

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: P323641

Luminaire Tested: **GLEON-SA7B-827-U-SL3-HSS**

Issue Date: 3/3/2020

### Test Information

Test Method: LM-79-08  
Report Number: P323641  
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-SA7B-827-U-SL3-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(7) 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: 25385 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

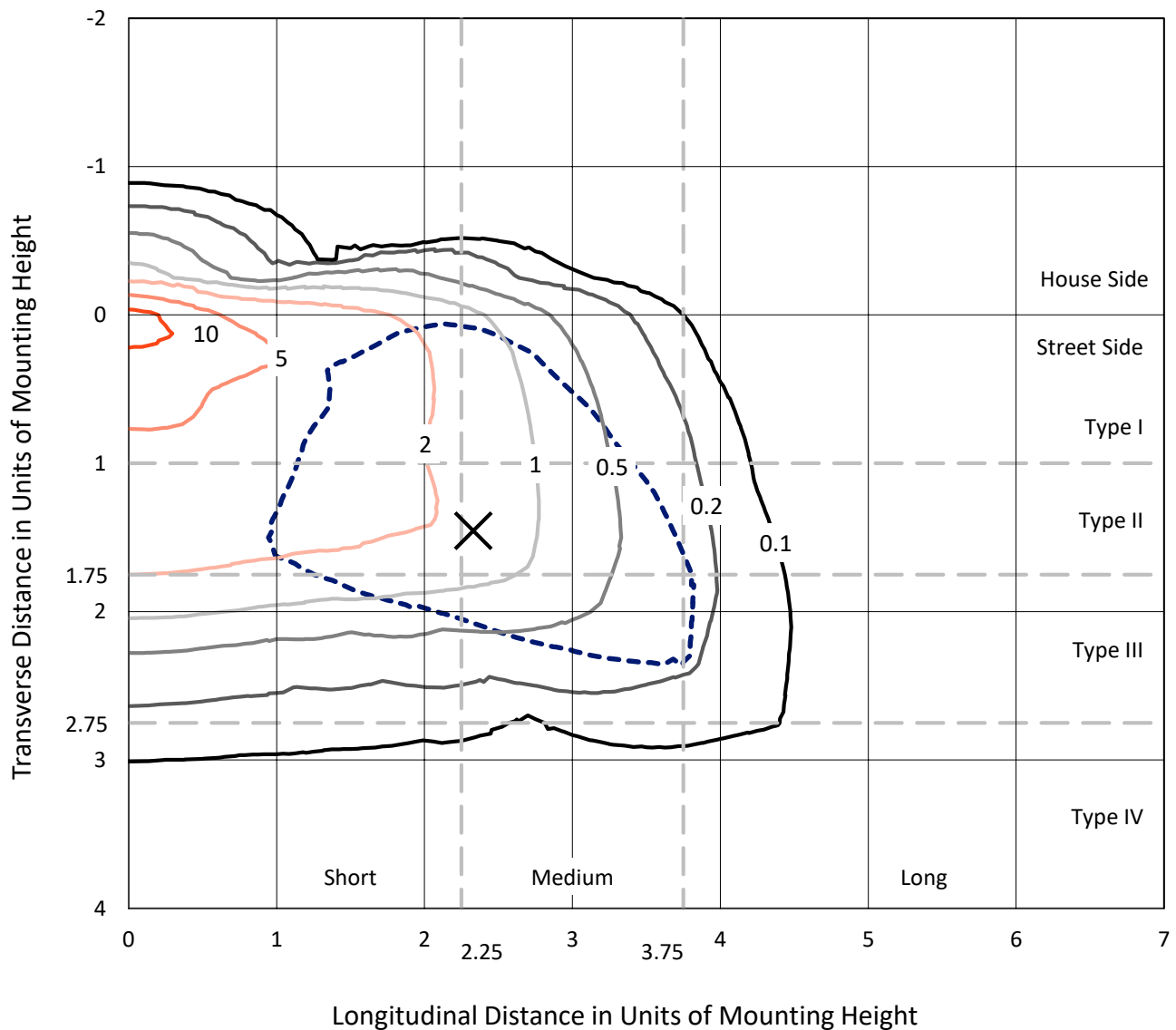
Input Watts (W): 295  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P323641  
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## Iso-Footcandle Lines of Horizontal Illumination

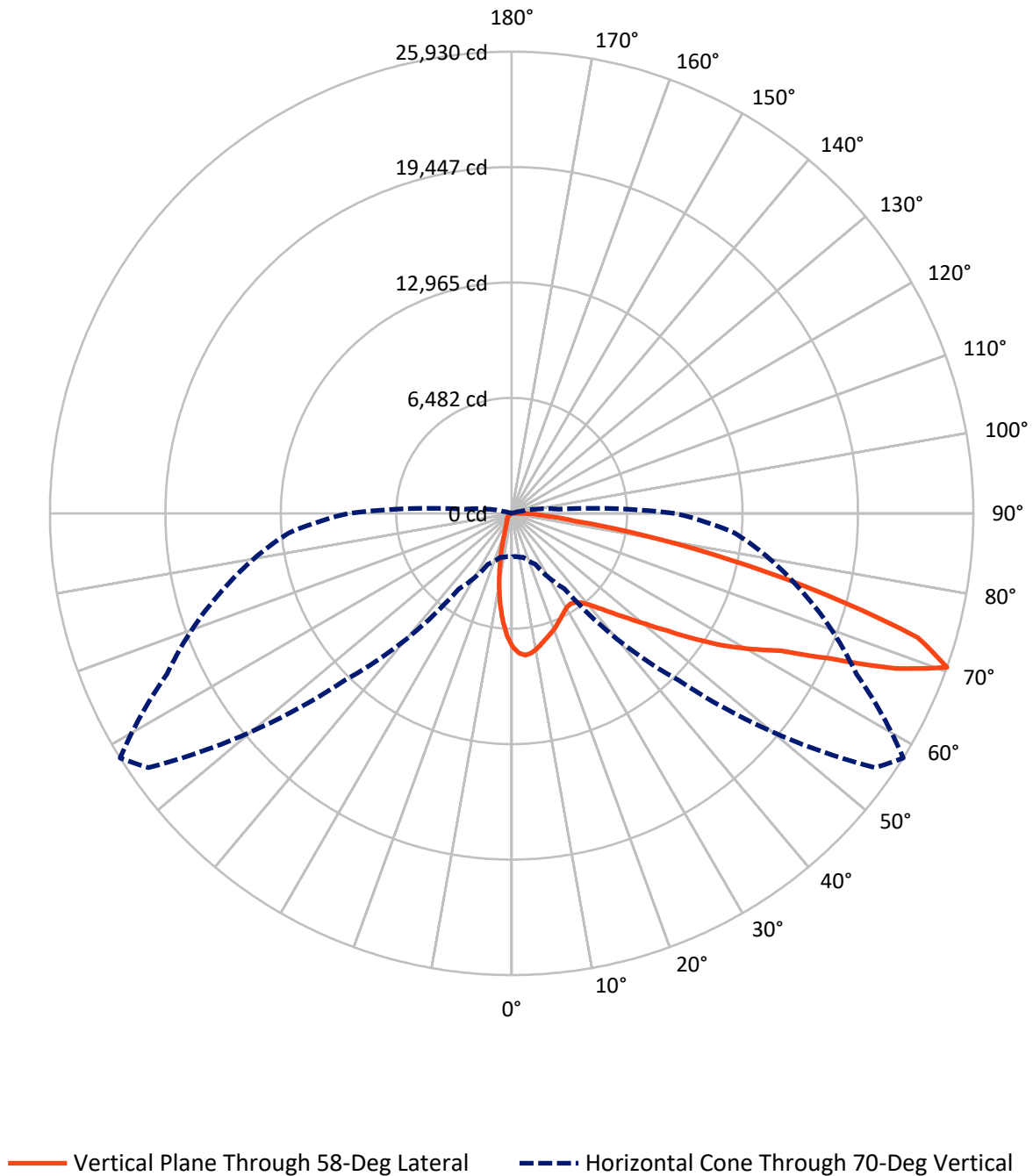
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 12.2 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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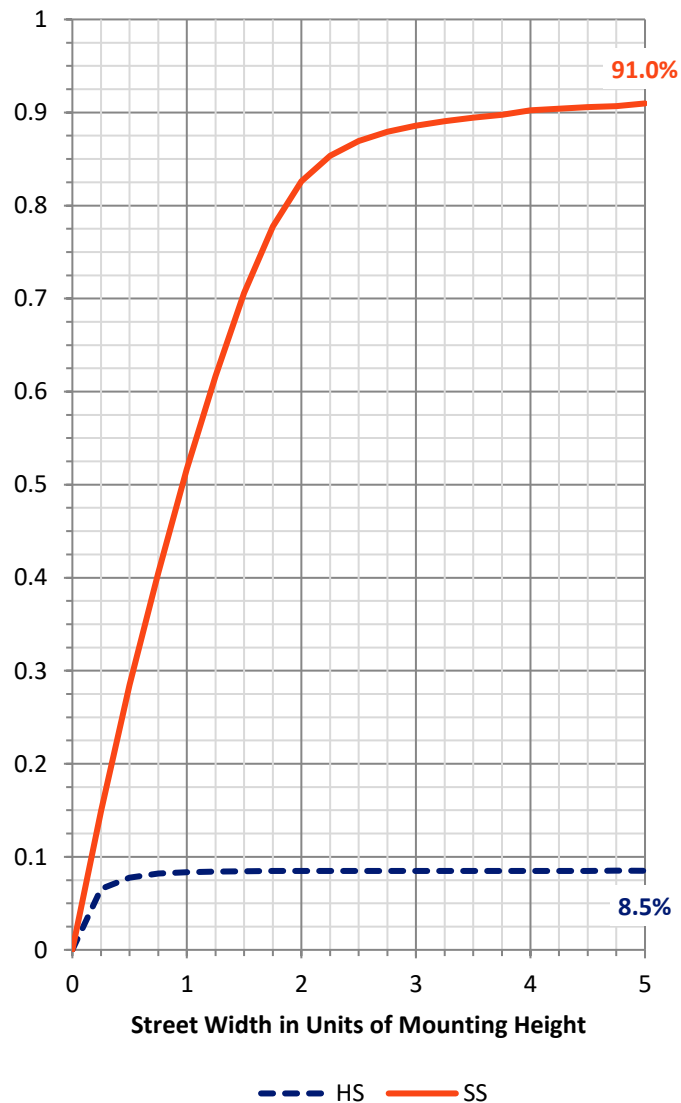
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2172.4   | 0.0    | 2172.4  |
|                    | % Fixture | 8.6      | 0.0    | 8.6     |
| <b>Street Side</b> | Lumens    | 23212.6  | 0.0    | 23212.6 |
|                    | % Fixture | 91.4     | 0.0    | 91.4    |
| <b>Total</b>       | Lumens    | 25385.0  | 0.0    | 25385.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 613.2   | 2.4       |
| 10°-20°   | 1287.0  | 5.1       |
| 20°-30°   | 1691.9  | 6.7       |
| 30°-40°   | 2240.7  | 8.8       |
| 40°-50°   | 3349.2  | 13.2      |
| 50°-60°   | 5365.3  | 21.1      |
| 60°-70°   | 6762.9  | 26.6      |
| 70°-80°   | 3647.9  | 14.4      |
| 80°-90°   | 427.0   | 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°    | 25385.0 | 100.0     |
| 0°-180°   | 25385.0 | 100.0     |

**Coefficient of Utilization**



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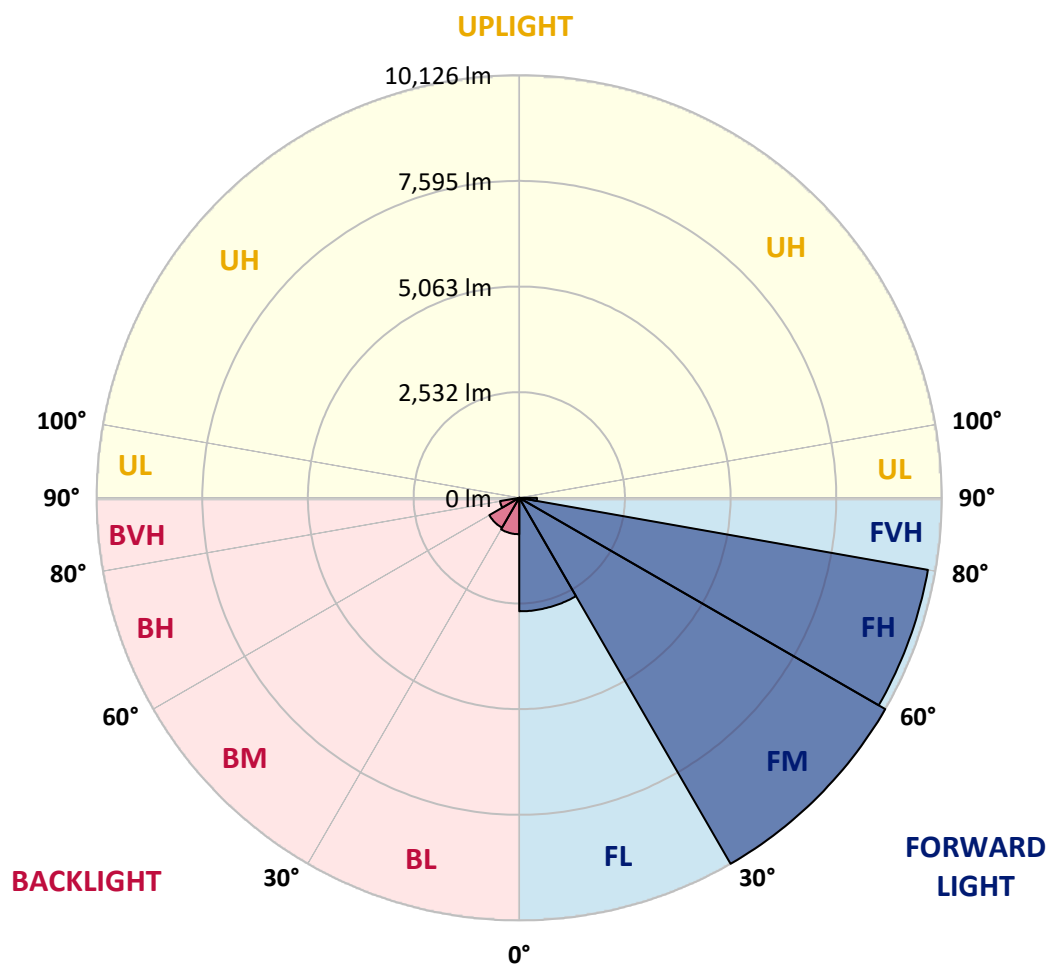
CATALOG NUMBER: GLEON-SA7B-827-U-SL3-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 2719.3  | 10.7      |                         |      |          |
| FM   | (30°-60°)   | 10126.5 | 39.9      |                         |      |          |
| FH   | (60°-80°)   | 9943.6  | 39.2      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 423.3   | 1.7       |                         |      | G3/500   |
| BL   | (0°-30°)    | 872.8   | 3.4       | B2/1000                 |      |          |
| BM   | (30°-60°)   | 828.7   | 3.3       | B1/1000                 |      |          |
| BH   | (60°-80°)   | 467.2   | 1.8       | B1/500                  |      | G1/500   |
| BVH  | (80°-90°)   | 3.7     | 0.0       |                         |      | G0/10    |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |          |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |          |

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

Type III Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 58°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 7498.6  | 7498.6  | 7498.6  | 7498.6  | 7498.6  | 7498.6  | 7498.6  | 7498.6  | 7498.6  | 7498.6  | 7498.6  |
| 2.5°  | 8120.3  | 8100.3  | 8092.9  | 8080.2  | 8031.7  | 7984.2  | 7890.2  | 7863.8  | 7804.7  | 7664.3  | 7515.5  |
| 5°    | 8126.7  | 8125.6  | 8147.8  | 8142.5  | 8125.6  | 8103.4  | 8035.9  | 8001.0  | 7900.8  | 7700.2  | 7427.9  |
| 7.5°  | 7735.1  | 7755.1  | 7804.7  | 7844.8  | 7891.3  | 7951.4  | 7959.9  | 7926.1  | 7843.8  | 7627.4  | 7266.4  |
| 10°   | 7209.4  | 7241.1  | 7310.7  | 7389.9  | 7511.3  | 7631.6  | 7739.3  | 7735.1  | 7706.6  | 7493.3  | 7072.2  |
| 12.5° | 6682.7  | 6719.6  | 6799.8  | 6917.0  | 7089.1  | 7285.4  | 7477.5  | 7503.9  | 7551.4  | 7373.0  | 6892.7  |
| 15°   | 6221.4  | 6253.1  | 6332.2  | 6475.8  | 6689.0  | 6952.9  | 7234.7  | 7283.3  | 7405.7  | 7279.1  | 6742.8  |
| 17.5° | 5829.8  | 5849.8  | 5907.9  | 6067.3  | 6314.3  | 6634.1  | 7000.4  | 7095.4  | 7278.0  | 7205.2  | 6613.0  |
| 20°   | 5556.4  | 5559.6  | 5597.6  | 5709.5  | 5956.5  | 6314.3  | 6757.6  | 6893.8  | 7142.9  | 7141.8  | 6479.0  |
| 22.5° | 5421.3  | 5410.7  | 5418.1  | 5482.5  | 5664.1  | 6009.2  | 6514.8  | 6676.3  | 7021.5  | 7088.0  | 6342.8  |
| 25°   | 5396.0  | 5387.5  | 5366.4  | 5374.8  | 5484.6  | 5742.2  | 6270.0  | 6456.8  | 6914.9  | 7055.3  | 6224.6  |
| 27.5° | 5475.1  | 5483.6  | 5447.7  | 5409.7  | 5418.1  | 5569.1  | 6052.5  | 6268.9  | 6828.3  | 7055.3  | 6141.2  |
| 30°   | 5634.5  | 5638.7  | 5612.3  | 5562.7  | 5496.2  | 5520.5  | 5901.6  | 6118.0  | 6785.1  | 7103.8  | 6088.4  |
| 32.5° | 5810.8  | 5834.0  | 5830.8  | 5790.7  | 5695.7  | 5597.6  | 5865.7  | 6063.1  | 6781.9  | 7211.5  | 6083.1  |
| 35°   | 6029.3  | 6055.7  | 6100.0  | 6091.6  | 5992.3  | 5830.8  | 5988.1  | 6143.3  | 6844.2  | 7388.8  | 6140.1  |
| 37.5° | 6261.5  | 6301.6  | 6396.6  | 6442.0  | 6377.6  | 6195.0  | 6262.6  | 6373.4  | 7010.9  | 7675.9  | 6284.7  |
| 40°   | 6486.3  | 6531.7  | 6704.8  | 6883.2  | 6834.7  | 6646.8  | 6678.4  | 6767.1  | 7307.6  | 8088.7  | 6559.2  |
| 42.5° | 6706.9  | 6774.5  | 7028.9  | 7322.3  | 7380.4  | 7230.5  | 7247.4  | 7318.1  | 7747.7  | 8656.5  | 7007.8  |
| 45°   | 6970.8  | 7046.8  | 7423.7  | 7785.7  | 7940.9  | 7875.4  | 7947.2  | 7993.7  | 8323.0  | 9407.0  | 7612.6  |
| 47.5° | 7358.2  | 7445.8  | 7908.2  | 8320.9  | 8593.2  | 8635.4  | 8780.0  | 8810.7  | 9050.3  | 10281.0 | 8401.1  |
| 50°   | 8114.0  | 8138.3  | 8556.3  | 8931.0  | 9323.7  | 9577.0  | 9741.6  | 9764.9  | 9930.6  | 11236.3 | 9385.9  |
| 52.5° | 9065.0  | 9080.9  | 9317.3  | 9568.5  | 10015.0 | 10532.3 | 10917.5 | 10950.2 | 10985.1 | 12167.3 | 10358.1 |
| 55°   | 10009.8 | 10007.6 | 10163.9 | 10311.6 | 10822.5 | 11574.1 | 12410.1 | 12430.1 | 12180.0 | 13050.8 | 11101.2 |
| 57.5° | 10599.8 | 10656.8 | 10894.3 | 11084.3 | 11797.9 | 12761.6 | 13921.6 | 13995.5 | 13435.0 | 13705.2 | 11835.9 |
| 60°   | 10411.9 | 10439.4 | 10966.1 | 11669.1 | 13012.8 | 14449.4 | 15451.1 | 15470.1 | 14378.7 | 14358.6 | 12764.7 |
| 62.5° | 8870.8  | 8885.6  | 9713.1  | 11162.4 | 13628.2 | 16638.6 | 17296.2 | 16986.9 | 15463.8 | 15265.3 | 13876.2 |
| 65°   | 6080.0  | 6176.0  | 6867.4  | 8658.7  | 12497.7 | 18011.9 | 20152.5 | 19640.6 | 17117.8 | 16572.1 | 14881.1 |
| 67.5° | 3580.4  | 3560.4  | 3902.4  | 5221.8  | 9179.0  | 17099.9 | 23765.7 | 23256.9 | 19373.5 | 17447.1 | 14586.6 |
| 70°   | 2445.7  | 2432.0  | 2562.9  | 3161.4  | 5181.7  | 13265.1 | 24902.5 | 25929.5 | 21365.3 | 16858.1 | 12553.6 |
| 72.5° | 1745.9  | 1753.3  | 1946.4  | 2456.3  | 3253.2  | 7728.7  | 21414.9 | 23845.9 | 20741.5 | 14696.4 | 9542.1  |
| 75°   | 1185.4  | 1205.4  | 1482.0  | 2015.0  | 2852.1  | 3931.9  | 15196.7 | 18126.9 | 16889.8 | 10681.1 | 5484.6  |
| 77.5° | 637.6   | 659.7   | 985.9   | 1623.4  | 2578.7  | 2731.8  | 9775.4  | 12475.5 | 10609.3 | 4801.7  | 1589.7  |
| 80°   | 266.0   | 278.7   | 461.3   | 1180.1  | 2228.3  | 2399.3  | 5751.7  | 7565.1  | 4520.9  | 946.8   | 354.7   |
| 82.5° | 115.1   | 121.4   | 192.1   | 704.1   | 1665.7  | 2025.6  | 3045.3  | 3639.5  | 1370.1  | 207.9   | 178.4   |
| 85°   | 22.2    | 23.2    | 79.2    | 372.6   | 1062.9  | 1143.2  | 1973.9  | 1934.8  | 615.4   | 89.7    | 129.8   |
| 87.5° | 0.0     | 0.0     | 19.0    | 117.2   | 312.4   | 622.8   | 1204.4  | 1189.6  | 209.0   | 43.3    | 48.6    |
| 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-SA7B-827-U-SL3-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 7498.6  | 7498.6 | 7498.6 | 7498.6 | 7498.6 | 7498.6 | 7498.6 | 7498.6 | 7498.6 | 7498.6 | 7498.6 |
| 2.5°  | 7439.5  | 7366.7 | 7213.6 | 7024.7 | 6880.1 | 6720.7 | 6594.0 | 6433.6 | 6363.9 | 6367.1 | 6329.1 |
| 5°    | 7272.7  | 7122.8 | 6784.0 | 6356.5 | 6027.2 | 5687.3 | 5394.9 | 5103.6 | 4931.5 | 4875.6 | 4822.8 |
| 7.5°  | 7034.2  | 6796.7 | 6256.2 | 5597.6 | 5040.2 | 4495.6 | 4021.6 | 3604.7 | 3340.8 | 3212.0 | 3164.5 |
| 10°   | 6765.0  | 6431.5 | 5649.3 | 4781.6 | 3985.7 | 3249.0 | 2634.6 | 2100.5 | 1887.3 | 1742.7 | 1705.8 |
| 12.5° | 6528.6  | 6076.8 | 5056.1 | 3944.6 | 2999.9 | 2111.1 | 1525.3 | 1192.8 | 1048.2 | 991.2  | 981.7  |
| 15°   | 6305.8  | 5745.3 | 4485.0 | 3186.7 | 2077.3 | 1299.4 | 970.0  | 857.1  | 823.3  | 813.8  | 813.8  |
| 17.5° | 6095.8  | 5429.7 | 3926.6 | 2440.4 | 1374.3 | 910.9  | 803.3  | 777.9  | 767.4  | 766.3  | 767.4  |
| 20°   | 5876.2  | 5114.1 | 3377.8 | 1788.1 | 959.5  | 771.6  | 742.0  | 728.3  | 725.2  | 725.2  | 725.2  |
| 22.5° | 5666.2  | 4798.5 | 2843.6 | 1277.2 | 769.5  | 704.1  | 689.3  | 679.8  | 676.6  | 675.6  | 673.4  |
| 25°   | 5464.6  | 4498.7 | 2322.2 | 902.5  | 675.6  | 644.9  | 632.3  | 619.6  | 610.1  | 604.8  | 601.7  |
| 27.5° | 5298.8  | 4231.7 | 1836.7 | 724.1  | 610.1  | 583.7  | 567.9  | 548.9  | 525.7  | 515.1  | 510.9  |
| 30°   | 5166.9  | 3987.9 | 1415.5 | 611.2  | 548.9  | 522.5  | 498.2  | 465.5  | 431.7  | 413.8  | 412.7  |
| 32.5° | 5063.5  | 3748.2 | 1074.5 | 540.4  | 494.0  | 461.3  | 426.4  | 385.3  | 346.2  | 326.2  | 325.1  |
| 35°   | 5012.8  | 3537.1 | 821.2  | 488.7  | 445.4  | 404.3  | 361.0  | 315.6  | 277.6  | 258.6  | 256.5  |
| 37.5° | 5046.6  | 3358.8 | 640.7  | 445.4  | 404.3  | 356.8  | 306.1  | 258.6  | 224.8  | 207.9  | 206.9  |
| 40°   | 5170.1  | 3244.8 | 520.4  | 408.5  | 369.4  | 311.4  | 256.5  | 212.2  | 183.7  | 169.9  | 168.9  |
| 42.5° | 5432.9  | 3202.5 | 444.4  | 377.9  | 335.7  | 269.2  | 213.2  | 175.2  | 148.8  | 139.3  | 137.2  |
| 45°   | 5872.0  | 3264.8 | 392.7  | 348.3  | 300.8  | 229.1  | 176.3  | 143.6  | 120.3  | 112.9  | 111.9  |
| 47.5° | 6456.8  | 3428.4 | 355.7  | 319.8  | 269.2  | 193.2  | 146.7  | 116.1  | 98.2   | 90.8   | 89.7   |
| 50°   | 7210.4  | 3688.1 | 325.1  | 291.3  | 239.6  | 163.6  | 121.4  | 91.8   | 76.0   | 70.7   | 70.7   |
| 52.5° | 8030.6  | 3997.4 | 297.7  | 264.9  | 210.1  | 136.2  | 98.2   | 70.7   | 60.2   | 53.8   | 53.8   |
| 55°   | 8708.3  | 4267.6 | 268.1  | 244.9  | 174.2  | 112.9  | 74.9   | 53.8   | 44.3   | 41.2   | 41.2   |
| 57.5° | 9384.9  | 4555.7 | 234.3  | 210.1  | 139.3  | 91.8   | 57.0   | 40.1   | 32.7   | 30.6   | 30.6   |
| 60°   | 10262.0 | 4908.3 | 201.6  | 171.0  | 109.8  | 69.7   | 42.2   | 28.5   | 24.3   | 23.2   | 23.2   |
| 62.5° | 11226.8 | 5115.2 | 172.1  | 137.2  | 85.5   | 51.7   | 30.6   | 19.0   | 17.9   | 17.9   | 16.9   |
| 65°   | 11816.9 | 4822.8 | 144.6  | 109.8  | 66.5   | 39.1   | 20.1   | 13.7   | 15.8   | 14.8   | 12.7   |
| 67.5° | 11064.2 | 3775.7 | 118.2  | 85.5   | 51.7   | 29.6   | 12.7   | 9.5    | 16.9   | 13.7   | 10.6   |
| 70°   | 9161.1  | 2643.1 | 91.8   | 60.2   | 41.2   | 25.3   | 8.4    | 6.3    | 17.9   | 13.7   | 8.4    |
| 72.5° | 6855.8  | 1769.1 | 72.8   | 40.1   | 30.6   | 22.2   | 7.4    | 3.2    | 15.8   | 11.6   | 7.4    |
| 75°   | 3746.1  | 712.5  | 58.1   | 25.3   | 19.0   | 15.8   | 5.3    | 2.1    | 10.6   | 8.4    | 5.3    |
| 77.5° | 985.9   | 187.9  | 42.2   | 16.9   | 10.6   | 6.3    | 3.2    | 1.1    | 5.3    | 4.2    | 2.1    |
| 80°   | 251.2   | 72.8   | 27.4   | 11.6   | 7.4    | 3.2    | 0.0    | 0.0    | 1.1    | 0.0    | 0.0    |
| 82.5° | 134.1   | 30.6   | 16.9   | 8.4    | 4.2    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 101.3   | 20.1   | 9.5    | 5.3    | 1.1    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 39.1    | 6.3    | 3.2    | 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              |           |                  |                  |

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### 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                            |                   |                                      |                                |

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### Melanopic Flux vs. Wavelength



**Melanopic Lumens: 9797**

**M/P: 2.26**

| 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            | 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              |           |                  |                  |

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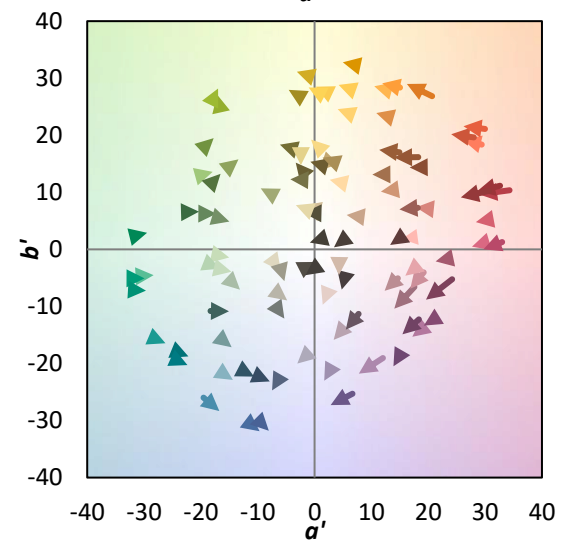
TM-30-18

### 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 ( $R_{fi}$ )**

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