

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: P382894

Luminaire Tested: **GLEON-SA2C-735-U-T2-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P382894  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-13)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA2C-735-U-T2-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(2) 70 CRI, 3500K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II  
OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 9590.3 lumens  
Efficiency: N/A  
Efficacy: 84.9 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 1' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B1 - U0 - G2

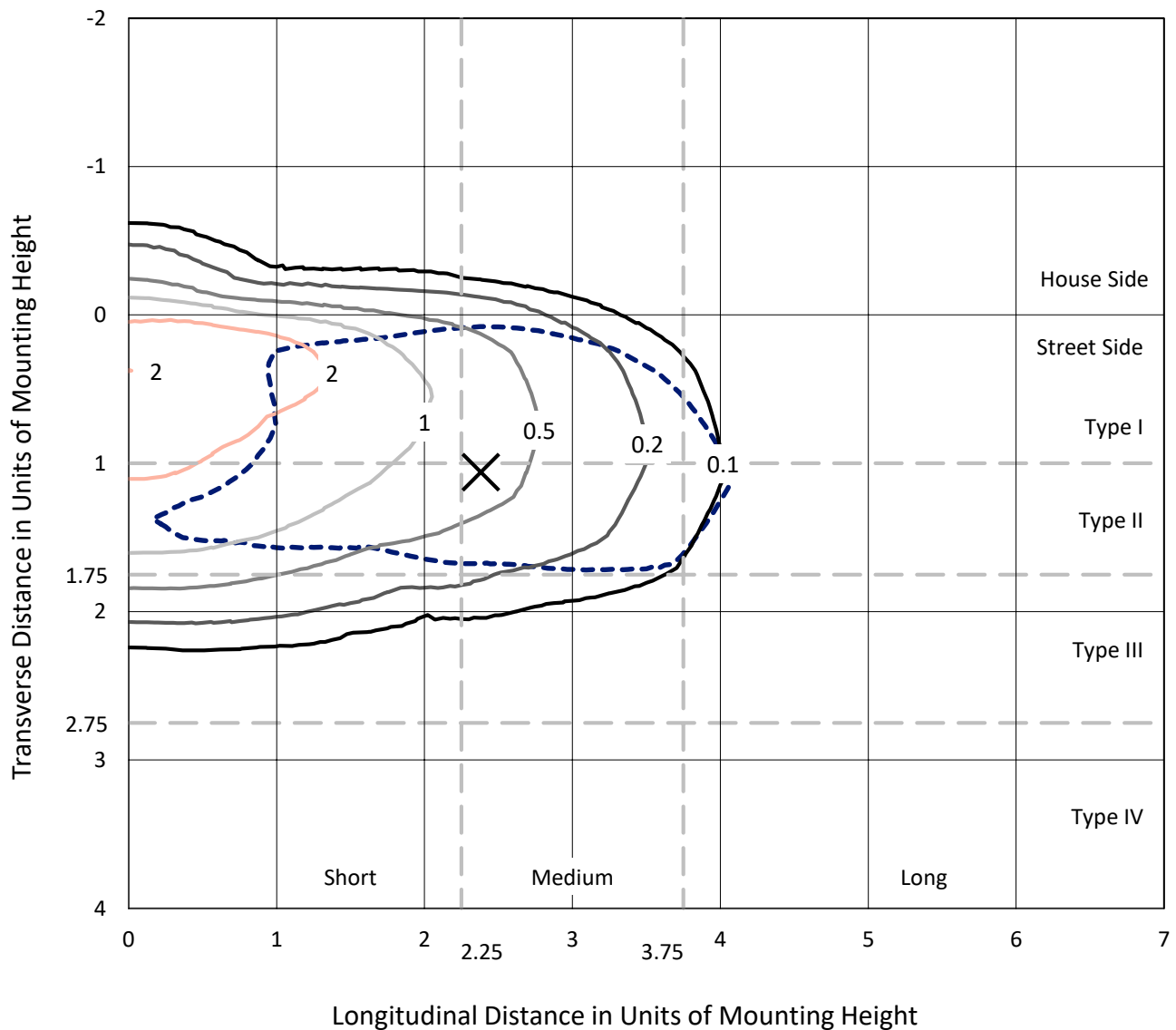
Input Watts (W): 113  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P382894  
 CATALOG NUMBER: GLEON-SA2C-735-U-T2-HSS

## Iso-Footcandle Lines of Horizontal Illumination

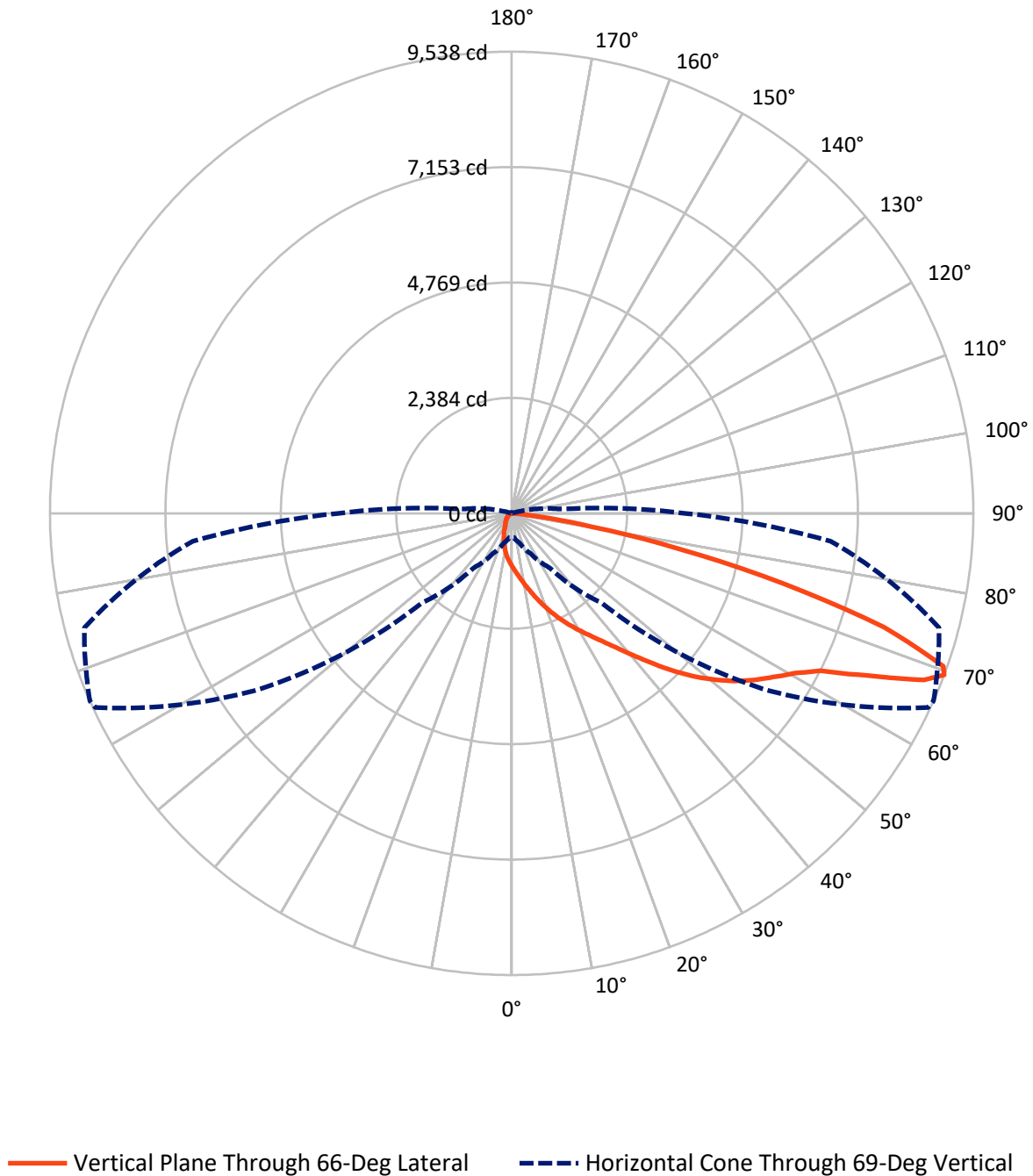
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 2.9 fc  
 Type II - Medium - N/A

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## Luminous Intensity Polar Plot



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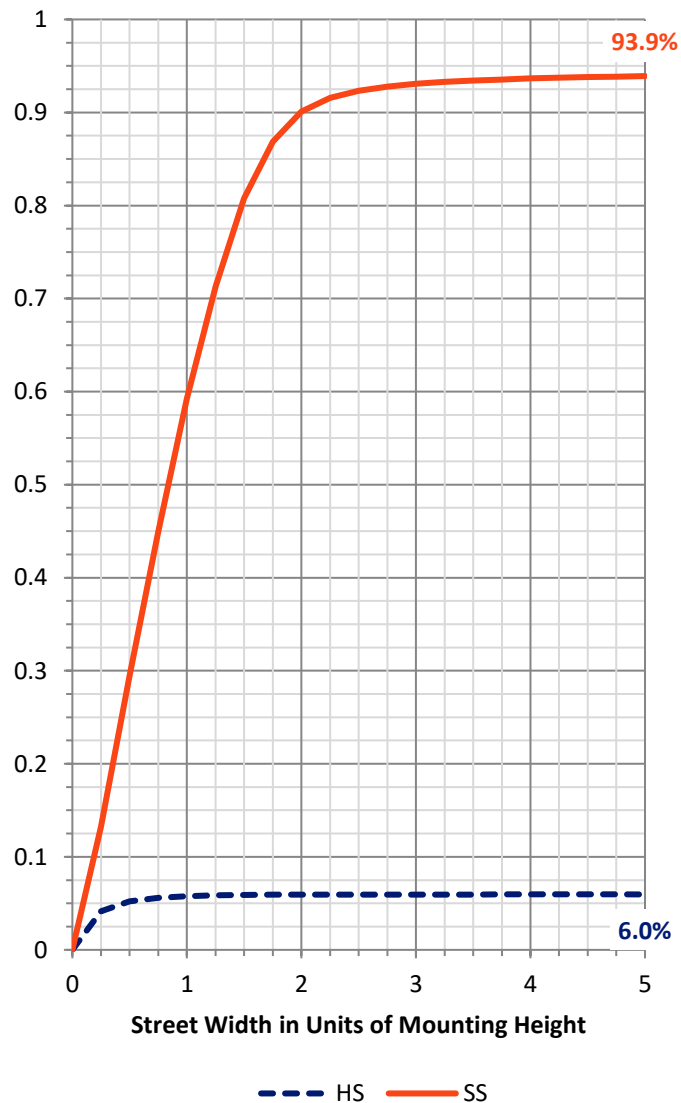
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 575.3    | 0.0    | 575.3  |
|                    | % Fixture | 6.0      | 0.0    | 6.0    |
| <b>Street Side</b> | Lumens    | 9015.0   | 0.0    | 9015.0 |
|                    | % Fixture | 94.0     | 0.0    | 94.0   |
| <b>Total</b>       | Lumens    | 9590.3   | 0.0    | 9590.3 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 105.5  | 1.1       |
| 10°-20°   | 314.0  | 3.3       |
| 20°-30°   | 546.8  | 5.7       |
| 30°-40°   | 959.3  | 10.0      |
| 40°-50°   | 1605.7 | 16.7      |
| 50°-60°   | 2360.2 | 24.6      |
| 60°-70°   | 2423.4 | 25.3      |
| 70°-80°   | 1196.3 | 12.5      |
| 80°-90°   | 79.1   | 0.8       |
| 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°    | 9590.3 | 100.0     |
| 0°-180°   | 9590.3 | 100.0     |

**Coefficient of Utilization**



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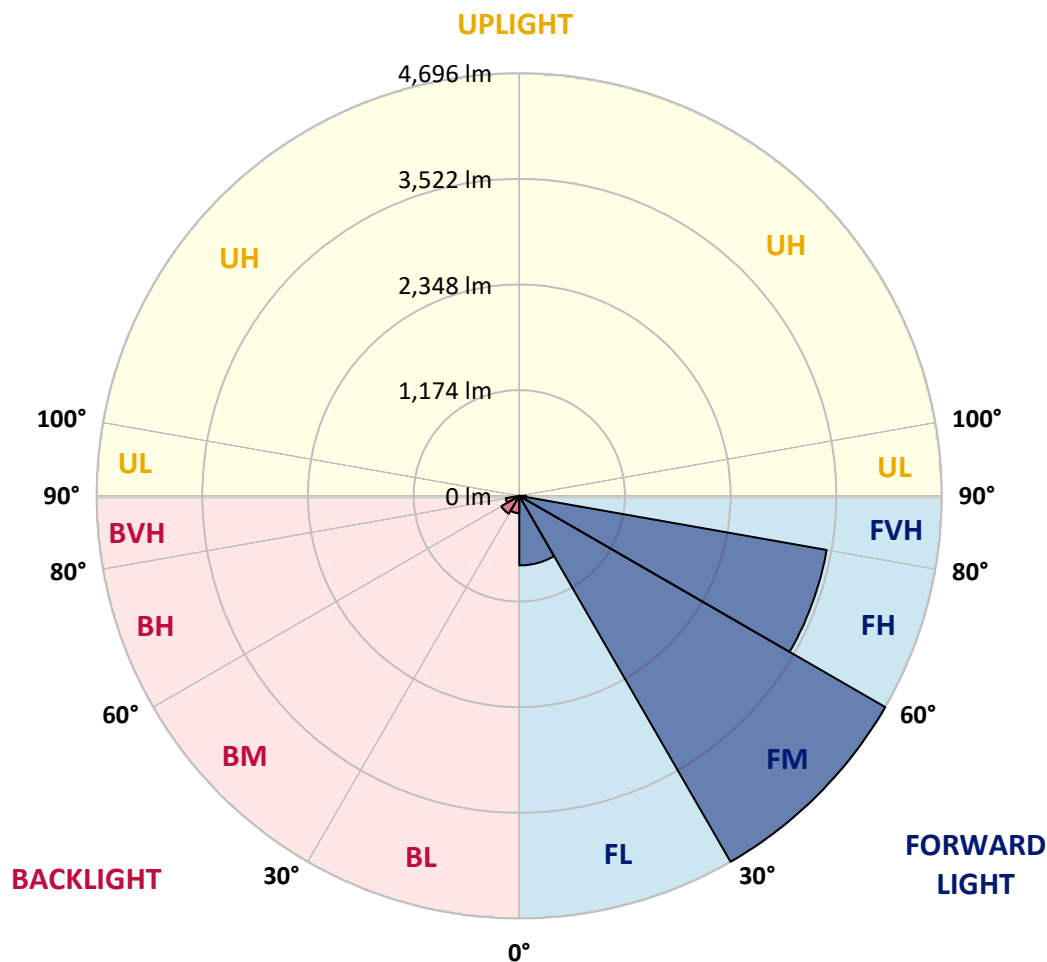
CATALOG NUMBER: GLEON-SA2C-735-U-T2-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 773.8  | 8.1       |                         |      |         |
| FM   | (30°-60°)   | 4695.9 | 49.0      |                         |      |         |
| FH   | (60°-80°)   | 3468.1 | 36.2      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 77.2   | 0.8       |                         |      | G1/100  |
| BL   | (0°-30°)    | 192.4  | 2.0       | B1/500                  |      |         |
| BM   | (30°-60°)   | 229.4  | 2.4       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 151.6  | 1.6       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 1.9    | 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°    | 66°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1091.4 | 1091.4 | 1091.4 | 1091.4 | 1091.4 | 1091.4 | 1091.4 | 1091.4 | 1091.4 | 1091.4 | 1091.4 |
| 2.5°  | 1284.5 | 1279.1 | 1276.8 | 1266.8 | 1249.5 | 1236.3 | 1210.7 | 1181.1 | 1175.7 | 1147.0 | 1111.9 |
| 5°    | 1451.3 | 1446.7 | 1443.5 | 1429.4 | 1411.7 | 1378.4 | 1331.9 | 1276.8 | 1266.3 | 1211.7 | 1141.5 |
| 7.5°  | 1567.4 | 1575.6 | 1575.6 | 1566.5 | 1544.2 | 1519.2 | 1462.2 | 1387.1 | 1373.8 | 1290.0 | 1181.1 |
| 10°   | 1635.3 | 1645.3 | 1653.0 | 1660.8 | 1657.6 | 1647.6 | 1593.9 | 1509.1 | 1493.2 | 1382.0 | 1227.1 |
| 12.5° | 1641.7 | 1651.7 | 1673.5 | 1705.8 | 1737.3 | 1760.1 | 1726.3 | 1644.4 | 1626.2 | 1488.6 | 1281.8 |
| 15°   | 1606.2 | 1616.6 | 1650.3 | 1713.2 | 1789.2 | 1855.7 | 1866.7 | 1794.3 | 1775.6 | 1615.7 | 1350.1 |
| 17.5° | 1544.2 | 1551.0 | 1599.3 | 1686.3 | 1805.6 | 1927.7 | 1993.8 | 1955.0 | 1937.7 | 1761.0 | 1426.2 |
| 20°   | 1498.2 | 1503.1 | 1545.5 | 1639.0 | 1795.7 | 1972.8 | 2114.1 | 2125.9 | 2107.6 | 1916.8 | 1508.6 |
| 22.5° | 1577.0 | 1586.1 | 1587.5 | 1631.6 | 1768.3 | 1995.1 | 2219.7 | 2293.9 | 2280.3 | 2082.1 | 1589.8 |
| 25°   | 1792.4 | 1802.9 | 1768.3 | 1741.0 | 1791.6 | 2005.2 | 2310.3 | 2466.2 | 2455.2 | 2260.2 | 1671.3 |
| 27.5° | 2077.2 | 2088.1 | 2043.4 | 1961.9 | 1913.1 | 2043.0 | 2391.0 | 2641.0 | 2640.6 | 2448.9 | 1759.2 |
| 30°   | 2356.8 | 2367.7 | 2322.2 | 2240.7 | 2128.6 | 2150.0 | 2460.7 | 2824.2 | 2826.9 | 2643.4 | 1852.6 |
| 32.5° | 2650.2 | 2663.9 | 2616.9 | 2512.1 | 2395.1 | 2334.9 | 2558.6 | 3008.2 | 3023.7 | 2868.8 | 1957.8 |
| 35°   | 2983.6 | 2985.4 | 2919.4 | 2809.5 | 2674.8 | 2582.2 | 2715.7 | 3214.6 | 3251.5 | 3148.1 | 2091.2 |
| 37.5° | 3310.6 | 3323.9 | 3269.6 | 3096.6 | 2972.7 | 2867.9 | 2949.5 | 3472.3 | 3524.8 | 3489.2 | 2265.7 |
| 40°   | 3553.0 | 3580.8 | 3573.0 | 3386.3 | 3268.7 | 3194.1 | 3239.5 | 3778.9 | 3845.4 | 3886.4 | 2485.7 |
| 42.5° | 3705.1 | 3726.1 | 3761.6 | 3649.1 | 3542.5 | 3554.8 | 3582.2 | 4136.1 | 4218.0 | 4339.2 | 2738.6 |
| 45°   | 3879.6 | 3889.6 | 3919.2 | 3869.6 | 3797.6 | 3921.5 | 3945.7 | 4538.2 | 4624.4 | 4826.2 | 3019.1 |
| 47.5° | 4092.8 | 4116.4 | 4124.6 | 4079.1 | 4046.3 | 4245.8 | 4295.9 | 4904.0 | 5024.8 | 5347.7 | 3316.1 |
| 50°   | 4364.2 | 4370.6 | 4384.8 | 4355.2 | 4322.4 | 4524.6 | 4610.2 | 5288.0 | 5397.9 | 5871.1 | 3609.0 |
| 52.5° | 4629.8 | 4652.6 | 4701.8 | 4683.1 | 4669.9 | 4761.9 | 4890.3 | 5634.2 | 5756.8 | 6307.5 | 3901.4 |
| 55°   | 4706.4 | 4725.9 | 4895.8 | 5012.0 | 5119.5 | 5054.4 | 5158.2 | 5944.4 | 6077.0 | 6697.4 | 4182.9 |
| 57.5° | 4400.7 | 4440.3 | 4734.6 | 5037.1 | 5483.0 | 5509.0 | 5526.2 | 6262.8 | 6381.8 | 6996.2 | 4475.9 |
| 60°   | 3628.2 | 3635.9 | 4118.7 | 4637.5 | 5422.8 | 5905.7 | 6063.7 | 6605.0 | 6704.6 | 7274.5 | 4826.6 |
| 62.5° | 2307.6 | 2386.4 | 2916.2 | 3648.7 | 4786.9 | 5848.3 | 6713.8 | 7122.3 | 7158.9 | 7608.4 | 5329.5 |
| 65°   | 1099.1 | 1150.2 | 1531.9 | 2254.3 | 3467.3 | 5113.5 | 7162.5 | 8058.4 | 8074.8 | 8270.3 | 6001.4 |
| 67.5° | 608.6  | 633.2  | 814.9  | 1213.5 | 2027.0 | 3616.3 | 6981.2 | 9167.2 | 9182.6 | 8946.2 | 6590.8 |
| 69°   | 476.0  | 497.0  | 640.0  | 914.7  | 1374.3 | 2599.1 | 6317.5 | 9491.9 | 9537.9 | 9139.9 | 6611.8 |
| 70°   | 404.0  | 424.5  | 551.2  | 772.5  | 1105.1 | 2008.3 | 5623.3 | 9411.3 | 9460.1 | 9121.6 | 6455.5 |
| 72.5° | 247.3  | 259.2  | 367.1  | 543.8  | 740.7  | 1010.4 | 3467.8 | 7959.1 | 8041.6 | 8367.3 | 5548.1 |
| 75°   | 166.7  | 173.1  | 229.5  | 375.3  | 529.8  | 520.2  | 1801.5 | 5610.1 | 5788.6 | 6508.8 | 4097.8 |
| 77.5° | 119.3  | 125.3  | 154.0  | 242.8  | 371.2  | 343.5  | 815.8  | 3486.5 | 3524.8 | 3903.7 | 2234.8 |
| 80°   | 67.9   | 73.3   | 108.9  | 144.4  | 251.9  | 229.2  | 324.4  | 1665.3 | 1684.5 | 1674.0 | 746.2  |
| 82.5° | 35.5   | 40.1   | 59.7   | 95.2   | 161.7  | 149.9  | 134.8  | 557.5  | 560.2  | 466.0  | 163.5  |
| 85°   | 6.8    | 8.2    | 29.6   | 65.1   | 83.4   | 65.1   | 55.1   | 130.7  | 133.5  | 117.9  | 40.5   |
| 87.5° | 0.0    | 0.5    | 11.8   | 14.5   | 16.4   | 16.9   | 17.8   | 25.5   | 27.3   | 36.9   | 10.9   |
| 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: P382894

CATALOG NUMBER: GLEON-SA2C-735-U-T2-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1091.4 | 1091.4 | 1091.4 | 1091.4 | 1091.4 | 1091.4 | 1091.4 | 1091.4 | 1091.4 | 1091.4 | 1091.4 |
| 2.5°  | 1096.4 | 1080.0 | 1048.5 | 1012.1 | 983.9  | 956.1  | 934.2  | 911.5  | 903.3  | 899.2  | 898.8  |
| 5°    | 1107.3 | 1072.8 | 1006.3 | 937.9  | 881.9  | 829.0  | 791.3  | 755.2  | 738.3  | 730.6  | 727.4  |
| 7.5°  | 1125.6 | 1070.0 | 962.9  | 858.6  | 778.0  | 712.0  | 659.5  | 620.4  | 600.8  | 592.7  | 589.4  |
| 10°   | 1147.0 | 1066.3 | 912.4  | 774.9  | 671.9  | 603.5  | 551.7  | 512.9  | 491.5  | 482.4  | 477.8  |
| 12.5° | 1172.1 | 1060.0 | 854.0  | 690.1  | 581.2  | 512.9  | 450.0  | 402.2  | 377.6  | 367.1  | 362.1  |
| 15°   | 1203.0 | 1053.6 | 793.0  | 610.3  | 501.5  | 418.2  | 349.4  | 317.0  | 312.1  | 310.2  | 310.7  |
| 17.5° | 1233.6 | 1043.6 | 726.5  | 531.5  | 417.7  | 326.6  | 291.5  | 289.7  | 290.6  | 290.6  | 290.6  |
| 20°   | 1260.8 | 1020.8 | 654.1  | 464.2  | 338.0  | 275.6  | 268.3  | 265.1  | 262.8  | 261.0  | 258.7  |
| 22.5° | 1282.3 | 990.2  | 584.5  | 397.2  | 276.0  | 252.4  | 241.0  | 230.9  | 222.7  | 217.2  | 214.5  |
| 25°   | 1296.8 | 949.7  | 520.6  | 332.9  | 248.3  | 229.5  | 209.0  | 192.3  | 179.5  | 171.7  | 168.5  |
| 27.5° | 1307.8 | 906.0  | 463.7  | 278.8  | 229.2  | 203.2  | 176.2  | 156.2  | 143.0  | 136.2  | 133.5  |
| 30°   | 1315.5 | 856.4  | 413.6  | 245.1  | 207.7  | 175.4  | 146.7  | 127.1  | 117.6  | 113.8  | 112.1  |
| 32.5° | 1322.8 | 801.2  | 366.2  | 229.2  | 187.7  | 149.9  | 123.0  | 108.0  | 102.0  | 97.4   | 96.1   |
| 35°   | 1341.1 | 750.3  | 321.1  | 212.3  | 167.2  | 128.0  | 105.6  | 94.7   | 88.9   | 86.1   | 85.1   |
| 37.5° | 1384.3 | 712.4  | 277.9  | 195.0  | 146.7  | 110.7  | 92.5   | 84.8   | 79.3   | 76.5   | 75.6   |
| 40°   | 1454.0 | 693.3  | 241.5  | 176.2  | 126.6  | 97.4   | 83.8   | 76.5   | 70.6   | 66.5   | 65.6   |
| 42.5° | 1556.5 | 696.1  | 215.9  | 157.6  | 110.7  | 87.0   | 75.6   | 67.0   | 60.6   | 56.9   | 56.0   |
| 45°   | 1680.8 | 716.1  | 198.1  | 139.4  | 97.4   | 78.8   | 66.5   | 57.4   | 51.5   | 48.3   | 47.4   |
| 47.5° | 1815.7 | 748.4  | 183.6  | 123.0  | 87.0   | 71.1   | 57.4   | 47.8   | 42.9   | 40.1   | 39.6   |
| 50°   | 1957.8 | 779.8  | 168.5  | 107.0  | 77.9   | 63.3   | 48.3   | 39.6   | 35.5   | 33.3   | 32.3   |
| 52.5° | 2101.8 | 816.3  | 154.9  | 92.5   | 70.1   | 54.2   | 40.1   | 32.3   | 29.2   | 27.3   | 26.5   |
| 55°   | 2256.6 | 843.6  | 141.7  | 81.0   | 62.4   | 46.0   | 33.3   | 26.9   | 24.1   | 21.9   | 21.4   |
| 57.5° | 2438.8 | 886.0  | 128.0  | 70.1   | 53.3   | 38.3   | 27.3   | 21.4   | 19.1   | 16.9   | 16.4   |
| 60°   | 2684.8 | 935.6  | 113.5  | 61.9   | 43.7   | 31.4   | 22.4   | 17.3   | 14.5   | 12.8   | 12.3   |
| 62.5° | 3009.1 | 990.7  | 95.2   | 54.2   | 35.5   | 25.5   | 17.8   | 13.7   | 10.4   | 8.2    | 8.2    |
| 65°   | 3420.5 | 1080.5 | 77.9   | 45.6   | 29.2   | 21.0   | 13.7   | 10.1   | 6.0    | 3.6    | 3.6    |
| 67.5° | 3660.5 | 1096.0 | 62.9   | 37.4   | 23.7   | 17.8   | 11.4   | 6.8    | 1.9    | 0.5    | 0.0    |
| 69°   | 3583.5 | 1006.3 | 53.3   | 31.9   | 20.5   | 16.9   | 10.4   | 5.0    | 0.9    | 0.0    | 0.0    |
| 70°   | 3438.6 | 920.1  | 46.9   | 28.2   | 18.6   | 15.9   | 10.1   | 3.6    | 0.9    | 0.0    | 0.0    |
| 72.5° | 2841.5 | 655.1  | 35.5   | 21.0   | 13.7   | 14.2   | 9.1    | 2.2    | 0.9    | 0.0    | 0.0    |
| 75°   | 2069.8 | 398.1  | 25.5   | 14.5   | 8.7    | 10.4   | 6.3    | 0.9    | 0.5    | 0.0    | 0.0    |
| 77.5° | 1151.5 | 187.7  | 15.9   | 8.2    | 5.5    | 6.3    | 3.2    | 0.0    | 0.0    | 0.0    | 0.0    |
| 80°   | 374.0  | 51.0   | 7.3    | 4.6    | 3.2    | 3.6    | 1.4    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 69.2   | 14.5   | 4.1    | 2.2    | 0.9    | 0.9    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 15.0   | 6.0    | 2.2    | 0.9    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 5.0    | 1.9    | 0.5    | 0.0    | 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

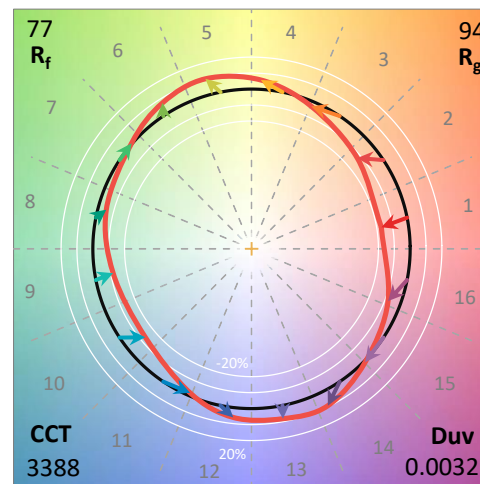
### Test Information

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

REPORT NUMBER: SP1-2101-121-7

| 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**



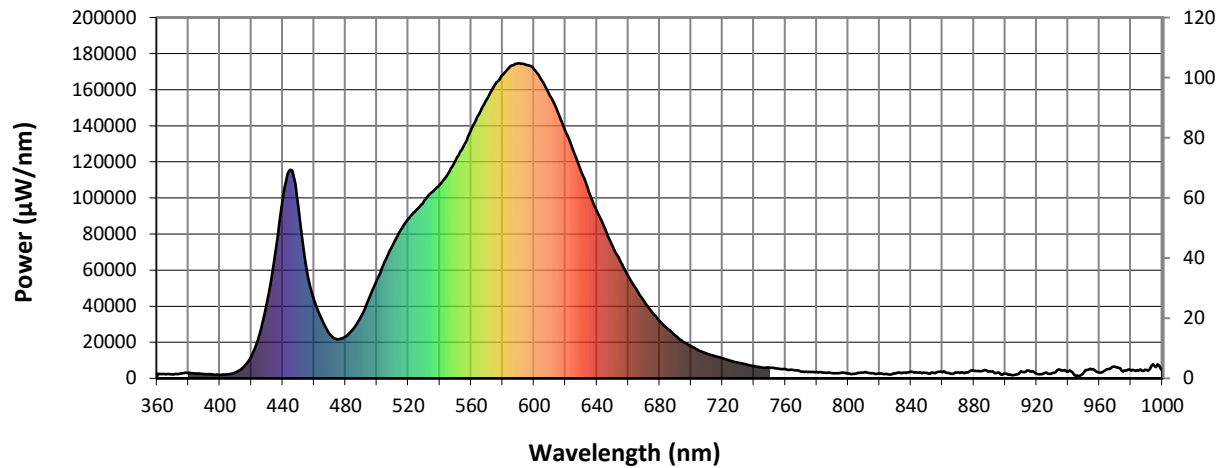
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 3500K 4-step quadrangle

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### Photopic Flux vs. Wavelength

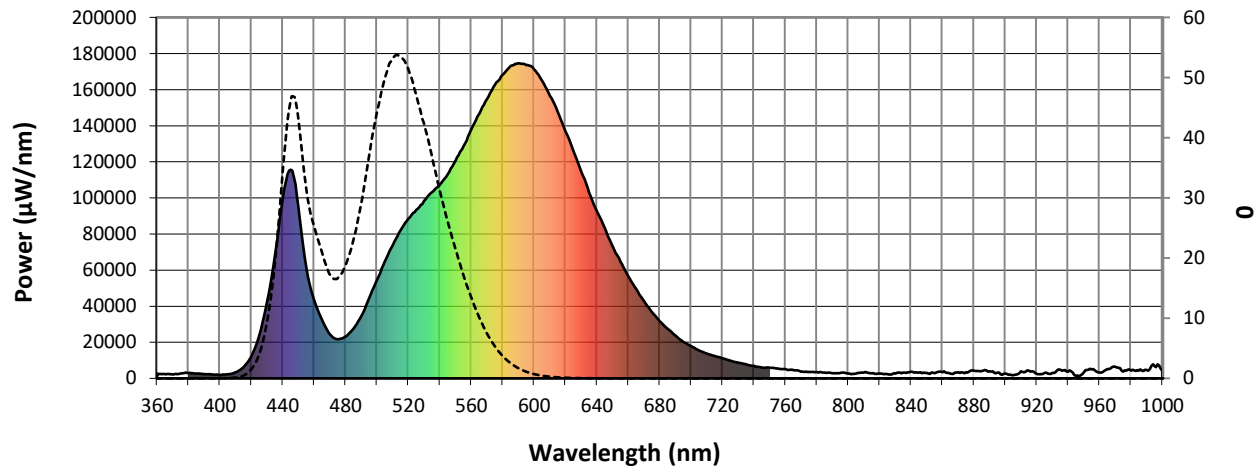


#####

| 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



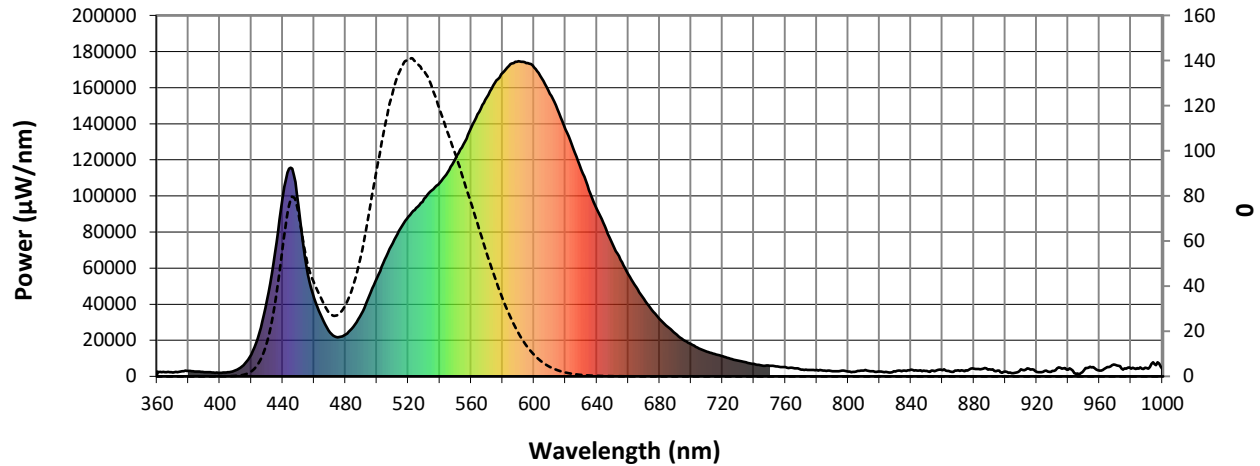
Scotopic Lumens: 12126

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

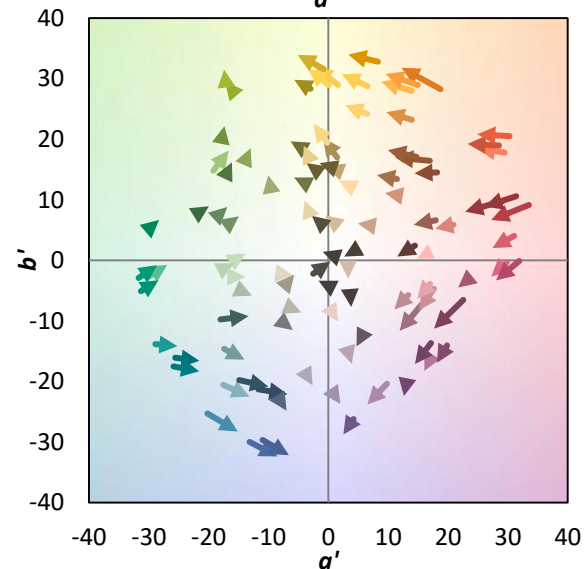
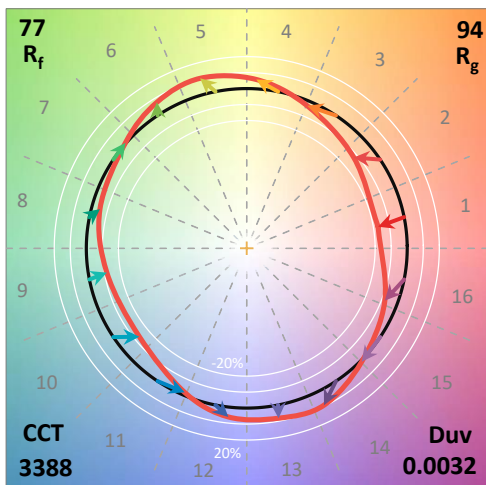
### Summary

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

### Spectral Power Distribution Comparison



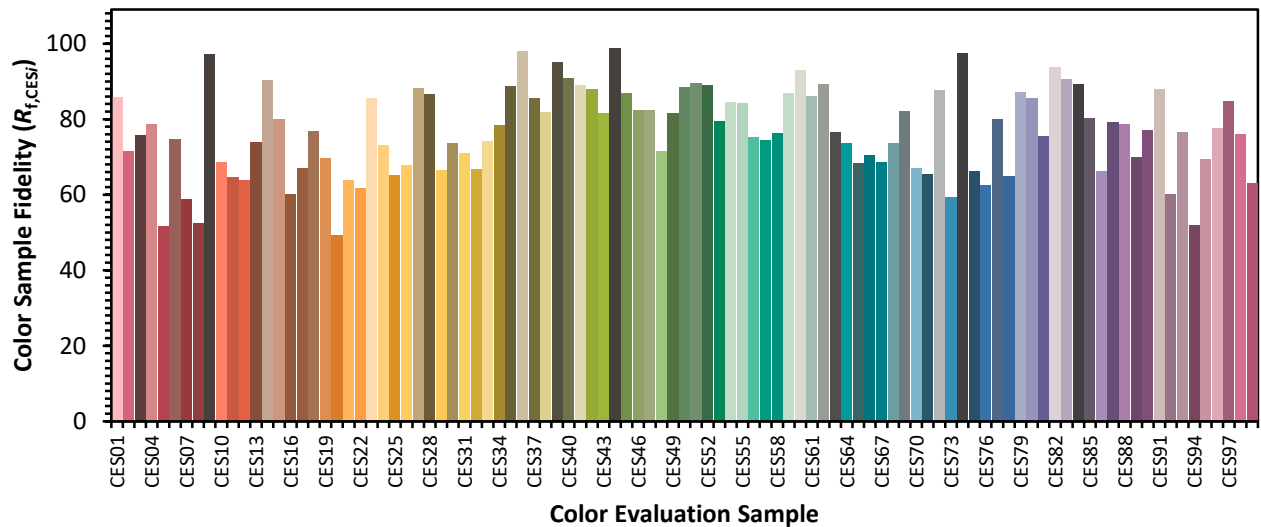
### Color Vector Graphics

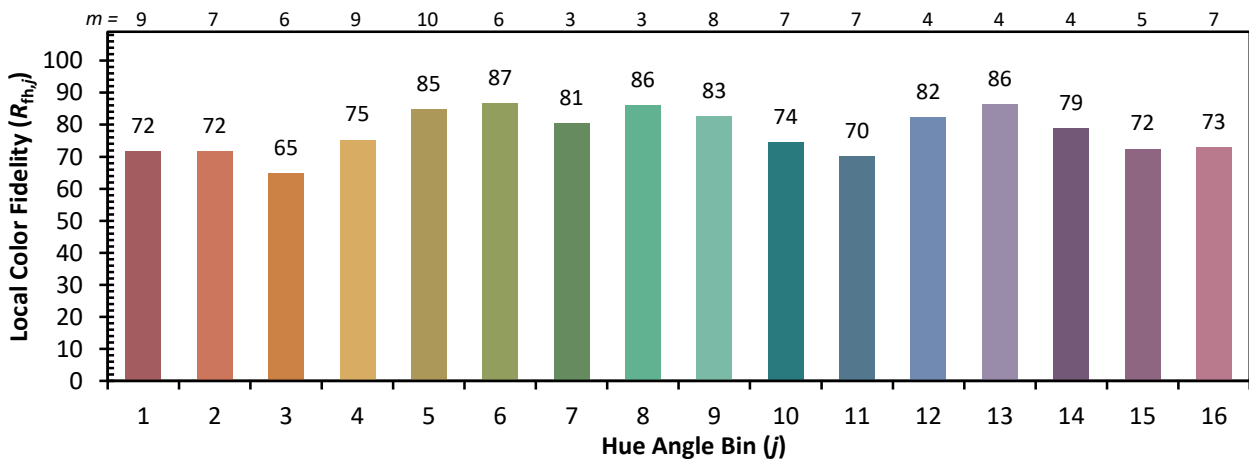
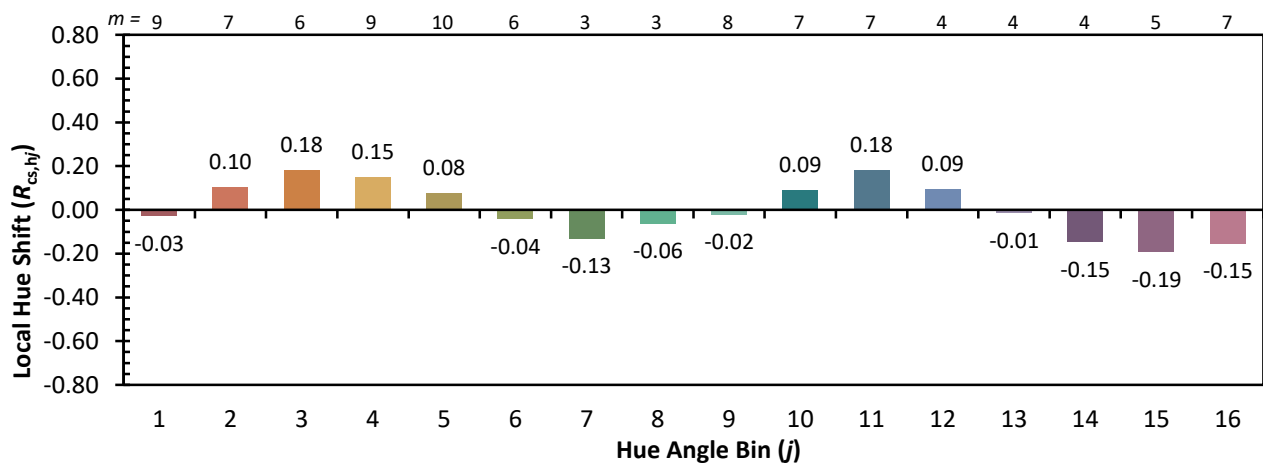




Individual Sample Fidelity Index ( $R_{f,i}$ )

|            |            |            |            |
|------------|------------|------------|------------|
| 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)