

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: P320962

Luminaire Tested: **GLEON-SA8B-740-U-AFL**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P320962  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-29)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA8B-740-U-AFL  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(8) 70 CRI, 4000K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND AUTOMOTIVE  
FRONTLINE OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 46987 lumens  
Efficiency: N/A  
Efficacy: 140.7 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B3 - U0 - G3

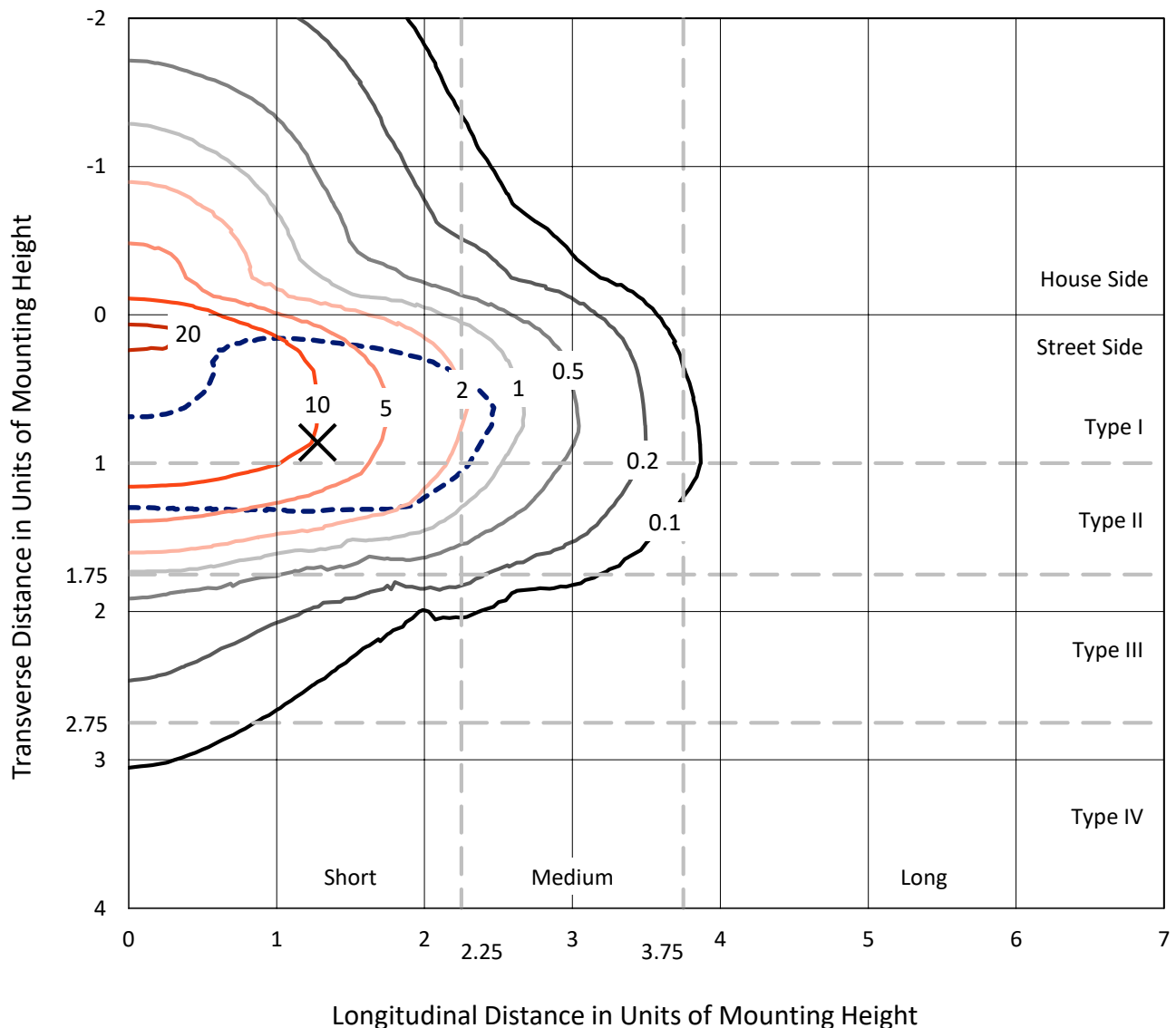
Input Watts (W): 334  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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 CATALOG NUMBER: GLEON-SA8B-740-U-AFL

## Iso-Footcandle Lines of Horizontal Illumination

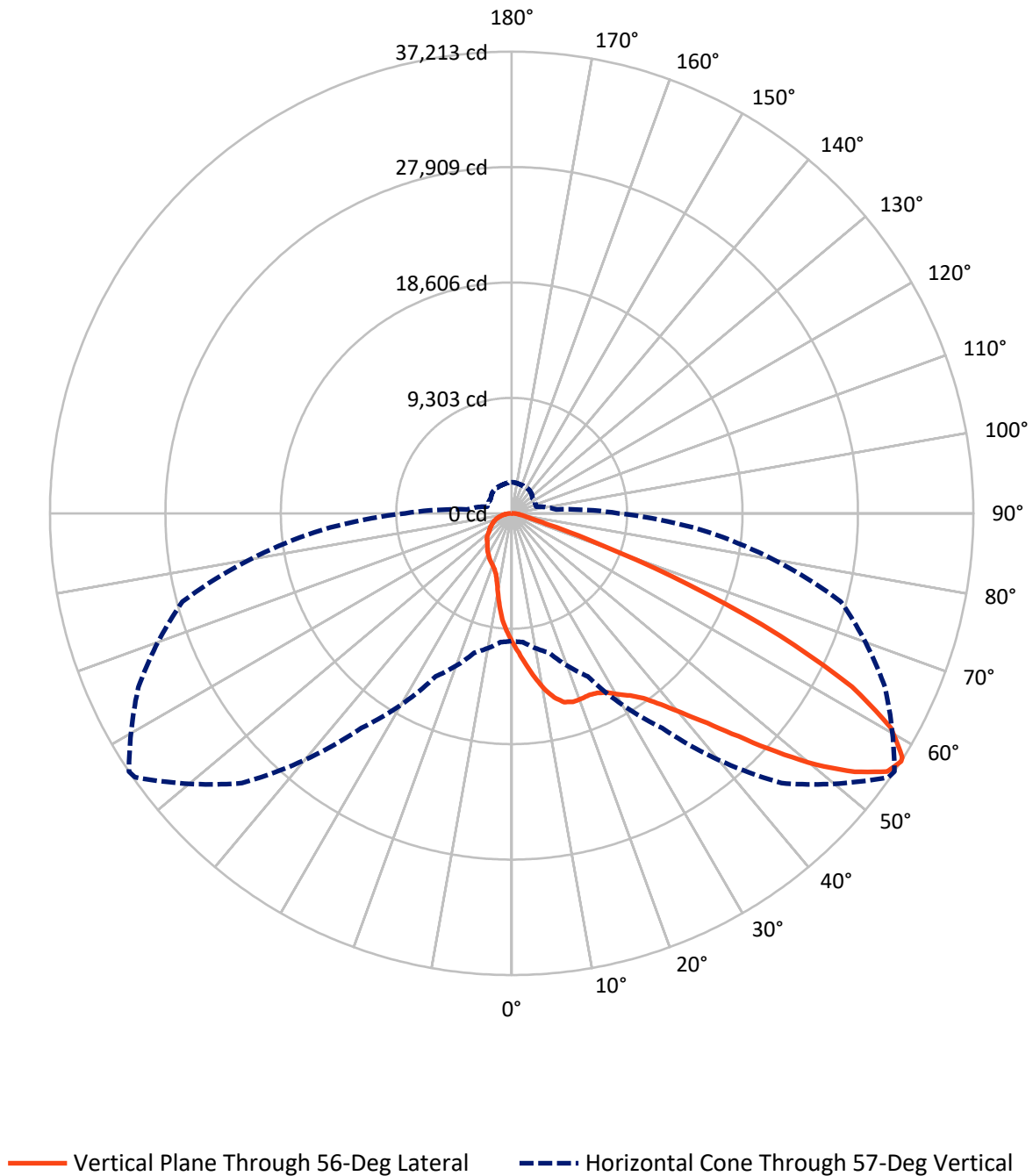
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 23.1 fc  
 Type II - Short - N/A

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## Luminous Intensity Polar Plot



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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 8099.6   | 0.0    | 8099.6  |
|                    | % Fixture | 17.2     | 0.0    | 17.2    |
| <b>Street Side</b> | Lumens    | 38887.4  | 0.0    | 38887.4 |
|                    | % Fixture | 82.8     | 0.0    | 82.8    |
| <b>Total</b>       | Lumens    | 46987.0  | 0.0    | 46987.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 995.5   | 2.1       |
| 10°-20°   | 2814.6  | 6.0       |
| 20°-30°   | 4584.5  | 9.8       |
| 30°-40°   | 6853.3  | 14.6      |
| 40°-50°   | 10395.0 | 22.1      |
| 50°-60°   | 11650.9 | 24.8      |
| 60°-70°   | 6881.5  | 14.6      |
| 70°-80°   | 2254.6  | 4.8       |
| 80°-90°   | 557.0   | 1.2       |
| 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°    | 46987.0 | 100.0     |
| 0°-180°   | 46987.0 | 100.0     |

**Coefficient of Utilization**



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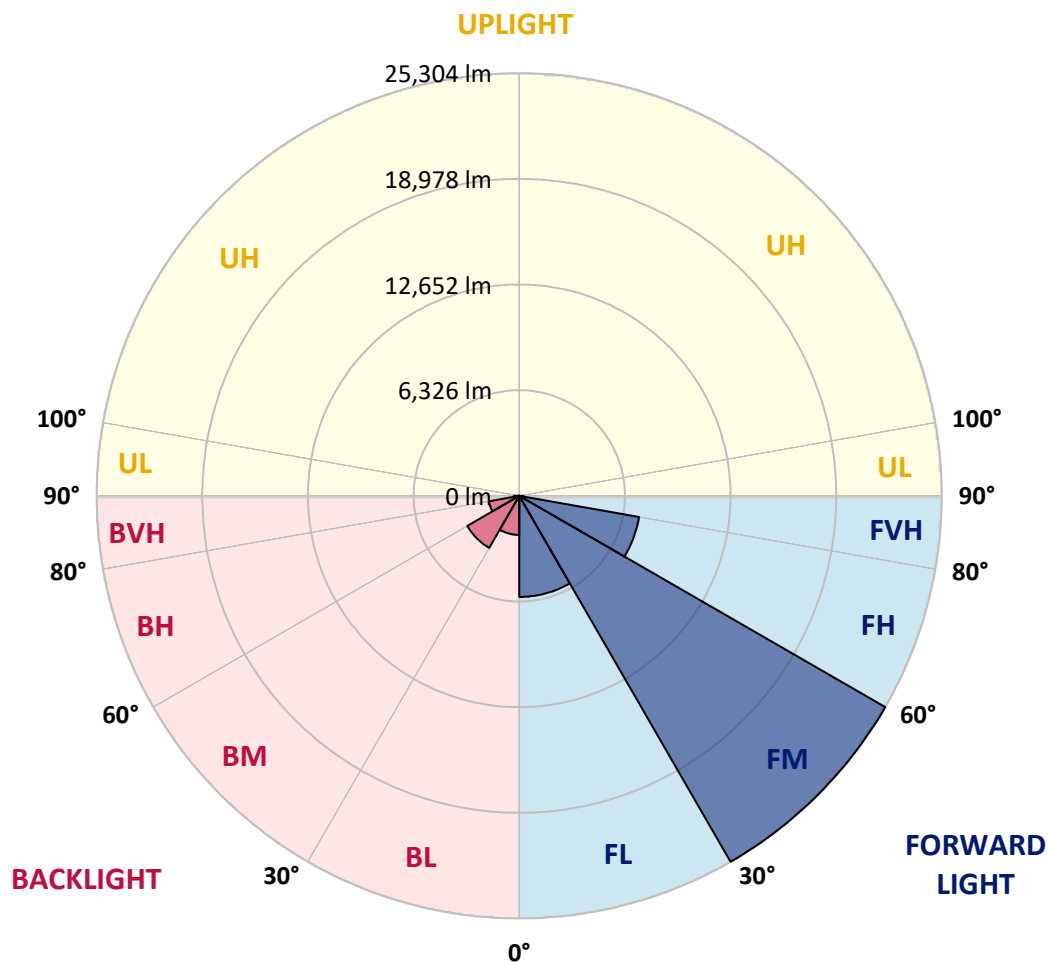
CATALOG NUMBER: GLEON-SA8B-740-U-AFL

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|---------|-----------|-------------------------|------|---------|
|      |             |         |           | B                       | U    | G       |
| FL   | (0°-30°)    | 6052.6  | 12.9      |                         |      |         |
| FM   | (30°-60°)   | 25304.1 | 53.9      |                         |      |         |
| FH   | (60°-80°)   | 7285.5  | 15.5      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 245.3   | 0.5       |                         |      | G3/500  |
| BL   | (0°-30°)    | 2342.0  | 5.0       | B3/2500                 |      |         |
| BM   | (30°-60°)   | 3595.1  | 7.7       | B3/5000                 |      |         |
| BH   | (60°-80°)   | 1850.7  | 3.9       | B3/2500                 |      | G3/2500 |
| BVH  | (80°-90°)   | 311.8   | 0.7       |                         |      | G3/500  |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G3**

Type II Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 56°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 10421.8 | 10421.8 | 10421.8 | 10421.8 | 10421.8 | 10421.8 | 10421.8 | 10421.8 | 10421.8 | 10421.8 | 10421.8 |
| 2.5°  | 11967.1 | 12076.9 | 12028.5 | 11860.5 | 11731.3 | 11548.9 | 11345.4 | 11284.0 | 11069.3 | 10828.7 | 10539.6 |
| 5°    | 13861.2 | 13806.3 | 13727.2 | 13465.6 | 13189.5 | 12868.1 | 12357.9 | 12277.1 | 11799.2 | 11255.0 | 10680.1 |
| 7.5°  | 14939.9 | 14935.1 | 14888.2 | 14734.8 | 14482.9 | 14063.1 | 13447.8 | 13352.6 | 12630.8 | 11755.6 | 10864.2 |
| 10°   | 14783.3 | 14772.0 | 14849.5 | 15009.3 | 15085.2 | 14998.0 | 14479.7 | 14384.4 | 13497.9 | 12309.4 | 11077.4 |
| 12.5° | 13893.5 | 13900.0 | 14024.3 | 14360.2 | 14817.2 | 15366.2 | 15282.2 | 15235.4 | 14397.3 | 12936.0 | 11335.7 |
| 15°   | 13200.8 | 13215.3 | 13313.8 | 13606.1 | 14145.4 | 15141.7 | 15769.9 | 15786.0 | 15267.7 | 13627.1 | 11637.7 |
| 17.5° | 12897.2 | 12927.9 | 12973.1 | 13178.2 | 13672.3 | 14694.5 | 15886.2 | 15973.4 | 16029.9 | 14344.0 | 11928.3 |
| 20°   | 12994.1 | 13023.2 | 13036.1 | 13166.9 | 13572.2 | 14423.2 | 15805.4 | 15962.1 | 16614.4 | 15019.0 | 12219.0 |
| 22.5° | 13428.5 | 13446.2 | 13454.3 | 13488.2 | 13803.1 | 14500.7 | 15752.1 | 15916.8 | 17037.5 | 15624.6 | 12438.6 |
| 25°   | 14148.7 | 14135.7 | 14084.1 | 14040.5 | 14252.0 | 14807.5 | 15874.9 | 16031.5 | 17381.4 | 16173.6 | 12582.3 |
| 27.5° | 15011.0 | 14994.8 | 14894.7 | 14775.2 | 14896.3 | 15285.5 | 16228.5 | 16352.8 | 17689.9 | 16687.1 | 12655.0 |
| 30°   | 16046.0 | 16004.0 | 15815.1 | 15673.0 | 15719.8 | 16002.4 | 16811.4 | 16924.5 | 18166.2 | 17270.0 | 12726.0 |
| 32.5° | 17242.6 | 17197.4 | 16924.5 | 16688.7 | 16688.7 | 16924.5 | 17412.1 | 17505.8 | 18569.9 | 17928.8 | 12840.7 |
| 35°   | 18741.1 | 18684.6 | 18329.3 | 17933.7 | 17822.3 | 17941.8 | 18230.8 | 18297.0 | 19296.6 | 18758.8 | 13049.0 |
| 37.5° | 20507.6 | 20431.8 | 19971.5 | 19441.9 | 19198.1 | 19191.6 | 19399.9 | 19535.6 | 20457.6 | 19848.8 | 13402.6 |
| 40°   | 22279.1 | 22225.8 | 21823.7 | 21407.1 | 20929.1 | 20775.7 | 21097.0 | 21139.0 | 21975.5 | 21202.0 | 13854.8 |
| 42.5° | 23648.4 | 23638.7 | 23564.4 | 23619.3 | 23130.0 | 22820.0 | 23071.9 | 23105.8 | 23829.2 | 22666.6 | 14336.0 |
| 45°   | 24371.8 | 24388.0 | 24748.0 | 25545.7 | 25726.6 | 25500.5 | 25624.9 | 25634.6 | 25947.8 | 24144.1 | 14776.8 |
| 47.5° | 23792.1 | 23876.1 | 24786.8 | 26571.1 | 28051.9 | 28802.7 | 28596.1 | 28715.5 | 28001.8 | 25413.3 | 15122.4 |
| 50°   | 21533.0 | 21636.4 | 23186.6 | 26114.1 | 29137.0 | 31998.4 | 31890.2 | 31862.7 | 29658.6 | 26343.4 | 15309.7 |
| 52.5° | 18734.6 | 18815.4 | 20094.3 | 23738.8 | 28340.9 | 33765.0 | 34758.0 | 34615.9 | 31131.3 | 27039.4 | 15345.2 |
| 55°   | 14473.2 | 14599.2 | 15824.8 | 18997.8 | 25121.1 | 33090.0 | 36866.9 | 36739.4 | 32473.1 | 27404.4 | 15303.2 |
| 57°   | 10289.3 | 10421.8 | 11639.3 | 14499.1 | 21132.6 | 30753.4 | 37076.9 | 37212.5 | 33198.2 | 27465.7 | 15350.1 |
| 57.5° | 9181.6  | 9317.3  | 10523.5 | 13300.9 | 19889.2 | 29908.9 | 36896.0 | 37122.1 | 33329.0 | 27456.0 | 15375.9 |
| 60°   | 4623.1  | 4674.8  | 5443.4  | 7424.7  | 12572.6 | 24179.6 | 34536.8 | 35119.7 | 33446.8 | 26981.3 | 15487.3 |
| 62.5° | 2874.3  | 2837.2  | 2812.9  | 3420.1  | 6116.8  | 16034.7 | 29668.3 | 30790.5 | 31191.0 | 25831.6 | 15217.6 |
| 65°   | 2527.1  | 2457.7  | 2191.2  | 2142.8  | 2701.5  | 7788.1  | 22342.0 | 23738.8 | 26370.9 | 24019.8 | 14575.0 |
| 67.5° | 2373.7  | 2305.9  | 2005.6  | 1824.7  | 1826.3  | 3087.5  | 13870.9 | 15443.7 | 20543.2 | 20956.6 | 13058.7 |
| 70°   | 2215.5  | 2154.1  | 1873.1  | 1660.0  | 1555.0  | 1710.0  | 6381.6  | 7574.9  | 13391.3 | 16472.3 | 10914.3 |
| 72.5° | 2012.0  | 1970.0  | 1703.6  | 1484.0  | 1372.6  | 1280.5  | 2443.2  | 2885.6  | 7752.5  | 11062.8 | 7579.8  |
| 75°   | 1798.9  | 1760.1  | 1532.4  | 1322.5  | 1186.9  | 1007.6  | 1375.8  | 1482.4  | 3938.4  | 5659.8  | 3731.7  |
| 77.5° | 1564.7  | 1542.1  | 1362.9  | 1169.1  | 1060.9  | 834.8   | 973.7   | 1025.4  | 1689.1  | 2427.0  | 1871.5  |
| 80°   | 1245.0  | 1288.6  | 1191.7  | 1041.5  | 941.4   | 668.5   | 689.5   | 723.4   | 983.4   | 1185.2  | 1062.5  |
| 82.5° | 810.6   | 886.5   | 933.3   | 846.1   | 775.1   | 526.4   | 495.7   | 510.3   | 641.1   | 723.4   | 461.8   |
| 85°   | 337.5   | 379.5   | 613.6   | 553.9   | 515.1   | 384.3   | 332.6   | 339.1   | 397.2   | 411.8   | 188.9   |
| 87.5° | 150.2   | 159.9   | 269.7   | 253.5   | 218.0   | 132.4   | 142.1   | 155.0   | 211.5   | 200.2   | 72.7    |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



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CATALOG NUMBER: GLEON-SA8B-740-U-AFL

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°    | 115°    | 125°    | 135°    | 145°    | 155°    | 165°    | 175°    | 180°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 10421.8 | 10421.8 | 10421.8 | 10421.8 | 10421.8 | 10421.8 | 10421.8 | 10421.8 | 10421.8 | 10421.8 | 10421.8 |
| 2.5°  | 10431.4 | 10295.8 | 10063.3 | 9806.5  | 9596.6  | 9428.7  | 9259.1  | 9142.9  | 9007.2  | 8934.6  | 8897.4  |
| 5°    | 10439.5 | 10173.1 | 9683.8  | 9181.6  | 8732.7  | 8322.6  | 7931.8  | 7631.4  | 7350.5  | 7198.7  | 7156.7  |
| 7.5°  | 10473.4 | 10073.0 | 9281.7  | 8455.0  | 7657.3  | 6929.0  | 6367.1  | 6015.0  | 5761.5  | 5648.5  | 5616.2  |
| 10°   | 10500.9 | 9955.1  | 8784.4  | 7560.4  | 6475.2  | 5737.3  | 5301.3  | 5104.3  | 5017.1  | 5002.6  | 4988.0  |
| 12.5° | 10565.5 | 9834.0  | 8261.2  | 6627.0  | 5556.4  | 5046.2  | 4894.4  | 4881.5  | 4905.7  | 4941.2  | 4941.2  |
| 15°   | 10667.2 | 9714.5  | 7663.7  | 5826.1  | 4971.9  | 4792.7  | 4823.3  | 4894.4  | 4960.6  | 5015.5  | 5023.6  |
| 17.5° | 10741.5 | 9567.5  | 7021.0  | 5185.0  | 4660.2  | 4708.7  | 4818.5  | 4918.6  | 4986.4  | 5039.7  | 5044.6  |
| 20°   | 10794.8 | 9339.9  | 6334.8  | 4695.8  | 4481.0  | 4631.2  | 4768.4  | 4857.2  | 4904.1  | 4957.4  | 4965.4  |
| 22.5° | 10767.3 | 9034.7  | 5726.0  | 4345.4  | 4335.7  | 4518.1  | 4648.9  | 4755.5  | 4720.0  | 4668.3  | 4702.2  |
| 25°   | 10634.9 | 8614.8  | 5099.5  | 4083.8  | 4182.3  | 4366.4  | 4527.8  | 4456.8  | 4337.3  | 4314.7  | 4327.6  |
| 27.5° | 10399.2 | 8078.7  | 4519.8  | 3841.6  | 4004.6  | 4225.9  | 4216.2  | 4145.1  | 4103.1  | 4074.1  | 4091.8  |
| 30°   | 10145.6 | 7497.4  | 4012.7  | 3630.0  | 3807.6  | 3990.1  | 3953.0  | 3951.4  | 3909.4  | 3862.5  | 3885.1  |
| 32.5° | 9895.3  | 6912.9  | 3610.6  | 3455.6  | 3659.1  | 3683.3  | 3764.0  | 3788.3  | 3705.9  | 3607.4  | 3600.9  |
| 35°   | 9677.3  | 6360.6  | 3305.4  | 3297.4  | 3479.8  | 3483.1  | 3600.9  | 3567.0  | 3362.0  | 3260.2  | 3260.2  |
| 37.5° | 9514.3  | 5810.0  | 3072.9  | 3155.3  | 3244.1  | 3328.1  | 3387.8  | 3247.3  | 3213.4  | 3156.9  | 3155.3  |
| 40°   | 9443.2  | 5325.5  | 2927.6  | 3047.1  | 3077.8  | 3184.3  | 3030.9  | 3085.8  | 3102.0  | 3072.9  | 3072.9  |
| 42.5° | 9368.9  | 4904.1  | 2801.6  | 2964.7  | 2959.9  | 2945.4  | 2867.8  | 2938.9  | 3003.5  | 3005.1  | 3000.3  |
| 45°   | 9294.6  | 4540.7  | 2690.2  | 2788.7  | 2856.5  | 2699.9  | 2714.4  | 2790.3  | 2880.8  | 2913.1  | 2913.1  |
| 47.5° | 9212.3  | 4253.3  | 2588.5  | 2603.0  | 2708.0  | 2603.0  | 2591.7  | 2649.8  | 2756.4  | 2808.1  | 2819.4  |
| 50°   | 9031.4  | 3995.0  | 2472.2  | 2439.9  | 2469.0  | 2504.5  | 2514.2  | 2541.7  | 2659.5  | 2741.9  | 2761.3  |
| 52.5° | 8781.1  | 3764.0  | 2323.7  | 2289.8  | 2289.8  | 2423.8  | 2469.0  | 2477.1  | 2577.2  | 2675.7  | 2695.1  |
| 55°   | 8572.8  | 3617.1  | 2170.3  | 2163.8  | 2157.3  | 2338.2  | 2415.7  | 2428.6  | 2498.1  | 2575.6  | 2585.3  |
| 57°   | 8587.4  | 3605.8  | 2052.4  | 2058.8  | 2057.2  | 2251.0  | 2365.6  | 2393.1  | 2428.6  | 2494.8  | 2506.1  |
| 57.5° | 8595.4  | 3613.9  | 2026.5  | 2029.8  | 2028.2  | 2226.8  | 2351.1  | 2381.8  | 2409.2  | 2478.7  | 2490.0  |
| 60°   | 8716.6  | 3634.9  | 1921.6  | 1886.1  | 1894.1  | 2097.6  | 2268.8  | 2307.5  | 2325.3  | 2417.3  | 2431.9  |
| 62.5° | 8537.3  | 3541.2  | 1837.6  | 1752.0  | 1752.0  | 1962.0  | 2154.1  | 2215.5  | 2242.9  | 2367.3  | 2391.5  |
| 65°   | 8017.4  | 3278.0  | 1739.1  | 1600.2  | 1616.4  | 1826.3  | 2016.9  | 2117.0  | 2159.0  | 2314.0  | 2339.8  |
| 67.5° | 7214.8  | 2972.8  | 1634.2  | 1464.6  | 1480.7  | 1684.2  | 1874.8  | 1982.9  | 2049.1  | 2255.8  | 2276.8  |
| 70°   | 6170.1  | 2599.8  | 1492.1  | 1320.9  | 1340.3  | 1529.2  | 1706.8  | 1829.5  | 1928.0  | 2200.9  | 2207.4  |
| 72.5° | 4548.8  | 2131.5  | 1293.4  | 1162.6  | 1183.6  | 1348.3  | 1537.3  | 1679.4  | 1811.8  | 2063.7  | 2060.5  |
| 75°   | 2704.7  | 1666.4  | 1073.8  | 1002.8  | 1017.3  | 1170.7  | 1383.9  | 1556.6  | 1755.3  | 2010.4  | 2041.1  |
| 77.5° | 1640.6  | 1254.7  | 875.2   | 839.7   | 857.4   | 1014.1  | 1274.1  | 1458.1  | 1731.0  | 1895.7  | 1886.1  |
| 80°   | 991.5   | 896.2   | 699.2   | 676.6   | 694.4   | 867.1   | 1178.8  | 1383.9  | 1513.0  | 1619.6  | 1619.6  |
| 82.5° | 518.3   | 547.4   | 513.5   | 495.7   | 520.0   | 704.0   | 1072.2  | 1207.9  | 1337.0  | 1148.1  | 1072.2  |
| 85°   | 211.5   | 285.8   | 311.7   | 310.0   | 324.6   | 487.7   | 925.3   | 1033.5  | 862.3   | 818.7   | 838.1   |
| 87.5° | 71.1    | 121.1   | 151.8   | 130.8   | 137.3   | 306.8   | 641.1   | 499.0   | 592.6   | 413.4   | 392.4   |
| 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



#####

| 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              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-2

### Scotopic Flux vs. Wavelength



Scotopic Lumens: 10425.8

S/P: 1.47

| $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) |
|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|
| 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              |           |                  |                  |

### 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)