

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: P323642

Luminaire Tested: **GLEON-SA8B-827-U-SL3-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P323642  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-23)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA8B-827-U-SL3-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(8) 80 CRI, 2700K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III  
SPILL LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 28764 lumens  
Efficiency: N/A  
Efficacy: 86.1 lumens/watt  
Luminous Opening: Rectangular (W 2' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B2 - U0 - G4

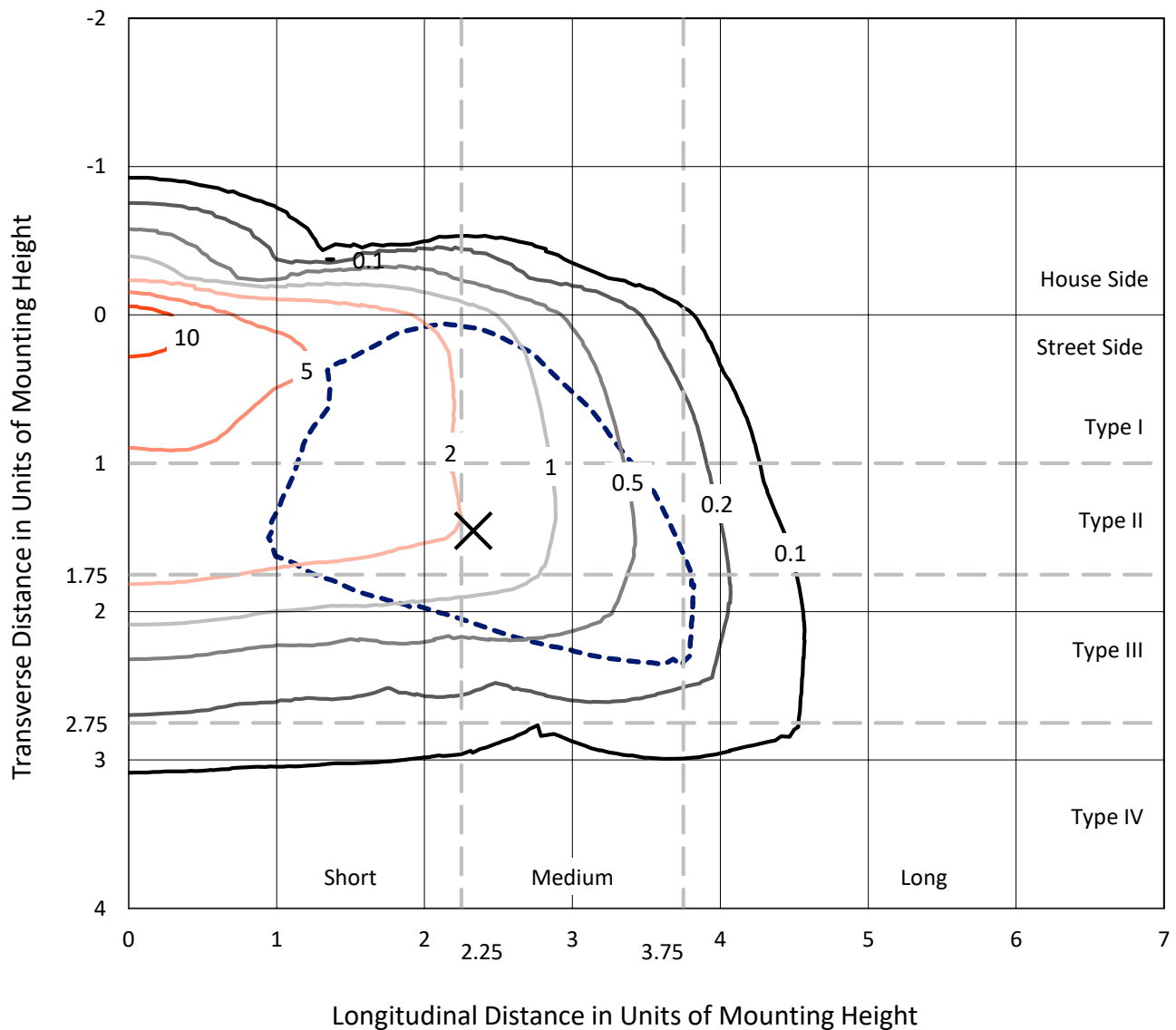
Input Watts (W): 334  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P323642  
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## Iso-Footcandle Lines of Horizontal Illumination

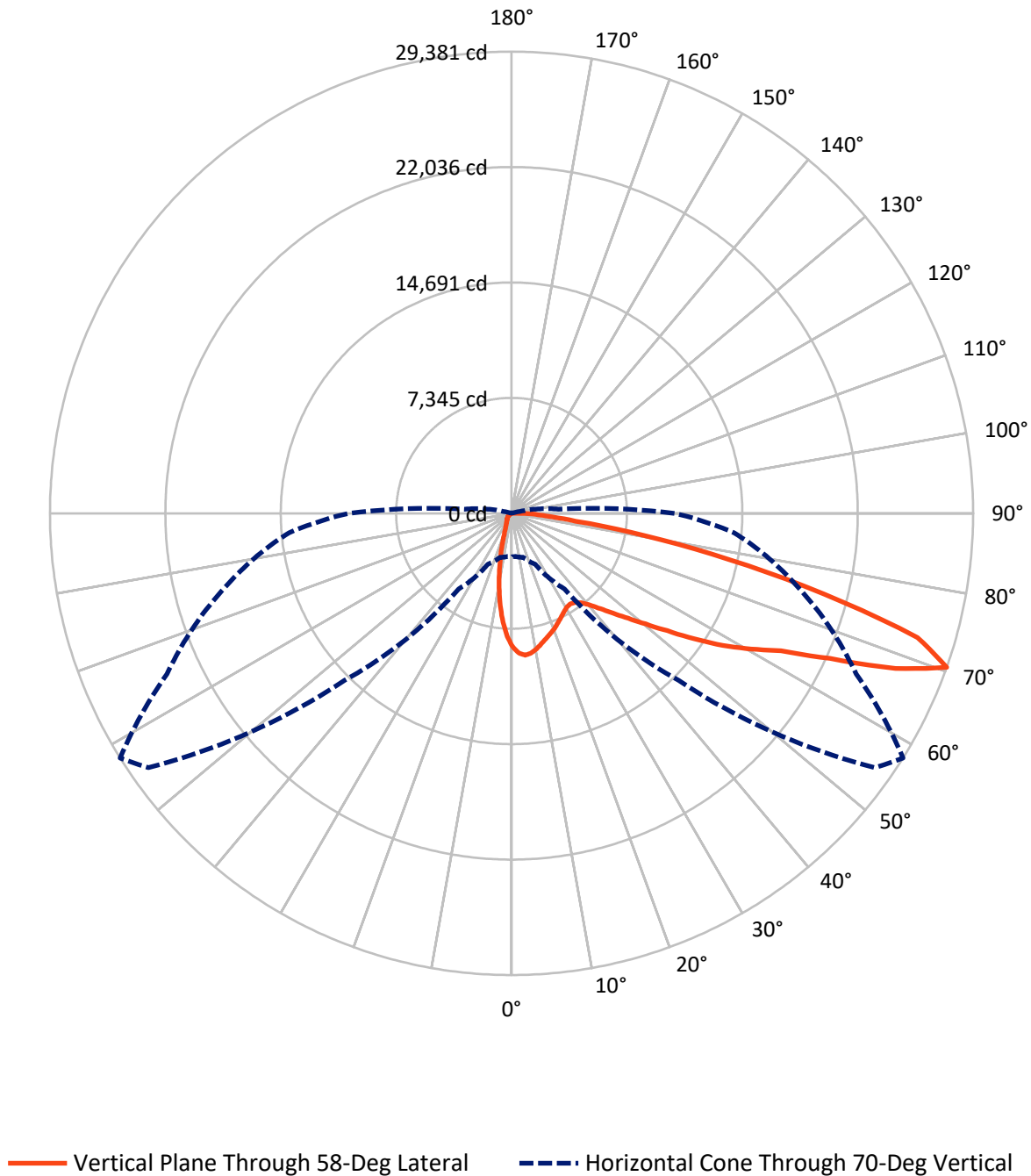
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 13.8 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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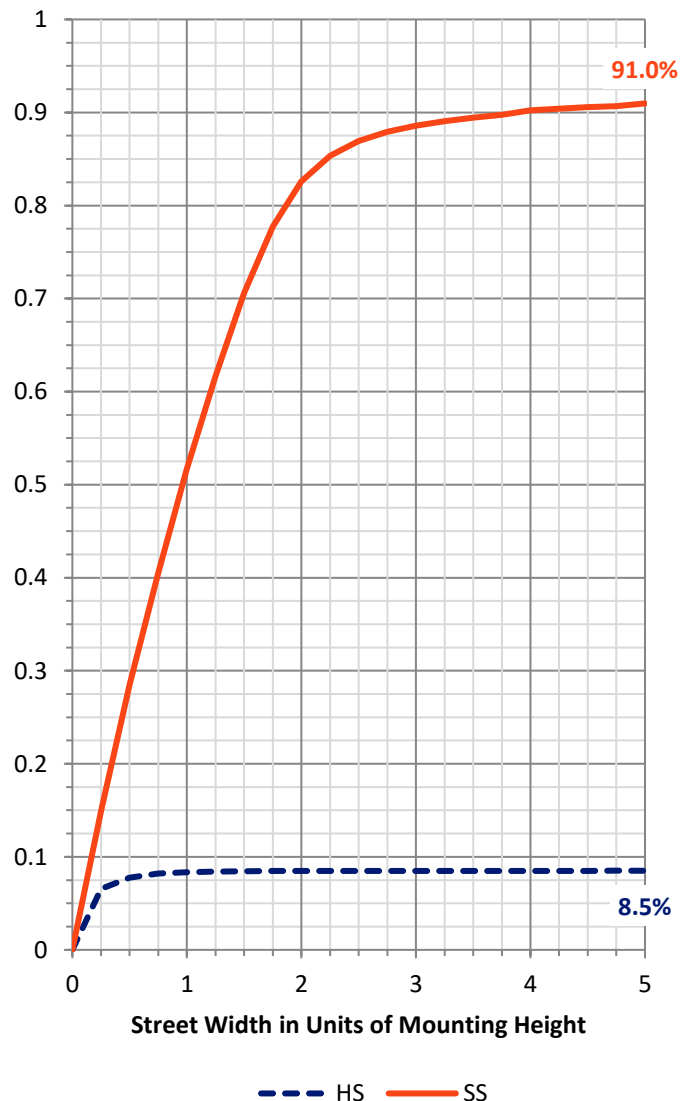
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2461.6   | 0.0    | 2461.6  |
|                    | % Fixture | 8.6      | 0.0    | 8.6     |
| <b>Street Side</b> | Lumens    | 26302.4  | 0.0    | 26302.4 |
|                    | % Fixture | 91.4     | 0.0    | 91.4    |
| <b>Total</b>       | Lumens    | 28764.0  | 0.0    | 28764.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 694.8   | 2.4       |
| 10°-20°   | 1458.3  | 5.1       |
| 20°-30°   | 1917.1  | 6.7       |
| 30°-40°   | 2539.0  | 8.8       |
| 40°-50°   | 3795.0  | 13.2      |
| 50°-60°   | 6079.5  | 21.1      |
| 60°-70°   | 7663.1  | 26.6      |
| 70°-80°   | 4133.4  | 14.4      |
| 80°-90°   | 483.8   | 1.7       |
| 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°    | 28764.0 | 100.0     |
| 0°-180°   | 28764.0 | 100.0     |

**Coefficient of Utilization**



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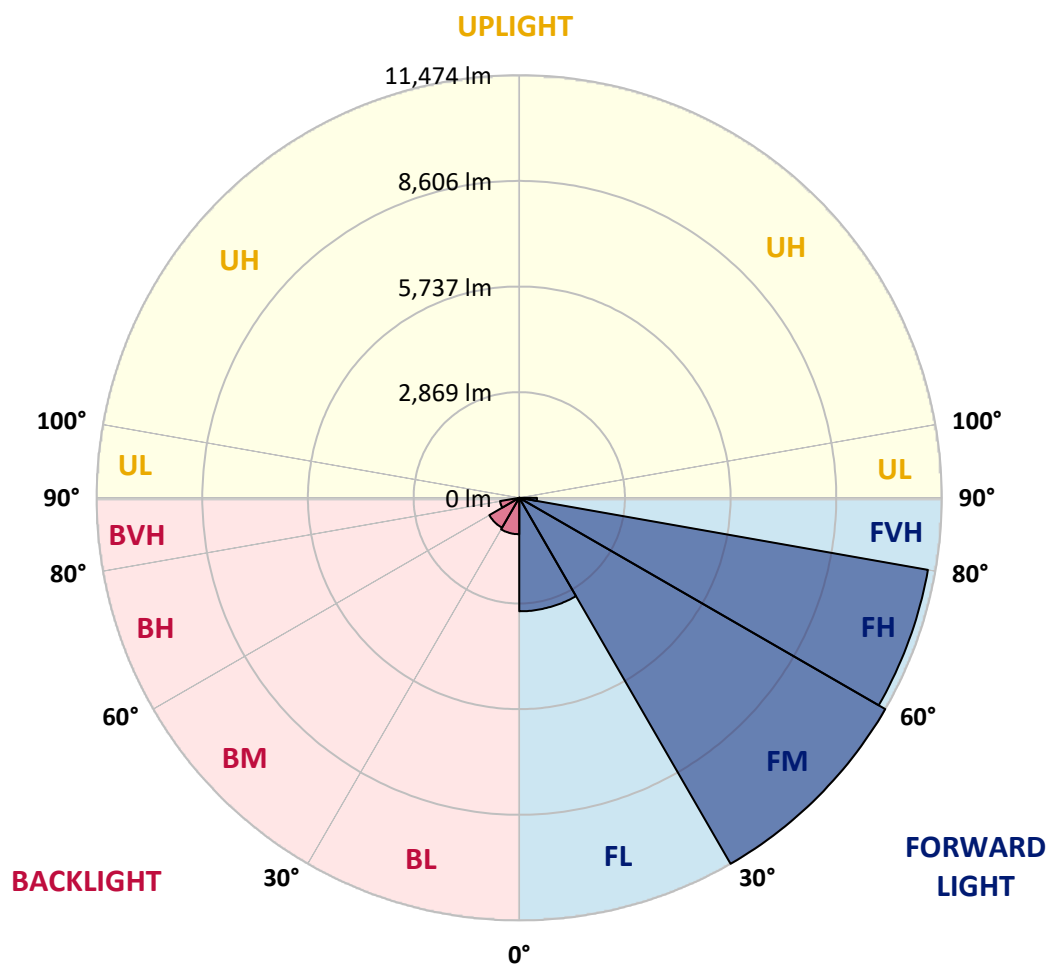
CATALOG NUMBER: GLEON-SA8B-827-U-SL3-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 3081.2  | 10.7      |                         |      |          |
| FM   | (30°-60°)   | 11474.4 | 39.9      |                         |      |          |
| FH   | (60°-80°)   | 11267.2 | 39.2      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 479.7   | 1.7       |                         |      | G3/500   |
| BL   | (0°-30°)    | 989.0   | 3.4       | B2/1000                 |      |          |
| BM   | (30°-60°)   | 939.1   | 3.3       | B1/1000                 |      |          |
| BH   | (60°-80°)   | 529.4   | 1.8       | B2/1000                 |      | G2/1000  |
| BVH  | (80°-90°)   | 4.2     | 0.0       |                         |      | G0/10    |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |          |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |          |

**BUG Rating: B2-U0-G4**

Type III Medium





REPORT NUMBER: P323642

CATALOG NUMBER: GLEON-SA8B-827-U-SL3-HSS

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 58°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 8496.7  | 8496.7  | 8496.7  | 8496.7  | 8496.7  | 8496.7  | 8496.7  | 8496.7  | 8496.7  | 8496.7  | 8496.7  |
| 2.5°  | 9201.2  | 9178.5  | 9170.1  | 9155.8  | 9100.8  | 9046.9  | 8940.5  | 8910.6  | 8843.6  | 8684.5  | 8515.9  |
| 5°    | 9208.4  | 9207.2  | 9232.3  | 9226.3  | 9207.2  | 9182.1  | 9105.5  | 9066.1  | 8952.4  | 8725.2  | 8416.6  |
| 7.5°  | 8764.7  | 8787.4  | 8843.6  | 8889.1  | 8941.7  | 9009.9  | 9019.4  | 8981.2  | 8887.9  | 8642.7  | 8233.6  |
| 10°   | 8169.0  | 8204.9  | 8283.9  | 8373.6  | 8511.1  | 8647.5  | 8769.4  | 8764.7  | 8732.4  | 8490.8  | 8013.5  |
| 12.5° | 7572.2  | 7614.1  | 7705.0  | 7837.7  | 8032.7  | 8255.1  | 8472.8  | 8502.7  | 8556.6  | 8354.4  | 7810.2  |
| 15°   | 7049.5  | 7085.4  | 7175.1  | 7337.8  | 7579.4  | 7878.4  | 8197.7  | 8252.8  | 8391.5  | 8248.0  | 7640.4  |
| 17.5° | 6605.8  | 6628.5  | 6694.3  | 6874.9  | 7154.8  | 7517.2  | 7932.2  | 8039.9  | 8246.8  | 8164.2  | 7493.3  |
| 20°   | 6296.0  | 6299.6  | 6342.7  | 6469.4  | 6749.3  | 7154.8  | 7657.1  | 7811.4  | 8093.7  | 8092.5  | 7341.4  |
| 22.5° | 6142.9  | 6131.0  | 6139.3  | 6212.3  | 6418.0  | 6809.1  | 7382.0  | 7565.0  | 7956.1  | 8031.5  | 7187.1  |
| 25°   | 6114.2  | 6104.6  | 6080.7  | 6090.3  | 6214.7  | 6506.5  | 7104.5  | 7316.2  | 7835.3  | 7994.4  | 7053.1  |
| 27.5° | 6203.9  | 6213.5  | 6172.8  | 6129.8  | 6139.3  | 6310.4  | 6858.2  | 7103.3  | 7737.3  | 7994.4  | 6958.6  |
| 30°   | 6384.5  | 6389.3  | 6359.4  | 6303.2  | 6227.8  | 6255.3  | 6687.1  | 6932.3  | 7688.2  | 8049.4  | 6898.8  |
| 32.5° | 6584.3  | 6610.6  | 6607.0  | 6561.5  | 6453.9  | 6342.7  | 6646.5  | 6870.1  | 7684.6  | 8171.4  | 6892.8  |
| 35°   | 6831.8  | 6861.7  | 6912.0  | 6902.4  | 6790.0  | 6607.0  | 6785.2  | 6961.0  | 7755.2  | 8372.4  | 6957.4  |
| 37.5° | 7095.0  | 7140.4  | 7248.1  | 7299.5  | 7226.5  | 7019.6  | 7096.2  | 7221.8  | 7944.2  | 8697.7  | 7121.3  |
| 40°   | 7349.7  | 7401.2  | 7597.3  | 7799.5  | 7744.4  | 7531.5  | 7567.4  | 7667.9  | 8280.3  | 9165.3  | 7432.3  |
| 42.5° | 7599.7  | 7676.3  | 7964.5  | 8297.0  | 8362.8  | 8193.0  | 8212.1  | 8292.2  | 8779.0  | 9808.8  | 7940.6  |
| 45°   | 7898.7  | 7984.8  | 8411.8  | 8822.1  | 8997.9  | 8923.7  | 9005.1  | 9057.7  | 9430.9  | 10659.2 | 8625.9  |
| 47.5° | 8337.7  | 8436.9  | 8960.8  | 9428.5  | 9737.1  | 9784.9  | 9948.8  | 9983.4  | 10254.9 | 11649.5 | 9519.4  |
| 50°   | 9194.0  | 9221.6  | 9695.2  | 10119.8 | 10564.7 | 10851.8 | 11038.4 | 11064.7 | 11252.5 | 12732.0 | 10635.3 |
| 52.5° | 10271.7 | 10289.6 | 10557.5 | 10842.2 | 11348.1 | 11934.2 | 12370.8 | 12407.8 | 12447.3 | 13786.9 | 11736.9 |
| 55°   | 11342.2 | 11339.8 | 11516.8 | 11684.2 | 12263.1 | 13114.7 | 14062.0 | 14084.7 | 13801.2 | 14788.0 | 12578.9 |
| 57.5° | 12010.7 | 12075.3 | 12344.4 | 12559.7 | 13368.3 | 14460.3 | 15774.7 | 15858.4 | 15223.3 | 15529.5 | 13411.3 |
| 60°   | 11797.9 | 11828.9 | 12425.8 | 13222.3 | 14744.9 | 16372.7 | 17507.8 | 17529.3 | 16292.6 | 16269.9 | 14463.9 |
| 62.5° | 10051.6 | 10068.4 | 11006.1 | 12648.2 | 15442.2 | 18853.4 | 19598.5 | 19248.1 | 17522.2 | 17297.3 | 15723.3 |
| 65°   | 6889.3  | 6998.1  | 7781.5  | 9811.2  | 14161.2 | 20409.4 | 22835.0 | 22254.9 | 19396.4 | 18778.0 | 16861.9 |
| 67.5° | 4057.0  | 4034.3  | 4421.8  | 5916.9  | 10400.9 | 19376.0 | 26929.1 | 26352.6 | 21952.3 | 19769.5 | 16528.2 |
| 70°   | 2771.3  | 2755.7  | 2904.0  | 3582.2  | 5871.4  | 15030.8 | 28217.2 | 29381.0 | 24209.3 | 19102.1 | 14224.6 |
| 72.5° | 1978.3  | 1986.6  | 2205.5  | 2783.2  | 3686.2  | 8757.5  | 24265.5 | 27020.0 | 23502.4 | 16652.6 | 10812.3 |
| 75°   | 1343.2  | 1365.9  | 1679.3  | 2283.3  | 3231.7  | 4455.3  | 17219.6 | 20539.8 | 19138.0 | 12102.8 | 6214.7  |
| 77.5° | 722.4   | 747.5   | 1117.1  | 1839.5  | 2922.0  | 3095.4  | 11076.6 | 14136.1 | 12021.5 | 5440.8  | 1801.3  |
| 80°   | 301.4   | 315.8   | 522.7   | 1337.2  | 2524.9  | 2718.6  | 6517.3  | 8572.1  | 5122.7  | 1072.9  | 401.9   |
| 82.5° | 130.4   | 137.5   | 217.7   | 797.8   | 1887.4  | 2295.2  | 3450.6  | 4124.0  | 1552.5  | 235.6   | 202.1   |
| 85°   | 25.1    | 26.3    | 89.7    | 422.2   | 1204.4  | 1295.3  | 2236.6  | 2192.4  | 697.3   | 101.7   | 147.1   |
| 87.5° | 0.0     | 0.0     | 21.5    | 132.8   | 354.0   | 705.7   | 1364.7  | 1347.9  | 236.8   | 49.0    | 55.0    |
| 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: P323642

CATALOG NUMBER: GLEON-SA8B-827-U-SL3-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 8496.7  | 8496.7 | 8496.7 | 8496.7 | 8496.7 | 8496.7 | 8496.7 | 8496.7 | 8496.7 | 8496.7 | 8496.7 |
| 2.5°  | 8429.8  | 8347.2 | 8173.8 | 7959.7 | 7795.9 | 7615.3 | 7471.7 | 7289.9 | 7211.0 | 7214.6 | 7171.5 |
| 5°    | 8240.8  | 8071.0 | 7687.0 | 7202.6 | 6829.5 | 6444.3 | 6113.0 | 5782.9 | 5588.0 | 5524.6 | 5464.8 |
| 7.5°  | 7970.5  | 7701.4 | 7089.0 | 6342.7 | 5711.1 | 5094.0 | 4557.0 | 4084.5 | 3785.5 | 3639.6 | 3585.8 |
| 10°   | 7665.5  | 7287.5 | 6401.3 | 5418.1 | 4516.3 | 3681.4 | 2985.3 | 2380.1 | 2138.5 | 1974.7 | 1932.8 |
| 12.5° | 7397.6  | 6885.7 | 5729.1 | 4469.6 | 3399.2 | 2392.1 | 1728.3 | 1351.5 | 1187.7 | 1123.1 | 1112.3 |
| 15°   | 7145.2  | 6510.1 | 5082.0 | 3610.9 | 2353.8 | 1472.3 | 1099.2 | 971.2  | 932.9  | 922.2  | 922.2  |
| 17.5° | 6907.2  | 6152.5 | 4449.3 | 2765.3 | 1557.3 | 1032.2 | 910.2  | 881.5  | 869.5  | 868.3  | 869.5  |
| 20°   | 6658.4  | 5794.9 | 3827.4 | 2026.1 | 1087.2 | 874.3  | 840.8  | 825.3  | 821.7  | 821.7  | 821.7  |
| 22.5° | 6420.4  | 5437.2 | 3222.2 | 1447.2 | 871.9  | 797.8  | 781.0  | 770.3  | 766.7  | 765.5  | 763.1  |
| 25°   | 6192.0  | 5097.6 | 2631.3 | 1022.6 | 765.5  | 730.8  | 716.4  | 702.1  | 691.3  | 685.3  | 681.7  |
| 27.5° | 6004.2  | 4795.0 | 2081.1 | 820.5  | 691.3  | 661.4  | 643.5  | 621.9  | 595.6  | 583.7  | 578.9  |
| 30°   | 5854.7  | 4518.7 | 1603.9 | 692.5  | 621.9  | 592.0  | 564.5  | 527.5  | 489.2  | 468.9  | 467.7  |
| 32.5° | 5737.5  | 4247.2 | 1217.6 | 612.4  | 559.8  | 522.7  | 483.2  | 436.6  | 392.3  | 369.6  | 368.4  |
| 35°   | 5680.0  | 4008.0 | 930.5  | 553.8  | 504.7  | 458.1  | 409.0  | 357.6  | 314.6  | 293.0  | 290.6  |
| 37.5° | 5718.3  | 3805.8 | 726.0  | 504.7  | 458.1  | 404.3  | 346.9  | 293.0  | 254.8  | 235.6  | 234.4  |
| 40°   | 5858.3  | 3676.7 | 589.7  | 462.9  | 418.6  | 352.8  | 290.6  | 240.4  | 208.1  | 192.6  | 191.4  |
| 42.5° | 6156.1  | 3628.8 | 503.5  | 428.2  | 380.3  | 305.0  | 241.6  | 198.5  | 168.6  | 157.9  | 155.5  |
| 45°   | 6653.6  | 3699.4 | 444.9  | 394.7  | 340.9  | 259.5  | 199.7  | 162.7  | 136.3  | 128.0  | 126.8  |
| 47.5° | 7316.2  | 3884.8 | 403.1  | 362.4  | 305.0  | 218.9  | 166.3  | 131.6  | 111.2  | 102.9  | 101.7  |
| 50°   | 8170.2  | 4179.0 | 368.4  | 330.1  | 271.5  | 185.4  | 137.5  | 104.1  | 86.1   | 80.1   | 80.1   |
| 52.5° | 9099.6  | 4529.4 | 337.3  | 300.2  | 238.0  | 154.3  | 111.2  | 80.1   | 68.2   | 61.0   | 61.0   |
| 55°   | 9867.4  | 4835.6 | 303.8  | 277.5  | 197.3  | 128.0  | 84.9   | 61.0   | 50.2   | 46.6   | 46.6   |
| 57.5° | 10634.1 | 5162.2 | 265.5  | 238.0  | 157.9  | 104.1  | 64.6   | 45.4   | 37.1   | 34.7   | 34.7   |
| 60°   | 11628.0 | 5561.6 | 228.4  | 193.8  | 124.4  | 78.9   | 47.8   | 32.3   | 27.5   | 26.3   | 26.3   |
| 62.5° | 12721.2 | 5796.1 | 195.0  | 155.5  | 96.9   | 58.6   | 34.7   | 21.5   | 20.3   | 20.3   | 19.1   |
| 65°   | 13389.8 | 5464.8 | 163.9  | 124.4  | 75.4   | 44.3   | 22.7   | 15.5   | 17.9   | 16.7   | 14.4   |
| 67.5° | 12537.0 | 4278.3 | 134.0  | 96.9   | 58.6   | 33.5   | 14.4   | 10.8   | 19.1   | 15.5   | 12.0   |
| 70°   | 10380.5 | 2994.9 | 104.1  | 68.2   | 46.6   | 28.7   | 9.6    | 7.2    | 20.3   | 15.5   | 9.6    |
| 72.5° | 7768.4  | 2004.6 | 82.5   | 45.4   | 34.7   | 25.1   | 8.4    | 3.6    | 17.9   | 13.2   | 8.4    |
| 75°   | 4244.8  | 807.3  | 65.8   | 28.7   | 21.5   | 17.9   | 6.0    | 2.4    | 12.0   | 9.6    | 6.0    |
| 77.5° | 1117.1  | 212.9  | 47.8   | 19.1   | 12.0   | 7.2    | 3.6    | 1.2    | 6.0    | 4.8    | 2.4    |
| 80°   | 284.7   | 82.5   | 31.1   | 13.2   | 8.4    | 3.6    | 0.0    | 0.0    | 1.2    | 0.0    | 0.0    |
| 82.5° | 151.9   | 34.7   | 19.1   | 9.6    | 4.8    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 114.8   | 22.7   | 10.8   | 6.0    | 1.2    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 44.3    | 7.2    | 3.6    | 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    |

Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

Invue

Report Number: SP1-2407-157-9

Test Date: 10/03/2024

Luminaire Tested: EMM2-HTN-SA1A-827-U-5WQ

Data applicable to all product families utilizing light square engine

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-157-9  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/03/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: Invue  
 Catalog Number: **EMM2-HTN-SA1A-827-U-5WQ**  
 Description: Epic Modern Light Square 40W 5WQ Optic

### Spectral Parameters

CCT (K): 2764  
 CIE  $u'$ : 0.2591  
 CIE  $v'$ : 0.5290  
 Duv: 0.0020  
 CIE x: 0.4581  
 CIE y: 0.4156  
 CIE z: 0.1263  
 Peak Wavelength (nm): 603  
 Dominant Wavelength (nm): 583  
 Purity: 62.2537  
 R<sub>f</sub>: 84.7  
 R<sub>g</sub>: 94.6

CRI (Ra): 80.9  
 R1: 78.8  
 R2: 89.9  
 R3: 96.2  
 R4: 79.1  
 R5: 79.1  
 R6: 88.8  
 R7: 81.3  
 R8: 54.3  
 R9: -1.5  
 R10: 77.9  
 R11: 78.9  
 R12: 71.6  
 R13: 81.2  
 R14: 98.5  
 R15: 69.9



### Test Conditions

Stabilization Time: 81M  
 Operation Time: 2H 21M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-157-9

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/18/2024        | 12/18/2024           |
| Power Meter                    | INXT2011004           | 2/8/2024         | 2/8/2025             |
| AC Power Source                | IN0063                | 10/24/2023       | 10/24/2024           |
| DC Power Source                | IN0208                | 10/24/2023       | 10/24/2024           |
| Sphere Thermometer             | IN0085                | 10/24/2023       | 10/24/2024           |
| Room Thermometer               | IN0046                | 10/24/2023       | 10/24/2024           |

REPORT NUMBER: SP1-2407-157-9

**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 2700K 4-step quadrangle

REPORT NUMBER: SP1-2407-157-9

### Photopic Flux vs. Wavelength



### Photopic Lumens: 4337.9

| 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       | 0                | 0.0              | 490       | 18018            | 2.6              | 620       | 87426            | 22.8             | 750       | 2680             | 0.0              | 880       | 58               | 0.0              |
| 365       | 0                | 0.0              | 495       | 22295            | 3.9              | 625       | 83013            | 18.2             | 755       | 2287             | 0.0              | 885       | 46               | 0.0              |
| 370       | 0                | 0.0              | 500       | 26478            | 5.8              | 630       | 78077            | 14.1             | 760       | 1944             | 0.0              | 890       | 45               | 0.0              |
| 375       | 0                | 0.0              | 505       | 30524            | 8.5              | 635       | 72080            | 10.7             | 765       | 1653             | 0.0              | 895       | 41               | 0.0              |
| 380       | 0                | 0.0              | 510       | 33611            | 11.5             | 640       | 66249            | 7.9              | 770       | 1413             | 0.0              | 900       | 38               | 0.0              |
| 385       | 0                | 0.0              | 515       | 36490            | 15.2             | 645       | 59973            | 5.7              | 775       | 1198             | 0.0              | 905       | 33               | 0.0              |
| 390       | 0                | 0.0              | 520       | 38610            | 18.7             | 650       | 53972            | 3.9              | 780       | 1025             | 0.0              | 910       | 30               | 0.0              |
| 395       | 0                | 0.0              | 525       | 40511            | 21.9             | 655       | 48369            | 2.7              | 785       | 874              | 0.0              | 915       | 23               | 0.0              |
| 400       | 48               | 0.0              | 530       | 42223            | 24.9             | 660       | 42641            | 1.8              | 790       | 747              | 0.0              | 920       | 24               | 0.0              |
| 405       | 201              | 0.0              | 535       | 44137            | 27.6             | 665       | 37602            | 1.1              | 795       | 639              | 0.0              | 925       | 22               | 0.0              |
| 410       | 457              | 0.0              | 540       | 46032            | 30.0             | 670       | 32798            | 0.7              | 800       | 547              | 0.0              | 930       | 22               | 0.0              |
| 415       | 925              | 0.0              | 545       | 48553            | 32.5             | 675       | 28558            | 0.5              | 805       | 473              | 0.0              | 935       | 17               | 0.0              |
| 420       | 1816             | 0.0              | 550       | 51408            | 34.9             | 680       | 24782            | 0.3              | 810       | 401              | 0.0              | 940       | 13               | 0.0              |
| 425       | 3217             | 0.0              | 555       | 54711            | 37.4             | 685       | 21386            | 0.2              | 815       | 351              | 0.0              | 945       | 6                | 0.0              |
| 430       | 5520             | 0.0              | 560       | 58847            | 40.0             | 690       | 18413            | 0.1              | 820       | 307              | 0.0              | 950       | 10               | 0.0              |
| 435       | 9225             | 0.1              | 565       | 63386            | 42.4             | 695       | 15721            | 0.1              | 825       | 261              | 0.0              | 955       | 11               | 0.0              |
| 440       | 15522            | 0.2              | 570       | 68196            | 44.3             | 700       | 13432            | 0.0              | 830       | 228              | 0.0              | 960       | 8                | 0.0              |
| 445       | 27642            | 0.6              | 575       | 73613            | 46.0             | 705       | 11513            | 0.0              | 835       | 193              | 0.0              | 965       | 12               | 0.0              |
| 450       | 36602            | 0.9              | 580       | 79207            | 47.1             | 710       | 9780             | 0.0              | 840       | 174              | 0.0              | 970       | 3                | 0.0              |
| 455       | 28292            | 0.9              | 585       | 84248            | 47.0             | 715       | 8356             | 0.0              | 845       | 151              | 0.0              | 975       | 8                | 0.0              |
| 460       | 21166            | 0.9              | 590       | 88397            | 45.7             | 720       | 7161             | 0.0              | 850       | 123              | 0.0              | 980       | 2                | 0.0              |
| 465       | 19092            | 1.0              | 595       | 91428            | 43.4             | 725       | 6067             | 0.0              | 855       | 106              | 0.0              | 985       | 13               | 0.0              |
| 470       | 14951            | 0.9              | 600       | 93452            | 40.3             | 730       | 5164             | 0.0              | 860       | 95               | 0.0              | 990       | 16               | 0.0              |
| 475       | 12606            | 1.0              | 605       | 93959            | 36.4             | 735       | 4393             | 0.0              | 865       | 82               | 0.0              | 995       | 20               | 0.0              |
| 480       | 13323            | 1.3              | 610       | 93079            | 32.0             | 740       | 3694             | 0.0              | 870       | 77               | 0.0              | 1000      | 0                | 0.0              |
| 485       | 15164            | 1.8              | 615       | 90707            | 27.3             | 745       | 3157             | 0.0              | 875       | 65               | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2407-157-9

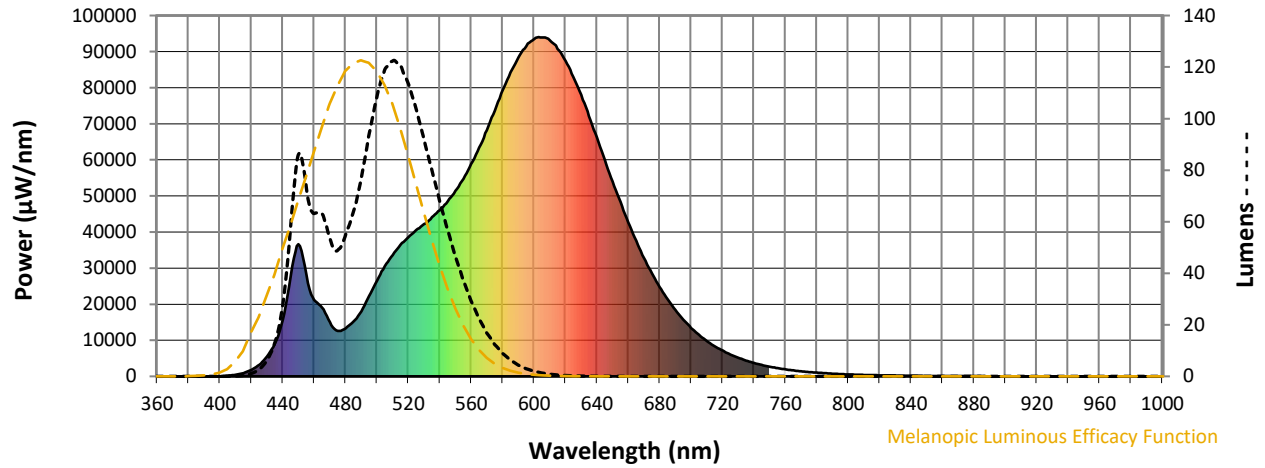
### Scotopic Flux vs. Wavelength


**Scotopic Lumens: 5286.7**
**S/P: 1.22**

| $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | 0.0                            | 490               | 18018                                | 75.9                           | 620               | 87426                                | 0.4                            | 750               | 2680                                 | 0.0                            | 880               | 58                                   | 0.0                            |
| 365               | 0                                    | 0.0                            | 495               | 22295                                | 93.2                           | 625               | 83013                                | 0.2                            | 755               | 2287                                 | 0.0                            | 885               | 46                                   | 0.0                            |
| 370               | 0                                    | 0.0                            | 500               | 26478                                | 107.8                          | 630               | 78077                                | 0.1                            | 760               | 1944                                 | 0.0                            | 890               | 45                                   | 0.0                            |
| 375               | 0                                    | 0.0                            | 505               | 30524                                | 118.7                          | 635               | 72080                                | 0.1                            | 765               | 1653                                 | 0.0                            | 895               | 41                                   | 0.0                            |
| 380               | 0                                    | 0.0                            | 510               | 33611                                | 122.2                          | 640               | 66249                                | 0.1                            | 770               | 1413                                 | 0.0                            | 900               | 38                                   | 0.0                            |
| 385               | 0                                    | 0.0                            | 515               | 36490                                | 120.8                          | 645               | 59973                                | 0.0                            | 775               | 1198                                 | 0.0                            | 905               | 33                                   | 0.0                            |
| 390               | 0                                    | 0.0                            | 520               | 38610                                | 113.9                          | 650               | 53972                                | 0.0                            | 780               | 1025                                 | 0.0                            | 910               | 30                                   | 0.0                            |
| 395               | 0                                    | 0.0                            | 525               | 40511                                | 104.1                          | 655               | 48369                                | 0.0                            | 785               | 874                                  | 0.0                            | 915               | 23                                   | 0.0                            |
| 400               | 48                                   | 0.0                            | 530               | 42223                                | 92.4                           | 660               | 42641                                | 0.0                            | 790               | 747                                  | 0.0                            | 920               | 24                                   | 0.0                            |
| 405               | 201                                  | 0.0                            | 535               | 44137                                | 80.5                           | 665               | 37602                                | 0.0                            | 795               | 639                                  | 0.0                            | 925               | 22                                   | 0.0                            |
| 410               | 457                                  | 0.1                            | 540               | 46032                                | 68.2                           | 670               | 32798                                | 0.0                            | 800               | 547                                  | 0.0                            | 930               | 22                                   | 0.0                            |
| 415               | 925                                  | 0.3                            | 545               | 48553                                | 57.1                           | 675               | 28558                                | 0.0                            | 805               | 473                                  | 0.0                            | 935               | 17                                   | 0.0                            |
| 420               | 1816                                 | 1.1                            | 550               | 51408                                | 46.7                           | 680               | 24782                                | 0.0                            | 810               | 401                                  | 0.0                            | 940               | 13                                   | 0.0                            |
| 425               | 3217                                 | 2.5                            | 555               | 54711                                | 37.4                           | 685               | 21386                                | 0.0                            | 815               | 351                                  | 0.0                            | 945               | 6                                    | 0.0                            |
| 430               | 5520                                 | 5.9                            | 560               | 58847                                | 29.4                           | 690               | 18413                                | 0.0                            | 820               | 307                                  | 0.0                            | 950               | 10                                   | 0.0                            |
| 435               | 9225                                 | 12.5                           | 565               | 63386                                | 22.5                           | 695               | 15721                                | 0.0                            | 825               | 261                                  | 0.0                            | 955               | 11                                   | 0.0                            |
| 440               | 15522                                | 26.3                           | 570               | 68196                                | 16.9                           | 700               | 13432                                | 0.0                            | 830               | 228                                  | 0.0                            | 960               | 8                                    | 0.0                            |
| 445               | 27642                                | 55.2                           | 575               | 73613                                | 12.4                           | 705               | 11513                                | 0.0                            | 835               | 193                                  | 0.0                            | 965               | 12                                   | 0.0                            |
| 450               | 36602                                | 85.4                           | 580               | 79207                                | 9.0                            | 710               | 9780                                 | 0.0                            | 840               | 174                                  | 0.0                            | 970               | 3                                    | 0.0                            |
| 455               | 28292                                | 75.1                           | 585               | 84248                                | 6.3                            | 715               | 8356                                 | 0.0                            | 845               | 151                                  | 0.0                            | 975               | 8                                    | 0.0                            |
| 460               | 21166                                | 63.2                           | 590               | 88397                                | 4.4                            | 720               | 7161                                 | 0.0                            | 850               | 123                                  | 0.0                            | 980               | 2                                    | 0.0                            |
| 465               | 19092                                | 63.2                           | 595               | 91428                                | 3.0                            | 725               | 6067                                 | 0.0                            | 855               | 106                                  | 0.0                            | 985               | 13                                   | 0.0                            |
| 470               | 14951                                | 54.2                           | 600               | 93452                                | 2.0                            | 730               | 5164                                 | 0.0                            | 860               | 95                                   | 0.0                            | 990               | 16                                   | 0.0                            |
| 475               | 12606                                | 48.8                           | 605               | 93959                                | 1.3                            | 735               | 4393                                 | 0.0                            | 865               | 82                                   | 0.0                            | 995               | 20                                   | 0.0                            |
| 480               | 13323                                | 54.2                           | 610               | 93079                                | 0.9                            | 740               | 3694                                 | 0.0                            | 870               | 77                                   | 0.0                            | 1000              | 0                                    | 0.0                            |
| 485               | 15164                                | 63.3                           | 615               | 90707                                | 0.5                            | 745               | 3157                                 | 0.0                            | 875               | 65                                   | 0.0                            |                   |                                      |                                |

REPORT NUMBER: SP1-2407-157-9

### Melanopic Flux vs. Wavelength


**Melanopic Lumens: 9797**
**M/P: 2.26**

| $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | 0.0                            | 490               | 18018                                | 27.7                           | 620               | 87426                                | 1.1                            | 750               | 2680                                 | 0.0                            | 880               | 58                                   | 0.0                            |
| 365               | 0                                    | 0.0                            | 495               | 22295                                | 36.0                           | 625               | 83013                                | 0.7                            | 755               | 2287                                 | 0.0                            | 885               | 46                                   | 0.0                            |
| 370               | 0                                    | 0.0                            | 500               | 26478                                | 44.2                           | 630               | 78077                                | 0.4                            | 760               | 1944                                 | 0.0                            | 890               | 45                                   | 0.0                            |
| 375               | 0                                    | 0.0                            | 505               | 30524                                | 51.8                           | 635               | 72080                                | 0.3                            | 765               | 1653                                 | 0.0                            | 895               | 41                                   | 0.0                            |
| 380               | 0                                    | 0.0                            | 510               | 33611                                | 57.0                           | 640               | 66249                                | 0.2                            | 770               | 1413                                 | 0.0                            | 900               | 38                                   | 0.0                            |
| 385               | 0                                    | 0.0                            | 515               | 36490                                | 60.5                           | 645               | 59973                                | 0.1                            | 775               | 1198                                 | 0.0                            | 905               | 33                                   | 0.0                            |
| 390               | 0                                    | 0.0                            | 520               | 38610                                | 61.4                           | 650               | 53972                                | 0.1                            | 780               | 1025                                 | 0.0                            | 910               | 30                                   | 0.0                            |
| 395               | 0                                    | 0.0                            | 525               | 40511                                | 60.6                           | 655               | 48369                                | 0.0                            | 785               | 874                                  | 0.0                            | 915               | 23                                   | 0.0                            |
| 400               | 48                                   | 0.0                            | 530               | 42223                                | 58.2                           | 660               | 42641                                | 0.0                            | 790               | 747                                  | 0.0                            | 920               | 24                                   | 0.0                            |
| 405               | 201                                  | 0.0                            | 535               | 44137                                | 55.0                           | 665               | 37602                                | 0.0                            | 795               | 639                                  | 0.0                            | 925               | 22                                   | 0.0                            |
| 410               | 457                                  | 0.0                            | 540               | 46032                                | 50.9                           | 670               | 32798                                | 0.0                            | 800               | 547                                  | 0.0                            | 930               | 22                                   | 0.0                            |
| 415               | 925                                  | 0.1                            | 545               | 48553                                | 46.6                           | 675               | 28558                                | 0.0                            | 805               | 473                                  | 0.0                            | 935               | 17                                   | 0.0                            |
| 420               | 1816                                 | 0.3                            | 550               | 51408                                | 42.0                           | 680               | 24782                                | 0.0                            | 810               | 401                                  | 0.0                            | 940               | 13                                   | 0.0                            |
| 425               | 3217                                 | 0.8                            | 555               | 54711                                | 37.4                           | 685               | 21386                                | 0.0                            | 815               | 351                                  | 0.0                            | 945               | 6                                    | 0.0                            |
| 430               | 5520                                 | 1.9                            | 560               | 58847                                | 32.9                           | 690               | 18413                                | 0.0                            | 820               | 307                                  | 0.0                            | 950               | 10                                   | 0.0                            |
| 435               | 9225                                 | 4.1                            | 565               | 63386                                | 28.4                           | 695               | 15721                                | 0.0                            | 825               | 261                                  | 0.0                            | 955               | 11                                   | 0.0                            |
| 440               | 15522                                | 8.7                            | 570               | 68196                                | 24.1                           | 700               | 13432                                | 0.0                            | 830               | 228                                  | 0.0                            | 960               | 8                                    | 0.0                            |
| 445               | 27642                                | 18.5                           | 575               | 73613                                | 20.0                           | 705               | 11513                                | 0.0                            | 835               | 193                                  | 0.0                            | 965               | 12                                   | 0.0                            |
| 450               | 36602                                | 28.3                           | 580               | 79207                                | 16.3                           | 710               | 9780                                 | 0.0                            | 840               | 174                                  | 0.0                            | 970               | 3                                    | 0.0                            |
| 455               | 28292                                | 24.7                           | 585               | 84248                                | 12.9                           | 715               | 8356                                 | 0.0                            | 845               | 151                                  | 0.0                            | 975               | 8                                    | 0.0                            |
| 460               | 21166                                | 20.4                           | 590               | 88397                                | 9.8                            | 720               | 7161                                 | 0.0                            | 850               | 123                                  | 0.0                            | 980               | 2                                    | 0.0                            |
| 465               | 19092                                | 20.1                           | 595               | 91428                                | 7.3                            | 725               | 6067                                 | 0.0                            | 855               | 106                                  | 0.0                            | 985               | 13                                   | 0.0                            |
| 470               | 14951                                | 17.2                           | 600               | 93452                                | 5.3                            | 730               | 5164                                 | 0.0                            | 860               | 95                                   | 0.0                            | 990               | 16                                   | 0.0                            |
| 475               | 12606                                | 15.7                           | 605               | 93959                                | 3.7                            | 735               | 4393                                 | 0.0                            | 865               | 82                                   | 0.0                            | 995               | 20                                   | 0.0                            |
| 480               | 13323                                | 18.0                           | 610               | 93079                                | 2.5                            | 740               | 3694                                 | 0.0                            | 870               | 77                                   | 0.0                            | 1000              | 0                                    | 0.0                            |
| 485               | 15164                                | 21.9                           | 615               | 90707                                | 1.7                            | 745               | 3157                                 | 0.0                            | 875               | 65                                   | 0.0                            |                   |                                      |                                |

REPORT NUMBER: SP1-2407-157-9

TM-30-18

### Summary

$R_f = 84.7$   
 $R_g = 94.6$   
 $CIE R_a = 80.9$   
 $R_g = -1.5$



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 84 | CES51 = 95 | CES76 = 81 |
| CES02 = 63 | CES27 = 95 | CES52 = 94 | CES77 = 84 |
| CES03 = 31 | CES28 = 94 | CES53 = 89 | CES78 = 81 |
| CES04 = 71 | CES29 = 87 | CES54 = 91 | CES79 = 89 |
| CES05 = 50 | CES30 = 94 | CES55 = 90 | CES80 = 89 |
| CES06 = 52 | CES31 = 89 | CES56 = 86 | CES81 = 69 |
| CES07 = 43 | CES32 = 82 | CES57 = 85 | CES82 = 96 |
| CES08 = 41 | CES33 = 91 | CES58 = 86 | CES83 = 93 |
| CES09 = 29 | CES34 = 92 | CES59 = 91 | CES84 = 92 |
| CES10 = 77 | CES35 = 96 | CES60 = 94 | CES85 = 76 |
| CES11 = 60 | CES36 = 90 | CES61 = 89 | CES86 = 65 |
| CES12 = 66 | CES37 = 96 | CES62 = 94 | CES87 = 84 |
| CES13 = 44 | CES38 = 98 | CES63 = 87 | CES88 = 86 |
| CES14 = 74 | CES39 = 98 | CES64 = 82 | CES89 = 73 |
| CES15 = 72 | CES40 = 95 | CES65 = 78 | CES90 = 88 |
| CES16 = 48 | CES41 = 96 | CES66 = 81 | CES91 = 82 |
| CES17 = 50 | CES42 = 97 | CES67 = 80 | CES92 = 64 |
| CES18 = 57 | CES43 = 91 | CES68 = 83 | CES93 = 78 |
| CES19 = 73 | CES44 = 99 | CES69 = 88 | CES94 = 59 |
| CES20 = 67 | CES45 = 93 | CES70 = 80 | CES95 = 74 |
| CES21 = 87 | CES46 = 89 | CES71 = 79 | CES96 = 83 |
| CES22 = 79 | CES47 = 92 | CES72 = 92 | CES97 = 88 |
| CES23 = 92 | CES48 = 83 | CES73 = 75 | CES98 = 83 |
| CES24 = 91 | CES49 = 90 | CES74 = 91 | CES99 = 74 |
| CES25 = 72 | CES50 = 94 | CES75 = 81 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**


(END OF REPORT)