

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



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: P318214

Luminaire Tested: **GLEON-SA0C-827-U-T2**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P318214  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-12)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GLEON-SA0C-827-U-T2  
Description: GALLEON AREA AND ROADWAY LUMINAIRE  
(10) 80 CRI, 2700K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 50505 lumens  
Efficiency: N/A  
Efficacy: 90.5 lumens/watt  
Luminous Opening: Rectangular (W 2.5' x L: 1' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B4 - U0 - G5

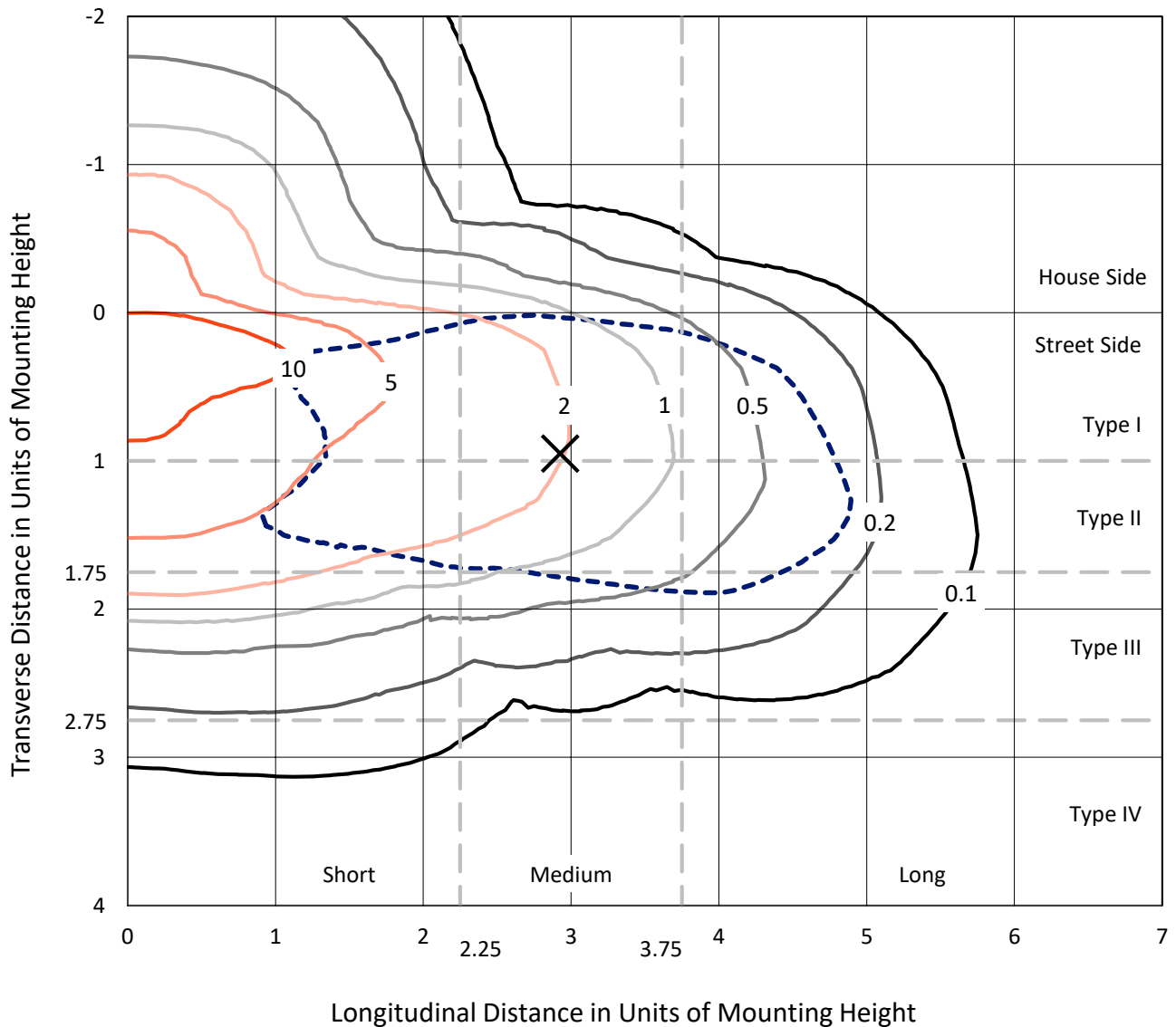
Input Watts (W): 558  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



REPORT NUMBER: P318214  
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### Iso-Footcandle Lines of Horizontal Illumination

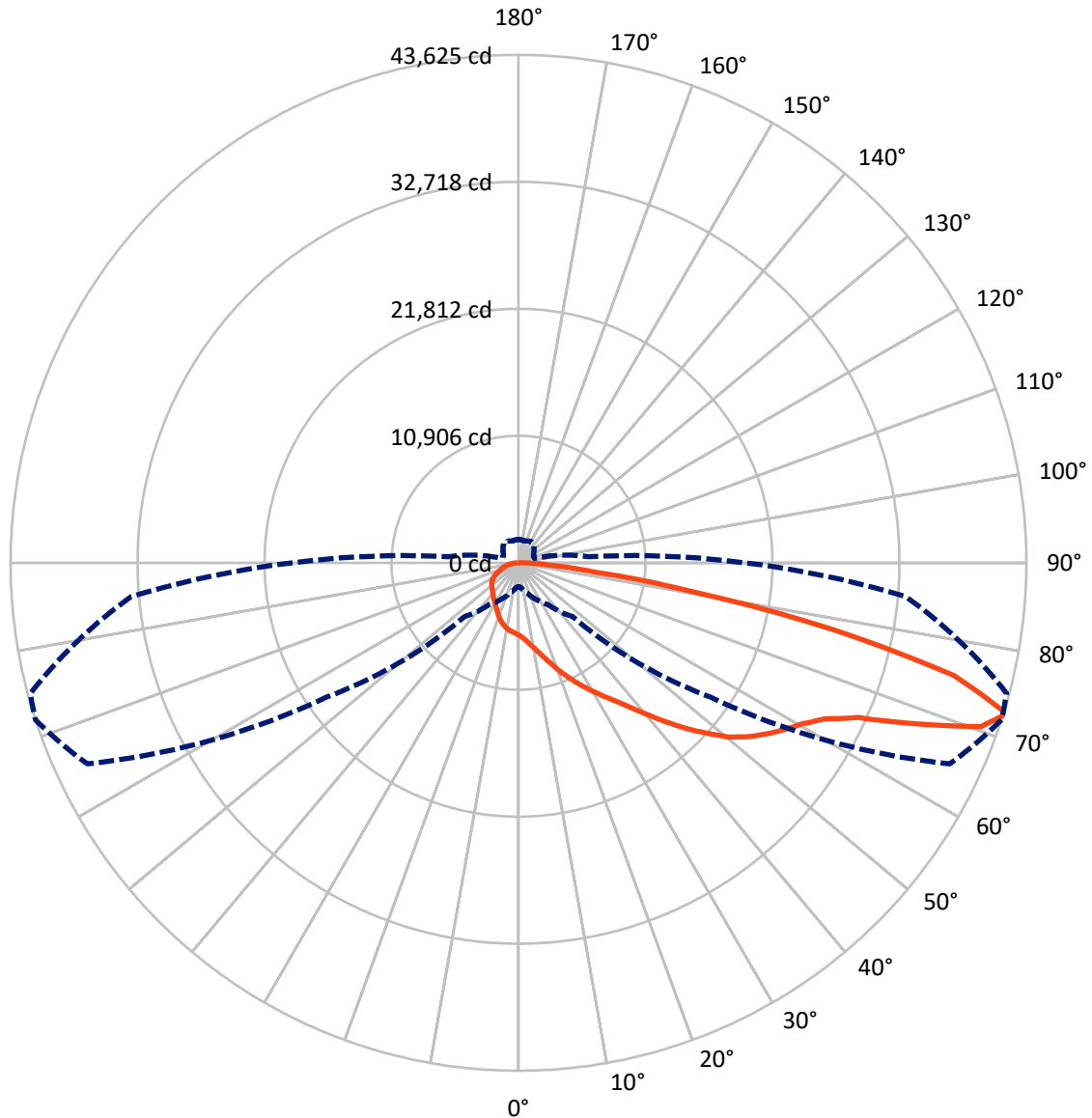
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 13.7 fc  
 Type III - Medium - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 72-Deg Lateral      - - - Horizontal Cone Through 72-Deg Vertical

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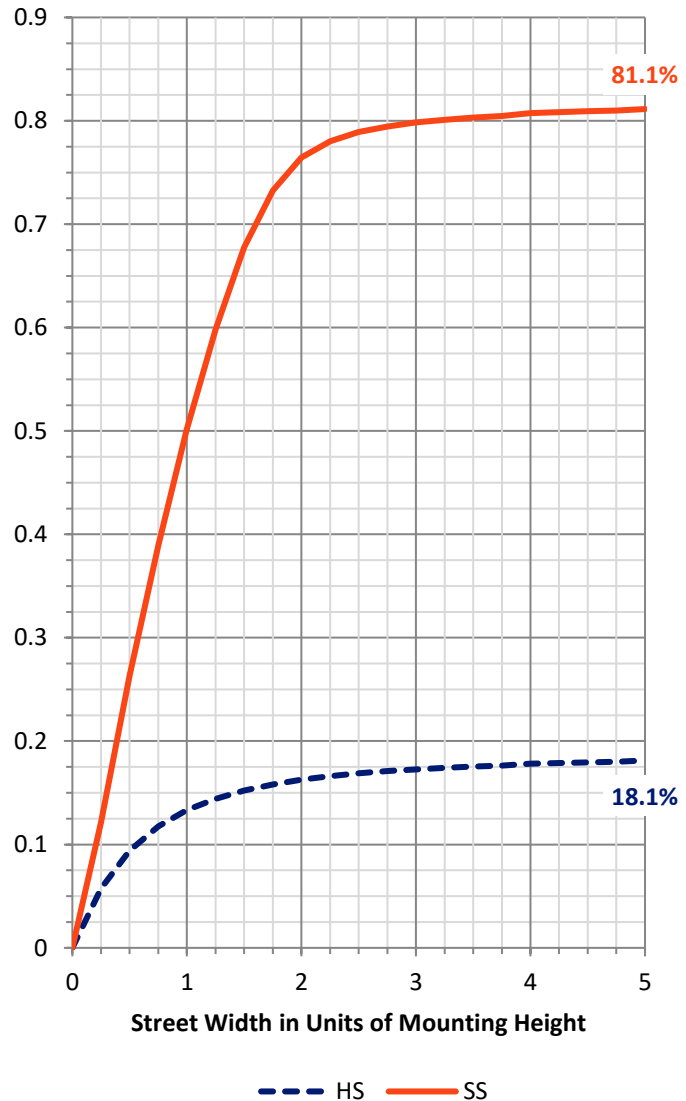
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 9369.0   | 0.0    | 9369.0  |
|                    | % Fixture | 18.6     | 0.0    | 18.6    |
| <b>Street Side</b> | Lumens    | 41136.0  | 0.0    | 41136.0 |
|                    | % Fixture | 81.4     | 0.0    | 81.4    |
| <b>Total</b>       | Lumens    | 50505.0  | 0.0    | 50505.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 622.6   | 1.2       |
| 10°-20°   | 2012.0  | 4.0       |
| 20°-30°   | 3525.6  | 7.0       |
| 30°-40°   | 5227.3  | 10.4      |
| 40°-50°   | 7645.4  | 15.1      |
| 50°-60°   | 10520.0 | 20.8      |
| 60°-70°   | 11711.9 | 23.2      |
| 70°-80°   | 7936.0  | 15.7      |
| 80°-90°   | 1304.3  | 2.6       |
| 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°    | 50505.0 | 100.0     |
| 0°-180°   | 50505.0 | 100.0     |

**Coefficient of Utilization**

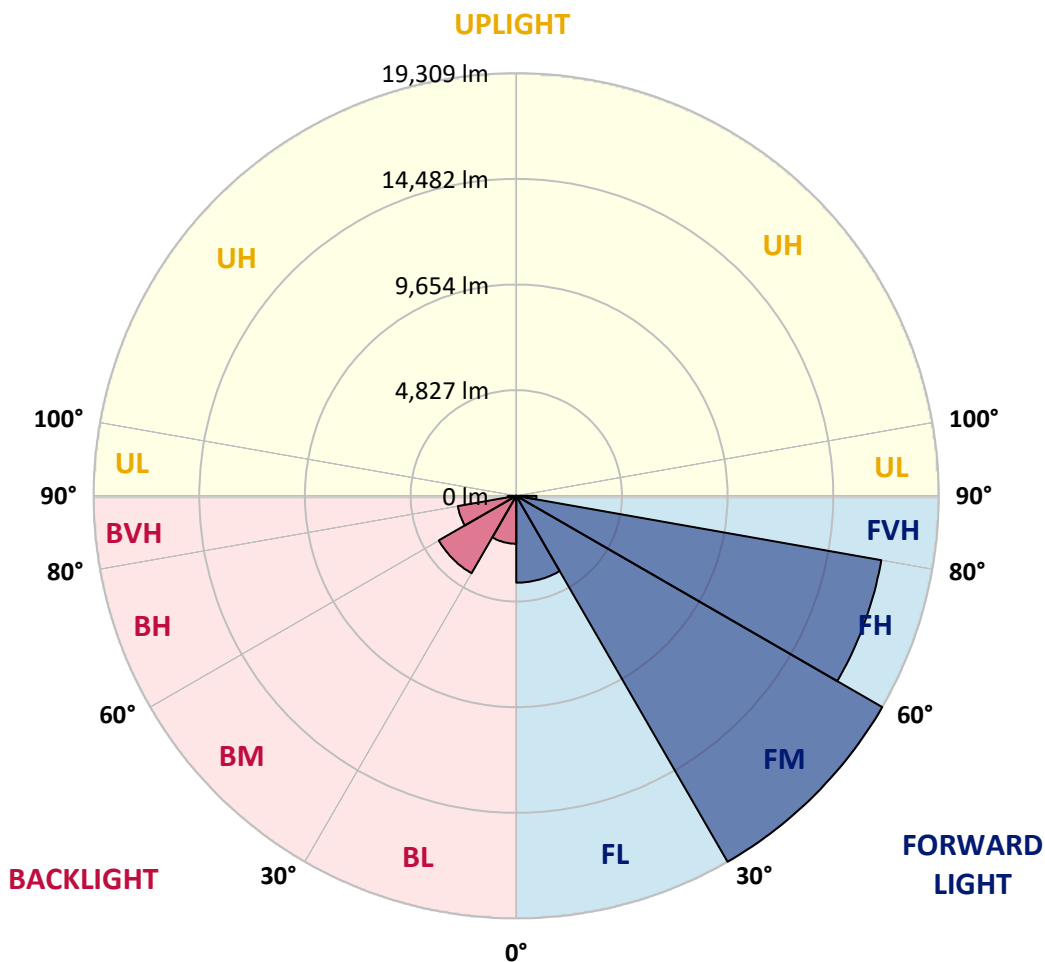


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|---------|-----------|-------------------------|------|---------|
|                |         |           | B                       | U    | G       |
| FL (0°-30°)    | 3970.0  | 7.9       |                         |      |         |
| FM (30°-60°)   | 19308.7 | 38.2      |                         |      |         |
| FH (60°-80°)   | 16937.2 | 33.5      |                         |      | G5      |
| FVH (80°-90°)  | 920.1   | 1.8       |                         |      | G5      |
| BL (0°-30°)    | 2190.1  | 4.3       | B3/2500                 |      |         |
| BM (30°-60°)   | 4084.0  | 8.1       | B3/5000                 |      |         |
| BH (60°-80°)   | 2710.6  | 5.4       | B4/5000                 |      | G4/5000 |
| BVH (80°-90°)  | 384.3   | 0.8       |                         |      | G3/500  |
| UL (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

**BUG Rating: B4-U0-G5**  
 Type III Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 65°     | 72°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 6213.4  | 6213.4  | 6213.4  | 6213.4  | 6213.4  | 6213.4  | 6213.4  | 6213.4  | 6213.4  | 6213.4  | 6213.4  |
| 2.5°  | 6863.8  | 6853.4  | 6816.9  | 6816.9  | 6747.3  | 6688.2  | 6576.9  | 6502.1  | 6413.4  | 6382.1  | 6277.8  |
| 5°    | 7528.1  | 7531.6  | 7486.4  | 7455.1  | 7352.5  | 7227.3  | 7037.7  | 6865.6  | 6693.4  | 6623.8  | 6409.9  |
| 7.5°  | 8086.3  | 8079.4  | 8067.2  | 8041.1  | 7945.5  | 7816.8  | 7561.2  | 7305.5  | 7051.6  | 6947.3  | 6578.6  |
| 10°   | 8444.6  | 8460.2  | 8470.6  | 8482.8  | 8442.8  | 8350.7  | 8108.9  | 7797.7  | 7465.5  | 7322.9  | 6780.3  |
| 12.5° | 8625.4  | 8653.2  | 8701.9  | 8785.4  | 8851.5  | 8841.1  | 8665.4  | 8335.0  | 7940.3  | 7761.1  | 7032.5  |
| 15°   | 8731.5  | 8768.0  | 8844.5  | 8994.1  | 9180.2  | 9286.2  | 9239.3  | 8940.2  | 8500.2  | 8279.4  | 7340.3  |
| 17.5° | 8797.6  | 8827.1  | 8945.4  | 9145.4  | 9421.9  | 9703.6  | 9827.1  | 9576.7  | 9133.2  | 8881.1  | 7693.3  |
| 20°   | 8842.8  | 8865.4  | 9013.2  | 9248.0  | 9606.2  | 10054.9 | 10399.2 | 10336.6 | 9830.5  | 9503.6  | 8062.0  |
| 22.5° | 8943.7  | 8962.8  | 9103.6  | 9340.1  | 9736.6  | 10315.7 | 10950.5 | 11044.4 | 10566.1 | 10195.7 | 8456.7  |
| 25°   | 9225.4  | 9225.4  | 9343.6  | 9508.8  | 9881.0  | 10541.8 | 11416.5 | 11832.1 | 11317.4 | 10886.1 | 8821.9  |
| 27.5° | 9762.7  | 9757.5  | 9801.0  | 9858.4  | 10140.1 | 10771.3 | 11832.1 | 12527.7 | 12096.5 | 11625.2 | 9176.7  |
| 30°   | 10399.2 | 10434.0 | 10439.2 | 10411.4 | 10543.5 | 11058.3 | 12216.4 | 13261.6 | 12880.7 | 12373.0 | 9540.1  |
| 32.5° | 11218.3 | 11240.9 | 11214.8 | 11122.6 | 11103.5 | 11465.2 | 12593.8 | 14030.2 | 13729.4 | 13153.8 | 9872.3  |
| 35°   | 12258.2 | 12214.7 | 12133.0 | 11945.2 | 11766.0 | 12009.5 | 13025.1 | 14798.9 | 14682.3 | 14098.0 | 10329.6 |
| 37.5° | 13372.9 | 13374.6 | 13273.8 | 12847.7 | 12600.8 | 12705.1 | 13619.8 | 15670.1 | 15835.3 | 15221.4 | 10915.7 |
| 40°   | 14266.7 | 14313.7 | 14376.3 | 13816.3 | 13496.3 | 13640.7 | 14376.3 | 16680.4 | 17198.7 | 16553.5 | 11679.1 |
| 42.5° | 14891.0 | 14944.9 | 15122.3 | 14771.0 | 14438.9 | 14706.7 | 15266.6 | 17758.6 | 18729.0 | 18090.8 | 12572.9 |
| 45°   | 15551.8 | 15581.4 | 15706.6 | 15555.3 | 15343.2 | 15946.6 | 16270.0 | 18875.1 | 20348.0 | 19728.9 | 13572.9 |
| 47.5° | 16247.4 | 16278.7 | 16407.4 | 16306.6 | 16195.3 | 17104.8 | 17316.9 | 19927.2 | 21899.2 | 21528.8 | 14640.6 |
| 50°   | 17106.5 | 17127.4 | 17249.1 | 17066.5 | 17101.3 | 17977.7 | 18252.5 | 20892.3 | 23525.1 | 23146.0 | 15711.8 |
| 52.5° | 18278.6 | 18283.8 | 18452.5 | 18287.3 | 18123.8 | 18617.7 | 19057.7 | 21801.8 | 24799.8 | 24620.7 | 16783.1 |
| 55°   | 19196.8 | 19252.4 | 19805.4 | 19770.6 | 19676.7 | 19198.5 | 19730.6 | 22667.8 | 25937.1 | 26022.3 | 17920.4 |
| 57.5° | 18610.7 | 18828.1 | 19948.0 | 20737.5 | 21506.2 | 20643.6 | 20640.1 | 23643.4 | 26994.4 | 27397.9 | 19170.7 |
| 60°   | 16299.6 | 16595.2 | 18245.5 | 19996.7 | 22401.7 | 23158.2 | 22528.7 | 24834.6 | 28062.2 | 28761.3 | 20737.5 |
| 62.5° | 11640.8 | 12127.8 | 14364.1 | 17160.4 | 21174.0 | 24824.2 | 26371.9 | 26724.9 | 29514.2 | 30340.3 | 22773.9 |
| 65°   | 5884.8  | 6253.4  | 8128.1  | 11496.5 | 16917.0 | 23735.6 | 30548.9 | 30863.7 | 32037.5 | 32771.4 | 25909.3 |
| 67.5° | 3575.4  | 3714.5  | 4629.2  | 6394.3  | 10371.4 | 18489.0 | 31912.3 | 37762.3 | 36920.6 | 37310.2 | 30380.3 |
| 70°   | 2634.6  | 2737.2  | 3307.6  | 4246.6  | 5964.8  | 10849.6 | 27728.3 | 42685.4 | 42132.4 | 42088.9 | 33684.4 |
| 72°   | 2052.0  | 2126.8  | 2631.1  | 3431.0  | 4361.4  | 6509.1  | 20097.6 | 40868.1 | 43624.5 | 43405.3 | 33381.8 |
| 72.5° | 1945.9  | 2012.0  | 2471.1  | 3229.3  | 4121.4  | 5900.4  | 18069.9 | 39642.2 | 43516.6 | 43417.5 | 32990.5 |
| 75°   | 1532.1  | 1579.0  | 1829.4  | 2497.2  | 3225.8  | 3347.6  | 9901.8  | 30721.1 | 38604.0 | 40209.1 | 29672.5 |
| 77.5° | 1267.7  | 1274.7  | 1406.8  | 1817.3  | 2514.6  | 2366.8  | 4864.0  | 21314.9 | 27643.1 | 29408.2 | 21019.2 |
| 80°   | 1033.0  | 1041.7  | 1104.3  | 1274.7  | 1902.5  | 1751.2  | 2309.4  | 12256.4 | 15477.1 | 15496.2 | 9995.7  |
| 82.5° | 822.5   | 824.3   | 893.8   | 932.1   | 1366.9  | 1252.1  | 1323.4  | 5754.3  | 6763.0  | 6505.6  | 3592.8  |
| 85°   | 579.1   | 566.9   | 873.0   | 765.2   | 893.8   | 803.4   | 730.4   | 2278.1  | 2796.3  | 2674.6  | 1125.1  |
| 87.5° | 193.0   | 200.0   | 387.8   | 495.6   | 521.7   | 455.6   | 325.2   | 873.0   | 1055.6  | 1046.9  | 356.5   |
| 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: P318214  
 CATALOG NUMBER: GLEON-SA0C-827-U-T2

**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 6213.4  | 6213.4 | 6213.4 | 6213.4 | 6213.4 | 6213.4 | 6213.4 | 6213.4 | 6213.4 | 6213.4 | 6213.4 |
| 2.5°  | 6244.7  | 6189.1 | 6107.4 | 6016.9 | 5945.6 | 5872.6 | 5818.7 | 5790.9 | 5759.6 | 5733.5 | 5764.8 |
| 5°    | 6310.8  | 6206.5 | 6032.6 | 5862.2 | 5736.9 | 5625.7 | 5545.7 | 5503.9 | 5465.7 | 5439.6 | 5443.1 |
| 7.5°  | 6418.6  | 6250.0 | 5957.8 | 5709.1 | 5535.2 | 5415.2 | 5333.5 | 5305.7 | 5281.3 | 5274.4 | 5283.1 |
| 10°   | 6533.4  | 6284.7 | 5858.7 | 5528.3 | 5330.0 | 5230.9 | 5194.4 | 5213.5 | 5230.9 | 5246.6 | 5263.9 |
| 12.5° | 6663.8  | 6316.0 | 5714.3 | 5316.1 | 5147.4 | 5109.2 | 5145.7 | 5229.2 | 5290.0 | 5326.5 | 5349.2 |
| 15°   | 6834.3  | 6343.9 | 5547.4 | 5104.0 | 4990.9 | 5034.4 | 5157.9 | 5302.2 | 5408.3 | 5476.1 | 5486.5 |
| 17.5° | 6990.8  | 6342.1 | 5333.5 | 4890.1 | 4864.0 | 4990.9 | 5177.0 | 5380.5 | 5523.1 | 5618.7 | 5637.8 |
| 20°   | 7152.5  | 6295.2 | 5084.8 | 4681.4 | 4735.3 | 4944.0 | 5185.7 | 5430.9 | 5603.0 | 5714.3 | 5740.4 |
| 22.5° | 7303.8  | 6213.4 | 4811.8 | 4491.8 | 4627.5 | 4881.4 | 5152.6 | 5401.3 | 5573.5 | 5663.9 | 5691.7 |
| 25°   | 7406.4  | 6070.8 | 4535.3 | 4331.8 | 4531.8 | 4804.8 | 5044.8 | 5244.8 | 5373.5 | 5418.7 | 5425.7 |
| 27.5° | 7458.6  | 5884.8 | 4274.5 | 4192.7 | 4432.7 | 4679.6 | 4844.8 | 4944.0 | 4980.5 | 4977.0 | 4970.1 |
| 30°   | 7465.5  | 5639.6 | 4050.1 | 4079.7 | 4317.9 | 4495.3 | 4573.6 | 4554.4 | 4507.5 | 4427.5 | 4434.4 |
| 32.5° | 7442.9  | 5363.1 | 3862.3 | 3971.9 | 4171.9 | 4271.0 | 4274.5 | 4182.3 | 4057.1 | 3930.1 | 3895.4 |
| 35°   | 7449.9  | 5091.8 | 3697.1 | 3850.1 | 3994.5 | 4037.9 | 3998.0 | 3862.3 | 3691.9 | 3528.4 | 3493.6 |
| 37.5° | 7526.4  | 4855.3 | 3554.5 | 3709.3 | 3798.0 | 3808.4 | 3751.0 | 3608.4 | 3483.2 | 3323.2 | 3309.3 |
| 40°   | 7709.0  | 4686.6 | 3418.9 | 3551.0 | 3601.5 | 3606.7 | 3524.9 | 3424.1 | 3434.5 | 3349.3 | 3347.6 |
| 42.5° | 8037.6  | 4613.6 | 3298.9 | 3385.8 | 3417.1 | 3427.6 | 3365.0 | 3300.6 | 3391.0 | 3335.4 | 3316.3 |
| 45°   | 8462.0  | 4630.9 | 3198.0 | 3224.1 | 3281.5 | 3330.2 | 3291.9 | 3213.7 | 3248.4 | 3006.7 | 2926.7 |
| 47.5° | 8952.4  | 4742.2 | 3118.0 | 3085.0 | 3184.1 | 3276.3 | 3217.1 | 3098.9 | 2975.4 | 2735.4 | 2690.2 |
| 50°   | 9526.2  | 4914.4 | 3045.0 | 2947.6 | 3078.0 | 3203.2 | 3144.1 | 2975.4 | 2789.3 | 2672.8 | 2657.2 |
| 52.5° | 10124.4 | 5124.8 | 2971.9 | 2796.3 | 2944.1 | 3147.6 | 3118.0 | 2947.6 | 2718.1 | 2603.3 | 2582.4 |
| 55°   | 10802.6 | 5337.0 | 2879.8 | 2620.7 | 2799.8 | 3121.5 | 3105.8 | 2846.7 | 2664.1 | 2599.8 | 2584.1 |
| 57.5° | 11646.1 | 5578.7 | 2758.0 | 2438.1 | 2664.1 | 3027.6 | 2978.9 | 2785.9 | 2608.5 | 2559.8 | 2554.6 |
| 60°   | 12745.1 | 5935.2 | 2582.4 | 2243.3 | 2498.9 | 2883.3 | 2872.8 | 2697.2 | 2519.8 | 2485.0 | 2478.1 |
| 62.5° | 14393.7 | 6524.7 | 2340.7 | 2048.5 | 2314.6 | 2638.1 | 2733.7 | 2577.2 | 2425.9 | 2424.2 | 2427.6 |
| 65°   | 16950.0 | 7411.6 | 2078.1 | 1878.1 | 2128.5 | 2431.1 | 2572.0 | 2453.7 | 2330.3 | 2365.0 | 2370.3 |
| 67.5° | 19913.2 | 8147.2 | 1820.7 | 1711.2 | 1939.0 | 2234.6 | 2425.9 | 2330.3 | 2203.3 | 2293.7 | 2295.5 |
| 70°   | 20899.3 | 7489.9 | 1594.7 | 1546.0 | 1742.5 | 2045.1 | 2267.7 | 2194.6 | 2065.9 | 2156.4 | 2147.7 |
| 72°   | 19448.9 | 6046.5 | 1448.6 | 1420.8 | 1594.7 | 1888.5 | 2126.8 | 2067.7 | 1940.7 | 2001.6 | 1979.0 |
| 72.5° | 18991.6 | 5764.8 | 1412.1 | 1389.5 | 1554.7 | 1848.6 | 2090.3 | 2036.4 | 1909.4 | 1961.6 | 1940.7 |
| 75°   | 16941.3 | 5006.6 | 1213.8 | 1219.0 | 1356.4 | 1653.8 | 1885.1 | 1867.7 | 1737.3 | 1742.5 | 1735.5 |
| 77.5° | 12287.7 | 3671.0 | 1022.5 | 1057.3 | 1154.7 | 1453.8 | 1678.1 | 1667.7 | 1525.1 | 1499.0 | 1493.8 |
| 80°   | 5702.2  | 1872.9 | 833.0  | 848.6  | 949.5  | 1215.6 | 1431.2 | 1417.3 | 1302.5 | 1269.5 | 1250.3 |
| 82.5° | 1952.9  | 890.4  | 626.0  | 636.5  | 735.6  | 979.1  | 1241.6 | 1232.9 | 1137.3 | 1073.0 | 1033.0 |
| 85°   | 697.3   | 443.4  | 438.2  | 427.8  | 525.2  | 770.4  | 1081.7 | 1034.7 | 893.8  | 761.7  | 758.2  |
| 87.5° | 226.1   | 189.6  | 226.1  | 224.3  | 306.1  | 521.7  | 786.0  | 669.5  | 648.6  | 539.1  | 528.7  |
| 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: 4π  
 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  
 Rf: 84.7  
 Rg: 94.6

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



**Test Conditions**

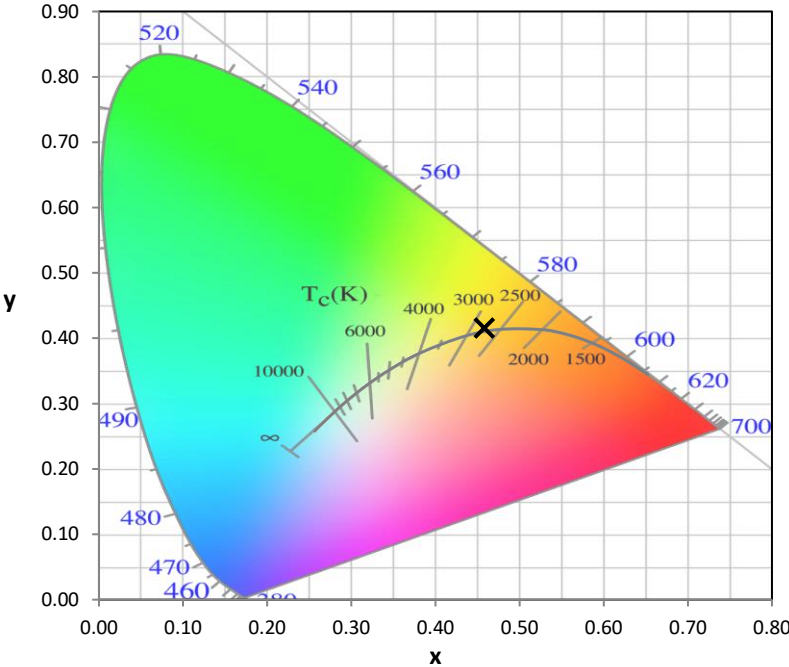
Stabilization Time: 81M  
 Operation Time: 2H 21M  
 Sphere Temperature (°C): 25.2

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**

| 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         | 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**

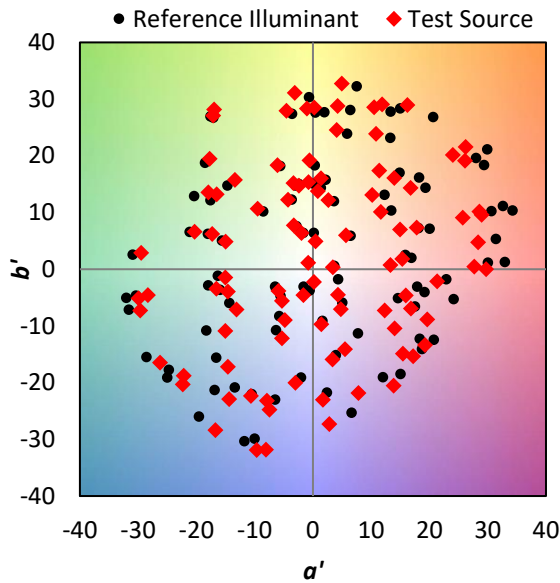
| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 0             | 0.0           | 490    | 18018         | 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           |        |               |               |

**Summary**

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



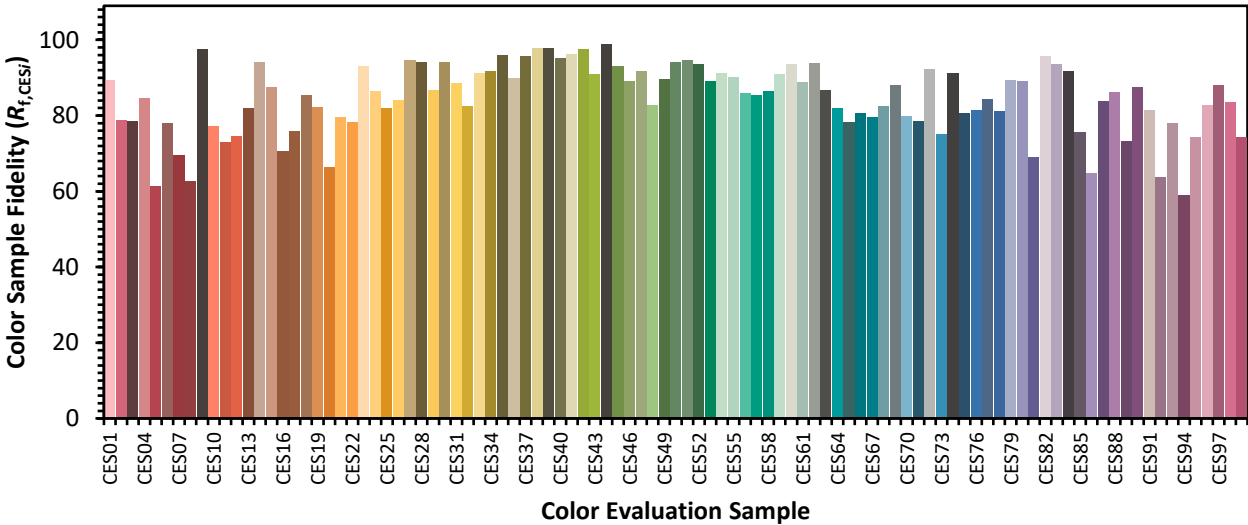
**Color Vector Graphics**



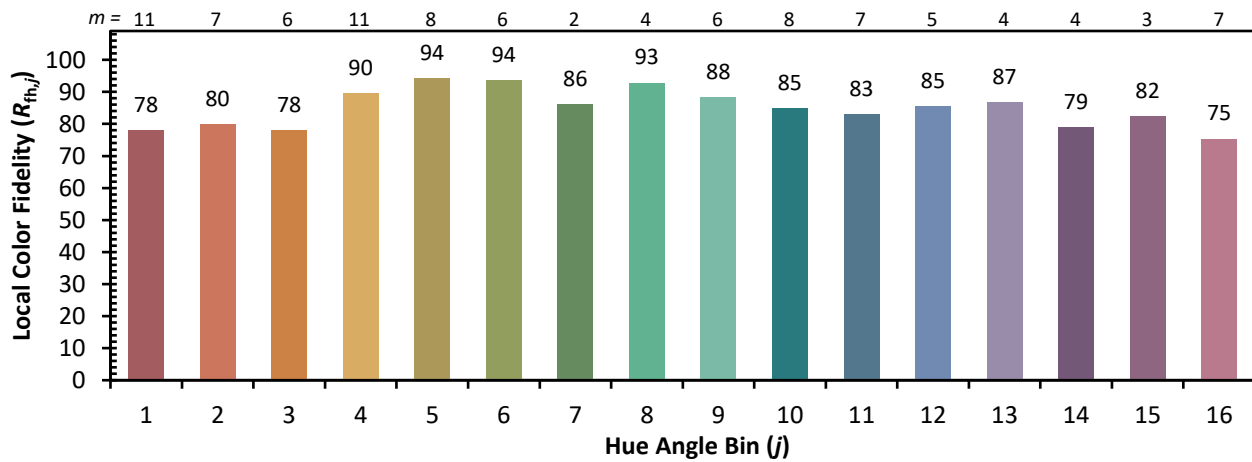
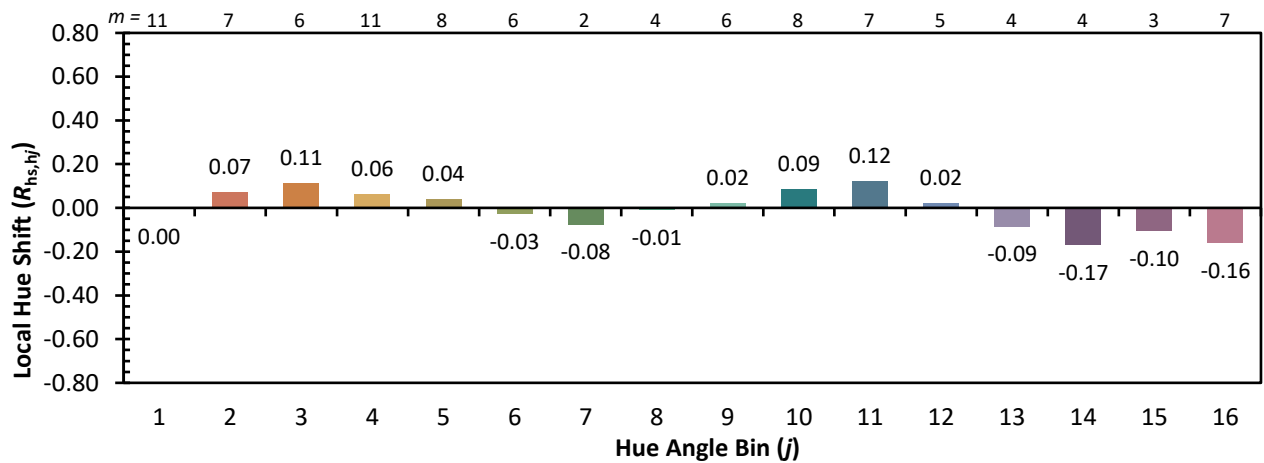
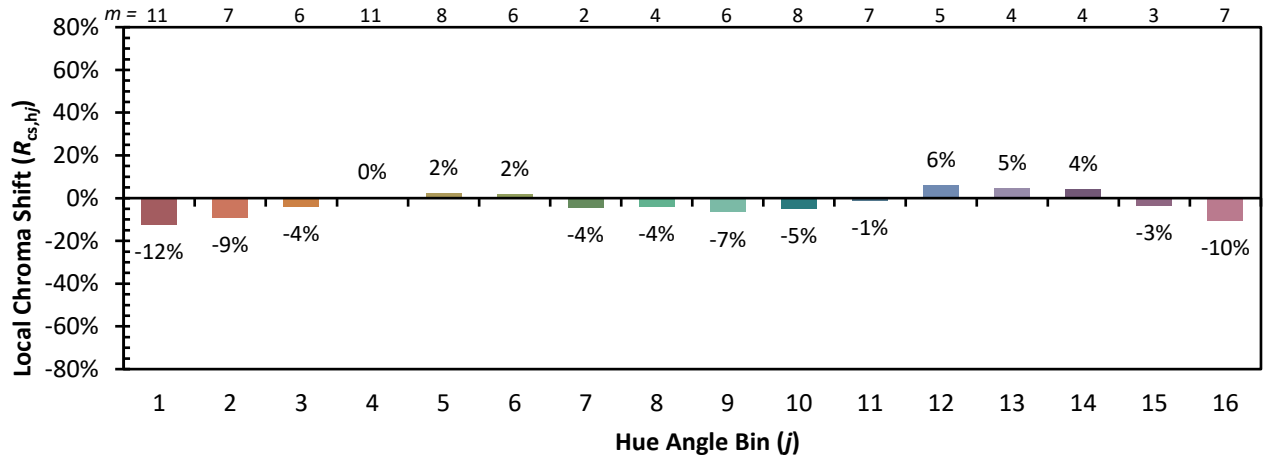


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

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