

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: P322043

Luminaire Tested: **GLEON-SA9B-827-U-T2-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P322043  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-13)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA9B-827-U-T2-HSS  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(9) 80 CRI, 2700K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II  
OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 26716 lumens  
Efficiency: N/A  
Efficacy: 71.4 lumens/watt  
Luminous Opening: Rectangular (W 2.5' x L: 1' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B2 - U0 - G4

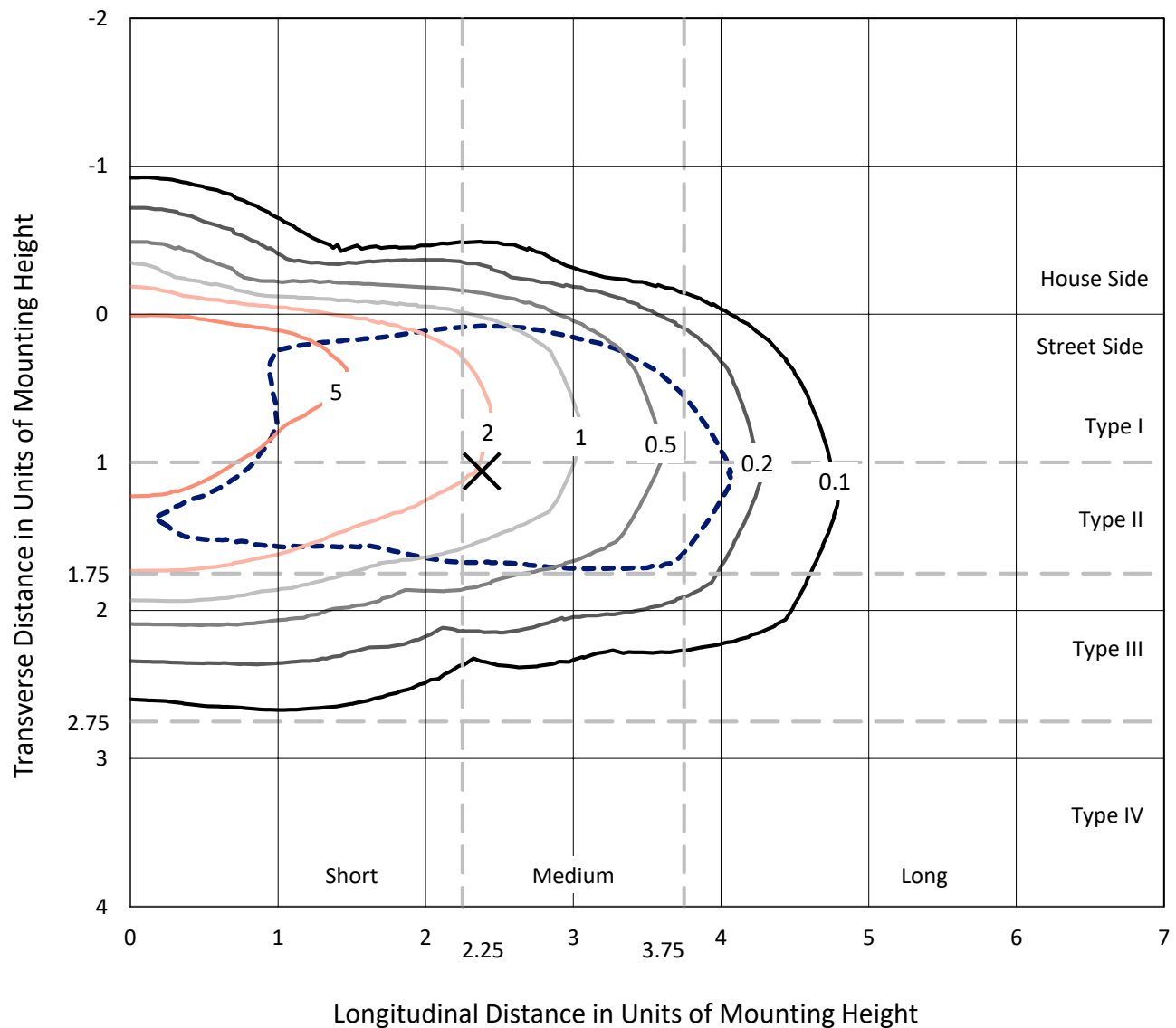
Input Watts (W): 374  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P322043  
 CATALOG NUMBER: GLEON-SA9B-827-U-T2-HSS

## Iso-Footcandle Lines of Horizontal Illumination

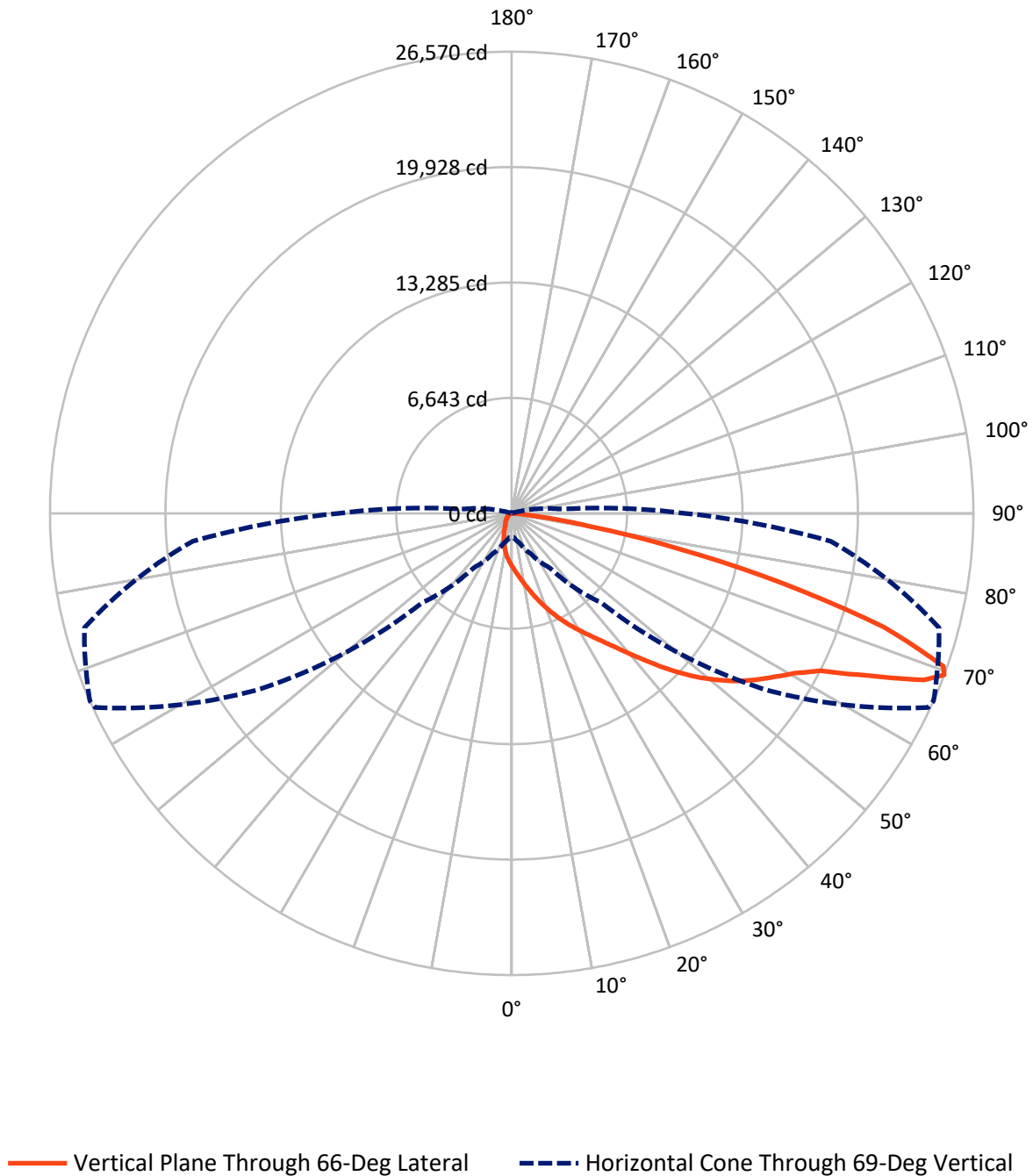
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 8 fc  
 Type II - Medium - N/A

REPORT NUMBER: P322043  
CATALOG NUMBER: GLEON-SA9B-827-U-T2-HSS

## Luminous Intensity Polar Plot



REPORT NUMBER: P322043

CATALOG NUMBER: GLEON-SA9B-827-U-T2-HSS

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 1602.6   | 0.0    | 1602.6  |
|                    | % Fixture | 6.0      | 0.0    | 6.0     |
| <b>Street Side</b> | Lumens    | 25113.4  | 0.0    | 25113.4 |
|                    | % Fixture | 94.0     | 0.0    | 94.0    |
| <b>Total</b>       | Lumens    | 26716.0  | 0.0    | 26716.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 293.9   | 1.1       |
| 10°-20°   | 874.7   | 3.3       |
| 20°-30°   | 1523.1  | 5.7       |
| 30°-40°   | 2672.3  | 10.0      |
| 40°-50°   | 4473.1  | 16.7      |
| 50°-60°   | 6575.0  | 24.6      |
| 60°-70°   | 6750.9  | 25.3      |
| 70°-80°   | 3332.7  | 12.5      |
| 80°-90°   | 220.4   | 0.8       |
| 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°    | 26716.0 | 100.0     |
| 0°-180°   | 26716.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P322043

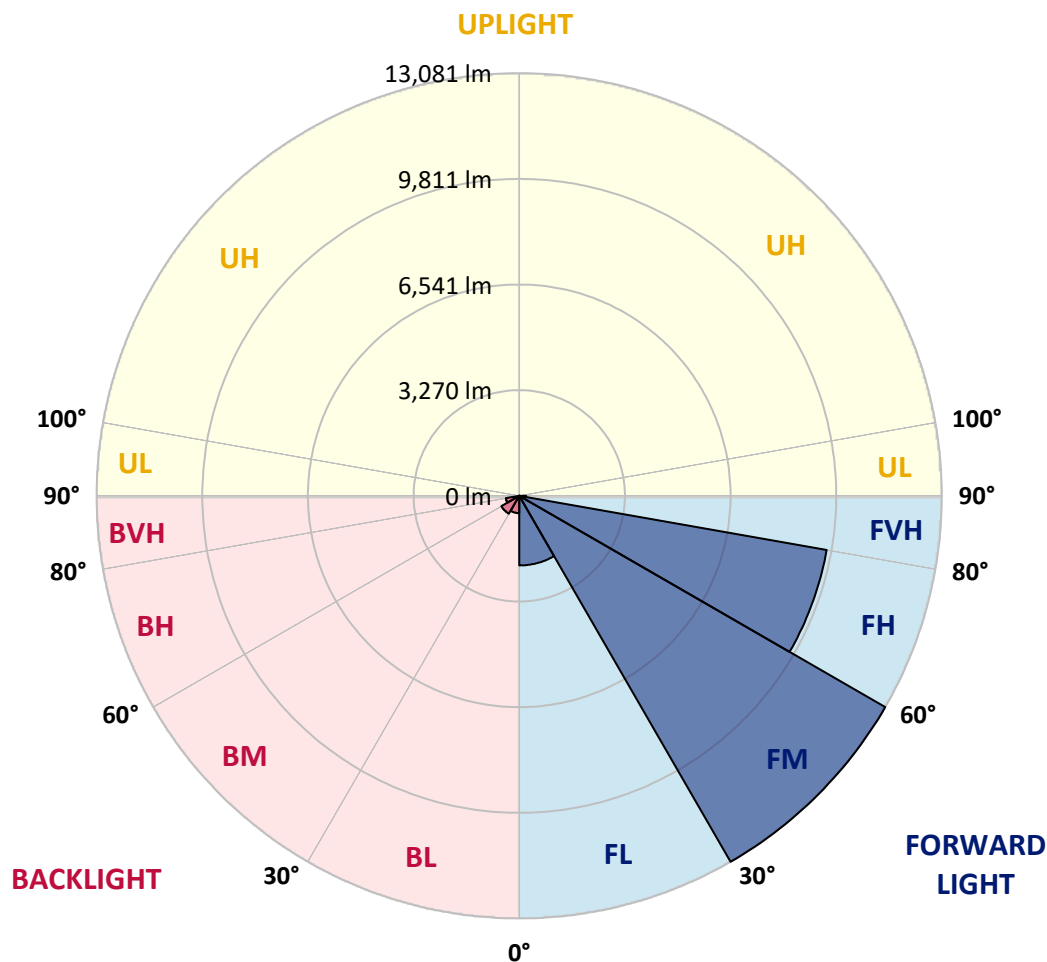
CATALOG NUMBER: GLEON-SA9B-827-U-T2-HSS

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 2155.7  | 8.1       |                         |      |          |
| FM   | (30°-60°)   | 13081.4 | 49.0      |                         |      |          |
| FH   | (60°-80°)   | 9661.2  | 36.2      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 215.0   | 0.8       |                         |      | G2/225   |
| BL   | (0°-30°)    | 536.0   | 2.0       | B2/1000                 |      |          |
| BM   | (30°-60°)   | 639.0   | 2.4       | B1/1000                 |      |          |
| BH   | (60°-80°)   | 422.3   | 1.6       | B1/500                  |      | G1/500   |
| BVH  | (80°-90°)   | 5.3     | 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 II Medium





REPORT NUMBER: P322043

CATALOG NUMBER: GLEON-SA9B-827-U-T2-HSS

**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 65°     | 66°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 3040.4  | 3040.4  | 3040.4  | 3040.4  | 3040.4  | 3040.4  | 3040.4  | 3040.4  | 3040.4  | 3040.4  | 3040.4  |
| 2.5°  | 3578.4  | 3563.2  | 3556.8  | 3528.9  | 3480.7  | 3443.9  | 3372.8  | 3290.3  | 3275.1  | 3195.2  | 3097.5  |
| 5°    | 4042.8  | 4030.1  | 4021.3  | 3981.9  | 3932.4  | 3839.8  | 3710.4  | 3556.8  | 3527.6  | 3375.4  | 3179.9  |
| 7.5°  | 4366.4  | 4389.2  | 4389.2  | 4363.9  | 4301.7  | 4231.9  | 4073.3  | 3863.9  | 3827.1  | 3593.6  | 3290.3  |
| 10°   | 4555.5  | 4583.4  | 4605.0  | 4626.5  | 4617.7  | 4589.7  | 4440.0  | 4204.0  | 4159.6  | 3849.9  | 3418.5  |
| 12.5° | 4573.2  | 4601.2  | 4662.1  | 4752.2  | 4839.7  | 4903.2  | 4809.3  | 4580.9  | 4530.1  | 4146.9  | 3570.8  |
| 15°   | 4474.3  | 4503.4  | 4597.3  | 4772.5  | 4984.4  | 5169.6  | 5200.1  | 4998.3  | 4946.3  | 4500.9  | 3761.1  |
| 17.5° | 4301.7  | 4320.7  | 4455.2  | 4697.6  | 5030.1  | 5370.1  | 5554.1  | 5446.3  | 5398.0  | 4905.7  | 3973.0  |
| 20°   | 4173.5  | 4187.5  | 4305.5  | 4565.6  | 5002.1  | 5495.8  | 5889.1  | 5922.1  | 5871.4  | 5339.7  | 4202.7  |
| 22.5° | 4393.1  | 4418.4  | 4422.2  | 4545.3  | 4926.0  | 5557.9  | 6183.5  | 6390.4  | 6352.3  | 5800.3  | 4428.6  |
| 25°   | 4993.3  | 5022.4  | 4926.0  | 4849.9  | 4990.7  | 5585.8  | 6436.0  | 6870.0  | 6839.6  | 6296.5  | 4655.7  |
| 27.5° | 5786.3  | 5816.8  | 5692.4  | 5465.3  | 5329.5  | 5691.2  | 6660.6  | 7357.3  | 7356.0  | 6821.8  | 4900.6  |
| 30°   | 6565.5  | 6595.9  | 6469.0  | 6241.9  | 5929.7  | 5989.4  | 6854.8  | 7867.4  | 7875.0  | 7363.6  | 5160.8  |
| 32.5° | 7382.7  | 7420.7  | 7290.0  | 6998.2  | 6672.1  | 6504.6  | 7127.6  | 8380.0  | 8423.2  | 7991.7  | 5453.9  |
| 35°   | 8311.5  | 8316.6  | 8132.6  | 7826.8  | 7451.2  | 7193.6  | 7565.4  | 8954.9  | 9057.7  | 8769.6  | 5825.7  |
| 37.5° | 9222.6  | 9259.4  | 9108.4  | 8626.2  | 8281.1  | 7989.2  | 8216.3  | 9673.1  | 9819.0  | 9720.0  | 6311.7  |
| 40°   | 9897.7  | 9975.1  | 9953.5  | 9433.3  | 9105.9  | 8897.8  | 9024.7  | 10527.1 | 10712.3 | 10826.5 | 6924.6  |
| 42.5° | 10321.5 | 10379.9 | 10478.9 | 10165.4 | 9868.5  | 9902.8  | 9978.9  | 11521.9 | 11750.3 | 12087.9 | 7628.8  |
| 45°   | 10807.5 | 10835.4 | 10917.9 | 10779.6 | 10579.1 | 10924.3 | 10991.5 | 12642.4 | 12882.2 | 13444.4 | 8410.5  |
| 47.5° | 11401.4 | 11467.4 | 11490.2 | 11363.3 | 11271.9 | 11827.7 | 11967.3 | 13661.3 | 13997.6 | 14897.3 | 9237.8  |
| 50°   | 12157.7 | 12175.4 | 12214.8 | 12132.3 | 12040.9 | 12604.3 | 12842.9 | 14731.1 | 15036.9 | 16355.3 | 10053.8 |
| 52.5° | 12897.4 | 12960.9 | 13097.9 | 13045.9 | 13009.1 | 13265.4 | 13623.3 | 15695.4 | 16036.8 | 17570.9 | 10868.4 |
| 55°   | 13110.6 | 13165.2 | 13638.5 | 13962.1 | 14261.6 | 14080.1 | 14369.4 | 16559.6 | 16928.9 | 18657.1 | 11652.6 |
| 57.5° | 12259.2 | 12369.6 | 13189.3 | 14031.9 | 15274.2 | 15346.5 | 15394.7 | 17446.6 | 17777.8 | 19489.6 | 12468.5 |
| 60°   | 10107.1 | 10128.6 | 11473.7 | 12919.0 | 15106.7 | 16451.7 | 16892.1 | 18399.5 | 18677.4 | 20264.9 | 13445.6 |
| 62.5° | 6428.4  | 6647.9  | 8123.7  | 10164.2 | 13335.2 | 16291.8 | 18702.8 | 19841.1 | 19942.6 | 21195.0 | 14846.5 |
| 65°   | 3061.9  | 3204.1  | 4267.4  | 6280.0  | 9659.1  | 14245.1 | 19952.7 | 22448.7 | 22494.4 | 23038.8 | 16718.2 |
| 67.5° | 1695.3  | 1763.8  | 2270.1  | 3380.4  | 5646.8  | 10074.1 | 19447.7 | 25537.3 | 25580.4 | 24921.9 | 18360.2 |
| 69°   | 1326.0  | 1384.4  | 1782.9  | 2548.0  | 3828.4  | 7240.5  | 17598.8 | 26442.1 | 26570.2 | 25461.2 | 18418.6 |
| 70°   | 1125.5  | 1182.6  | 1535.4  | 2152.1  | 3078.4  | 5594.7  | 15665.0 | 26217.5 | 26353.2 | 25410.4 | 17983.3 |
| 72.5° | 689.0   | 722.0   | 1022.8  | 1515.1  | 2063.3  | 2814.5  | 9660.4  | 22172.1 | 22401.8 | 23309.1 | 15455.6 |
| 75°   | 464.4   | 482.2   | 639.5   | 1045.6  | 1475.8  | 1449.1  | 5018.6  | 15628.2 | 16125.6 | 18131.8 | 11415.3 |
| 77.5° | 332.5   | 349.0   | 428.9   | 676.3   | 1034.2  | 956.8   | 2272.7  | 9712.4  | 9819.0  | 10874.8 | 6225.4  |
| 80°   | 189.1   | 204.3   | 303.3   | 402.3   | 701.7   | 638.3   | 903.5   | 4639.2  | 4692.5  | 4663.3  | 2078.5  |
| 82.5° | 99.0    | 111.7   | 166.2   | 265.2   | 450.5   | 417.5   | 375.6   | 1553.2  | 1560.8  | 1298.1  | 455.5   |
| 85°   | 19.0    | 22.8    | 82.5    | 181.5   | 232.2   | 181.5   | 153.5   | 364.2   | 371.8   | 328.7   | 112.9   |
| 87.5° | 0.0     | 1.3     | 33.0    | 40.6    | 45.7    | 47.0    | 49.5    | 71.1    | 76.1    | 102.8   | 30.5    |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



REPORT NUMBER: P322043

CATALOG NUMBER: GLEON-SA9B-827-U-T2-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 3040.4  | 3040.4 | 3040.4 | 3040.4 | 3040.4 | 3040.4 | 3040.4 | 3040.4 | 3040.4 | 3040.4 | 3040.4 |
| 2.5°  | 3054.3  | 3008.6 | 2921.1 | 2819.6 | 2740.9 | 2663.5 | 2602.6 | 2539.1 | 2516.3 | 2504.9 | 2503.6 |
| 5°    | 3084.8  | 2988.3 | 2803.1 | 2612.7 | 2456.7 | 2309.5 | 2204.1 | 2103.9 | 2056.9 | 2035.4 | 2026.5 |
| 7.5°  | 3135.5  | 2980.7 | 2682.5 | 2391.9 | 2167.3 | 1983.3 | 1837.4 | 1728.3 | 1673.7 | 1650.9 | 1642.0 |
| 10°   | 3195.2  | 2970.6 | 2541.7 | 2158.5 | 1871.7 | 1681.3 | 1536.7 | 1428.8 | 1369.2 | 1343.8 | 1331.1 |
| 12.5° | 3265.0  | 2952.8 | 2379.3 | 1922.4 | 1619.2 | 1428.8 | 1253.7 | 1120.5 | 1051.9 | 1022.8 | 1008.8 |
| 15°   | 3351.3  | 2935.0 | 2209.2 | 1700.4 | 1397.1 | 1164.9 | 973.3  | 883.2  | 869.2  | 864.1  | 865.4  |
| 17.5° | 3436.3  | 2907.1 | 2024.0 | 1480.8 | 1163.6 | 909.8  | 812.1  | 807.0  | 809.6  | 809.6  | 809.6  |
| 20°   | 3512.4  | 2843.7 | 1822.2 | 1293.0 | 941.5  | 767.7  | 747.4  | 738.5  | 732.2  | 727.1  | 720.8  |
| 22.5° | 3572.1  | 2758.7 | 1628.0 | 1106.5 | 769.0  | 703.0  | 671.3  | 643.3  | 620.5  | 605.3  | 597.7  |
| 25°   | 3612.7  | 2645.7 | 1450.4 | 927.6  | 691.6  | 639.5  | 582.4  | 535.5  | 500.0  | 478.4  | 469.5  |
| 27.5° | 3643.1  | 2523.9 | 1291.8 | 776.6  | 638.3  | 565.9  | 491.1  | 435.2  | 398.4  | 379.4  | 371.8  |
| 30°   | 3664.7  | 2385.6 | 1152.2 | 682.7  | 578.6  | 488.5  | 408.6  | 354.0  | 327.4  | 317.2  | 312.2  |
| 32.5° | 3685.0  | 2232.1 | 1020.2 | 638.3  | 522.8  | 417.5  | 342.6  | 300.7  | 284.2  | 271.6  | 267.7  |
| 35°   | 3735.7  | 2089.9 | 894.6  | 591.3  | 465.7  | 356.6  | 294.4  | 263.9  | 247.4  | 239.8  | 237.3  |
| 37.5° | 3856.3  | 1984.6 | 774.0  | 543.1  | 408.6  | 308.4  | 257.6  | 236.0  | 220.8  | 213.2  | 210.6  |
| 40°   | 4050.4  | 1931.3 | 672.5  | 491.1  | 352.8  | 271.6  | 233.5  | 213.2  | 196.7  | 185.3  | 182.7  |
| 42.5° | 4335.9  | 1938.9 | 601.5  | 439.1  | 308.4  | 242.4  | 210.6  | 186.5  | 168.8  | 158.6  | 156.1  |
| 45°   | 4682.4  | 1994.8 | 552.0  | 388.3  | 271.6  | 219.5  | 185.3  | 159.9  | 143.4  | 134.5  | 132.0  |
| 47.5° | 5058.0  | 2084.9 | 511.4  | 342.6  | 242.4  | 198.0  | 159.9  | 133.2  | 119.3  | 111.7  | 110.4  |
| 50°   | 5453.9  | 2172.4 | 469.5  | 298.2  | 217.0  | 176.4  | 134.5  | 110.4  | 99.0   | 92.6   | 90.1   |
| 52.5° | 5854.9  | 2273.9 | 431.4  | 257.6  | 195.4  | 151.0  | 111.7  | 90.1   | 81.2   | 76.1   | 73.6   |
| 55°   | 6286.3  | 2350.1 | 394.6  | 225.9  | 173.8  | 128.2  | 92.6   | 74.9   | 67.3   | 60.9   | 59.6   |
| 57.5° | 6793.9  | 2468.1 | 356.6  | 195.4  | 148.5  | 106.6  | 76.1   | 59.6   | 53.3   | 47.0   | 45.7   |
| 60°   | 7479.1  | 2606.4 | 316.0  | 172.6  | 121.8  | 87.6   | 62.2   | 48.2   | 40.6   | 35.5   | 34.3   |
| 62.5° | 8382.6  | 2759.9 | 265.2  | 151.0  | 99.0   | 71.1   | 49.5   | 38.1   | 29.2   | 22.8   | 22.8   |
| 65°   | 9528.4  | 3009.9 | 217.0  | 126.9  | 81.2   | 58.4   | 38.1   | 27.9   | 16.5   | 10.2   | 10.2   |
| 67.5° | 10197.2 | 3053.1 | 175.1  | 104.1  | 66.0   | 49.5   | 31.7   | 19.0   | 5.1    | 1.3    | 0.0    |
| 69°   | 9982.7  | 2803.1 | 148.5  | 88.8   | 57.1   | 47.0   | 29.2   | 14.0   | 2.5    | 0.0    | 0.0    |
| 70°   | 9579.2  | 2563.2 | 130.7  | 78.7   | 52.0   | 44.4   | 27.9   | 10.2   | 2.5    | 0.0    | 0.0    |
| 72.5° | 7915.6  | 1824.7 | 99.0   | 58.4   | 38.1   | 39.3   | 25.4   | 6.3    | 2.5    | 0.0    | 0.0    |
| 75°   | 5766.0  | 1109.0 | 71.1   | 40.6   | 24.1   | 29.2   | 17.8   | 2.5    | 1.3    | 0.0    | 0.0    |
| 77.5° | 3207.9  | 522.8  | 44.4   | 22.8   | 15.2   | 17.8   | 8.9    | 0.0    | 0.0    | 0.0    | 0.0    |
| 80°   | 1041.8  | 142.1  | 20.3   | 12.7   | 8.9    | 10.2   | 3.8    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 192.9   | 40.6   | 11.4   | 6.3    | 2.5    | 2.5    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 41.9    | 16.5   | 6.3    | 2.5    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 14.0    | 5.1    | 1.3    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 90°   | 0.0     | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

LM-79-2019: 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

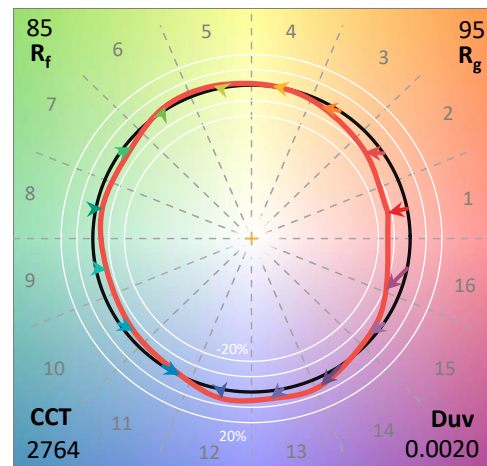
### Test Information

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**



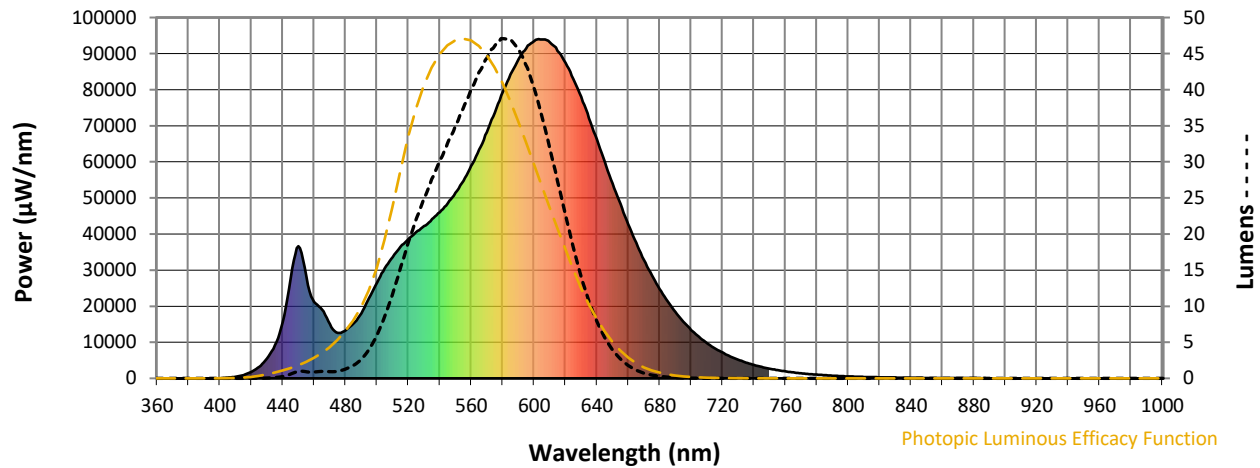
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 2700K 4-step quadrangle

REPORT NUMBER: SP1-2407-157-9

### Photopic Flux vs. Wavelength



**Photopic Lumens: 4337.9**

| λ (nm) | Power (μW/nm) | Lumens (Φ/nm) | λ (nm) | Power (μW/nm) | Lumens (Φ/nm) | λ (nm) | Power (μW/nm) | Lumens (Φ/nm) | λ (nm) | Power (μW/nm) | Lumens (Φ/nm) | λ (nm) | Power (μW/nm) | Lumens (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**

| 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              |           |                  |                  |

REPORT NUMBER: SP1-2407-157-9

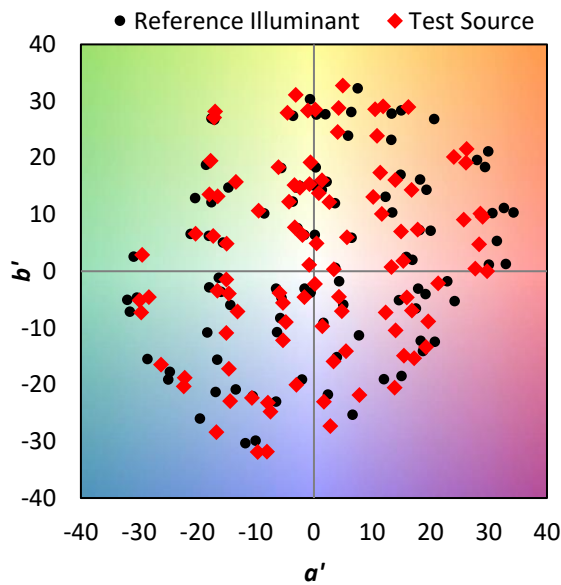
TM-30-18

### 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)