             | 0.0              | 1000      | 4150             | 0.0              |
| 485       | 27564            | 3.3              | 615       | 147879           | 44.6             | 745       | 6124             | 0.0              | 875       | 3325             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



Scotopic Lumens: 12126

S/P: 1.36

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2672             | 0.0              | 490       | 34553            | 53.2             | 620       | 136720           | 1.7              | 750       | 5870             | 0.0              | 880       | 4216             | 0.0              |
| 365       | 2252             | 0.0              | 495       | 44336            | 71.7             | 625       | 126308           | 1.1              | 755       | 5421             | 0.0              | 885       | 4132             | 0.0              |
| 370       | 2217             | 0.0              | 500       | 54643            | 91.4             | 630       | 114625           | 0.6              | 760       | 5097             | 0.0              | 890       | 3992             | 0.0              |
| 375       | 2697             | 0.0              | 505       | 64676            | 110.0            | 635       | 103216           | 0.4              | 765       | 4626             | 0.0              | 895       | 3214             | 0.0              |
| 380       | 3039             | 0.0              | 510       | 73825            | 125.1            | 640       | 92605            | 0.2              | 770       | 3782             | 0.0              | 900       | 2580             | 0.0              |
| 385       | 2655             | 0.0              | 515       | 81872            | 135.7            | 645       | 83234            | 0.1              | 775       | 3506             | 0.0              | 905       | 1776             | 0.0              |
| 390       | 2357             | 0.0              | 520       | 88574            | 140.8            | 650       | 73263            | 0.1              | 780       | 3507             | 0.0              | 910       | 3995             | 0.0              |
| 395       | 2186             | 0.0              | 525       | 93289            | 139.6            | 655       | 64627            | 0.1              | 785       | 3267             | 0.0              | 915       | 4288             | 0.0              |
| 400       | 2015             | 0.0              | 530       | 98393            | 135.7            | 660       | 56614            | 0.0              | 790       | 2849             | 0.0              | 920       | 2446             | 0.0              |
| 405       | 2234             | 0.1              | 535       | 103269           | 128.7            | 665       | 49537            | 0.0              | 795       | 3037             | 0.0              | 925       | 3009             | 0.0              |
| 410       | 3412             | 0.2              | 540       | 107316           | 118.6            | 670       | 42866            | 0.0              | 800       | 2716             | 0.0              | 930       | 3026             | 0.0              |
| 415       | 6135             | 0.6              | 545       | 113101           | 108.4            | 675       | 36708            | 0.0              | 805       | 2648             | 0.0              | 935       | 4734             | 0.0              |
| 420       | 12146            | 2.0              | 550       | 120690           | 98.7             | 680       | 31814            | 0.0              | 810       | 3187             | 0.0              | 940       | 3719             | 0.0              |
| 425       | 23983            | 5.9              | 555       | 128583           | 87.9             | 685       | 27485            | 0.0              | 815       | 2931             | 0.0              | 945       | 1480             | 0.0              |
| 430       | 42142            | 14.3             | 560       | 137796           | 77.0             | 690       | 23698            | 0.0              | 820       | 2717             | 0.0              | 950       | 3450             | 0.0              |
| 435       | 68228            | 30.5             | 565       | 146577           | 65.8             | 695       | 20309            | 0.0              | 825       | 2236             | 0.0              | 955       | 5051             | 0.0              |
| 440       | 99323            | 55.5             | 570       | 154581           | 54.6             | 700       | 17890            | 0.0              | 830       | 2628             | 0.0              | 960       | 3176             | 0.0              |
| 445       | 115584           | 77.4             | 575       | 162633           | 44.3             | 705       | 15500            | 0.0              | 835       | 3140             | 0.0              | 965       | 5178             | 0.0              |
| 450       | 94997            | 73.6             | 580       | 168101           | 34.6             | 710       | 13699            | 0.0              | 840       | 3675             | 0.0              | 970       | 6385             | 0.0              |
| 455       | 61433            | 53.7             | 585       | 173145           | 26.5             | 715       | 12398            | 0.0              | 845       | 3283             | 0.0              | 975       | 3810             | 0.0              |
| 460       | 43373            | 41.9             | 590       | 174675           | 19.5             | 720       | 11147            | 0.0              | 850       | 3055             | 0.0              | 980       | 4322             | 0.0              |
| 465       | 32472            | 34.3             | 595       | 173724           | 13.9             | 725       | 9761             | 0.0              | 855       | 2932             | 0.0              | 985       | 4200             | 0.0              |
| 470       | 24257            | 27.9             | 600       | 171241           | 9.7              | 730       | 8651             | 0.0              | 860       | 3382             | 0.0              | 990       | 4661             | 0.0              |
| 475       | 21690            | 27.1             | 605       | 165134           | 6.5              | 735       | 7730             | 0.0              | 865       | 2605             | 0.0              | 995       | 6746             | 0.0              |
| 480       | 23173            | 31.3             | 610       | 156652           | 4.2              | 740       | 6847             | 0.0              | 870       | 3325             | 0.0              | 1000      | 4150             | 0.0              |
| 485       | 27564            | 40.0             | 615       | 147879           | 2.7              | 745       | 6124             | 0.0              | 875       | 3325             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: 4490.7

M/P: 0.5

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2672             | 0.0              | 490       | 34553            | 28.8             | 620       | 136720           | 0.1              | 750       | 5870             | 0.0              | 880       | 4216             | 0.0              |
| 365       | 2252             | 0.0              | 495       | 44336            | 36.6             | 625       | 126308           | 0.1              | 755       | 5421             | 0.0              | 885       | 4132             | 0.0              |
| 370       | 2217             | 0.0              | 500       | 54643            | 43.9             | 630       | 114625           | 0.0              | 760       | 5097             | 0.0              | 890       | 3992             | 0.0              |
| 375       | 2697             | 0.0              | 505       | 64676            | 49.6             | 635       | 103216           | 0.0              | 765       | 4626             | 0.0              | 895       | 3214             | 0.0              |
| 380       | 3039             | 0.0              | 510       | 73825            | 53.0             | 640       | 92605            | 0.0              | 770       | 3782             | 0.0              | 900       | 2580             | 0.0              |
| 385       | 2655             | 0.0              | 515       | 81872            | 53.5             | 645       | 83234            | 0.0              | 775       | 3506             | 0.0              | 905       | 1776             | 0.0              |
| 390       | 2357             | 0.0              | 520       | 88574            | 51.6             | 650       | 73263            | 0.0              | 780       | 3507             | 0.0              | 910       | 3995             | 0.0              |
| 395       | 2186             | 0.0              | 525       | 93289            | 47.3             | 655       | 64627            | 0.0              | 785       | 3267             | 0.0              | 915       | 4288             | 0.0              |
| 400       | 2015             | 0.0              | 530       | 98393            | 42.5             | 660       | 56614            | 0.0              | 790       | 2849             | 0.0              | 920       | 2446             | 0.0              |
| 405       | 2234             | 0.0              | 535       | 103269           | 37.2             | 665       | 49537            | 0.0              | 795       | 3037             | 0.0              | 925       | 3009             | 0.0              |
| 410       | 3412             | 0.1              | 540       | 107316           | 31.4             | 670       | 42866            | 0.0              | 800       | 2716             | 0.0              | 930       | 3026             | 0.0              |
| 415       | 6135             | 0.4              | 545       | 113101           | 26.3             | 675       | 36708            | 0.0              | 805       | 2648             | 0.0              | 935       | 4734             | 0.0              |
| 420       | 12146            | 1.4              | 550       | 120690           | 21.7             | 680       | 31814            | 0.0              | 810       | 3187             | 0.0              | 940       | 3719             | 0.0              |
| 425       | 23983            | 3.7              | 555       | 128583           | 17.3             | 685       | 27485            | 0.0              | 815       | 2931             | 0.0              | 945       | 1480             | 0.0              |
| 430       | 42142            | 8.9              | 560       | 137796           | 13.6             | 690       | 23698            | 0.0              | 820       | 2717             | 0.0              | 950       | 3450             | 0.0              |
| 435       | 68228            | 18.2             | 565       | 146577           | 10.3             | 695       | 20309            | 0.0              | 825       | 2236             | 0.0              | 955       | 5051             | 0.0              |
| 440       | 99323            | 33.2             | 570       | 154581           | 7.6              | 700       | 17890            | 0.0              | 830       | 2628             | 0.0              | 960       | 3176             | 0.0              |
| 445       | 115584           | 45.6             | 575       | 162633           | 5.4              | 705       | 15500            | 0.0              | 835       | 3140             | 0.0              | 965       | 5178             | 0.0              |
| 450       | 94997            | 43.8             | 580       | 168101           | 3.8              | 710       | 13699            | 0.0              | 840       | 3675             | 0.0              | 970       | 6385             | 0.0              |
| 455       | 61433            | 32.2             | 585       | 173145           | 2.6              | 715       | 12398            | 0.0              | 845       | 3283             | 0.0              | 975       | 3810             | 0.0              |
| 460       | 43373            | 25.6             | 590       | 174675           | 1.7              | 720       | 11147            | 0.0              | 850       | 3055             | 0.0              | 980       | 4322             | 0.0              |
| 465       | 32472            | 21.2             | 595       | 173724           | 1.1              | 725       | 9761             | 0.0              | 855       | 2932             | 0.0              | 985       | 4200             | 0.0              |
| 470       | 24257            | 17.4             | 600       | 171241           | 0.7              | 730       | 8651             | 0.0              | 860       | 3382             | 0.0              | 990       | 4661             | 0.0              |
| 475       | 21690            | 16.6             | 605       | 165134           | 0.5              | 735       | 7730             | 0.0              | 865       | 2605             | 0.0              | 995       | 6746             | 0.0              |
| 480       | 23173            | 18.6             | 610       | 156652           | 0.3              | 740       | 6847             | 0.0              | 870       | 3325             | 0.0              | 1000      | 4150             | 0.0              |
| 485       | 27564            | 22.7             | 615       | 147879           | 0.2              | 745       | 6124             | 0.0              | 875       | 3325             | 0.0              |           |                  |                  |

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TM-30-18

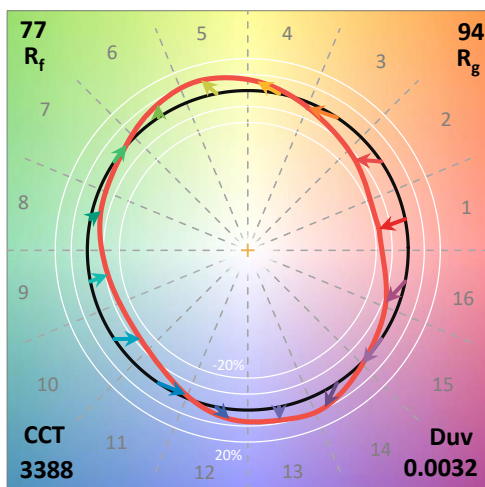
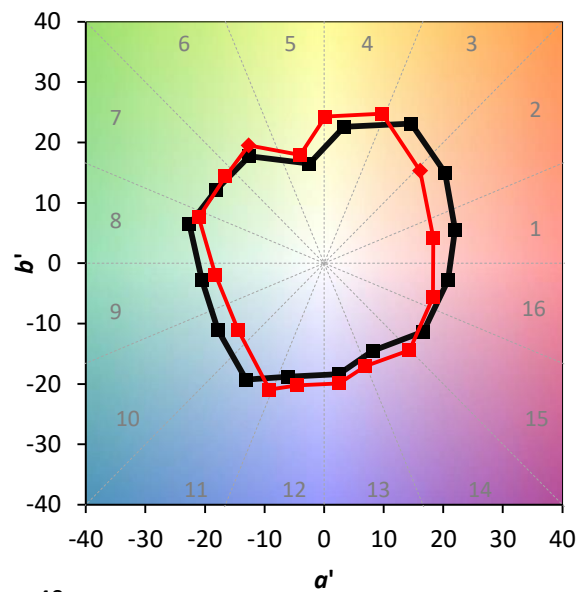
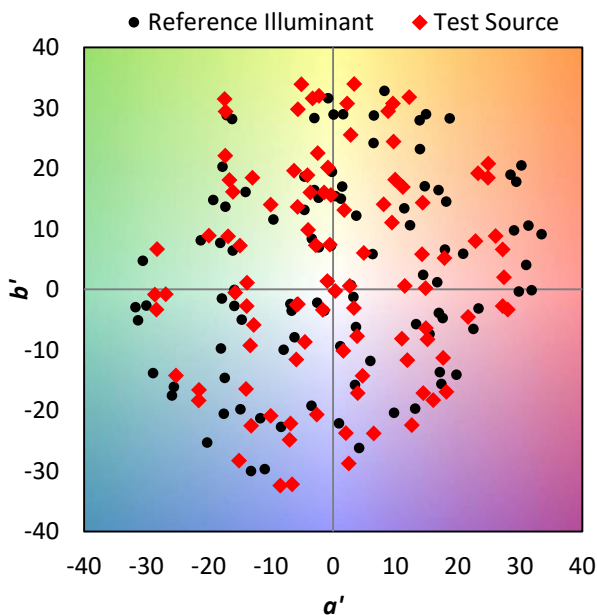
### Summary

$R_f = 76.9$   
 $R_g = 94.4$   
 CIE  $R_a = 73.1$   
 $R_g = -34.6$

### Spectral Power Distribution Comparison



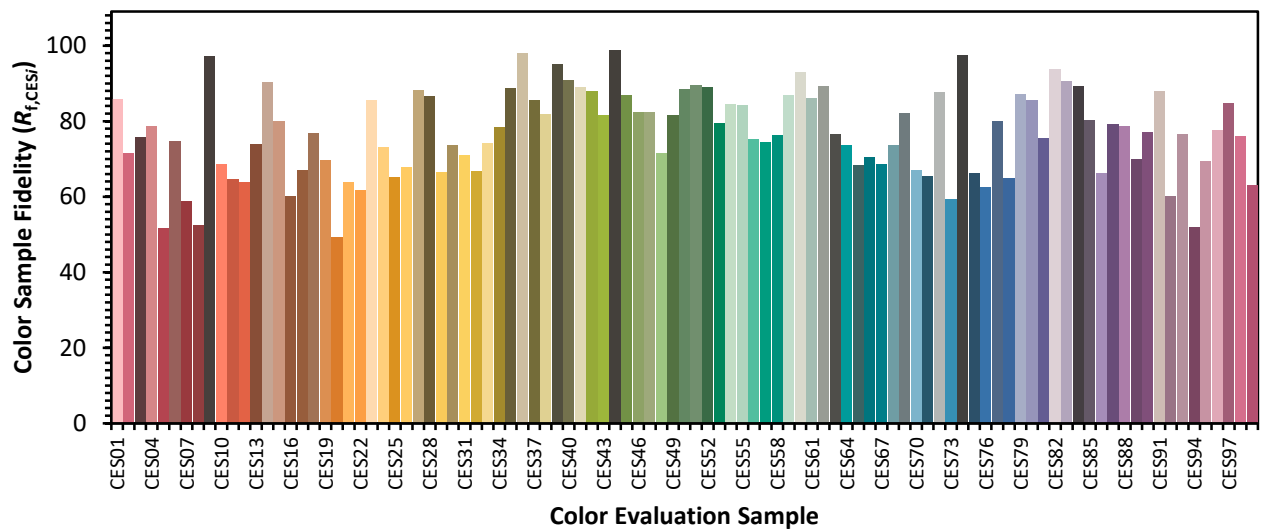
### Color Vector Graphics



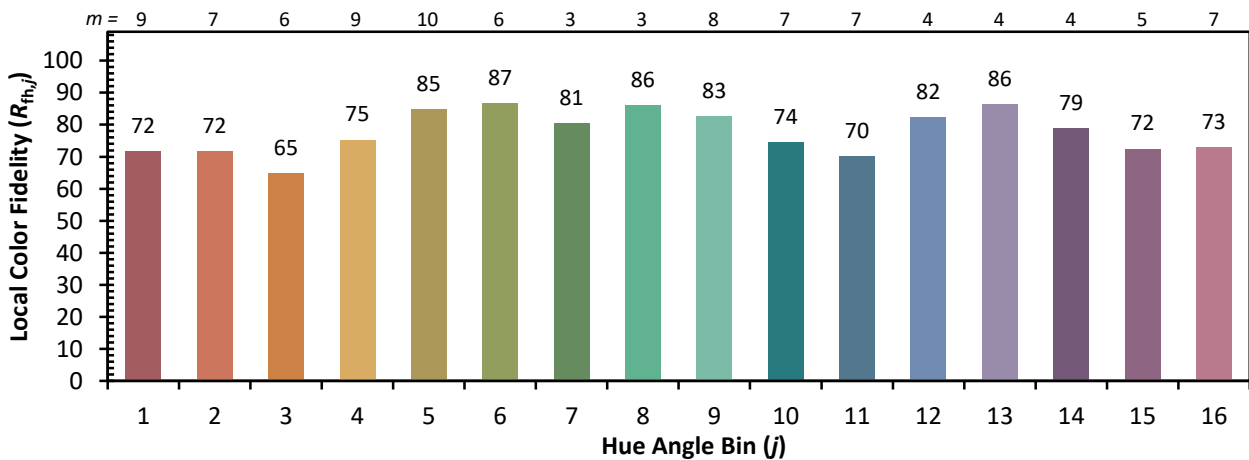
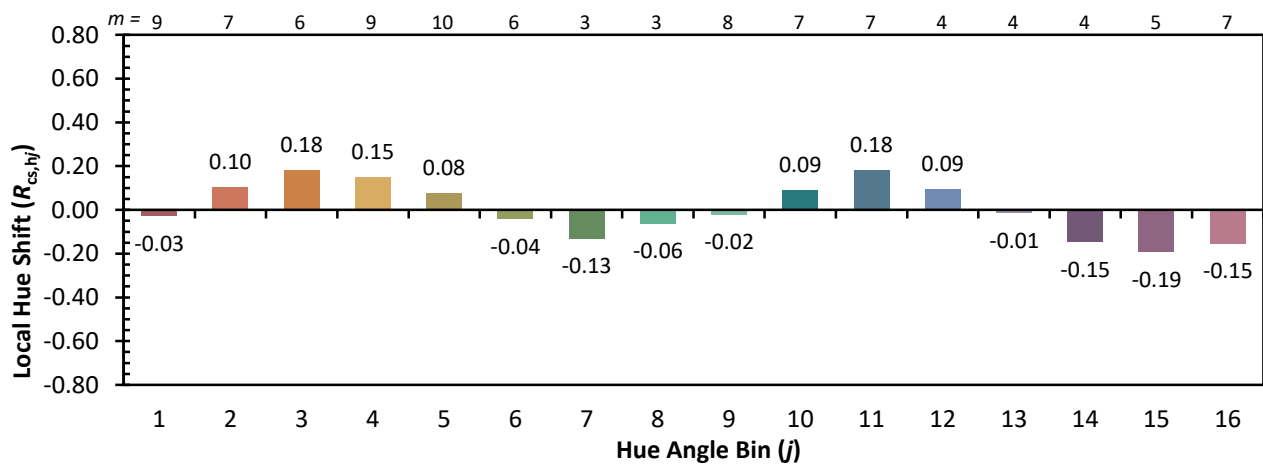
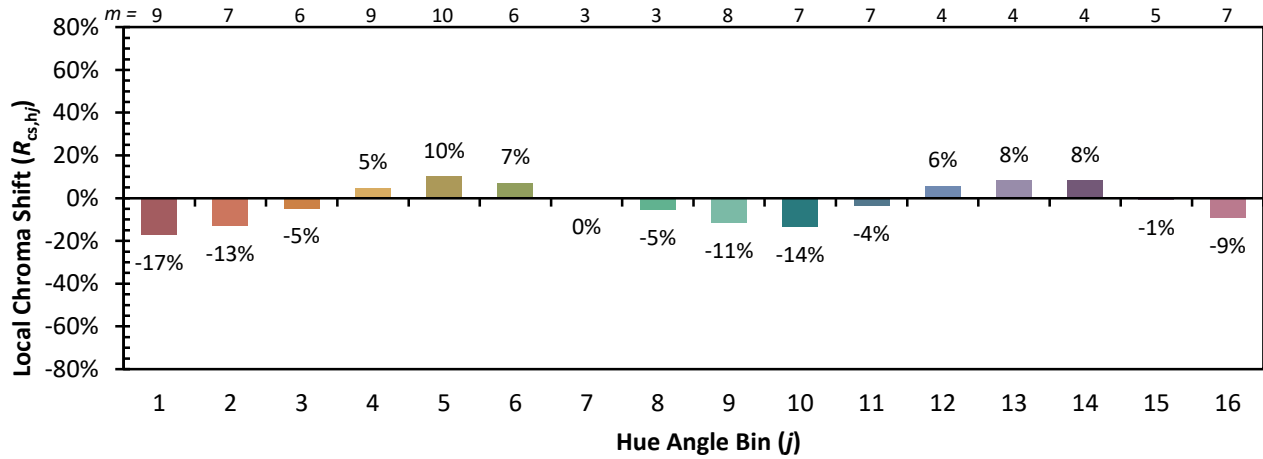


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 68 | CES51 = 90 | CES76 = 63 |
| CES02 = 62 | CES27 = 88 | CES52 = 89 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 80 | CES78 = 65 |
| CES04 = 70 | CES29 = 67 | CES54 = 84 | CES79 = 87 |
| CES05 = 48 | CES30 = 74 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 71 | CES56 = 75 | CES81 = 75 |
| CES07 = 40 | CES32 = 67 | CES57 = 74 | CES82 = 94 |
| CES08 = 39 | CES33 = 74 | CES58 = 76 | CES83 = 91 |
| CES09 = 29 | CES34 = 78 | CES59 = 87 | CES84 = 89 |
| CES10 = 75 | CES35 = 89 | CES60 = 93 | CES85 = 80 |
| CES11 = 58 | CES36 = 98 | CES61 = 86 | CES86 = 66 |
| CES12 = 64 | CES37 = 86 | CES62 = 89 | CES87 = 79 |
| CES13 = 43 | CES38 = 82 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 95 | CES64 = 74 | CES89 = 70 |
| CES15 = 71 | CES40 = 91 | CES65 = 68 | CES90 = 77 |
| CES16 = 47 | CES41 = 89 | CES66 = 71 | CES91 = 88 |
| CES17 = 50 | CES42 = 88 | CES67 = 69 | CES92 = 60 |
| CES18 = 56 | CES43 = 82 | CES68 = 74 | CES93 = 77 |
| CES19 = 72 | CES44 = 99 | CES69 = 82 | CES94 = 52 |
| CES20 = 65 | CES45 = 87 | CES70 = 67 | CES95 = 69 |
| CES21 = 86 | CES46 = 82 | CES71 = 66 | CES96 = 78 |
| CES22 = 79 | CES47 = 82 | CES72 = 88 | CES97 = 85 |
| CES23 = 92 | CES48 = 72 | CES73 = 59 | CES98 = 76 |
| CES24 = 91 | CES49 = 82 | CES74 = 97 | CES99 = 63 |
| CES25 = 72 | CES50 = 88 | CES75 = 66 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)