

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: P382792

Luminaire Tested: **GLEON-SA1C-735-U-T4W-HSS**

Issue Date: 3/3/2020

### Test Information

Test Method: LM-79-08  
Report Number: P382792  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-19)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA1C-735-U-T4W-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(1) 70 CRI, 3500K, 1050mA LIGHTSQUARE WITH 16 LEDS AND TYPE IV WIDE OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

### Summary

Lumens per Lamp: N/A  
Luminaire Lumens: 5000.6 lumens  
Efficiency: N/A  
Efficacy: 84.8 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B1 - U0 - G2

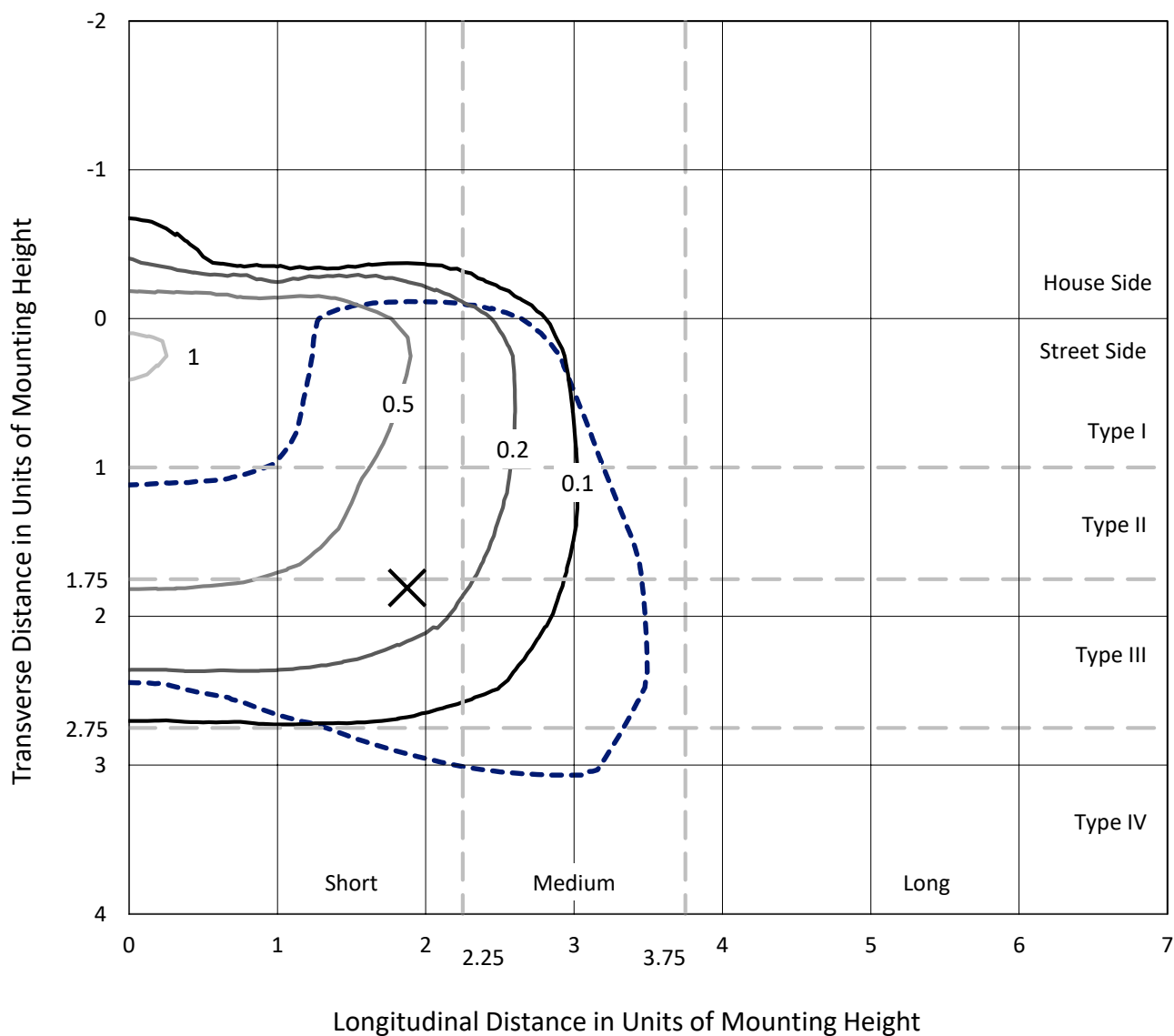
Input Watts (W): 59  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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 CATALOG NUMBER: GLEON-SA1C-735-U-T4W-HSS

## Iso-Footcandle Lines of Horizontal Illumination

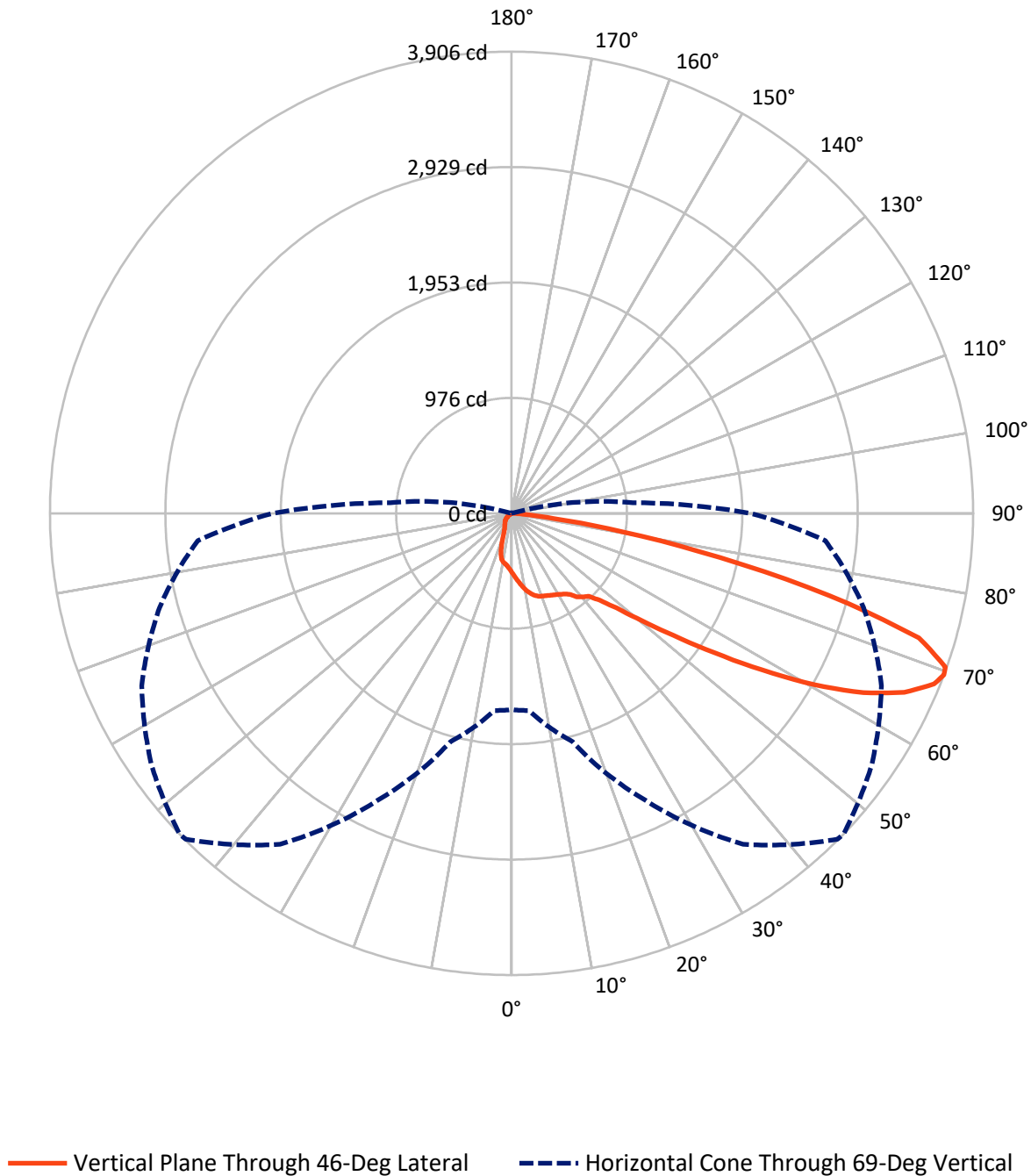
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 1.2 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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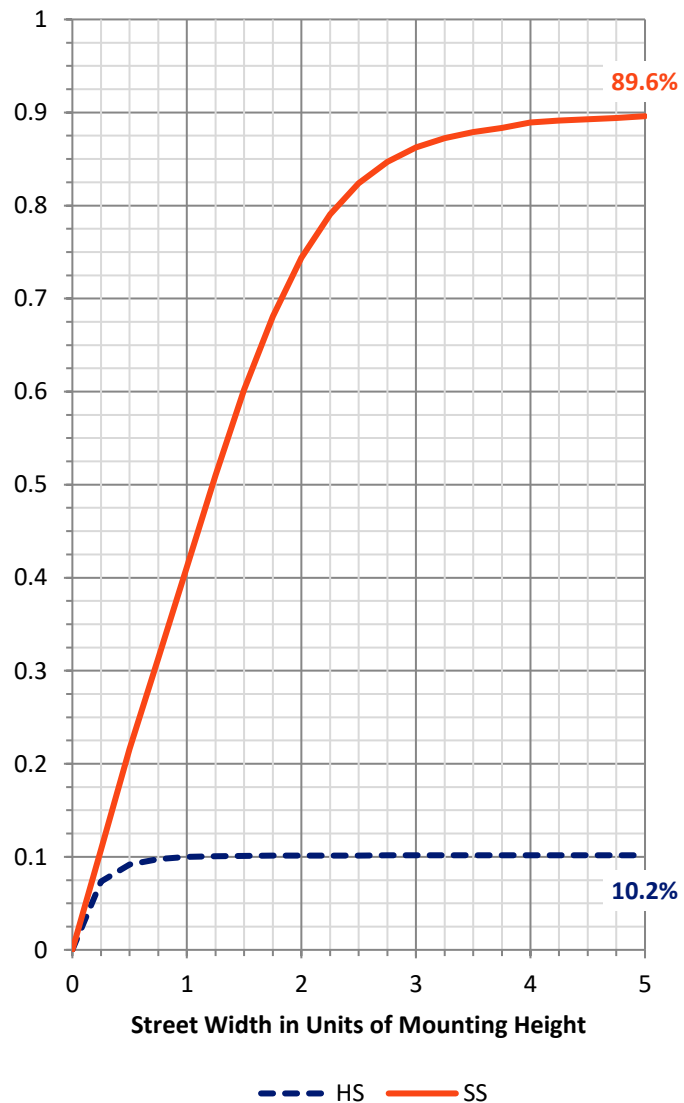
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 513.2    | 0.0    | 513.2  |
|                    | % Fixture | 10.3     | 0.0    | 10.3   |
| <b>Street Side</b> | Lumens    | 4487.3   | 0.0    | 4487.3 |
|                    | % Fixture | 89.7     | 0.0    | 89.7   |
| <b>Total</b>       | Lumens    | 5000.6   | 0.0    | 5000.6 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 49.9   | 1.0       |
| 10°-20°   | 151.3  | 3.0       |
| 20°-30°   | 237.9  | 4.8       |
| 30°-40°   | 341.2  | 6.8       |
| 40°-50°   | 589.7  | 11.8      |
| 50°-60°   | 1165.1 | 23.3      |
| 60°-70°   | 1628.3 | 32.6      |
| 70°-80°   | 786.6  | 15.7      |
| 80°-90°   | 50.6   | 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°    | 5000.6 | 100.0     |
| 0°-180°   | 5000.6 | 100.0     |

**Coefficient of Utilization**



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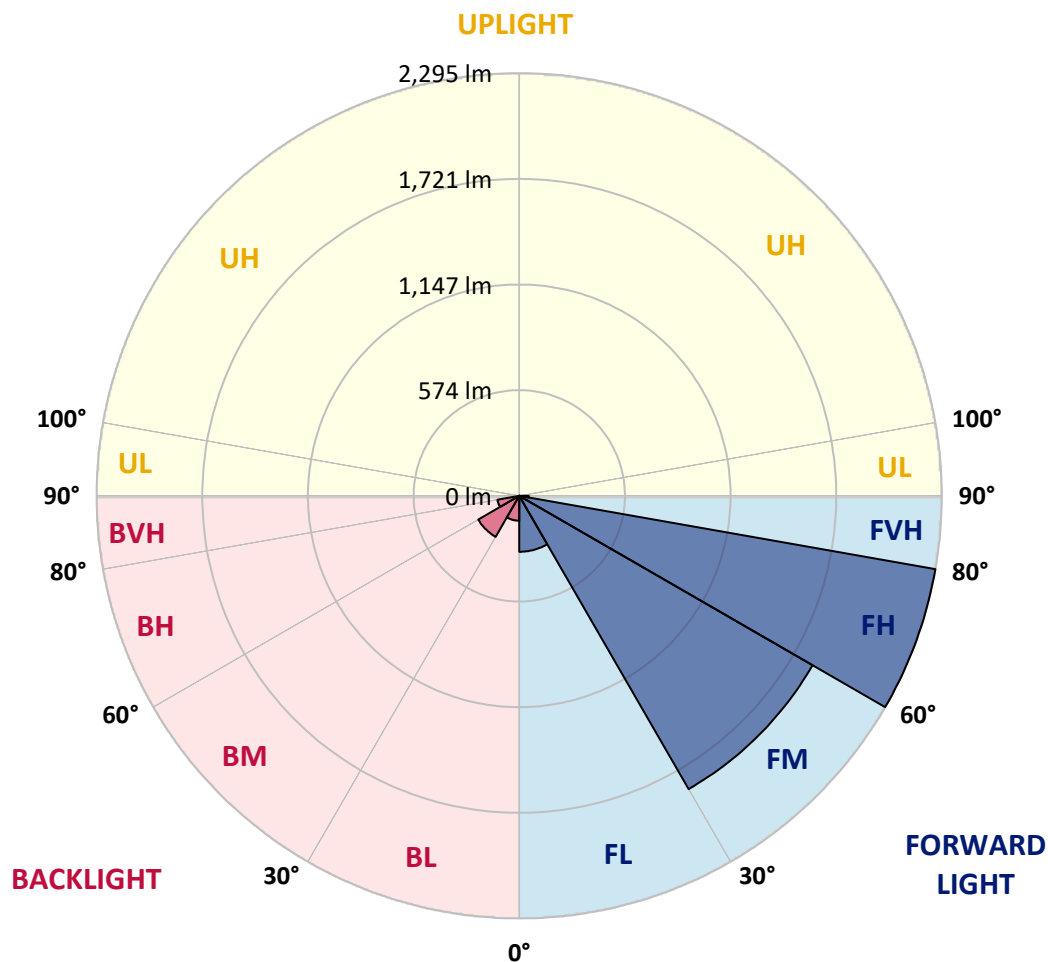
CATALOG NUMBER: GLEON-SA1C-735-U-T4W-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 303.8  | 6.1       |                         |      |         |
| FM   | (30°-60°)   | 1838.8 | 36.8      |                         |      |         |
| FH   | (60°-80°)   | 2294.6 | 45.9      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 50.1   | 1.0       |                         |      | G1/100  |
| BL   | (0°-30°)    | 135.3  | 2.7       | B1/500                  |      |         |
| BM   | (30°-60°)   | 257.2  | 5.1       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 120.3  | 2.4       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 0.4    | 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 IV Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 46°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 501.1  | 501.1  | 501.1  | 501.1  | 501.1  | 501.1  | 501.1  | 501.1  | 501.1  | 501.1  | 501.1  |
| 2.5°  | 556.6  | 555.9  | 552.6  | 551.2  | 543.3  | 538.5  | 536.7  | 530.8  | 522.4  | 513.9  | 504.5  |
| 5°    | 619.9  | 619.7  | 613.6  | 607.7  | 592.7  | 578.7  | 576.1  | 562.5  | 543.5  | 525.7  | 507.9  |
| 7.5°  | 684.6  | 681.6  | 675.5  | 664.2  | 642.4  | 619.9  | 617.8  | 598.6  | 571.6  | 545.8  | 520.3  |
| 10°   | 739.5  | 737.6  | 729.6  | 712.5  | 686.9  | 661.4  | 658.8  | 635.1  | 604.7  | 573.0  | 540.4  |
| 12.5° | 782.1  | 780.7  | 770.2  | 748.9  | 721.7  | 695.1  | 691.7  | 670.5  | 637.9  | 602.5  | 564.1  |
| 15°   | 808.2  | 807.5  | 794.6  | 771.9  | 745.1  | 722.1  | 719.1  | 700.5  | 670.3  | 633.3  | 589.9  |
| 17.5° | 814.3  | 814.5  | 801.1  | 778.1  | 756.1  | 739.7  | 737.4  | 723.3  | 698.0  | 661.2  | 615.7  |
| 20°   | 800.7  | 803.5  | 791.5  | 771.6  | 758.0  | 749.3  | 747.5  | 739.0  | 717.7  | 683.0  | 636.3  |
| 22.5° | 781.5  | 782.9  | 774.7  | 761.3  | 755.7  | 757.3  | 756.3  | 751.7  | 733.6  | 701.7  | 656.7  |
| 25°   | 769.7  | 769.7  | 764.8  | 753.5  | 757.3  | 767.4  | 767.6  | 766.7  | 752.4  | 724.7  | 681.6  |
| 27.5° | 769.3  | 767.9  | 762.2  | 753.8  | 764.1  | 779.6  | 780.5  | 786.9  | 777.9  | 752.6  | 712.5  |
| 30°   | 788.0  | 786.4  | 774.4  | 763.4  | 776.5  | 793.2  | 795.5  | 809.3  | 804.9  | 782.9  | 747.0  |
| 32.5° | 831.9  | 826.0  | 799.5  | 781.5  | 791.3  | 811.2  | 814.3  | 836.3  | 843.3  | 820.1  | 780.3  |
| 35°   | 891.9  | 873.3  | 835.1  | 815.7  | 816.6  | 837.5  | 840.3  | 872.7  | 893.5  | 854.3  | 806.1  |
| 37.5° | 974.7  | 965.5  | 903.3  | 851.3  | 855.5  | 887.2  | 895.4  | 930.5  | 924.7  | 873.1  | 835.4  |
| 40°   | 1156.1 | 1141.8 | 1075.7 | 951.2  | 892.8  | 927.5  | 930.1  | 948.9  | 949.3  | 915.5  | 896.3  |
| 42.5° | 1403.2 | 1397.4 | 1327.7 | 1132.4 | 966.2  | 954.5  | 959.1  | 990.8  | 1026.2 | 1005.1 | 1004.2 |
| 45°   | 1676.9 | 1673.8 | 1599.9 | 1373.0 | 1114.6 | 1042.9 | 1048.7 | 1091.1 | 1158.9 | 1163.6 | 1193.4 |
| 47.5° | 1897.0 | 1895.6 | 1853.1 | 1641.5 | 1341.8 | 1192.7 | 1194.5 | 1239.6 | 1358.7 | 1417.5 | 1465.1 |
| 50°   | 2097.7 | 2104.5 | 2070.9 | 1931.9 | 1651.3 | 1427.4 | 1422.9 | 1452.9 | 1644.3 | 1740.6 | 1799.7 |
| 52.5° | 2376.7 | 2386.3 | 2292.3 | 2202.9 | 1976.0 | 1718.6 | 1715.1 | 1746.5 | 1987.5 | 2059.7 | 2070.3 |
| 55°   | 2623.1 | 2606.7 | 2532.4 | 2506.6 | 2372.0 | 2078.2 | 2077.3 | 2104.9 | 2319.5 | 2350.2 | 2369.7 |
| 57.5° | 2731.9 | 2725.6 | 2761.5 | 2820.5 | 2786.7 | 2503.3 | 2501.2 | 2480.1 | 2616.5 | 2619.8 | 2679.6 |
| 60°   | 2800.6 | 2808.3 | 2918.3 | 3100.5 | 3184.7 | 2960.7 | 2947.1 | 2818.4 | 2900.3 | 2893.0 | 2957.0 |
| 62.5° | 2749.0 | 2764.3 | 2962.1 | 3265.7 | 3482.4 | 3360.0 | 3340.8 | 3128.3 | 3142.7 | 3117.6 | 3177.1 |
| 65°   | 2475.2 | 2498.9 | 2823.1 | 3234.6 | 3630.1 | 3672.1 | 3652.6 | 3402.0 | 3335.1 | 3293.9 | 3260.9 |
| 67.5° | 2009.8 | 2023.9 | 2362.4 | 2963.3 | 3563.5 | 3858.2 | 3854.3 | 3641.8 | 3480.5 | 3264.1 | 3007.6 |
| 69°   | 1660.9 | 1674.7 | 2000.6 | 2677.7 | 3417.0 | 3898.1 | 3905.8 | 3718.7 | 3452.9 | 3083.1 | 2664.9 |
| 70°   | 1406.7 | 1421.5 | 1725.1 | 2432.9 | 3247.0 | 3879.6 | 3893.4 | 3711.5 | 3373.6 | 2873.5 | 2364.1 |
| 72.5° | 737.9  | 750.5  | 1062.1 | 1676.1 | 2647.0 | 3562.3 | 3604.3 | 3397.7 | 2859.7 | 2086.9 | 1397.9 |
| 75°   | 231.9  | 239.1  | 414.7  | 876.2  | 1812.3 | 2769.9 | 2779.5 | 2665.3 | 2030.7 | 1147.9 | 582.1  |
| 77.5° | 88.4   | 86.3   | 138.1  | 322.9  | 916.3  | 1744.1 | 1803.0 | 1665.6 | 1065.6 | 405.9  | 134.3  |
| 80°   | 47.6   | 47.8   | 71.7   | 133.7  | 392.0  | 896.3  | 946.1  | 807.3  | 378.7  | 126.6  | 30.9   |
| 82.5° | 20.6   | 21.6   | 40.3   | 70.8   | 180.1  | 330.6  | 355.5  | 295.9  | 144.7  | 85.1   | 11.5   |
| 85°   | 4.5    | 4.9    | 19.5   | 38.5   | 73.4   | 92.9   | 97.3   | 95.9   | 92.1   | 66.1   | 4.5    |
| 87.5° | 0.0    | 0.0    | 8.7    | 13.8   | 18.5   | 21.1   | 18.5   | 24.1   | 50.9   | 44.5   | 2.3    |
| 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: P382792

CATALOG NUMBER: GLEON-SA1C-735-U-T4W-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 501.1  | 501.1  | 501.1 | 501.1 | 501.1 | 501.1 | 501.1 | 501.1 | 501.1 | 501.1 | 501.1 |
| 2.5°  | 501.5  | 497.3  | 490.0 | 482.1 | 476.4 | 470.5 | 465.9 | 463.7 | 461.4 | 459.8 | 461.9 |
| 5°    | 500.6  | 492.3  | 478.3 | 464.7 | 454.9 | 446.9 | 440.3 | 437.7 | 435.1 | 433.3 | 433.1 |
| 7.5°  | 508.8  | 497.3  | 475.7 | 455.8 | 440.5 | 429.7 | 420.9 | 417.1 | 414.1 | 412.7 | 411.5 |
| 10°   | 524.5  | 509.7  | 480.9 | 454.9 | 435.1 | 416.9 | 397.7 | 382.9 | 373.3 | 368.8 | 367.1 |
| 12.5° | 544.9  | 526.3  | 490.7 | 459.8 | 431.2 | 396.0 | 355.2 | 320.1 | 297.3 | 289.8 | 285.3 |
| 15°   | 568.8  | 545.8  | 503.6 | 466.1 | 416.6 | 352.4 | 283.2 | 237.3 | 216.2 | 211.9 | 207.3 |
| 17.5° | 591.8  | 566.5  | 519.1 | 467.3 | 384.7 | 281.6 | 207.5 | 176.3 | 168.1 | 170.9 | 171.6 |
| 20°   | 611.9  | 586.9  | 534.3 | 456.9 | 326.9 | 211.3 | 160.6 | 152.9 | 155.9 | 161.3 | 162.3 |
| 22.5° | 632.3  | 606.5  | 548.4 | 429.7 | 252.7 | 160.4 | 144.7 | 146.5 | 149.6 | 155.0 | 155.9 |
| 25°   | 657.2  | 630.5  | 561.5 | 379.8 | 189.7 | 136.5 | 137.4 | 140.2 | 143.3 | 148.2 | 148.7 |
| 27.5° | 685.8  | 660.7  | 570.2 | 314.9 | 140.7 | 125.5 | 128.5 | 132.7 | 135.7 | 140.5 | 141.4 |
| 30°   | 723.8  | 700.5  | 573.0 | 247.6 | 117.9 | 115.6 | 117.0 | 122.1 | 126.6 | 130.8 | 131.5 |
| 32.5° | 759.4  | 739.9  | 563.7 | 186.9 | 109.3 | 106.5 | 106.5 | 109.5 | 114.7 | 118.7 | 119.6 |
| 35°   | 792.2  | 779.6  | 533.6 | 136.7 | 102.7 | 98.0  | 95.7  | 95.7  | 98.9  | 102.2 | 103.1 |
| 37.5° | 835.6  | 835.1  | 485.1 | 109.0 | 96.3  | 91.0  | 86.1  | 82.3  | 81.1  | 81.8  | 82.3  |
| 40°   | 909.9  | 910.6  | 421.8 | 97.8  | 91.0  | 83.7  | 76.2  | 69.4  | 63.1  | 60.9  | 60.7  |
| 42.5° | 1026.0 | 1015.5 | 355.5 | 92.4  | 86.3  | 76.2  | 64.9  | 55.8  | 45.9  | 42.9  | 42.7  |
| 45°   | 1210.3 | 1147.7 | 285.1 | 87.5  | 81.3  | 67.7  | 53.7  | 41.3  | 33.3  | 30.9  | 30.9  |
| 47.5° | 1478.7 | 1321.4 | 220.9 | 82.1  | 74.8  | 58.1  | 40.5  | 29.8  | 24.4  | 23.2  | 23.5  |
| 50°   | 1756.3 | 1491.6 | 169.3 | 75.3  | 66.8  | 48.1  | 30.0  | 21.6  | 18.5  | 18.5  | 18.7  |
| 52.5° | 2002.5 | 1616.3 | 132.0 | 68.0  | 57.0  | 37.7  | 22.7  | 16.9  | 15.5  | 15.3  | 15.5  |
| 55°   | 2233.0 | 1696.8 | 101.1 | 59.5  | 45.3  | 28.1  | 17.3  | 13.8  | 12.9  | 12.4  | 12.2  |
| 57.5° | 2455.3 | 1736.6 | 75.7  | 48.1  | 32.8  | 20.4  | 13.8  | 11.7  | 10.8  | 10.1  | 9.9   |
| 60°   | 2603.2 | 1704.3 | 52.1  | 35.4  | 22.7  | 14.8  | 11.5  | 10.1  | 8.9   | 8.2   | 8.0   |
| 62.5° | 2686.7 | 1615.9 | 33.5  | 25.5  | 16.2  | 11.0  | 9.1   | 8.5   | 6.8   | 6.1   | 6.1   |
| 65°   | 2652.9 | 1470.1 | 23.5  | 18.3  | 11.7  | 8.2   | 6.8   | 6.8   | 4.9   | 4.0   | 3.7   |
| 67.5° | 2350.9 | 1241.9 | 17.8  | 13.6  | 8.5   | 6.1   | 5.1   | 5.9   | 3.1   | 1.9   | 1.9   |
| 69°   | 2022.7 | 1029.3 | 15.3  | 11.3  | 7.1   | 4.9   | 4.5   | 5.4   | 2.1   | 1.4   | 1.2   |
| 70°   | 1757.9 | 887.9  | 13.8  | 9.9   | 5.9   | 4.2   | 4.0   | 5.1   | 2.1   | 1.2   | 0.9   |
| 72.5° | 1051.8 | 495.2  | 10.5  | 7.1   | 3.7   | 3.3   | 3.3   | 5.9   | 2.1   | 1.2   | 0.9   |
| 75°   | 425.1  | 174.5  | 7.7   | 4.9   | 2.8   | 2.8   | 4.0   | 7.5   | 1.9   | 0.9   | 0.7   |
| 77.5° | 96.3   | 38.2   | 4.5   | 3.1   | 1.9   | 2.8   | 4.7   | 5.9   | 1.2   | 0.5   | 0.0   |
| 80°   | 23.5   | 9.4    | 2.8   | 1.9   | 1.2   | 2.1   | 3.5   | 3.3   | 0.3   | 0.0   | 0.0   |
| 82.5° | 7.7    | 3.3    | 1.2   | 0.9   | 0.3   | 0.7   | 1.7   | 0.9   | 0.0   | 0.0   | 0.0   |
| 85°   | 3.3    | 1.9    | 0.5   | 0.3   | 0.0   | 0.0   | 0.3   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 2.1    | 0.7    | 0.0   | 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)