

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: P321276

Luminaire Tested: **GLEON-SA2B-740-U-T2R-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P321276  
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-SA2B-740-U-T2R-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(2) 70 CRI, 4000K, 800mA 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: 9437 lumens  
Efficiency: N/A  
Efficacy: 111.0 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 1' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B1 - U0 - G2

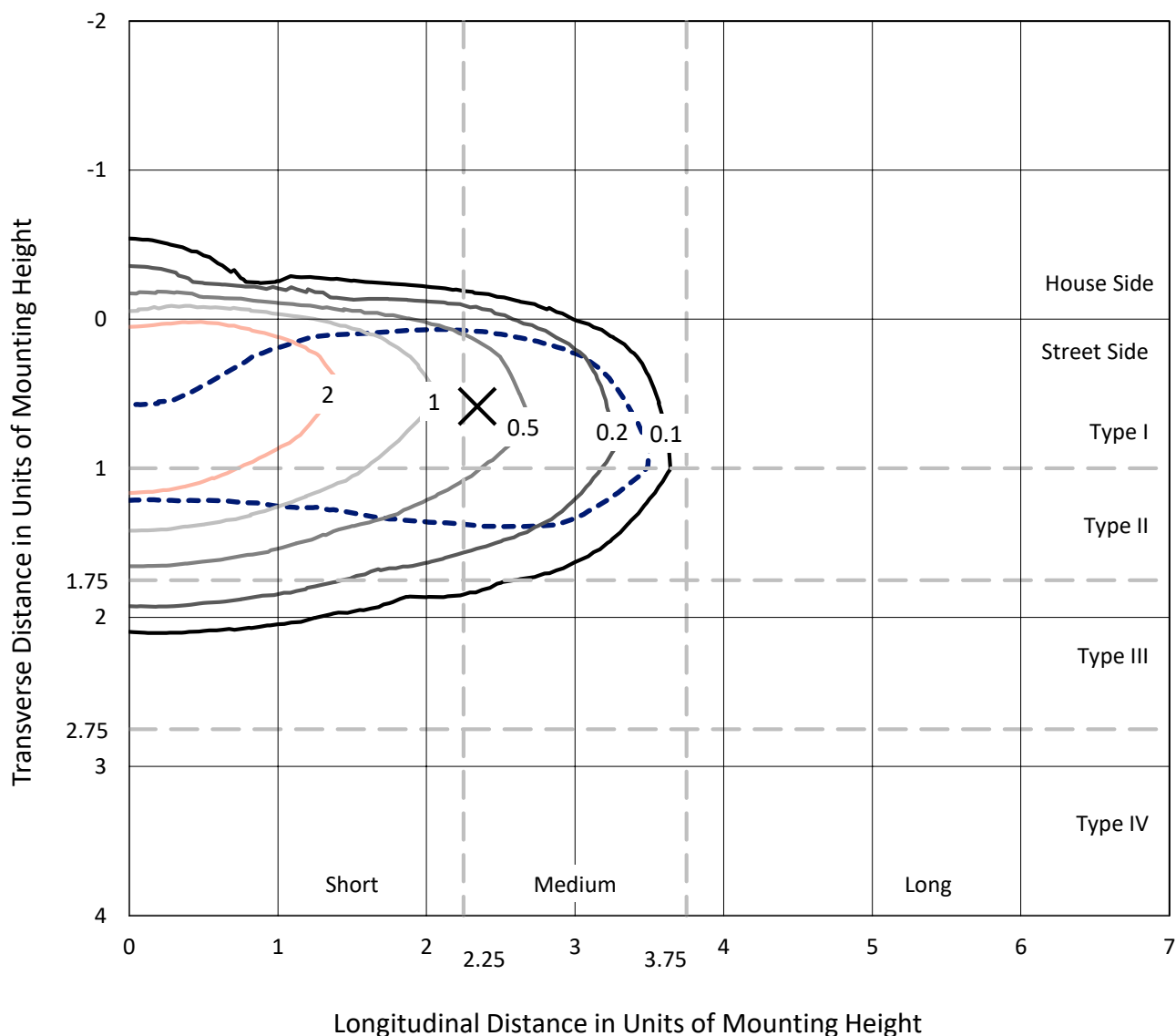
Input Watts (W): 85  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P321276  
 CATALOG NUMBER: GLEON-SA2B-740-U-T2R-HSS

## Iso-Footcandle Lines of Horizontal Illumination

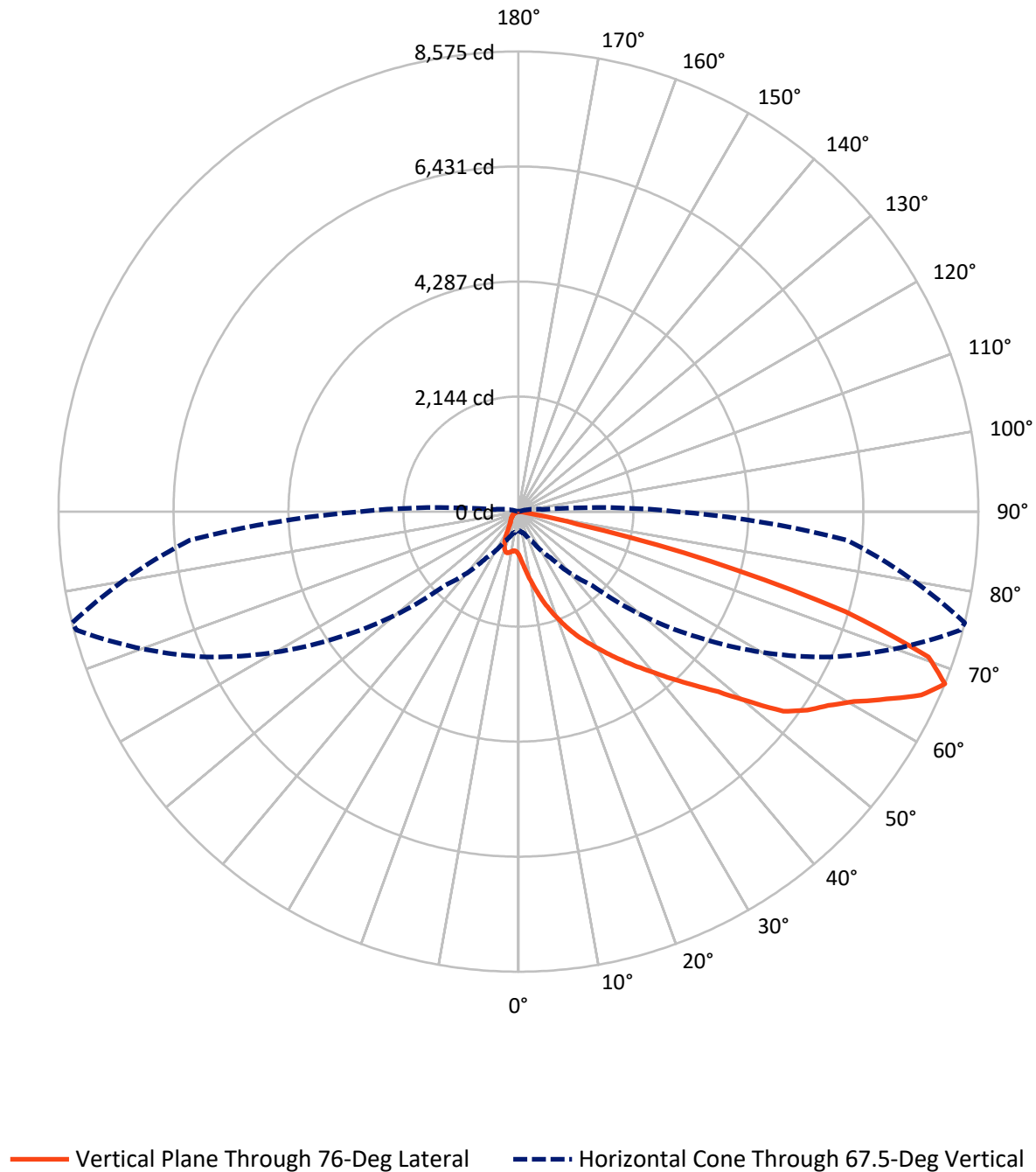
× Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 4.5 fc  
 Type II - Medium - N/A

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## Luminous Intensity Polar Plot



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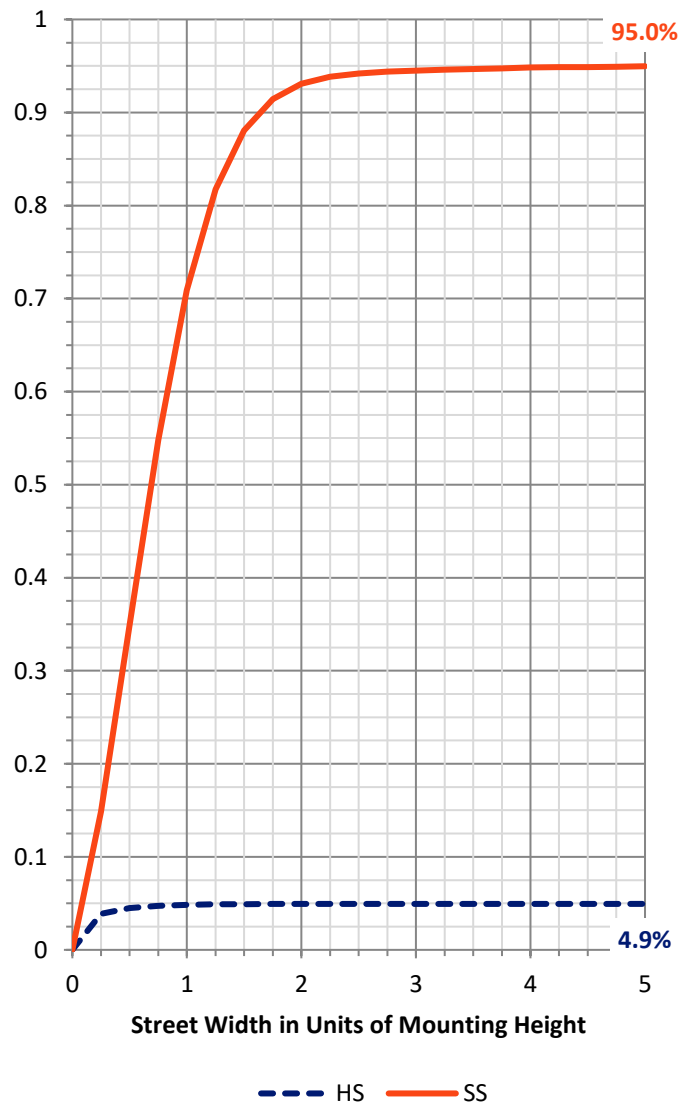
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 468.6    | 0.0    | 468.6  |
|                    | % Fixture | 5.0      | 0.0    | 5.0    |
| <b>Street Side</b> | Lumens    | 8968.4   | 0.0    | 8968.4 |
|                    | % Fixture | 95.0     | 0.0    | 95.0   |
| <b>Total</b>       | Lumens    | 9437.0   | 0.0    | 9437.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 99.5   | 1.1       |
| 10°-20°   | 394.6  | 4.2       |
| 20°-30°   | 802.9  | 8.5       |
| 30°-40°   | 1393.6 | 14.8      |
| 40°-50°   | 1968.9 | 20.9      |
| 50°-60°   | 2232.9 | 23.7      |
| 60°-70°   | 1852.0 | 19.6      |
| 70°-80°   | 670.8  | 7.1       |
| 80°-90°   | 21.8   | 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°    | 9437.0 | 100.0     |
| 0°-180°   | 9437.0 | 100.0     |

**Coefficient of Utilization**



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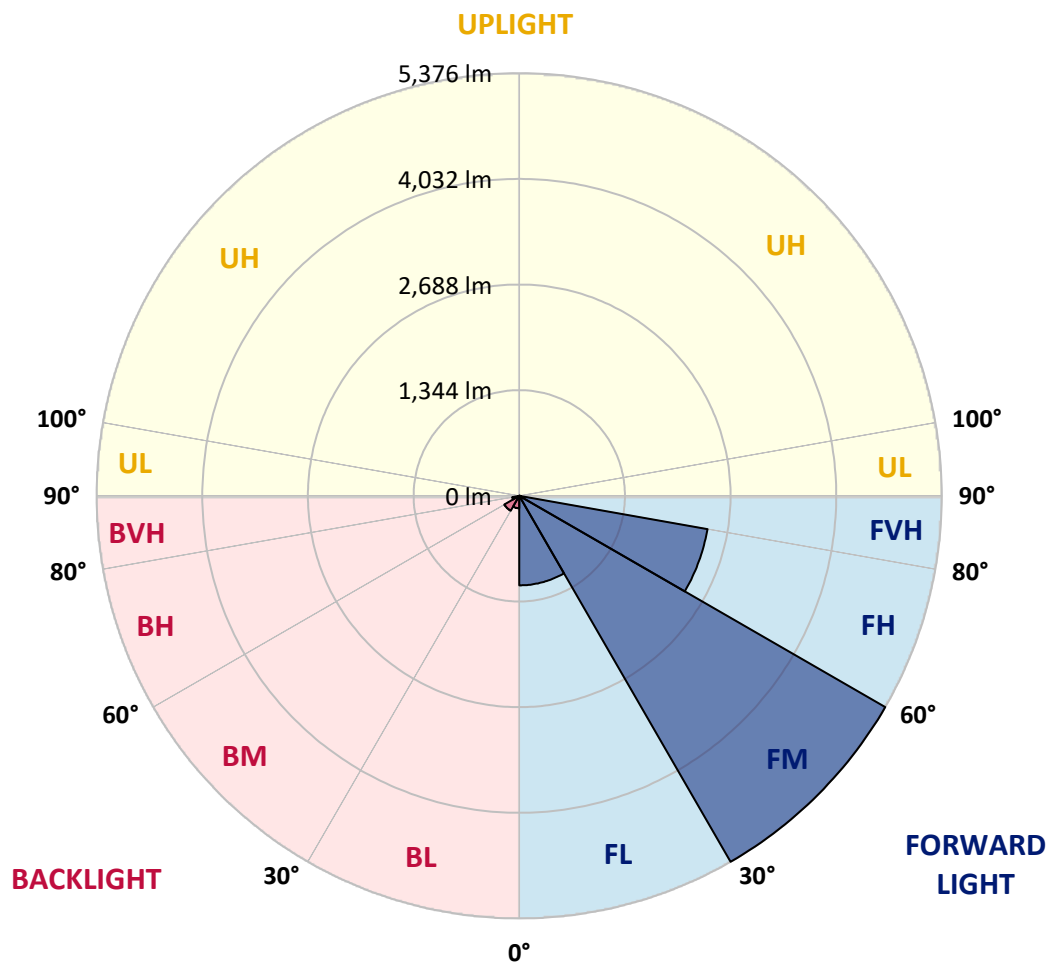
CATALOG NUMBER: GLEON-SA2B-740-U-T2R-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 1139.0 | 12.1      |                         |      |         |
| FM   | (30°-60°)   | 5376.1 | 57.0      |                         |      |         |
| FH   | (60°-80°)   | 2432.2 | 25.8      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 21.1   | 0.2       |                         |      | G1/100  |
| BL   | (0°-30°)    | 158.0  | 1.7       | B1/500                  |      |         |
| BM   | (30°-60°)   | 219.3  | 2.3       | B0/220                  |      |         |
| BH   | (60°-80°)   | 90.6   | 1.0       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 0.7    | 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°    | 800.5  | 800.5  | 800.5  | 800.5  | 800.5  | 800.5  | 800.5  | 800.5  | 800.5  | 800.5  | 800.5  |
| 2.5°  | 1195.0 | 1168.1 | 1174.3 | 1157.0 | 1125.5 | 1061.0 | 1006.0 | 953.9  | 893.2  | 891.1  | 841.1  |
| 5°    | 1611.4 | 1588.7 | 1585.8 | 1550.6 | 1493.6 | 1384.0 | 1277.3 | 1155.7 | 1020.1 | 1010.2 | 903.9  |
| 7.5°  | 1989.3 | 1971.1 | 1964.5 | 1922.8 | 1816.5 | 1709.8 | 1570.9 | 1392.2 | 1180.1 | 1161.9 | 988.7  |
| 10°   | 2279.6 | 2270.9 | 2272.6 | 2242.8 | 2151.8 | 2052.6 | 1870.2 | 1642.4 | 1361.6 | 1333.5 | 1090.4 |
| 12.5° | 2499.6 | 2501.7 | 2516.5 | 2498.4 | 2447.5 | 2373.9 | 2179.1 | 1909.1 | 1562.6 | 1524.2 | 1206.6 |
| 15°   | 2661.3 | 2671.6 | 2698.9 | 2721.6 | 2717.9 | 2654.2 | 2475.6 | 2180.0 | 1776.0 | 1733.4 | 1336.0 |
| 17.5° | 2765.9 | 2777.5 | 2817.2 | 2867.6 | 2913.9 | 2899.0 | 2761.7 | 2441.3 | 1991.8 | 1942.6 | 1474.5 |
| 20°   | 2857.7 | 2871.3 | 2913.9 | 2980.5 | 3066.9 | 3085.5 | 2995.4 | 2694.8 | 2207.2 | 2147.3 | 1617.6 |
| 22.5° | 3056.6 | 3056.2 | 3082.2 | 3121.1 | 3203.4 | 3251.3 | 3194.3 | 2930.0 | 2420.2 | 2357.8 | 1763.6 |
| 25°   | 3416.3 | 3402.7 | 3393.6 | 3363.0 | 3381.2 | 3410.9 | 3379.1 | 3150.0 | 2634.4 | 2571.1 | 1911.6 |
| 27.5° | 3843.9 | 3852.1 | 3778.5 | 3696.3 | 3632.6 | 3602.0 | 3549.9 | 3353.9 | 2840.3 | 2770.8 | 2056.3 |
| 30°   | 4295.0 | 4297.5 | 4210.6 | 4105.6 | 3965.4 | 3849.2 | 3759.1 | 3548.6 | 3052.0 | 2976.4 | 2196.9 |
| 32.5° | 4701.9 | 4685.8 | 4599.7 | 4456.7 | 4279.7 | 4149.0 | 3961.7 | 3766.1 | 3276.1 | 3203.0 | 2353.2 |
| 35°   | 5024.4 | 5005.4 | 4900.8 | 4770.5 | 4586.9 | 4455.4 | 4230.1 | 3983.2 | 3511.8 | 3440.3 | 2509.9 |
| 37.5° | 5260.1 | 5237.8 | 5130.3 | 4996.3 | 4837.9 | 4761.4 | 4541.4 | 4219.3 | 3769.0 | 3692.1 | 2674.9 |
| 40°   | 5342.0 | 5322.5 | 5255.1 | 5157.1 | 5029.8 | 5012.4 | 4871.8 | 4491.0 | 4049.0 | 3967.1 | 2861.8 |
| 42.5° | 5293.2 | 5274.2 | 5250.2 | 5217.1 | 5164.2 | 5180.7 | 5183.6 | 4800.7 | 4359.9 | 4279.3 | 3068.2 |
| 45°   | 5099.7 | 5082.7 | 5107.5 | 5155.9 | 5221.6 | 5303.5 | 5468.1 | 5133.6 | 4707.3 | 4621.2 | 3306.7 |
| 47.5° | 4814.8 | 4802.4 | 4871.0 | 4991.7 | 5184.0 | 5409.8 | 5728.2 | 5483.4 | 5097.2 | 5017.4 | 3604.5 |
| 50°   | 4409.5 | 4407.5 | 4544.7 | 4765.1 | 5060.8 | 5461.1 | 5997.0 | 5881.2 | 5638.9 | 5554.9 | 4018.4 |
| 52.5° | 3778.5 | 3782.7 | 4052.7 | 4405.4 | 4844.5 | 5426.3 | 6169.8 | 6392.3 | 6269.0 | 6181.8 | 4376.9 |
| 55°   | 3177.7 | 3202.5 | 3394.0 | 3902.6 | 4512.9 | 5297.3 | 6229.3 | 6630.8 | 6616.8 | 6534.1 | 4576.2 |
| 57.5° | 2589.3 | 2634.4 | 2818.8 | 3293.9 | 4028.7 | 5000.0 | 6196.7 | 6734.2 | 6875.6 | 6812.4 | 4839.2 |
| 60°   | 1951.7 | 1972.4 | 2184.9 | 2629.0 | 3407.2 | 4457.5 | 5959.7 | 6790.5 | 7229.6 | 7185.8 | 5220.8 |
| 62.5° | 1241.7 | 1293.4 | 1482.0 | 1910.4 | 2653.0 | 3704.1 | 5560.3 | 6789.6 | 7672.4 | 7696.4 | 5713.3 |
| 65°   | 654.2  | 714.5  | 814.6  | 1183.8 | 1823.1 | 2862.6 | 4959.5 | 6725.9 | 8215.8 | 8249.3 | 6098.3 |
| 67.5° | 352.7  | 370.1  | 423.0  | 614.5  | 1057.3 | 1939.3 | 4076.7 | 6411.7 | 8530.5 | 8574.7 | 6152.0 |
| 70°   | 258.0  | 267.5  | 287.4  | 339.9  | 532.2  | 1126.4 | 2974.7 | 5699.2 | 8124.8 | 8108.3 | 5466.0 |
| 72.5° | 198.1  | 213.0  | 227.8  | 248.9  | 306.0  | 601.2  | 1852.1 | 4462.9 | 6482.8 | 6373.6 | 4085.8 |
| 75°   | 156.3  | 158.8  | 179.9  | 198.9  | 229.5  | 342.4  | 822.4  | 2599.2 | 3956.8 | 3698.3 | 2118.8 |
| 77.5° | 124.9  | 126.5  | 138.9  | 155.5  | 184.4  | 224.9  | 254.7  | 1022.6 | 1263.2 | 1127.2 | 459.8  |
| 80°   | 74.0   | 78.2   | 103.4  | 119.9  | 153.0  | 141.8  | 93.0   | 222.0  | 197.2  | 178.6  | 77.3   |
| 82.5° | 41.3   | 44.7   | 58.3   | 94.7   | 106.7  | 67.8   | 46.3   | 60.0   | 46.3   | 45.1   | 21.9   |
| 85°   | 0.0    | 2.1    | 37.6   | 58.7   | 43.4   | 14.9   | 19.4   | 19.8   | 13.6   | 12.8   | 8.7    |
| 87.5° | 0.0    | 0.0    | 11.6   | 11.2   | 1.7    | 2.5    | 4.5    | 6.6    | 5.4    | 5.4    | 4.5    |
| 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: P321276

CATALOG NUMBER: GLEON-SA2B-740-U-T2R-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 800.5  | 800.5  | 800.5 | 800.5 | 800.5 | 800.5 | 800.5 | 800.5 | 800.5 | 800.5 | 800.5 |
| 2.5°  | 816.2  | 793.9  | 751.7 | 710.4 | 675.7 | 647.1 | 621.5 | 611.1 | 602.9 | 601.6 | 595.0 |
| 5°    | 852.6  | 807.6  | 726.9 | 660.8 | 616.5 | 585.1 | 558.2 | 541.7 | 528.9 | 523.9 | 519.4 |
| 7.5°  | 907.6  | 839.4  | 723.6 | 647.5 | 594.6 | 541.7 | 492.1 | 438.3 | 404.8 | 392.0 | 384.6 |
| 10°   | 974.6  | 881.6  | 736.0 | 643.8 | 551.2 | 439.5 | 357.3 | 289.0 | 261.3 | 252.2 | 249.8 |
| 12.5° | 1052.8 | 934.1  | 757.5 | 620.7 | 458.6 | 312.2 | 246.4 | 223.3 | 217.1 | 214.2 | 214.2 |
| 15°   | 1142.5 | 991.6  | 772.8 | 553.7 | 339.1 | 236.1 | 213.4 | 202.6 | 196.0 | 192.3 | 192.7 |
| 17.5° | 1234.3 | 1047.8 | 765.4 | 456.5 | 250.2 | 210.1 | 193.1 | 181.5 | 172.4 | 168.7 | 167.9 |
| 20°   | 1326.9 | 1099.9 | 724.0 | 339.9 | 211.7 | 190.6 | 171.6 | 158.8 | 149.7 | 146.0 | 145.1 |
| 22.5° | 1422.8 | 1144.1 | 651.3 | 249.3 | 190.2 | 169.1 | 150.5 | 137.7 | 129.0 | 125.7 | 124.0 |
| 25°   | 1516.3 | 1180.1 | 549.5 | 201.8 | 169.9 | 148.9 | 131.1 | 119.1 | 111.2 | 107.9 | 107.5 |
| 27.5° | 1603.5 | 1202.9 | 431.7 | 178.2 | 152.2 | 130.7 | 114.5 | 103.8 | 97.2  | 94.7  | 94.3  |
| 30°   | 1682.1 | 1204.9 | 319.2 | 160.9 | 136.5 | 115.0 | 100.1 | 90.6  | 84.8  | 82.3  | 81.5  |
| 32.5° | 1761.5 | 1187.6 | 232.4 | 145.1 | 122.0 | 101.3 | 86.8  | 79.4  | 75.3  | 73.2  | 73.2  |
| 35°   | 1836.3 | 1147.5 | 181.1 | 131.5 | 107.9 | 88.1  | 76.5  | 71.1  | 68.6  | 66.6  | 66.6  |
| 37.5° | 1909.5 | 1090.0 | 153.8 | 119.5 | 94.7  | 76.9  | 67.4  | 64.1  | 62.0  | 60.0  | 60.0  |
| 40°   | 1984.0 | 1017.6 | 139.8 | 108.3 | 83.9  | 68.2  | 60.0  | 57.1  | 55.0  | 53.3  | 52.9  |
| 42.5° | 2075.3 | 934.1  | 130.7 | 98.0  | 74.4  | 60.4  | 52.9  | 49.6  | 48.0  | 46.3  | 45.5  |
| 45°   | 2181.2 | 862.1  | 123.2 | 87.7  | 66.6  | 53.8  | 45.9  | 42.6  | 40.1  | 38.0  | 37.6  |
| 47.5° | 2333.8 | 810.0  | 113.3 | 76.5  | 59.1  | 46.7  | 39.7  | 36.0  | 32.3  | 30.2  | 29.8  |
| 50°   | 2528.5 | 767.0  | 100.5 | 66.6  | 51.7  | 39.7  | 33.1  | 28.5  | 25.2  | 23.2  | 23.2  |
| 52.5° | 2625.3 | 710.8  | 88.9  | 57.9  | 43.4  | 33.5  | 26.9  | 21.5  | 19.8  | 17.8  | 17.8  |
| 55°   | 2664.2 | 667.8  | 77.3  | 49.2  | 36.0  | 27.7  | 21.1  | 16.5  | 15.3  | 14.1  | 13.6  |
| 57.5° | 2773.3 | 655.4  | 67.4  | 41.8  | 29.8  | 21.9  | 16.1  | 12.4  | 11.6  | 9.9   | 9.9   |
| 60°   | 2949.1 | 661.6  | 58.3  | 35.6  | 24.0  | 17.0  | 12.0  | 9.5   | 8.7   | 7.0   | 7.0   |
| 62.5° | 3138.9 | 653.7  | 49.2  | 30.6  | 18.6  | 12.4  | 8.3   | 7.0   | 7.0   | 4.1   | 3.7   |
| 65°   | 3175.2 | 582.2  | 42.2  | 25.2  | 14.5  | 9.1   | 5.4   | 4.5   | 6.2   | 0.8   | 0.0   |
| 67.5° | 2947.0 | 451.5  | 36.4  | 19.4  | 10.8  | 7.0   | 4.1   | 2.1   | 5.4   | 0.0   | 0.0   |
| 70°   | 2356.5 | 287.0  | 29.4  | 14.1  | 8.3   | 5.8   | 3.3   | 0.8   | 4.1   | 0.0   | 0.0   |
| 72.5° | 1666.4 | 166.6  | 23.2  | 9.9   | 7.0   | 4.5   | 2.5   | 0.0   | 2.5   | 0.0   | 0.0   |
| 75°   | 842.7  | 88.9   | 14.5  | 7.4   | 5.4   | 3.3   | 1.7   | 0.0   | 0.4   | 0.0   | 0.0   |
| 77.5° | 182.4  | 41.3   | 9.1   | 5.4   | 3.7   | 2.1   | 0.8   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80°   | 39.7   | 18.2   | 5.8   | 3.3   | 2.1   | 1.2   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 14.5   | 9.5    | 2.9   | 1.7   | 0.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 7.9    | 5.0    | 1.7   | 0.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 4.1    | 1.7    | 0.4   | 0.4   | 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

MCGRAW, INVUE, LUMARK AND STREETWORKS

DATA VALID FOR LUMINAIRES UTILIZING SA LIGHT ENGINES

Report Number: SP1-2101-121-2

Luminaire Tested: IFLD-S-SA2A-740-U-T3R-HSS

Test Date: 03/05/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-2  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/05/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2A-740-U-T3R-HSS**  
 Description: STREETWORKS INF FLOOD

SHIELD, DRIVER PROGRAMMED @ 615mA.

### Spectral Parameters

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 3905    | CRI (Ra): | 71.2 |      |       |
| CIE u':                   | 0.2273  | R1:       | 68.9 | R9:  | -29.7 |
| CIE v':                   | 0.5024  | R2:       | 77.0 | R10: | 46.2  |
| Duv:                      | -0.0008 | R3:       | 84.0 | R11: | 68.8  |
| CIE x:                    | 0.3841  | R4:       | 71.6 | R12: | 45.6  |
| CIE y:                    | 0.3774  | R5:       | 68.9 | R13: | 69.5  |
| CIE z:                    | 0.2385  | R6:       | 68.3 | R14: | 90.7  |
| Peak Wavelength (nm):     | 443     | R7:       | 78.7 |      |       |
| Dominant Wavelength (nm): | 579     | R8:       | 52.2 |      |       |
| Purity:                   | 28.7    |           |      |      |       |
| Rf:                       | 71.7    |           |      |      |       |
| Rg:                       | 96.9    |           |      |      |       |



### Test Conditions

Stabilization Time: 211M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.8/312%  
 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 4000K 4-step quadrangle

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### Photopic Flux vs. Wavelength

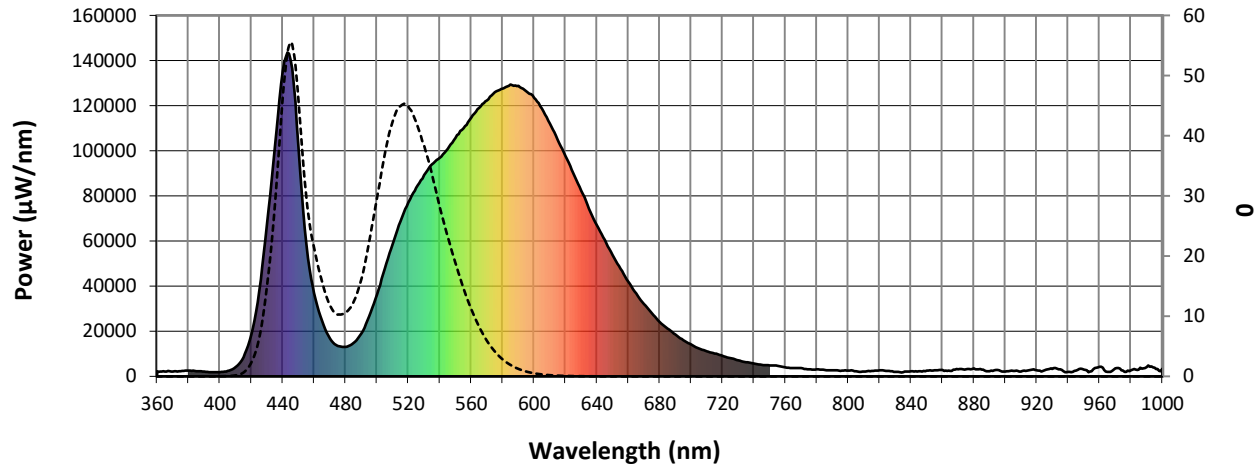


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| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2304             | 0.0              | 490       | 19043            | 2.7              | 620       | 97577            | 25.4             | 750       | 4830             | 0.0              | 880       | 3505             | 0.0              |
| 365       | 2150             | 0.0              | 495       | 26606            | 4.8              | 625       | 90158            | 19.9             | 755       | 4664             | 0.0              | 885       | 2991             | 0.0              |
| 370       | 2146             | 0.0              | 500       | 36376            | 8.0              | 630       | 82240            | 14.9             | 760       | 4006             | 0.0              | 890       | 2327             | 0.0              |
| 375       | 2332             | 0.0              | 505       | 47714            | 13.3             | 635       | 74361            | 11.2             | 765       | 3715             | 0.0              | 895       | 2775             | 0.0              |
| 380       | 2527             | 0.0              | 510       | 58741            | 20.2             | 640       | 66994            | 8.0              | 770       | 3696             | 0.0              | 900       | 2141             | 0.0              |
| 385       | 2304             | 0.0              | 515       | 68716            | 28.5             | 645       | 60405            | 5.8              | 775       | 3117             | 0.0              | 905       | 2421             | 0.0              |
| 390       | 2064             | 0.0              | 520       | 77136            | 37.4             | 650       | 53806            | 3.9              | 780       | 3062             | 0.0              | 910       | 2200             | 0.0              |
| 395       | 1856             | 0.0              | 525       | 83567            | 44.9             | 655       | 47610            | 2.7              | 785       | 2907             | 0.0              | 915       | 2716             | 0.0              |
| 400       | 1856             | 0.0              | 530       | 89283            | 52.6             | 660       | 42018            | 1.8              | 790       | 2655             | 0.0              | 920       | 2656             | 0.0              |
| 405       | 2374             | 0.0              | 535       | 94097            | 58.4             | 665       | 36742            | 1.2              | 795       | 2467             | 0.0              | 925       | 2671             | 0.0              |
| 410       | 4084             | 0.0              | 540       | 96845            | 63.1             | 670       | 32105            | 0.7              | 800       | 2609             | 0.0              | 930       | 3292             | 0.0              |
| 415       | 8543             | 0.0              | 545       | 100829           | 67.1             | 675       | 27946            | 0.5              | 805       | 2293             | 0.0              | 935       | 3188             | 0.0              |
| 420       | 18394            | 0.1              | 550       | 105648           | 71.8             | 680       | 24146            | 0.3              | 810       | 2188             | 0.0              | 940       | 1997             | 0.0              |
| 425       | 37987            | 0.2              | 555       | 110017           | 75.1             | 685       | 21191            | 0.2              | 815       | 2386             | 0.0              | 945       | 2623             | 0.0              |
| 430       | 67605            | 0.5              | 560       | 114586           | 77.9             | 690       | 18544            | 0.1              | 820       | 2712             | 0.0              | 950       | 2969             | 0.0              |
| 435       | 102160           | 1.2              | 565       | 118987           | 79.1             | 695       | 16058            | 0.1              | 825       | 2473             | 0.0              | 955       | 2277             | 0.0              |
| 440       | 135103           | 2.1              | 570       | 122326           | 79.5             | 700       | 14133            | 0.0              | 830       | 1969             | 0.0              | 960       | 4267             | 0.0              |
| 445       | 140126           | 2.9              | 575       | 125968           | 78.4             | 705       | 12309            | 0.0              | 835       | 1917             | 0.0              | 965       | 2034             | 0.0              |
| 450       | 102339           | 2.7              | 580       | 127613           | 75.8             | 710       | 11142            | 0.0              | 840       | 2248             | 0.0              | 970       | 3586             | 0.0              |
| 455       | 58751            | 2.0              | 585       | 129466           | 71.9             | 715       | 10143            | 0.0              | 845       | 2266             | 0.0              | 975       | 2505             | 0.0              |
| 460       | 36892            | 1.5              | 590       | 128813           | 66.6             | 720       | 9072             | 0.0              | 850       | 2558             | 0.0              | 980       | 2666             | 0.0              |
| 465       | 24637            | 1.3              | 595       | 126387           | 59.9             | 725       | 8130             | 0.0              | 855       | 2767             | 0.0              | 985       | 2934             | 0.0              |
| 470       | 16738            | 1.0              | 600       | 123477           | 53.2             | 730       | 7149             | 0.0              | 860       | 2826             | 0.0              | 990       | 4120             | 0.0              |
| 475       | 13456            | 1.1              | 605       | 118718           | 46.0             | 735       | 6311             | 0.0              | 865       | 2385             | 0.0              | 995       | 3858             | 0.0              |
| 480       | 13081            | 1.2              | 610       | 112091           | 38.5             | 740       | 5711             | 0.0              | 870       | 3194             | 0.0              | 1000      | 3405             | 0.0              |
| 485       | 14734            | 1.7              | 615       | 105039           | 31.7             | 745       | 5111             | 0.0              | 875       | 3189             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



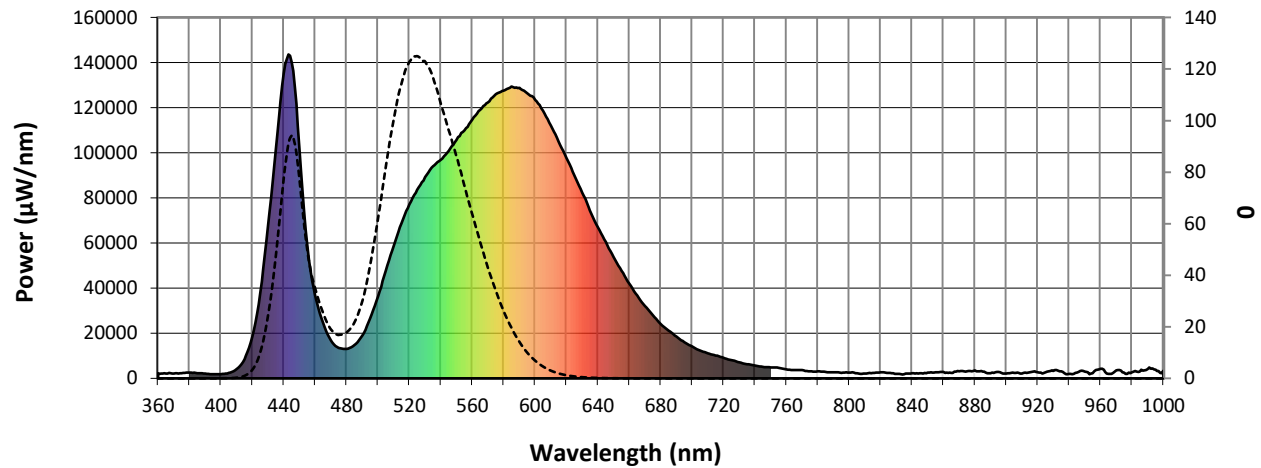
Scotopic Lumens: 10425.8

S/P: 1.47

| 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       | 2304             | 0.0              | 490       | 19043            | 29.3             | 620       | 97577            | 1.2              | 750       | 4830             | 0.0              | 880       | 3505             | 0.0              |
| 365       | 2150             | 0.0              | 495       | 26606            | 43.0             | 625       | 90158            | 0.8              | 755       | 4664             | 0.0              | 885       | 2991             | 0.0              |
| 370       | 2146             | 0.0              | 500       | 36376            | 60.8             | 630       | 82240            | 0.5              | 760       | 4006             | 0.0              | 890       | 2327             | 0.0              |
| 375       | 2332             | 0.0              | 505       | 47714            | 81.1             | 635       | 74361            | 0.3              | 765       | 3715             | 0.0              | 895       | 2775             | 0.0              |
| 380       | 2527             | 0.0              | 510       | 58741            | 99.6             | 640       | 66994            | 0.2              | 770       | 3696             | 0.0              | 900       | 2141             | 0.0              |
| 385       | 2304             | 0.0              | 515       | 68716            | 113.9            | 645       | 60405            | 0.1              | 775       | 3117             | 0.0              | 905       | 2421             | 0.0              |
| 390       | 2064             | 0.0              | 520       | 77136            | 122.6            | 650       | 53806            | 0.1              | 780       | 3062             | 0.0              | 910       | 2200             | 0.0              |
| 395       | 1856             | 0.0              | 525       | 83567            | 125.0            | 655       | 47610            | 0.0              | 785       | 2907             | 0.0              | 915       | 2716             | 0.0              |
| 400       | 1856             | 0.0              | 530       | 89283            | 123.1            | 660       | 42018            | 0.0              | 790       | 2655             | 0.0              | 920       | 2656             | 0.0              |
| 405       | 2374             | 0.1              | 535       | 94097            | 117.3            | 665       | 36742            | 0.0              | 795       | 2467             | 0.0              | 925       | 2671             | 0.0              |
| 410       | 4084             | 0.2              | 540       | 96845            | 107.0            | 670       | 32105            | 0.0              | 800       | 2609             | 0.0              | 930       | 3292             | 0.0              |
| 415       | 8543             | 0.9              | 545       | 100829           | 96.7             | 675       | 27946            | 0.0              | 805       | 2293             | 0.0              | 935       | 3188             | 0.0              |
| 420       | 18394            | 3.0              | 550       | 105648           | 86.4             | 680       | 24146            | 0.0              | 810       | 2188             | 0.0              | 940       | 1997             | 0.0              |
| 425       | 37987            | 9.3              | 555       | 110017           | 75.2             | 685       | 21191            | 0.0              | 815       | 2386             | 0.0              | 945       | 2623             | 0.0              |
| 430       | 67605            | 23.0             | 560       | 114586           | 64.0             | 690       | 18544            | 0.0              | 820       | 2712             | 0.0              | 950       | 2969             | 0.0              |
| 435       | 102160           | 45.7             | 565       | 118987           | 53.4             | 695       | 16058            | 0.0              | 825       | 2473             | 0.0              | 955       | 2277             | 0.0              |
| 440       | 135103           | 75.5             | 570       | 122326           | 43.2             | 700       | 14133            | 0.0              | 830       | 1969             | 0.0              | 960       | 4267             | 0.0              |
| 445       | 140126           | 93.8             | 575       | 125968           | 34.3             | 705       | 12309            | 0.0              | 835       | 1917             | 0.0              | 965       | 2034             | 0.0              |
| 450       | 102339           | 79.3             | 580       | 127613           | 26.3             | 710       | 11142            | 0.0              | 840       | 2248             | 0.0              | 970       | 3586             | 0.0              |
| 455       | 58751            | 51.3             | 585       | 129466           | 19.8             | 715       | 10143            | 0.0              | 845       | 2266             | 0.0              | 975       | 2505             | 0.0              |
| 460       | 36892            | 35.6             | 590       | 128813           | 14.3             | 720       | 9072             | 0.0              | 850       | 2558             | 0.0              | 980       | 2666             | 0.0              |
| 465       | 24637            | 26.0             | 595       | 126387           | 10.1             | 725       | 8130             | 0.0              | 855       | 2767             | 0.0              | 985       | 2934             | 0.0              |
| 470       | 16738            | 19.3             | 600       | 123477           | 7.0              | 730       | 7149             | 0.0              | 860       | 2826             | 0.0              | 990       | 4120             | 0.0              |
| 475       | 13456            | 16.8             | 605       | 118718           | 4.7              | 735       | 6311             | 0.0              | 865       | 2385             | 0.0              | 995       | 3858             | 0.0              |
| 480       | 13081            | 17.7             | 610       | 112091           | 3.0              | 740       | 5711             | 0.0              | 870       | 3194             | 0.0              | 1000      | 3405             | 0.0              |
| 485       | 14734            | 21.4             | 615       | 105039           | 1.9              | 745       | 5111             | 0.0              | 875       | 3189             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength



**Melanopic Lumens: 3927.2**

**M/P: 0.55**

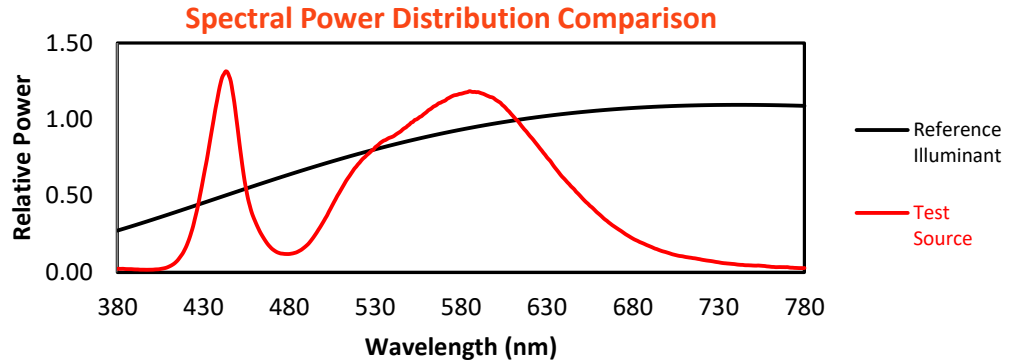
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2304             | 0.0              | 490       | 19043            | 15.8             | 620       | 97577            | 0.1              | 750       | 4830             | 0.0              | 880       | 3505             | 0.0              |
| 365       | 2150             | 0.0              | 495       | 26606            | 22.0             | 625       | 90158            | 0.0              | 755       | 4664             | 0.0              | 885       | 2991             | 0.0              |
| 370       | 2146             | 0.0              | 500       | 36376            | 29.2             | 630       | 82240            | 0.0              | 760       | 4006             | 0.0              | 890       | 2327             | 0.0              |
| 375       | 2332             | 0.0              | 505       | 47714            | 36.6             | 635       | 74361            | 0.0              | 765       | 3715             | 0.0              | 895       | 2775             | 0.0              |
| 380       | 2527             | 0.0              | 510       | 58741            | 42.2             | 640       | 66994            | 0.0              | 770       | 3696             | 0.0              | 900       | 2141             | 0.0              |
| 385       | 2304             | 0.0              | 515       | 68716            | 44.9             | 645       | 60405            | 0.0              | 775       | 3117             | 0.0              | 905       | 2421             | 0.0              |
| 390       | 2064             | 0.0              | 520       | 77136            | 44.9             | 650       | 53806            | 0.0              | 780       | 3062             | 0.0              | 910       | 2200             | 0.0              |
| 395       | 1856             | 0.0              | 525       | 83567            | 42.4             | 655       | 47610            | 0.0              | 785       | 2907             | 0.0              | 915       | 2716             | 0.0              |
| 400       | 1856             | 0.0              | 530       | 89283            | 38.6             | 660       | 42018            | 0.0              | 790       | 2655             | 0.0              | 920       | 2656             | 0.0              |
| 405       | 2374             | 0.0              | 535       | 94097            | 33.9             | 665       | 36742            | 0.0              | 795       | 2467             | 0.0              | 925       | 2671             | 0.0              |
| 410       | 4084             | 0.2              | 540       | 96845            | 28.3             | 670       | 32105            | 0.0              | 800       | 2609             | 0.0              | 930       | 3292             | 0.0              |
| 415       | 8543             | 0.6              | 545       | 100829           | 23.4             | 675       | 27946            | 0.0              | 805       | 2293             | 0.0              | 935       | 3188             | 0.0              |
| 420       | 18394            | 2.1              | 550       | 105648           | 19.0             | 680       | 24146            | 0.0              | 810       | 2188             | 0.0              | 940       | 1997             | 0.0              |
| 425       | 37987            | 5.9              | 555       | 110017           | 14.8             | 685       | 21191            | 0.0              | 815       | 2386             | 0.0              | 945       | 2623             | 0.0              |
| 430       | 67605            | 14.3             | 560       | 114586           | 11.3             | 690       | 18544            | 0.0              | 820       | 2712             | 0.0              | 950       | 2969             | 0.0              |
| 435       | 102160           | 27.3             | 565       | 118987           | 8.4              | 695       | 16058            | 0.0              | 825       | 2473             | 0.0              | 955       | 2277             | 0.0              |
| 440       | 135103           | 45.1             | 570       | 122326           | 6.0              | 700       | 14133            | 0.0              | 830       | 1969             | 0.0              | 960       | 4267             | 0.0              |
| 445       | 140126           | 55.3             | 575       | 125968           | 4.2              | 705       | 12309            | 0.0              | 835       | 1917             | 0.0              | 965       | 2034             | 0.0              |
| 450       | 102339           | 47.2             | 580       | 127613           | 2.9              | 710       | 11142            | 0.0              | 840       | 2248             | 0.0              | 970       | 3586             | 0.0              |
| 455       | 58751            | 30.8             | 585       | 129466           | 1.9              | 715       | 10143            | 0.0              | 845       | 2266             | 0.0              | 975       | 2505             | 0.0              |
| 460       | 36892            | 21.7             | 590       | 128813           | 1.3              | 720       | 9072             | 0.0              | 850       | 2558             | 0.0              | 980       | 2666             | 0.0              |
| 465       | 24637            | 16.1             | 595       | 126387           | 0.8              | 725       | 8130             | 0.0              | 855       | 2767             | 0.0              | 985       | 2934             | 0.0              |
| 470       | 16738            | 12.0             | 600       | 123477           | 0.5              | 730       | 7149             | 0.0              | 860       | 2826             | 0.0              | 990       | 4120             | 0.0              |
| 475       | 13456            | 10.3             | 605       | 118718           | 0.3              | 735       | 6311             | 0.0              | 865       | 2385             | 0.0              | 995       | 3858             | 0.0              |
| 480       | 13081            | 10.5             | 610       | 112091           | 0.2              | 740       | 5711             | 0.0              | 870       | 3194             | 0.0              | 1000      | 3405             | 0.0              |
| 485       | 14734            | 12.1             | 615       | 105039           | 0.1              | 745       | 5111             | 0.0              | 875       | 3189             | 0.0              |           |                  |                  |

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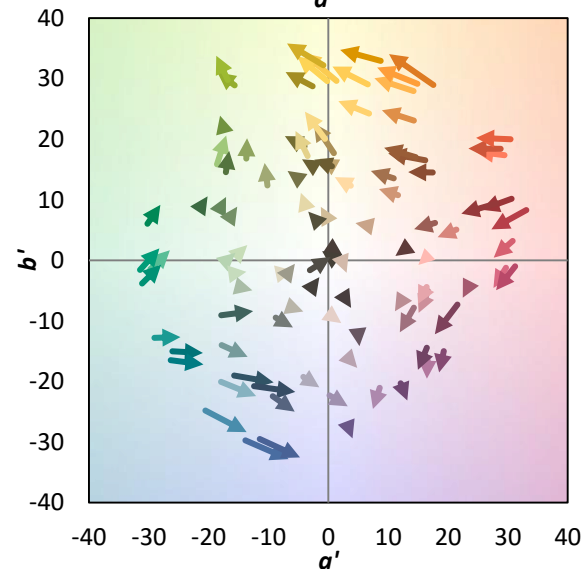
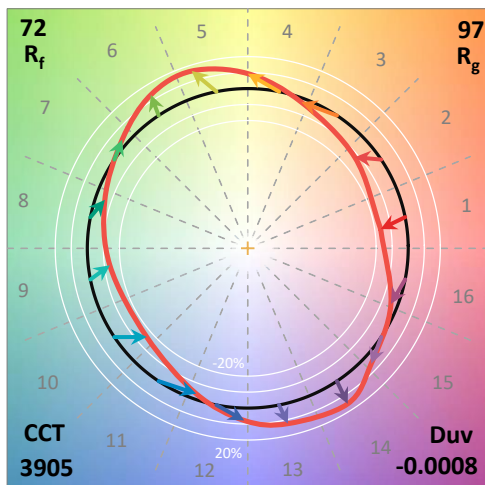
TM-30-18

### Summary

$R_f = 71.7$   
 $R_g = 96.9$   
 CIE  $R_a = 71.2$   
 $R_g = -29.7$



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 55 | CES51 = 86 | CES76 = 45 |
| CES02 = 61 | CES27 = 80 | CES52 = 87 | CES77 = 68 |
| CES03 = 30 | CES28 = 79 | CES53 = 74 | CES78 = 49 |
| CES04 = 70 | CES29 = 51 | CES54 = 81 | CES79 = 77 |
| CES05 = 47 | CES30 = 60 | CES55 = 80 | CES80 = 75 |
| CES06 = 50 | CES31 = 56 | CES56 = 69 | CES81 = 75 |
| CES07 = 40 | CES32 = 52 | CES57 = 67 | CES82 = 90 |
| CES08 = 39 | CES33 = 62 | CES58 = 69 | CES83 = 85 |
| CES09 = 29 | CES34 = 65 | CES59 = 86 | CES84 = 87 |
| CES10 = 74 | CES35 = 81 | CES60 = 91 | CES85 = 83 |
| CES11 = 57 | CES36 = 92 | CES61 = 85 | CES86 = 72 |
| CES12 = 63 | CES37 = 74 | CES62 = 81 | CES87 = 77 |
| CES13 = 42 | CES38 = 69 | CES63 = 72 | CES88 = 77 |
| CES14 = 74 | CES39 = 92 | CES64 = 69 | CES89 = 72 |
| CES15 = 71 | CES40 = 86 | CES65 = 64 | CES90 = 75 |
| CES16 = 46 | CES41 = 84 | CES66 = 63 | CES91 = 91 |
| CES17 = 49 | CES42 = 75 | CES67 = 60 | CES92 = 66 |
| CES18 = 56 | CES43 = 70 | CES68 = 67 | CES93 = 80 |
| CES19 = 72 | CES44 = 98 | CES69 = 77 | CES94 = 56 |
| CES20 = 65 | CES45 = 80 | CES70 = 57 | CES95 = 72 |
| CES21 = 86 | CES46 = 77 | CES71 = 53 | CES96 = 78 |
| CES22 = 78 | CES47 = 74 | CES72 = 84 | CES97 = 83 |
| CES23 = 92 | CES48 = 66 | CES73 = 47 | CES98 = 73 |
| CES24 = 91 | CES49 = 76 | CES74 = 96 | CES99 = 63 |
| CES25 = 72 | CES50 = 85 | CES75 = 52 |            |



### Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)